Draft Environmental Assessment
State Project No. H.008220, RPC Project No. LA406ea
Woodland Highway/LA 406 Widening (LA Hwy 23 To LA Hwy 407)
Orleans And Plaquemines Parishes
Belle Chasse And New Orleans, Louisiana

Regional Planning Commission For Jefferson, Orleans, Plaquemines, St. Bernard And St. Tammany Parishes
And U.S. Department Of Transportation Federal Highway Administration
And Louisiana Department Of Transportation And Development
January 2015

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DRAFT ENVIRONMENTAL ASSESSMENT

STATE PROJECT NO. H.008220
RPC PROJECT NO. LA406EA
LA 406/WOODLAND HIGHWAY WIDENING
(LA HWY 23 TO LA HWY 407)
ORLEANS AND PLAQUEMINES PARISHES
BELLE CHASSE AND NEW ORLEANS, LOUISIANA

REGIONAL PLANNING COMMISSION for JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD and ST. TAMMANY PARISHES
AND
US DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
AND
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

January 2015

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S.0 Summary

S.1 Description of the Proposed Action

The Regional Planning Commission for Jefferson, Orleans, Plaquemines, St. Bernard and St. Tammany Parishes (RPC), in cooperation with the Louisiana Department of Transportation and Development (LADOTD) and the Federal Highway Administration (FHWA) proposes to widen LA 406/Woodland Highway from LA 23/Belle Chasse Highway to approximately 0.3 mile south of LA 407/General de Gaulle Drive in Belle Chasse, within Plaquemines and Orleans Parishes, Louisiana. The total length of the project is approximately 3.27 miles. The improved highway will include four, 12-foot travel lanes with an 18-foot raised grass median with curb and gutter shoulders. Median breaks will be provided at seven locations along the highway. A 10-foot shared-use bicycle and pedestrian path will also be constructed along the west side of the highway. The widening will take place within the existing right-of-way and no relocations will be required.

As this project is anticipated to receive funding assistance from the FHWA, it is subject to the requirements of the National Environmental Policy Act (NEPA). This document is an Environmental Assessment (EA), prepared to meet NEPA requirements. When the significance of impacts of a transportation project proposal is uncertain, an EA is prepared to assist in making this determination. If it is found that significant impacts will result, an environmental impact statement (EIS) should be prepared. FHWA must approve an EA before it is made available to the public. EAs are made available to the public through notices of availability in local, state, or regional clearinghouses, newspapers and other means. After public comments are received and considered, a determination of the significance of the impacts is made:

- If at any point in the process of preparing an EA it is discovered that the project would result in significant impacts an EIS must be prepared.
- If, after completing the EA, it is evident that there are no significant impacts associated with the project, a finding of no significant impact (FONSI) may be prepared.

If it is determined that there will be no significant impacts a FONSI will be prepared to conclude the process and document the decision. A FONSI is issued when environmental analysis and interagency review during the EA process find a project to have no significant impacts on the quality of the environment. The FONSI document is the EA modified to reflect all applicable comments and responses. If it was not done in the EA, the FONSI must include the project sponsor's recommendation or selected alternative. No formal public circulation of the FONSI is required, but the state clearinghouse must be notified of the availability of the FONSI. In addition, FHWA recommends that the public be notified through notices in local newspapers.

S.2 Project Purpose

The purpose of the project is to reduce congestion, improve safety, and accommodate current and future traffic demands.

S.3 Analysis of Alternatives

Section 2 includes a discussion of the alternatives considered in the planning of the proposed LA 406/Woodland Highway widening project. A planning study for widening LA 406/Woodland Highway from LA 23/Belle Chasse Highway, beyond LA 47/General de Gaulle Drive, to English Turn Parkway was conducted in March 2004. The purpose of the study was to determine the feasibility of widening LA 406/Woodland Highway in order to reduce existing congestion and to accommodate ongoing and future demands created by new residential and commercial development along LA 406/Woodland Highway as well as within the Belle Chasse area in general. The planning study recommended that the highway be widened to include intermittent five, four, or three-lanes as soon as possible. The planning study also forecast that a continuous five or four-lane section will be needed sometime before 2025.

In April 2013, a traffic analysis was performed along the study corridor to assess the 2011 existing and future traffic volumes for the year 2038. The year 2038 analysis also evaluated the capacity for the future Build and No-Build Alternative scenarios. The traffic analysis recommended that the highway be widened to include two 12-foot travel lanes per direction from LA 23/Belle Chasse Highway to LA 407/General de Gaulle Drive.

S.4 Comments and Coordination

A Solicitation of Views (SOV) letter was sent to Federal, state, and local agencies as well as tribal interests on December 13, 2011 and a public meeting was held for the project on April 25, 2012.

Following the distribution of the Draft Environmental Assessment, a comment period will be observed and a public hearing will be held to give the public an opportunity to comment on the proposed Build Alternative. Comments received from the public hearing will be considered and responses will be included in the Final Environmental Document.

The designation of a proposed Build Alternative in the Draft Environmental Assessment does not preclude further minor refinement of the road design. Only after the publication of the Draft Environmental Assessment and the review of comments received will a decision be made as to the selection of the alternative for construction. After the close of the public hearing comment period, the RPC, the LADOTD, and the FHWA will evaluate all comments received and a decision will be made regarding an alternative to move forward through the NEPA and design process.

At the conclusion of the NEPA process, and if the Final Environmental Assessment has shown that the project will not have significant impacts to the human or natural environment, the FHWA will issue a FONSI. The FONSI would allow Federal funding to be used in the engineering and construction of the LA 406/Woodland Highway widening project.

S.5 Right-of-Way Requirements, Utilities, and Estimated Construction Cost

No additional right-of-way will be required for the proposed LA 406/Woodland Highway widening project.

Relocation plans for utilities will be developed during the final design phase of the project. Functional or financial responsibility for the relocation of utilities may differ depending on prior agreements between the utility providers, current landowners, local government, and the LADOTD. The determination of responsibility will be in accordance with LADOTD policies and procedures. The utility relocation that is expected to occur includes sub-surface gas lines that cross the highway which may need to be lowered. The majority of other major utilities are located within an existing easement that is adjacent to the existing right-of-way and outside of the proposed construction limits.

The 2014 preliminary estimated construction cost for the proposed LA 406/Woodland Highway widening project is $22,743,619.31.

S.6 Project Impacts

Table S-6-1 summarizes the potential impacts associated with the proposed LA 406/Woodland Highway widening project. The environmental consequences associated with the proposed project are discussed in Section 3. Temporary construction impacts are discussed in Section 3.20.

S.7 Mitigation Measures

The proposed Build Alternative was developed so as not to require additional right-of-way while taking into consideration any impacts to social, economic, cultural, and environmentally sensitive resources. Where resource avoidance is not practical, minimization or mitigation measures will be employed prior to construction. The following coordination or avoidance measures will be utilized through the development of the project:

- Should the US Army Corp of Engineers (USACE) determine that Jurisdictional Wetlands or Waters of the US are impacted, appropriate mitigation will be completed in consultation with the USACE prior to construction;
- In accordance with the Clean Water Act (CWA), a Section 401 Water Quality Certification will be obtained prior to construction to mitigate for impacts to waters of the state including wetlands;
- Louisiana Pollutant Discharge Elimination System (LPDES) Storm Water General Permit for Construction Activities will be obtained prior to construction to mitigate for impacts to area waters;
- Coastal Use Permit (CUP) will be obtained to mitigate for impacts to coastal resources; and a
- Flood Protection Levees and Floodgates Approval will be obtained prior to construction to reduce the probability and risk of flooding in the area as a result of the project.

Table S-6-1: LA 406/Woodland Highway Widening Summary of Impacts

Feature or Resource	Involvement or Impact
Real Estate / Right-of-Way	None Required
Cultural and Section 106 Resources	
Section 4(f) or 6(f) Properties?	No
Historic Sites?	No
Archeological Sites?	No
Natural Resources	
Wetland Impacts?	No
Other Waters of the US Impacts?	Yes
Endangered/Threatened Species/Habitat Impacts?	No
Floodplain Impacts?	Yes
Coastal Zone Management Impacts?	Yes
Coastal Barrier Island Impacts	No
Farmland Impacts	No
Sole Source Aquifer Impacts	No
Natural or Scenic Stream Impacts	No
Navigable Waterway Impacts	No
Physical Impacts	
Noise Impacts	Yes
Air Quality Impacts	No
Social Impacts	
Land Use Change Impacts	No
Churches and Schools Impacts	No
Title VI Environmental Justice Impacts	No
Hospitals, Medical Facilities, Fire, Police Impacts	No
Transportation Pattern Changes	No
Community Cohesion Impacts	No
Major Social/Economic Construction Impacts	No
Special Construction Times Required	No
Context Sensitive Solutions Applied	No
Highway Closure Required	No

S.8 Permits and Approvals

The Build Alternative may require the preparation and submittal of the following Federal and state permit applications:

- Department of the Army CWA Section 404/10 Permit for impacts to other waters;
- CWA Section 401 Water Quality Certification;
- LPDES Storm Water General Permit for Construction Activities;
- CUP; and
- Flood Protection Levees and Floodgates Approval.

Department of the Army CWA Section 404/10 Permit

The USACE requires a permit under the authority of Section 404 of the Department of the Army CWA and Section 10 of the Rivers and Harbors Act for impacts to navigable water and waters of the US, including wetlands. Only the USACE can make an impact

determination on wetlands and other waters affected by construction of the proposed Build Alternative; therefore, a jurisdictional determination will have to be obtained for the study corridor. A Section 404/10 permit will need to be obtained, if the USACE determines that the proposed Build Alternative will impact navigable waters or other waters of the US, including wetlands. Two canals, Planters Canal and the Industrial Canal are crossed by the Build Alternative. It is not anticipated that these canals are navigable canals requiring a permit. Based on the *Wetlands Finding Report*, it is expected that the project will require a Pre-Construction Notification (PCN) for authorization under Programmatic General Permit (PGP), be filed with the USACE New Orleans District (MVN).

Section 401 Water Quality Certification

Section 401 of the CWA requires that a Water Quality Certification (WQC) be obtained in conjunction with the submittal of the Section 404/10 permit application. The Louisiana Department of Environment Quality (LDEQ), under the authority contained in the Louisiana Revised Statutes of 1950, Title 30, Chapter 11, Part IV, Section 2074 A (3) and provisions of Section 401 of the CWA (PL 95 217), must certify that any work placing dredged or fill material into waters of the state including wetlands will not violate the state's water quality standards.

LPDES Storm Water General Permit for Construction Activities

The LDEQ requires projects with discharges of storm water from construction activities as defined in the Louisiana Administrative Code (LAC) 33:IX.2511.B.14.j to obtain a LPDES Storm Water General Permit for Construction Activities. Storm water runoff from construction activities requires an LPDES permit if it results in the disturbance of greater than one acre. The proposed Build Alternative will result in the disturbance of greater than one acre; therefore a LPDES Storm Water General Permit for Construction Activity will be required.

As part of the LDEQ Storm Water General Permit requirements, a Storm Water Pollution Prevention Plan (SWPPP) will be developed for the construction activities. The SWPPP will provide site specific Best Management Plans (BMPs), maintenance procedures, and an inspection process that will minimize construction impacts to water quality.

Coastal Use Permit

Under authority of the Louisiana State and Local Coastal Resources Management Act of 1978, as amended (Act 361, La. R.S. 49:214.21 et seq), the Office of Coastal Management (OCM) of the Louisiana Department of Natural Resources (LDNR) regulates development activities and manages the resources of the coastal zone. The OCM requires that an application for a CUP be submitted for projects that involve dredging or filling within the coastal zone boundary. The project will involve filling within the coastal zone and therefore will require a CUP.

Flood Protection Levees and Floodgates

The Southeast Louisiana Flood Protection Authority-West (SLFPAW) was created by the Louisiana Legislature in 2006. The SLFPAW manages two levee districts, the West Jefferson Levee District and the Algiers Levee District, and their jurisdiction contains almost all the land in Jefferson and Orleans Parishes west of the Mississippi River. A levee permit is required for any construction that includes excavation within 300 feet or major excavation within 1,500 feet of any levee within SLFPAW. At the point where LA 406/Woodland Highway turns due south, it is approximately 450 feet from the levee associated with the Intracoastal Waterway (ICWW). If significant excavation occurs at this bend, the SLFPAW must be notified.

S.9 Historic Resources

An historic property is any property that is included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). NRHP-listed or eligible properties fall into five broad categories:

- *Buildings:* Constructions designed principally to shelter human activity, including houses, barns, commercial buildings, government buildings, etc.
- *Structures:* Functional constructions not principally designed for human shelter, including bridges, canals, lighthouses, dams, boats, aircrafts, etc.
- *Sites:* Locations of significant events, or prehistoric or historic occupation or activity, including ceremonial sites, battlefields, shipwrecks, trails, designed landscapes, archaeological remains of habitation sites, natural features having cultural significance, etc.
- *Objects:* Constructions that are relatively small in scale, frequently artistic in nature, and associated with a specific setting or environment. They are not museum objects, but include sculptures, monuments, fountains, boundary markers, etc.
- *Districts:* A concentration or continuity of sites, buildings, structures, or objects that are united by their history or aesthetics. The identity of a district results from the interrelationship of its resources. Frequently encountered districts include residential areas, commercial areas, transportation networks, large farms, rural villages, groupings of habitation sites or ceremonial sites.

Historic properties also include artifacts, records, and remains related to and located within such properties, and properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization.

No historic resources were identified along the study corridor. The proposed widening of LA 406/Woodland Highway will have no effect on any listed or known historic resources or archaeological resources and no further investigations are required.

S.10 Archeological Resources

No archeological resources were identified along the study corridor. In addition, no additional right-of-way will be required for the proposed project. The proposed widening of LA 406/Woodland Highway will have no effect on archeological resources and no further investigations are required. If archaeological materials are uncovered during

construction, all construction work in the area of the find will cease. The LADOTD and recognized Native American tribes will be immediately contacted so that their representative may have the opportunity to examine and evaluate the materials.

S.11 Traffic Congestion

Construction sequence and traffic maintenance plans will be developed as part of the final design, to allow for continued access to adjacent properties. Requirements for special considerations will be identified and addressed. The traffic analysis report stated that if no improvements are made to LA 406/Woodland Highway, the 2038 level of service (LOS) will continue to worsen to a condition of LOS E or LOS F. The report concluded that by widening LA 406/Woodland Highway to a four-lane divided highway, the LOS will improve to A or B in 2038.

S.12 Air Quality

An *Air Quality Analysis Report* (August 2012) was completed to determine if any localized impacts would occur under the Build Alternative condition; A quantitative analysis of Carbon Dioxide (CO_2) emissions was performed along with a qualitative mobile source air toxics (MSATs) analysis and the results determined that no impacts to air quality will occur as a result of the project. The project does not require Carbon Monoxide (CO) or Particulate Matter (PM) hotspot analyses because the project does not involve modifications to a signalized intersection and the future traffic volume for the proposed action is less than 140,000 vehicles per day. The proposed improvements will reduce traffic congestion and the parishes are in attainment for criteria air pollutants. Therefore, short-term or long-term air quality impacts are not anticipated, and an air quality analysis was not required for this project.

S.13 Noise

A *Noise Analysis Technical Report* (September 2013) was completed for the project to consider the potential noise impacts that may result from the proposed LA 406/Woodland Highway widening project. The analysis included a determination of the noise levels at land uses for the 2011 Existing and 2038 No-Build and Build Alternative conditions and analyzed noise abatement measures to mitigate potential impacts giving weight to the benefits and costs of abatement and to overall social, economic, and environmental effects.

The noise analysis was performed using the FHWA's Traffic Noise Model (TNM) Version 2.5. The noise barrier analyses were also performed using the TNM model. TNM predicted noise impacts that approach or exceed the Noise Abatement Criteria (NAC) at 24 modeled receptor sites representing 26 individual noise sensitive receptor sites for the 2038 Build Alternative. As a result, noise abatement measures were evaluated at several locations along the study corridor. The barriers were analyzed relative to the LADOTD's reasonableness criteria. All of the barriers were found to meet the 8 dBA reduction goal; however, none were able to meet the LADOTD's cost-per-benefitted-receptor goal. Therefore, it was determined that noise barriers were not reasonable for the proposed Woodland Highway/LA 406 project.

Summary of Permits, Mitigation and Commitments

The following table is a list of potential permits, mitigation, and commitments that must be filed, approved, and completed prior to construction of the LA 406/Woodland Highway widening project as it is designed and funded. A discussion of all permits, mitigation, and commitments required for the proposed action is included in Section 3 of this document.

Permit, Mitigation, or Commitment	Agency, Organization, or Individual Granting Approval
Department of the Army Section 404/10 Permit	USACE
401 Water Quality Certification	LDEQ
Storm Water General Permit for Construction Activities	LDEQ
Mitigation for Impact to Jurisdictional Wetlands and/or Jurisdictional Waters of the US	USACE, LDNR, LDEQ
Use of BMPs during construction	LDEQ
Letters of No Objection, Floodplains	Floodplain Administrator for RPC
Engineering “No Rise” Certification	Floodplain Administrator for RPC
Coordinate with Utility Providers on Relocations	Plaquemines and Orleans Parishes
Coastal Use Permit	LDNR
Levee/Local Permits	Algiers Levee District, Plaquemines Parish Government, USACE, LADOTD

Environmental Determination Checklist

State Project No. H.008220
RPC Project No. LA406EA
Name: LA 406/WOODLAND HIGHWAY WIDENING (LA 23 TO 0.3 MILE SOUTH OF LA 407)
Route: LA 406
Parish: PLAQUEMINES AND ORLEANS PARISH

1. General Information

Status: ( ) Conceptual Layout ( ) Plan-in-Hand
( ) Line and Grade (X) Preliminary Plans
( ) Survey ( ) Final Design

2. Class of Action

( ) Environmental Impact Statement (E.I.S.)
(X) Environmental Assessment (E.A.)
( ) Categorical Exclusion (C.E.)
( ) Programmatic C.E. (as defined in letter of agreement dated 03/15/95, does not require FHWA approval)

3. Project Description (use attachment if necessary)

LA 406/Woodland Highway will be widened from LA 23/Belle Chasse Highway to approximately 0.3 mile south of LA 407/General de Gaulle Drive in Belle Chasse, within Plaquemines and Orleans Parishes, Louisiana. The total length of the new highway is approximately 3.27 miles. The improved highway will include four, 12-foot travel lanes with an 18-foot raised grass median with curb and gutter shoulders. A 10-foot shared-use bicycle and pedestrian path will also be constructed along the west side of the highway. The widening will take place within the existing right-of-way and no relocations will be required.

4. Public Involvement

(X) Views were solicited on December 13, 2011 and on June 5, 2012.
Responses are attached.
( ) No adverse comments were received.
(X) Comments are addressed in Chapter 6.
( ) A public hearing (P/H)/Opportunity is not required.
(X) An opportunity for requesting a P/H will be afforded upon your concurrence.
( ) Opportunity was afforded, with no requests for P/H.
( ) A Public Hearing was held on _____.
(X) A Public Meeting was held on April 25, 2012.

5. Real Estate

	NO	YES
a. Will additional right-of-way be required?	(X)	( )
b. Will any relocations be required?	(X)	( )
c. Are construction or drainage servitudes required?	(X)	( )
d. Will right-of-way be required from a Wetland Reserve Program (WRP) property?	(X)	( )

6. Cultural and 106 Impacts

	NO	YES
a. Section 4(f) or 6(f) lands		
Are any impacted by the project? (If so, list below)	(X)	( )
Are any adjacent to the project? (If so, list below)	(X)	( )
b. Known Historic sites/structures		
Are any impacted by the project? (If so, list below)	(X)	( )
Are any adjacent to the project? (If so, list below)	(X)	( )
c. Known Archaeological sites		
Are any impacted by the project? (If so, list site # below)	(X)	( )
Are any adjacent to the project? (If so, list site # below)	(X)	( )
d. Cemeteries		
Are any impacted by the project? (If so, list below)	(X)	( )
Are any adjacent to the project? (If so, list below)	(X)	( )
e. Historic Bridges	(X)	( )

7. Wetlands

	NO	YES
a. Are wetlands being affected?	(X)	( )
b. Are other waters of the US being affected?	( )	(X)
c. Can C.O.E. Nationwide Permit be used?	(X)	( )

8. Natural Environment

	NO	YES
a. Endangered/Threatened Species/Habitat?	(X)	( )
b. Within 100-Year Floodplain?	( )	(X)
Is project a significant encroachment in Floodplain?	(X)	( )
c. In Coastal Zone Management Area?	( )	(X)
Is the project consistent with the Coastal Management Program?	( )	(X)
Will a Coastal Use Permit be required?	( )	(X)
d. Coastal Barrier Island (Grand Isle only)?	(X)	( )
e. Farmlands (use form AD 1006 if necessary)?	(X)	( )
f. Is project on Sole Source Aquifer?	(X)	( )
Is coordination with USEPA necessary?	(X)	( )
g. Natural & Scenic Stream Permit required?	(X)	( )
h. Is project impacting a waterway?	( )	(X)
Has navigability determination been made?	(X)	( )
Will a US Coast Guard permit or amended permit be required?	(X)	( )

9. Physical Impacts

	NO	YES
a. Is a noise analysis warranted (Type I project)?	( )	(X)
Are there noise impacts based on violation of the NAC?	( )	(X)
Are there noise impacts based on the 10 dBA increase?	(X)	( )
Are noise abatement measures reasonable and feasible?	(X)	( )
b. Is an air quality study warranted?	(X)	( )
Do project level air quality levels exceed the NAAQS for CO?	(X)	( )
c. Is project in a non-attainment area for Carbon monoxide (CO), Ozone (O_3), Nitrogen dioxide (NO_2), or Particulates (PM-10)?	(X)	( )
d. Is project in an approved Transportation Plan, Transportation Improvement Program (TIP) and State Transportation Improvement Program (STIP)?	( )	(X)
e. Are construction air, noise, & water impacts major?	(X)	( )
Are there any known waste sites or USTs?	(X)	( )
Will these sites require further investigation prior to purchase?	(X)	( )

10. Social Impacts

	NO	YES
a. Land use changes?	(X)	( )
b. Churches and Schools		
Are any impacted by the project? (If so, list below)	(X)	( )
Are any adjacent to the project? (If so, list below)	( )	(X)
c. Title VI Considerations?	( )	(X)
d. Will any specific groups be adversely affected?		
(i.e., minorities, low-income, elderly, disabled, etc.)?	(X)	( )
e. Hospitals, medical facilities, fire police		
Are any impacted by the project? (If so, list below)	(X)	( )
Are any adjacent to the project? (If so, list below)	(X)	( )
f. Transportation pattern changes?	(X)	( )
g. Community cohesion?	(X)	( )
h. Are short-term social/economic impacts due to construction		
considered major?	(X)	( )
I. Do conditions warrant special construction times?		
(i.e., school in session, congestion, tourist season, harvest)?	(X)	( )
j. Were Context Sensitive Solutions considered? (If so explain below)	(X)	( )
k. Will the highway/bridge be closed? (If yes, answer questions below)	(X)	( )
Will a detour bridge be provided?	(X)	( )
Will a detour route be signed?	(X)	( )

11. Other (Use this space to explain or expand answers to questions above.)

10.b. Churches and Schools. One church, Exceleration Church is located along the project at 202 Woodland Highway.

Preparer: Janet L. Evans
Title: Vice President
Date: _____

Attachments

(X) S.O.V. and Responses
(X) Wetlands Finding
( ) Project Description Sheet
( ) Conceptual Stage Relocation Plan
(X) Noise Analysis
(X) Air Analysis
(X) Exhibits and/or Maps
( ) 4(f) Evaluation
( ) Form AD 1006 (Farmlands)
( ) 106 Documentation
(X) Other: Public Involvement Comments

1.0 PURPOSE AND NEED

1.1 Description and Location of the Proposed Action

The LADOTD and the RPC propose widening LA 406/Woodland Highway in Belle Chasse, within Plaquemines and Orleans Parishes, Louisiana. A planning study was completed in March 2004 to assess the project's feasibility and establish the requirements for widening LA 406/Woodland Highway to accommodate current and future traffic demands in the Belle Chasse area. The March 2004 planning study concluded that a five or four-lane highway would be needed sometime before 2025.

In April 2013, a traffic analysis was performed along the study corridor to assess the existing and future traffic volumes for the year 2038. The April 2013 traffic analysis recommended that the highway be widened to include two 12-foot travel lanes per direction from LA 23/Belle Chasse Highway to LA 407/General de Gaulle Drive. This recommendation was based on the need to accommodate the projected increase in traffic and the need to improve safety along the highway.

The total length of the project is approximately 3.27 miles beginning at Latitude 29°51'44.55"N and Longitude 89°59'45.38"W and ending at Latitude 29°54'14.46"N and Longitude 89°58'44.16"W. The study corridor includes approximately 3,368.7 acres with a majority located in Plaquemines Parish and a small portion extending into Orleans Parish (see **Figure 1**). The study corridor is bound by the ICWW to the west, Donner Canal northeast of the LA 407/General de Gaulle Drive intersection to the north, the Mississippi River to the east, and the LA 23/Belle Chasse Highway to the south. The logical termini for the project are the intersection of LA 406/Woodland Highway and LA 23/Belle Chasse Highway and along LA 406/Woodland Highway where it widens from two-lanes to divided four-lanes approximately 0.3 mile south of the intersection of LA 406/Woodland Highway and LA 407/General de Gaulle Drive. The southern terminus at the intersection of LA 406/Woodland Highway and LA 23/Belle Chasse Highway is logical because LA 23/Belle Chasse Highway is an existing four-lane divided Principal Arterial highway. The northern terminus is logical because the existing LA 406/Woodland Highway is a divided four-lane highway approximately 0.3 mile south of LA 407/General de Gaulle Drive. The termini were described in a letter to the LADOTD dated March 23, 2012 included in **Appendix A**. The logical termini were approved by the FHWA in a letter to the LADOTD dated May 8, 2012 included in **Appendix B**.

LA 406/Woodland Highway is classified as a Principal Arterial highway with inconsistent lane configurations through the limits of the project. The highway primarily consists of two lanes; however, an approximate one mile long segment of LA 406/Woodland Highway (from LA 23/Belle Chasse Highway to the entrance of Bailey Estates) consists of two-lanes with a center turn lane. A short segment near the project's northern terminus at LA 407/General de Gaulle Drive is four-lanes with a grassed median.

1.2 Purpose and Need of the Proposed Action

The purpose and need of the proposed widening of LA 406/Woodland Highway from LA 23/Belle Chasse Highway to approximately 0.3 mile south of LA 407/General de Gaulle Drive is to:

1. Reduce existing congestion,
2. Improve safety, and to
3. Accommodate current and future traffic demands along the study corridor created by continued residential and commercial development along LA 406/Woodland Highway as well as development in the vicinity of the project including the Federal City project in Algiers and the expansion of services at the Naval Air Station Joint Reserve Base in Belle Chasse.

1.3 Vehicular Traffic Conditions

1.3.1 Existing and Projected Average Daily Traffic

The existing year 2011 average daily traffic (ADT) along this segment of LA 406/Woodland Highway ranges from 8,664 to 10,239 vehicles. The projected ADT for design year 2038 ranges from 15,062 to 26,448 vehicles. This represents an increase of approximately 6,398 to 16,209 vehicles per day, depending upon the location along the study corridor, which is equivalent to a 38% to 58% increase in traffic volume between the existing year 2011 and design year 2038. **Table 1-1** summarizes the ADT for the existing year 2011 and the design year 2038 for the LA 406/Woodland Highway study corridor.

Table 1-1: Existing 2011 and Design Year 2038 Average Daily Traffic

Location	Average Daily Traffic*		Percent Increase from Existing Year (2011) to Design Year (2038)
	Existing Year (2011)	Design Year (2038)	
LA 406/Woodland Highway at Victoria Drive in the vicinity of the project begin point at LA 23/Belle Chasse Highway.	10,239	26,448	38%
LA 406/Woodland Highway near Chancellor Drive midway through the study corridor.	8,664	15,062	58%

** Average Daily Traffic derived from RPC.*

1.3.2 Existing and Projected LOS Conditions

LOS is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six LOS are defined, with letters designating each level, from A to F. **Table 1-2** provides an illustration of the LOS conditions of travel lanes along a four-lane highway. LOS A represents the best operating conditions and LOS F the worst. Each LOS represents a range of operating

conditions as the driver's perception of those conditions. Safety is not included in the measures that establish LOS.

Table 1-2: Travel Lanes Level of Service (LOS) Descriptions

Level of Service	Flow Condition Illustration	Description
A		Completely free-flow conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway and by driver preferences.
B		Indicative of free flow, although the presence of other vehicles begins to be noticeable. Average travel speeds are the same as in LOS A, but drivers have less freedom to maneuver.
C		Range in which the influence of traffic density on operations becomes marked. The ability to maneuver within the traffic stream is now clearly affected by the presence of other vehicles.
D		Range in which ability to maneuver is severely restricted because of traffic congestion. Travel speed begins to be reduced by increasing volumes.
E		Operation at or near capacity and is quite unstable. Vehicles are operating with the minimum spacing at which uniform flow can be maintained.
F		Breakdown condition where maneuverability and speeds may drop to zero.

The LOS was analyzed for both morning and evening peaks at two locations along LA 406/Woodland Highway for 2011 and 2038 traffic volumes. The traffic analysis can be found in **Appendix F**.

- **Existing 2011 LOS Conditions**

Currently the LA 406/Woodland Highway operates at a LOS C and D.

- **No-Build 2038 Alternative LOS**

If no improvements are made to LA 406/Woodland Highway, the 2038 LOS will continue to worsen to LOS E and LOS F. LOS E and F represent the worst traffic flow conditions for a highway.

- **Build Alternative 2038 LOS**

As previously discussed, LA 406/Woodland Highway is classified as a Principal Arterial highway in the study corridor. The LADOTD Design Guidelines state that the "*designer should strive to provide the highest level of service practical*" and that a LOS C is generally the minimum allowable goal under the design year traffic.

1.4 Safety / Crash Data

As part of the traffic analysis crash data was also obtained from the New Orleans RPC and reviewed. The crash data included a three year period from 2009 to 2011. During the three year period, an average of 47 crashes per year occurred along LA 406/Woodland Highway within the study corridor. None of the crashes involved fatalities or pedestrians. Rear-end collisions comprised 49% of the crashes over the three year period. The high rate of rear-end collisions is as a result of vehicles wanting to make left-turns being stopped in the through-lane while waiting for a break in traffic. The addition of through-lanes and a grassed median with designated left-turn breaks is expected to improve the safety conditions by removing stopped vehicles from the through-lanes. The addition of a grassed median will also improve safety by providing a separation between directional traffic.

Figure 1
Project Location Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 1 Project Location Map.mxd

2.0 ALTERNATIVES

The No-Action or No-Build Alternative and the Build Alternative are evaluated in this Draft Environmental Assessment.

2.1 No-Build Alternative

The No-Build Alternative will leave this portion of LA 406/Woodland Highway as it currently exists, other than the continuation of routine maintenance as needed. The No-Build, or No-Action Alternative constitutes a baseline condition from which to measure impacts. The No-Build Alternative will not relieve the existing traffic congestion problems and would not accommodate the future projected traffic volumes along the highway. The safety of the highway will also not be improved under the No-Build Alternative. If no improvements are made to the LA 406/Woodland Highway, the LOS would continue to drop and would eventually reach total failure represented by a LOS E and F.

2.2 Build Alternative

The Build Alternative proposes to widen LA 406/Woodland Highway from LA 23/Belle Chasse Highway to approximately 0.3 mile south of LA 407/General de Gaulle Drive in Belle Chasse, within Plaquemines and Orleans Parishes, Louisiana. The total length of the project is approximately 3.27 miles. The improved highway will include four, 12-foot travel lanes with an 18-foot raised grass median with curb and gutter shoulders. A 10-foot shared-use bicycle and pedestrian path will also be constructed along the west side of the highway. The widening will take place within the existing right-of-way and no relocations will be required.

The proposed Build Alternative is illustrated on **Figures 2a through 2f**. The proposed Build Alternative will meet the projected capacity needs for 2038 and will improve the safety of the highway by removing left-turn vehicles from the through-lanes and by separating directional traffic with a raised median. Median breaks will be provided at the following locations or cross roads in the form of median U-Turn openings:

- Median will begin at Station 115+00 1,500 feet north of the LA 23/Belle Chasse Highway intersection,
- Station 123+00 at Springwood Drive at the Springwood Estates sub-division,
- Station 136+00 with paved U-Turn bulb-outs,
- Station 144+50 at Pleasant Ridge Drive at the Pleasant Ridge Estates sub-division,
- Station 164+00 with paved U-Turn bulb-outs,
- Station 179+00 at Green Trails Drive the entrance to the Parks of Plaquemine sub-division,
- Station 193+00 at Chancellor Drive,
- Station 202+00 paved U-Turn bulb-outs,
- Station 216+00 approximately 0.5 mile north of Chancellor Drive,
- Station 229+40 approximately 0.25 mile south of Herbert Boulevard,
- Station 247+00 at Herbert Boulevard and Keating Drive.

2.3 Design Criteria

The design criteria for LA 406/Woodland Highway are for an Urban Arterial road with the status of an Urban Arterial-2 (UA-2) facility. The design guidelines for a UA-2 facility are summarized in **Table 2-1.**

2.4 Estimated Construction Cost

The estimated 2013 construction cost for the Build Alternative as described above is $22,743,619.31. A preliminary estimate of the cost is included in **Appendix H**.

Table 2-1: LADOTD Design Guidelines for Urban Arterial Roads

Item No.	Item	Urban Arterial (UA-2) Design Criteria
1	Design Speed	45 miles per hour
2	LOS [1]	C
3	Number of Lanes	2 (min) - 4 (typical)
4	Width of Travel Lanes	11 – 12 ft
5	Width of Shoulders (minimum)	
	(a) Inside on multilane facilities	N/A
	(b) Outside	8 ft [2]
6	Shoulder Type	Paved
7	Parking Lane Width	10 – 12 ft
8	Width of Median on Multilane Facilities	
	(a) Depressed	N/A
	(b) Raised	6 [3] – 30 ft
	(c) Two way left turn lane	11 - 14 typical [4] ft
9	Width of Sidewalk (minimum) (where used)	
	(a) When offset from curb	4 ft [5]
	(b) When adjacent to curb	6 ft [5]
10	Fore slope (vertical - horizontal)	1:3 (minimum) - 1:4 (desired)
11	Back slope (vertical - horizontal)	1:3
12	Pavement Cross-slope	2.5%
13	Min. Stopping Sight Distance	360 ft
14	Maximum Super-elevation (%)	4%
15	Minimum Radius (ft) [6, 7]	
	(a) With normal crown (-2.5% cross-slope)	1,000 ft
	(b) With 2.5% Super-elevation	750 ft
	(c) With full Super-elevation	700 ft
16	Maximum Grade	6%
17	Minimum Vertical Clearance [8]	16 ft
18	Minimum Clear Zone (ft)	
	(a) From edge of through-lane	24 [9] ft

	(b) Outside from back of curb (when curb is used)	6 (minimum) - 22 (desired) [11] ft
	(c) Median from back of curb [12] (when curb is used)	4 (minimum) - 18 (desired) ft
19	Bridge Design Live Load [13]	American Association of State Highway and Transportation Officials (AASHTO)
20	Width of Bridges (minimum) (face-to-face of bridge rail at gutter line) (ft)	
	(a) Curbed facilities (without sidewalks)	Traveled [14] way plus 8 ft
	(b) Shoulder facilities	Highway width
21	Guardrail Required at Bridge Ends	- [14]

Notes:

1. LOS D allowable in heavily developed urban areas.
   Program provides estimates of the population for the nation, states, and counties.

2. Curb may be used in place of shoulders on UA-1 and UA-2 facilities.

3. With Chief Engineer's approval, curb offsets may be eliminated and the minimum median with can be reduced to 4 feet. On principal arterials, particularly at intersections, the upper limit should be considered.

4. Cannot be used on multilane highways (with four or more through-lanes) without the Chief Engineer's approval.

5. Sidewalks must be separated from the shoulder and should be placed as near the right-of-way line as possible. On high speed facilities, they should preferably be placed outside the minimum clear zone shown in item 18.

6. It may be necessary to increase the radius of the curve and/or increase the shoulder width (maximum of 12 feet) to provide adequate stopping sight distance on structure.

7. The following radii apply at divisional islands. The radius selected must match the design speed of the road. These radii also apply to the other guidelines where divisional islands are mentioned.

Design Speed	*Radius (rounded)*	*Degree of Curve*	*Design Speed*	*Radius (rounded)*	*Degree of Curve*
20 mph	1,450'	4˚	40 mph	2,900'	2˚
25 mph	1,650'	3˚ 30'	45 mph	3,850'	1˚ 30'
30 mph	1,950'	3˚	50 mph	5,750'	1˚
35 mph	2,300'	2˚ 30'	55 & 60 mph	11,500'	0˚ 30'

8. An additional 6 inches should be added for additional future surfacing.

9. Applies to facilities with shoulders. Reference to the Roadside Design Guide when 1:3 fore slopes are used or for slopes flatter than 1:4.

10. The distance may be reduced by 6 feet if 1:6 slopes are used. For outside shoulders wider than 8 feet, further reduction should be proportional to the added shoulder width.

11. If outside shoulders and curb are used, refer to the Roadside Design Guide.

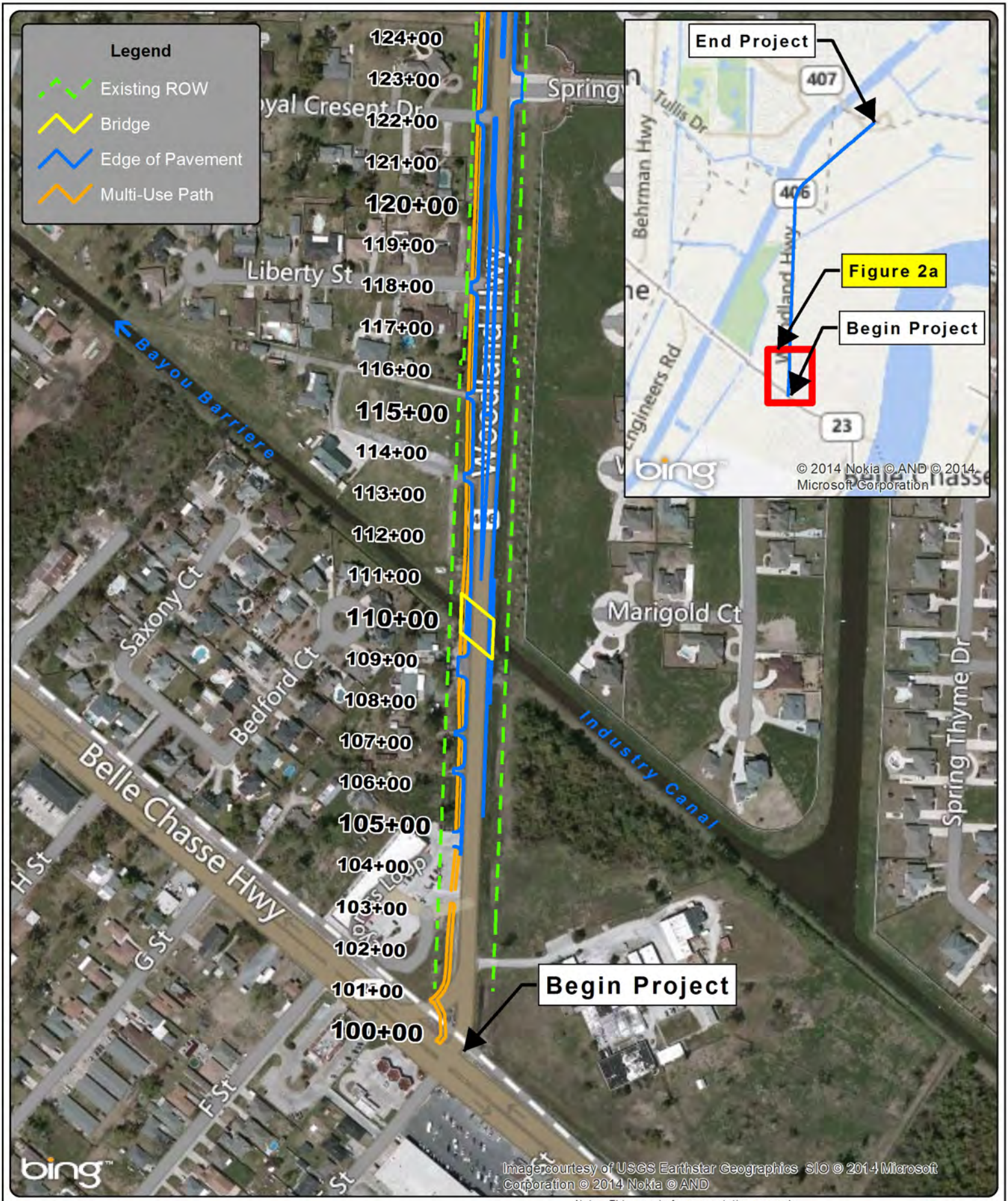
12. Where left turn lanes are provided or where the median is less than 6 feet in width, the minimum clearance will be 1.5 feet from back of curb. For median slopes steeper than 1:6, reference to the Roadside Design Guide for the desirable clear zone.

13. Load and Resistance Factor Design (LRFD) for Bridge design.

14. Refer to EDSM (Engineering Directives and Standards Manual) II.3.1.4 when sidewalks will be provided and for guardrail requirements.

General Note:

LADOTD pavement preservation minimum design guidelines or 3R minimum design guidelines (separate sheets) shall be applicable to those projects for which the primary purpose is to improve the riding surface.



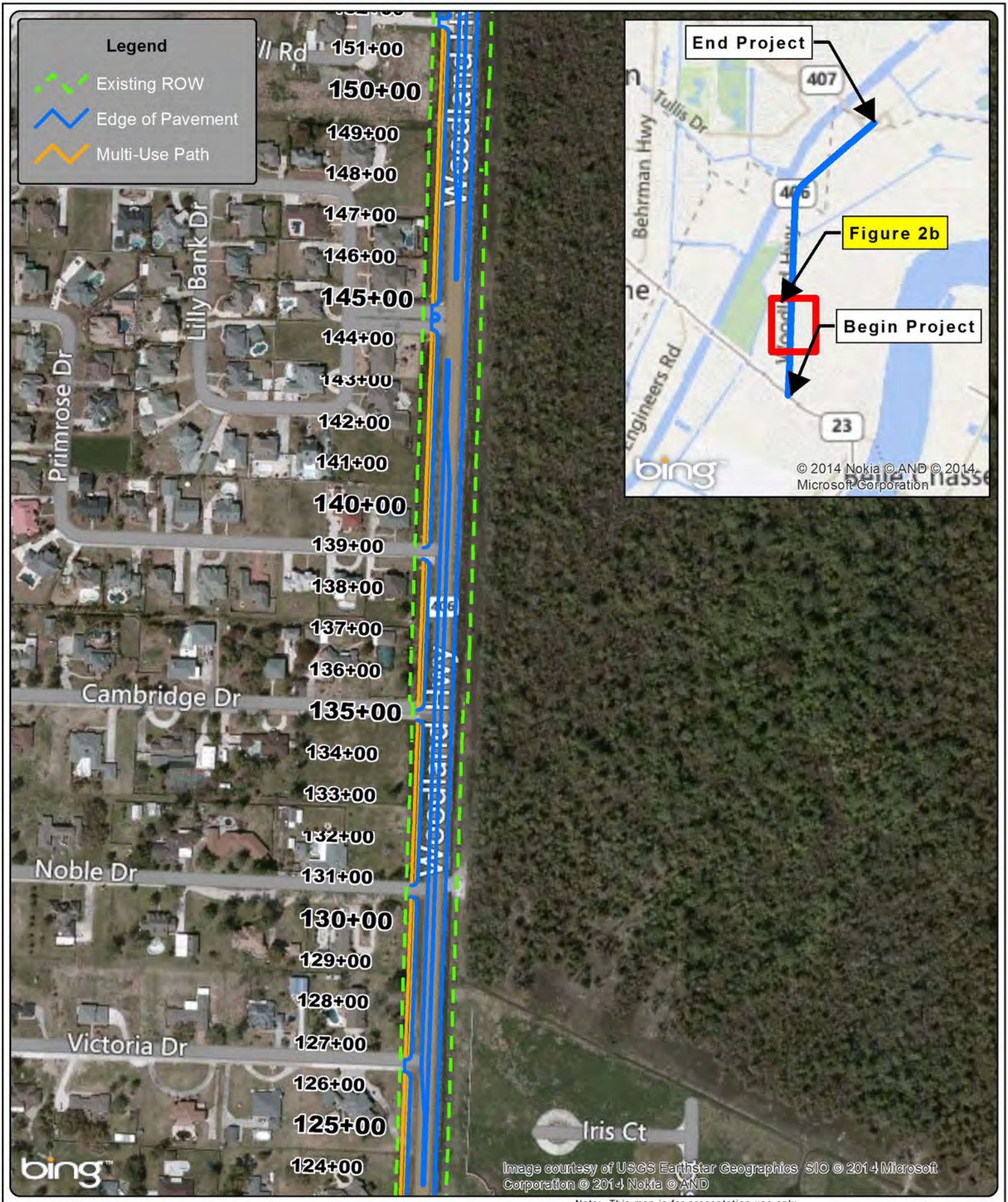
Note: This map is for presentation use only and not to be used for construction purposes.

0 150 300 Feet

1 inch = 300 feet

Figure 2a
Build Alternative Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 2a Build Alternative Map.mxd



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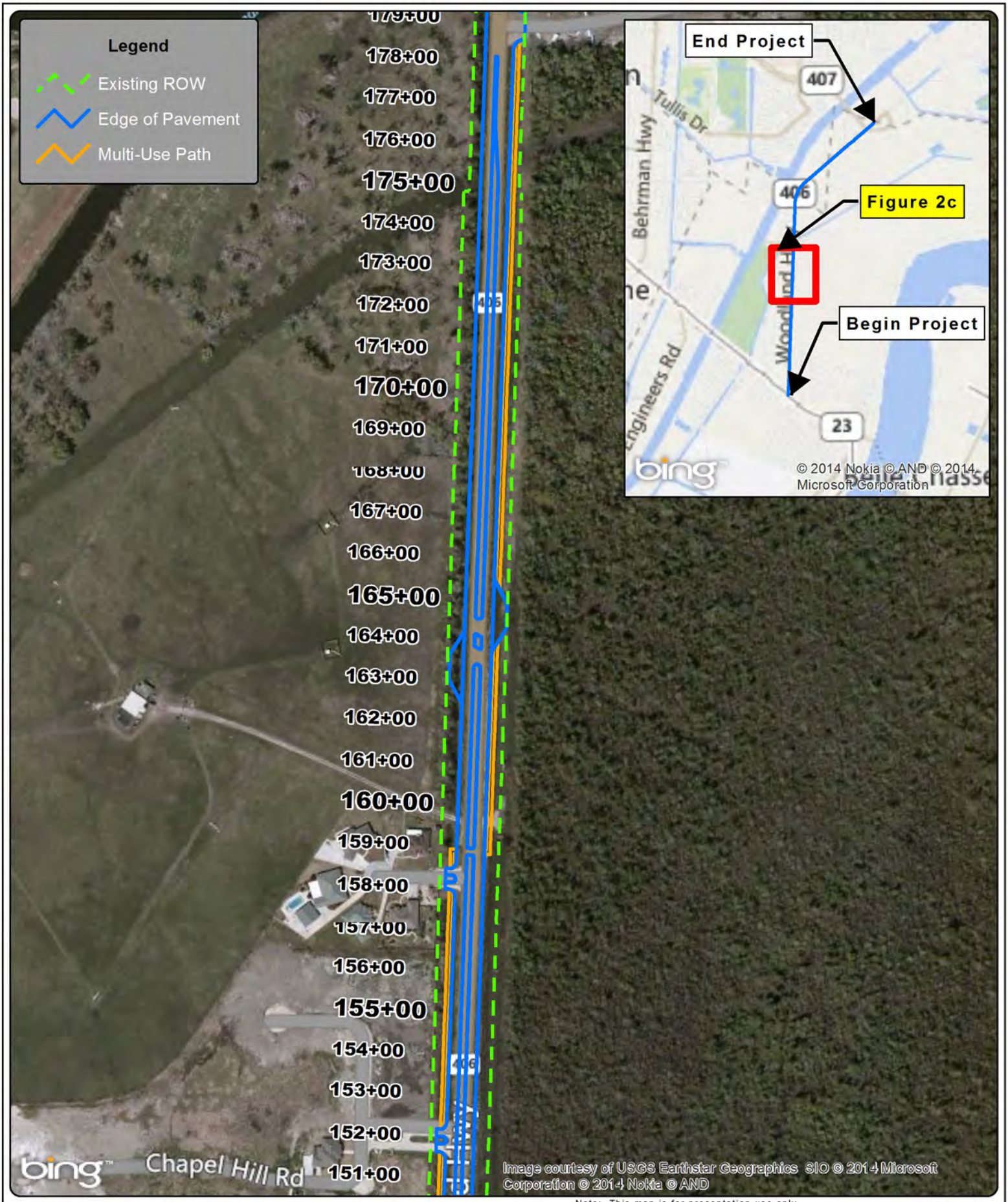
1 inch = 300 feet

Note: This map is for presentation use only and not to be used for construction purposes.

Figure 2b
Build Alternative Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 2b Build Alternative Map.mxd



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1 inch = 300 feet

Note: This map is for presentation use only and not to be used for construction purposes.

Figure 2c
Build Alternative Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

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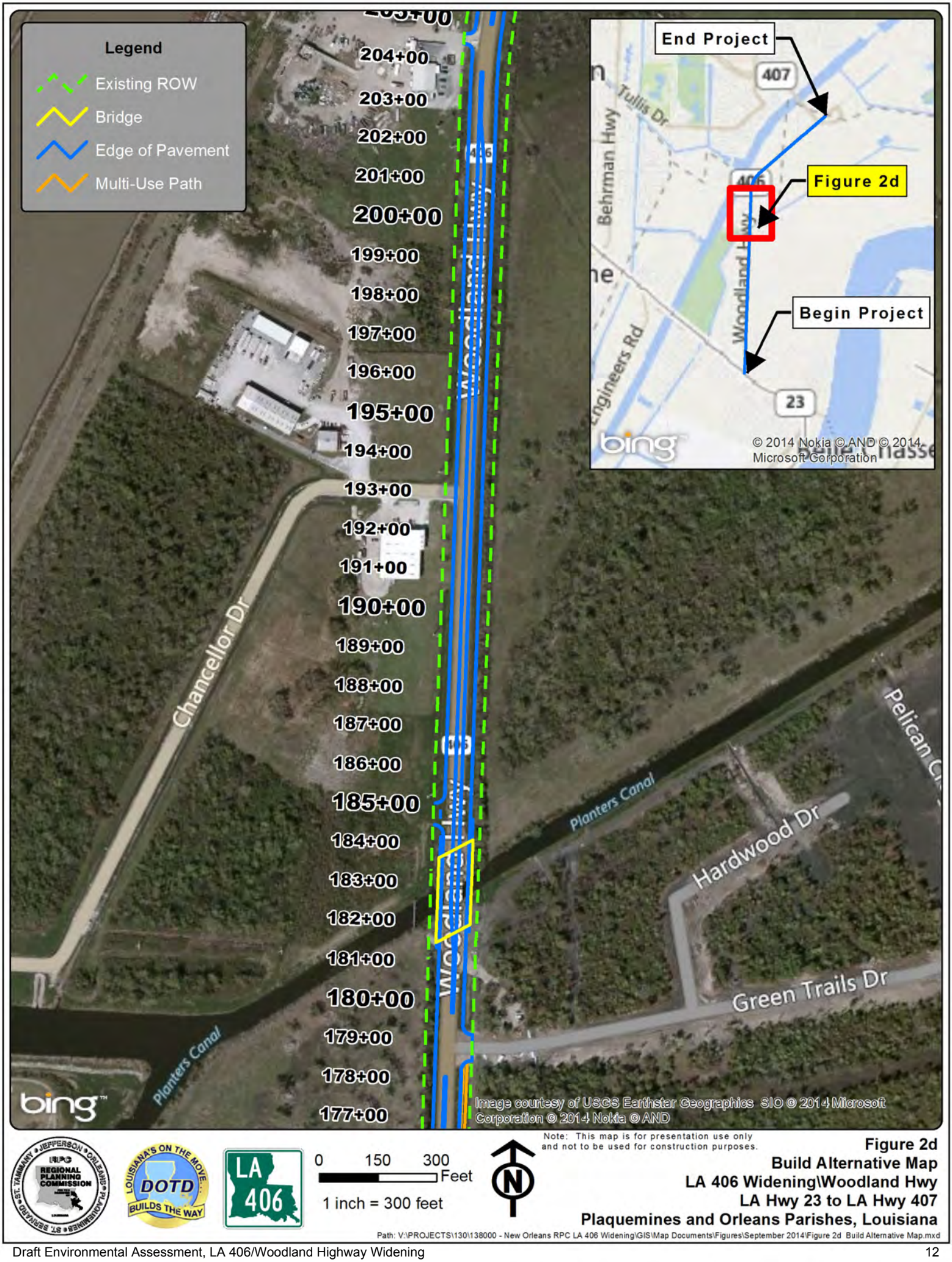
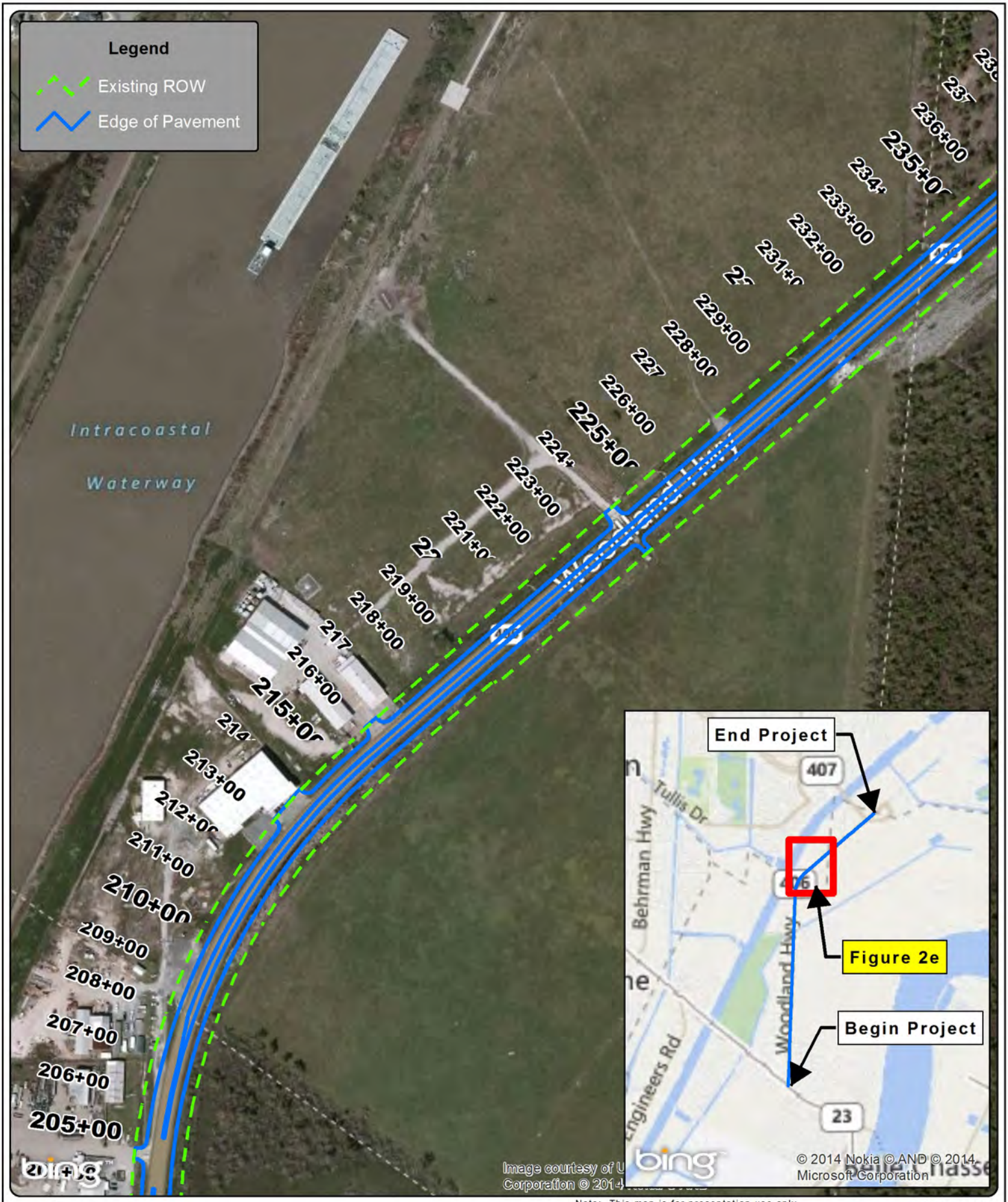


Figure 2d
Build Alternative Map
LA 406 Widening\Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 2d Build Alternative Map.mxd



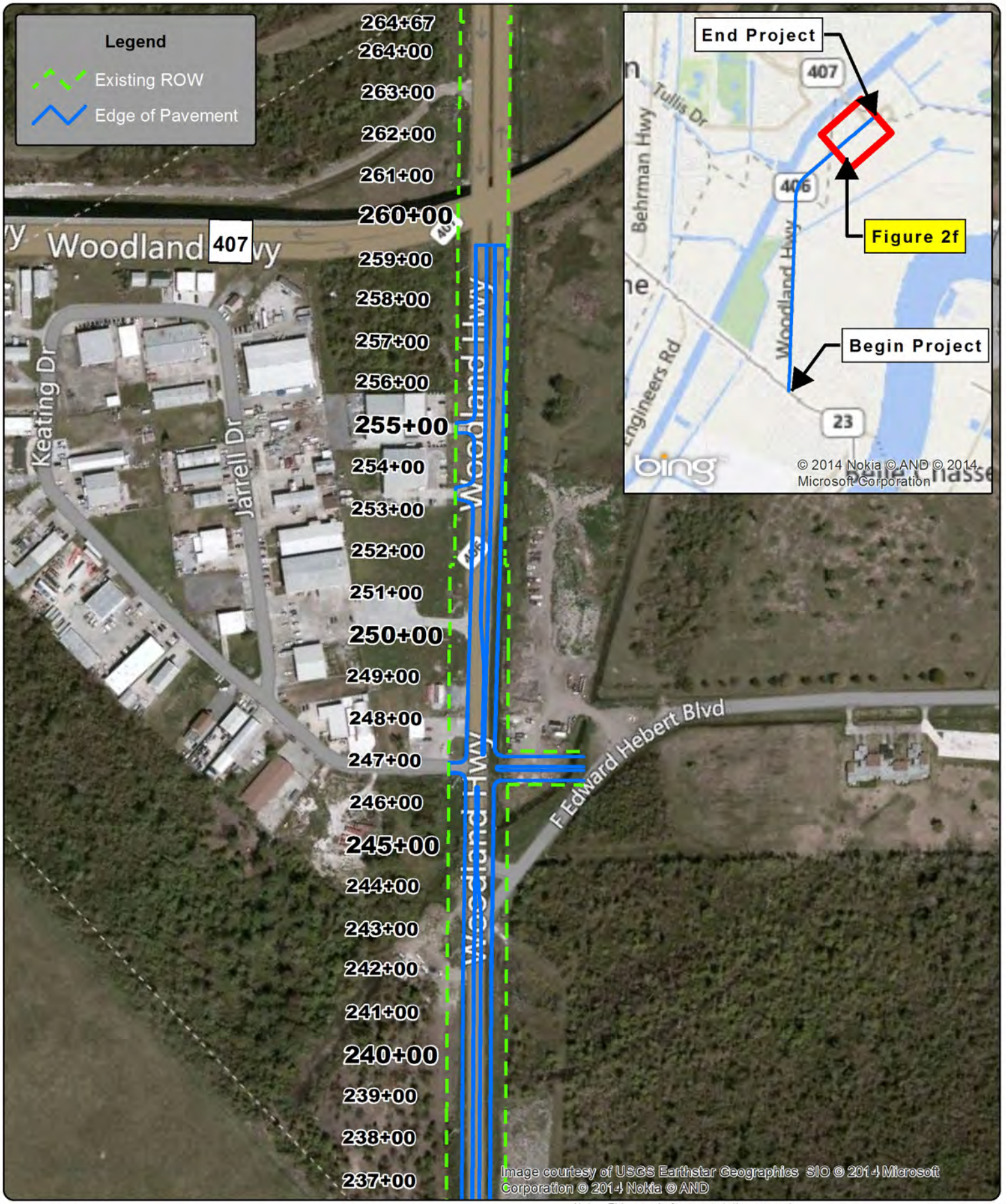
Note: This map is for presentation use only and not to be used for construction purposes.

0 150 300 Feet

1 inch = 300 feet

Figure 2e
Build Alternative Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 2e Build Alternative Map.mxd



Note: This map is for presentation use only and not to be used for construction purposes.

0 150 300 Feet

1 inch = 300 feet

Figure 2f
Build Alternative Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 2f Build Alternative Map.mxd

3.0 EXISTING CONDITIONS AND ENVIRONMENTAL CONSEQUENCES

This section describes the existing social/community, economic, cultural, and natural resources within the project's study corridor and the potential direct impacts the proposed build alternative may have on these resources (environmental consequences). The project effects are described as being adverse, beneficial, or having no adverse effect and the duration of the effect is described as being either short-term or long-term. This chapter also includes discussions of temporary construction impacts and efforts made to avoid, minimize, and/or mitigate for environmental consequences resulting from the proposed project.

3.1 Land Use Impacts

Land use along the highway primarily consists of residential, commercial, industrial, agricultural, and undeveloped forest land uses. The land use is illustrated on **Figure 3**.

3.1.1 No-Build Alternative

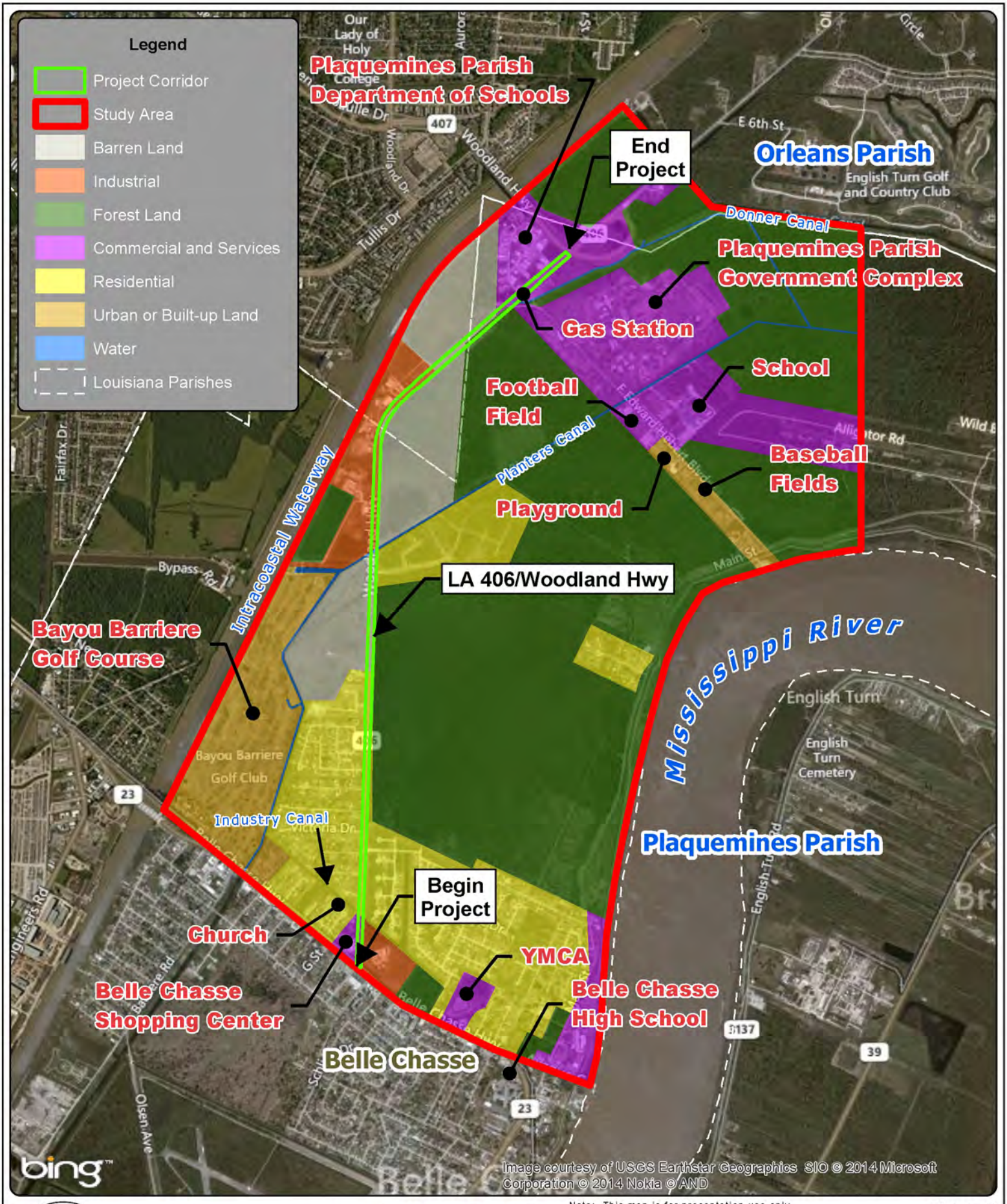
The No-Build Alternative will not change the current development pattern of land use in the study corridor. However, under the No-Build Alternative condition the LOS of LA 406/Woodland Highway will continue to decrease and congestion will increase. The increase in congestion may have a long-term adverse effect on land use by slowing the rate of development along the highway.

3.1.2 Build Alternative

The proposed Build Alternative will not require relocations or additional right-of-way from property owners along the highway. The Build Alternative is expected to increase the LOS of LA 406/Woodland Highway and decrease congestion. As a result, the improved highway may have a long-term beneficial effect on land use by accommodating the development that is occurring within the study corridor.

3.2 Prime and Unique Farmland Impacts

Impacts to prime and unique farmland are assessed by the US Department of Agriculture (USDA) because this resource is vital for meeting the nation's short and long range needs for food and fiber. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. There are no prime or unique farmland areas adjacent to LA 406/Woodland Highway, according to the Natural Resources Conservation Service (NRCS) data-server. However, prime and unique farmland is located within the study corridor (see **Figure 4**). Coordination with the NRCS regarding potential impacts to prime and unique farmlands was conducted on December 13, 2011 (see **Appendix A**). On January 9, 2012, the NRCS State Conservationist responded with a determination that the project is exempt from the rules and regulations of the Farmland Protection Policy Act-Subtitle I of Title XV, Section 1539-1549. The project is exempt because the proposed construction areas will not impact prime farmland. A copy of the determination letter is included in **Appendix B**. As a result, it was determined that the Build Alternative will not adversely affect prime and unique farmland.


Legend
Project Corridor
Study Area
Barren Land
Industrial
Forest Land
Commercial and Services
Residential
Urban or Built-up Land
Water
Louisiana Parishes
Plaquemines Parish Department of Schools
End Project
Orleans Parish
English Turn Golf and Country Club
Donner Canal
Plaquemines Parish Government Complex
Gas Station
School
Football Field
Planters Canal
Baseball Fields
Playground
Intracoastal Waterway
LA 406/Woodland Hwy
Bayou Barriere Golf Course
Mississippi River
English Turn
English Turn Cemetery
Bayou Barriere Golf Club
Industry Canal
Plaquemines Parish
Begin Project
Church
YMCA
Belle Chasse Shopping Center
Belle Chasse High School
Belle Chasse
Woodland Dr
Tullis Dr
Fairfax Dr
Bypass Rd
Main St
Victoria Dr
G St
Olsen Ave
Image courtesy of USGS Earthstar Geographics SIO © 2014 Microsoft Corporation © 2014 Nokia © AND
bing
0 1,250 2,500 Feet
1 inch = 2,500 feet
Note: This map is for presentation use only and not to be used for construction purposes.
Figure 3
Land Use Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana
Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 3 Land Use Map.mxd

0 1,250 2,500 Feet

1 inch = 2,500 feet

Note: This map is for presentation use only and not to be used for construction purposes.

Figure 4
Prime & Unique Farmland Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 4 Prime & Unique Farmalnd Map.mxd

3.3 Section 4(f) Evaluation

Section 4(f) of the Department of Transportation Act of 1966, as amended, (49 U.S.C. 303) states that the US Department of Transportation may not approve the use of publicly-owned land from a public park, recreation area, or wildlife and waterfowl refuge, or land from any historic site of national, state, or local significance unless determination is made that: 1) there is no feasible and prudent alternative to the use of land from the property; and 2) the action includes all possible planning to minimize harm to the property resulting from such use. The proposed Build Alternative will not acquire additional right-of-way from adjacent properties. In addition, no Section 4(f) resources were identified within the study corridor; therefore, no Section 4(f) impacts will occur and a Section 4(f) Evaluation is not required for this project.

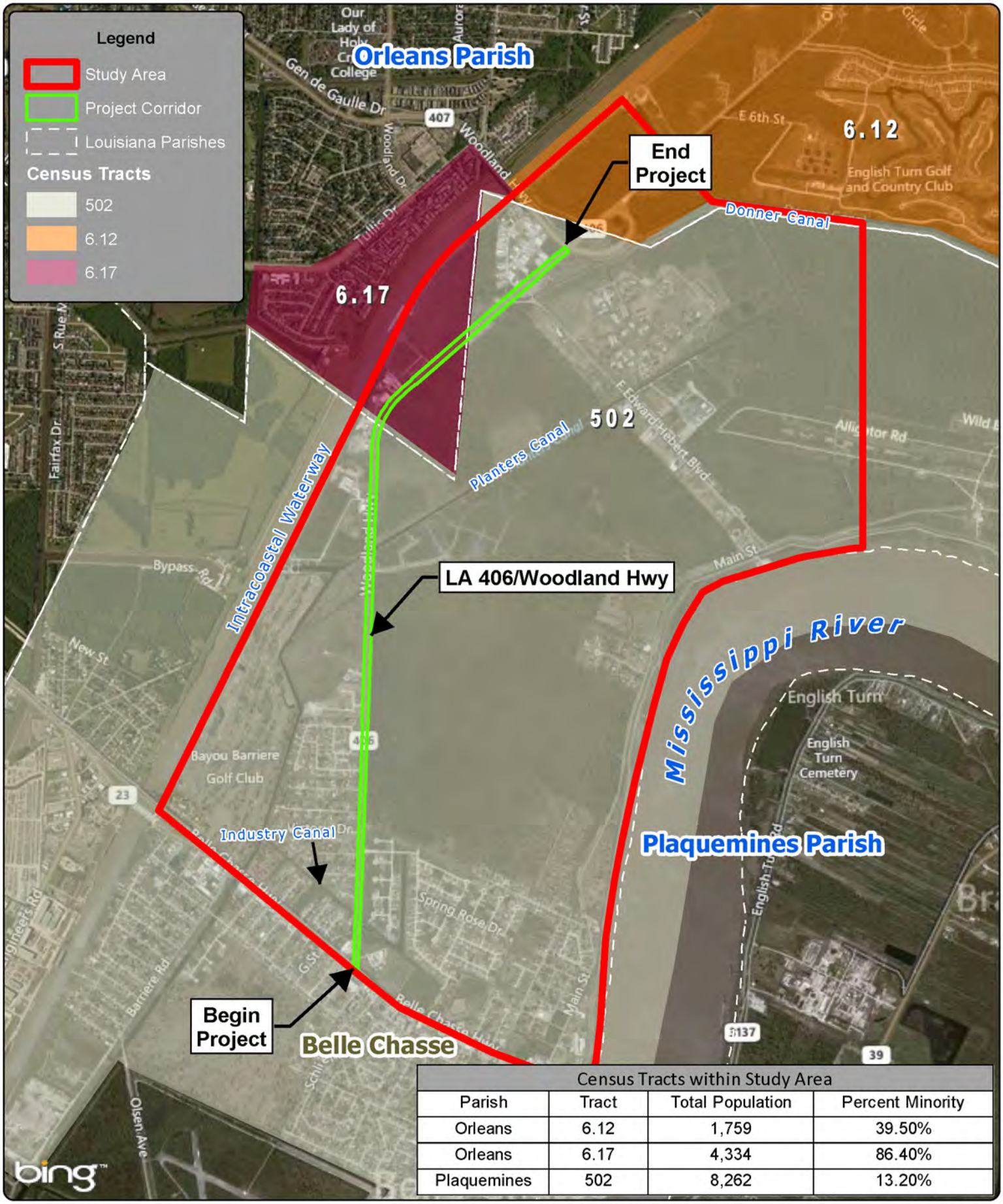
3.4 Social Impacts

The study corridor is the geographic area that encompasses the Build Alternative. The residents, businesses, industries, farms, and church located within the study corridor will directly experience the effects of the Build Alternative and construction activities associated with the proposed LA 406/Woodland Highway widening project. Social data was available at the census tract level. As shown on **Figure 5**, the study corridor is comprised of the following census tracts:

- Orleans Parish Census Tract 6.12,
- Orleans Parish Census Tract 6.17, and
- Plaquemines Parish Census Tract 502.

3.4.1 Community Demographics

Demographic data for the census tracts relating to employment status, industry, transportation methods, income, etc. was obtained from the US Census Bureau (USCB), 2006-2010 American Community Survey (ACS) 5-Year Estimates. The demographic data for the census tracts are illustrated in **Table 3-1**.



Census Tracts within Study Area			
Parish	Tract	Total Population	Percent Minority
Orleans	6.12	1,759	39.50%
Orleans	6.17	4,334	86.40%
Plaquemines	502	8,262	13.20%

0 1,250 2,500 Feet

1 inch = 2,500 feet

Note: This map is for presentation use only and not to be used for construction purposes.

Figure 5
Census Tracts, Population & Percent Minority Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 5 Census Tracts Map.mxd

Table 3-1: LA 406/Woodland Highway Census Tract Demographic Data

Location	Orleans Parish				Plaquemines Parish	
	Tract 6.12		Tract 6.17		Tract 502	
	Estimate	Percent	Estimate	Percent	Estimate	Percent
Household by Type						
Total households	487	-	1,438	-	3,184	-
Family households (families)	422	86.7%	665	46.2%	2,412	75.8%
Married-couple family	386	79.3%	226	15.7%	1,890	59.4%
Male householder, no wife present, family	0	0.0%	77	5.4%	61	1.9%
Female householder, no husband present, family	36	7.4%	362	25.2%	461	14.5%
Nonfamily households	65	13.3%	773	53.8%	772	24.2%
Households with one or more people under 18 years	192	39.4%	471	32.8%	1,374	43.2%
Households with one or more people 65 years and over	96	19.7%	156	10.8%	660	20.7%
Average household size	2.81	-	2.38	-	2.84	-
Average family size	3.09	-	3.27	-	3.22	-
Educational Attainment						
Population 25 years and over	974	-	2,485	-	6,553	-
Percent high school graduate or higher	894	91.8	1952	78.6	5,227	79.8
Percent bachelor's degree or higher	601	61.7	366	14.7	1,393	21.3
Employment Status						
Population 16 years and over	1,019	-	2,900	-	7,845	-
In labor force	678	66.5%	1,797	62.0%	4,823	61.5%
Civilian labor force	678	66.5%	1,743	60.1%	4,771	60.8%
Employed	634	62.2%	1,510	52.1%	4,659	59.4%
Unemployed	44	4.3%	233	8.0%	112	1.4%
Armed Forces	0	0.0%	54	1.9%	52	0.7%
Not in labor force	341	33.5%	1,103	38.0%	3,022	38.5%
Commuting to Work						
Workers 16 years and over	634	-	1,548	-	4,546	-
Car, truck, or van -- drove alone	517	81.5%	1,072	69.3%	3,707	81.5%
Car, truck, or van -- carpooled	57	9.0%	149	9.6%	585	12.9%
Public transportation (excluding taxicab)	0	0.0%	154	9.9%	0	0.0%
Walked	0	0.0%	138	8.9%	118	2.6%
Other means	0	0.0%	35	2.3%	25	0.5%
Worked at home	60	9.5%	0	0.0%	111	2.4%
Mean travel time to work (minutes)	27.7	-	25.4	-	20.4	-

Location	Orleans Parish				Plaquemines Parish	
	Tract 6.12		Tract 6.17		Tract 502	
	Estimate	Percent	Estimate	Percent	Estimate	Percent
Industry						
Civilian employed population 16 years and over	634	-	1,510	-	4,659	-
Agriculture, forestry, fishing and hunting, and mining	8	1.3%	35	2.3%	174	3.7%
Construction	31	4.9%	114	7.5%	225	4.8%
Manufacturing	49	7.7%	32	2.1%	501	10.8%
Wholesale trade	0	0.0%	26	1.7%	150	3.2%
Retail trade	82	12.9%	159	10.5%	727	15.6%
Transportation and warehousing, and utilities	24	3.8%	70	4.6%	375	8.0%
Information	12	1.9%	41	2.7%	61	1.3%
Finance and insurance, and real estate and rental and leasing	64	10.1%	234	15.5%	341	7.3%
Professional, scientific, management, administrative, waste mgmt	73	11.5%	92	6.1%	528	11.3%
Educational services, and health care and social assistance	212	33.4%	377	25.0%	772	16.6%
Arts, entertainment, recreation, accommodation, food services	14	2.2%	90	6.0%	339	7.3%
Other services, except public administration	37	5.8%	0	0.0%	156	3.3%
Public administration	28	4.4%	240	15.9%	310	6.7%
Income and Benefits (in 2009 inflation-Adjusted Dollars)						
Total households	487	-	1,438	-	3,184	-
Less than $10,000	12	2.5%	173	12.0%	115	3.6%
$10,000 to $14,999	12	2.5%	79	5.5%	134	4.2%
$15,000 to $24,999	0	0.0%	184	12.8%	238	7.5%
$25,000 to $34,999	37	7.6%	304	21.1%	314	9.9%
$35,000 to $49,999	37	7.6%	357	24.8%	287	9.0%
$50,000 to $74,999	30	6.2%	205	14.3%	466	14.6%
$75,000 to $99,999	50	10.3%	99	6.9%	529	16.6%
$100,000 to $149,999	68	14.0%	25	1.7%	757	23.8%
$150,000 to $199,999	60	12.3%	12	0.8%	196	6.2%
$200,000 or more	121	24.8%	0	0.0%	148	4.6%
Median household income (dollars)	$139,432	-	$33,990	-	$77,649	-

Notes:

1. Although the American Community Survey produces population, demographic and housing unit estimates, for 2010, the 2010 Census provides the official counts of the population and housing units for the nation, states, counties, cities and towns. For 2006 to 2009, the Population Estimates Program provides estimates of the population for the nation, states, and counties.
2. An estimated margin of error was given for each category and is available on the American Fact Finder website.

Source: US Census Bureau, 2006-2010 American Community Survey 5-Year Estimates Table DP-02 and DP-03

Race and minority data for the census tracts are shown in **Table 3-2** and illustrated on **Figure 5**.

Of the 14,355 people who live within the three census tracts that include the study corridor, approximately 61% are white; 29% are African American; 1% is American Indian/Alaska Native; 3% are Asian; 1% is two or more races; and 5% are of Hispanic origin. The majority of the minority populations within the study corridor live within the Orleans Parish in Census Tract 6.17. Census Tract 6.17 is divided by the ICWW and the land use to the south of the waterway adjacent to the LA 406/Woodland Highway is industrial while the land use to the north across the ICWW is residential.

Table 3-2: LA 406/Woodland Highway Census Tract Population Characteristics

Parish	Census Tract	Subject	Total Population (all races)	White Alone	Black or African American Alone	Am. Indian & Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Two or More Races	Hispanic [1]	Minority Calculation [2]
Orleans	6.12	No.	1,759	1,065	337	4	169	0	7	54	123	694
		%	100.0%	60.5%	19.2%	0.2%	9.6%	0.0%	0.4%	3.1%	7.0%	39.5%
Orleans	6.17	No.	4,334	502	3,443	20	65	3	3	53	245	3,832
		%	100.0%	11.6%	79.4%	0.5%	1.5%	0.1%	0.1%	1.2%	5.7%	88.4%
Plaquemines	502	No.	8,262	7,172	317	78	176	10	26	97	386	1,090
		%	100.0%	86.8%	3.8%	0.9%	2.1%	0.1%	0.3%	1.2%	4.7%	13.2%

Notes:

[1] Since all Hispanics regardless of race are considered a minority, the population with Hispanic ethnicity is identified in this column and all the other race categories do not include Hispanic ethnicity.

[2] In accordance with FHWA Order 6640.23A and DOT Order 5610.2, a minority means a person who is Black, Asian American, American Indian/Alaskan Native, or Hispanic (regardless of race). To determine the number of minorities, the total population minus the "white alone" population was determined.

Source: US Census Bureau (USCB), 2010 Census Summary File 1 (SF 1) 100-Percent Data, Tables QT-P4 and QT-P6: Race Alone or in Combination and Hispanic or Latino.

Poverty status was also obtained from the 2006-2010 ACS dataset. Poverty status is detailed on **Table 3-3** and is shown on **Figure 6**. The majority of the impoverished populations are located within the Orleans Parish in Census Tract 6.17. Census Tract 6.17 is divided by the ICWW and the land use to the south of the waterway is industrial while the land use to the north across the ICWW is residential.

Table 3-3: LA 406/Woodland Highway Census Tract 12 Month Poverty Status

Census Tract	Subject	Population for whom Poverty Status is Determined
Tract 6.12	Total Population Status Determined	1,368
	Below Poverty Level	85
	Percent Below Poverty Level	6.2%
Tract 6.17	Total Population Status Determined	3,806
	Below Poverty Level	1,254
	Percent Below Poverty Level	32.9%
Tract 502	Total Population Status Determined	9,706
	Below Poverty Level	974
	Percent Below Poverty Level	10.0%

Notes:
1. Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, for 2010, the 2010 Census provides the official counts of the population and housing units for the nation, states, counties, cities and towns. For 2006 to 2009, the Population Estimates Program provides estimates of the population for the nation, states, and counties.
2. While the 2006-2010 ACS data generally reflect the December 2009 Office of Management and Budget definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.
3. An estimated margin of error was given for each category and is available on the American Fact Finder website.

Source: US Census Bureau, 2006-2010 American Community Survey 5-Year Estimates Table S1701: Poverty Status in the Past 12 Months

The US Department of Health and Human Services (HHS) publishes *Poverty Guidelines* each year. HHS *Poverty Guidelines* are used to determine whether families/households qualify for certain types of government financial assistance. **Table 3-4** presents a comparison of the median household income, average household size, and the HHS *Poverty Guidelines* for the study corridor. Based on this analysis, the median household income for the Census Tracts within the study corridor are above the HHS *Poverty Guidelines* for 2014.

Table 3-4: LA 406/Woodland Highway Census Tract Income and Household Size Comparison to HHS Poverty Guidelines

Census Tract	Average Household Size	Median Household Income	HHS 2014 Poverty Guidelines	Median Household Income Below HHS 2014 Poverty Guidelines
Tract 6.12	2.81	$139,432	$19,790	No
Tract 6.17	2.38	$33,990	$15,730	No
Tract 502	2.84	$77,649	$19,790	No

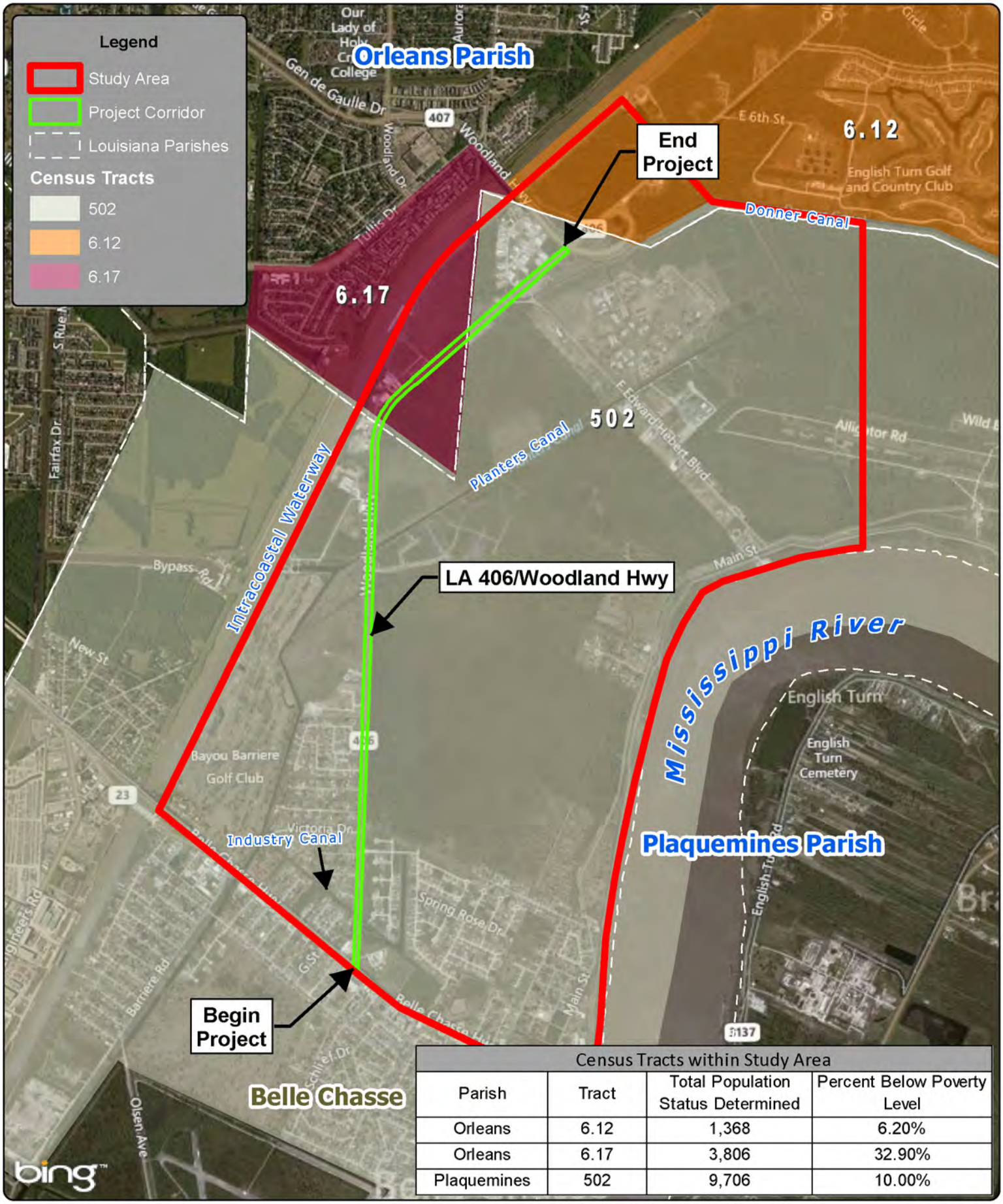
Source: US Census Bureau, 2006-2010 American Community Survey; US Department of Health and Human Services, 2014

3.4.1.1 No-Build Alternative

Under the No-Build Alternative scenario and as traffic volumes increase, congestion will increase and the LOS will decrease. The safety concerns along the highway will also not be addressed. As conditions deteriorate, access to properties along the LA 406/Woodland Highway corridor will be diminished. As is illustrated in **Table 3-1** the majority of the population that lives along the study corridor commute to work. Under the No-Build Alternative condition, minority and low-income residents' ability to commute to and from work would be long-term adversely affected by the increase in congestion.

3.4.1.2 Build Alternative

The proposed Build Alternative will not require relocations or additional right-of-way from property owners along the highway. The Build Alternative will increase the LOS of LA 406/Woodland Highway and decrease congestion and the ability for minority and low-income residents to access the highway is expected to improve. The increased capacity of the highway will accommodate the predicted increase in traffic and will better facilitate commuter traffic. The Build Alternative will also improve the safety of the highway. As a result, it is anticipated that the Build Alternative will have a long term beneficial effect on minority and low-income residents in the area.



Census Tracts within Study Area			
Parish	Tract	Total Population Status Determined	Percent Below Poverty Level
Orleans	6.12	1,368	6.20%
Orleans	6.17	3,806	32.90%
Plaquemines	502	9,706	10.00%

0 1,250 2,500 Feet

1 inch = 2,500 feet

Note: This map is for presentation use only and not to be used for construction purposes.

Figure 6
Poverty Status Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 6 Poverty Status Map.mxd

3.4.2 Disruption of Neighborhoods / Communities

LA 406/Woodland Highway connects the community of Belle Chasse with the City of New Orleans.

3.4.2.1 No-Build Alternative

Under the No-Build Alternative scenario and as traffic volumes increase, congestion will increase and the LOS will decrease. The safety concerns along the highway will also not be addressed. As conditions deteriorate, the connectivity of neighborhoods and communities along LA 406/Woodland Highway to the City of New Orleans and Belle Chasse will experience both short and long-term adverse effects.

3.4.2.2 Build Alternative

LA 406/Woodland Highway is an existing highway and disruption of neighborhoods or communities would have occurred in the past when the highway was originally constructed. The proposed Build Alternative includes widening and will not require additional right-of-way from neighborhoods or communities along the highway. Access to neighborhoods will also be maintained under the Build Alternative condition. The Build Alternative is expected to increase the LOS of LA 406/Woodland Highway and decrease congestion and access to neighborhoods and communities along the highway is expected to improve. The increased capacity of the highway will also accommodate the predicted increase in traffic and will facilitate the predicted increase in development within the neighborhoods and communities along the highway and in the study corridor. The Build Alternative will also improve the safety of the highway. As a result, it is expected the Build Alternative will result in both short and long-term beneficial effects to neighborhoods and communities within the study corridor.

3.4.3 Changes in Travel Patterns and Traffic Safety

3.4.3.1 No-Build Alternative

The existing highway will not accommodate the projected future traffic volumes and as congestion increases, the LOS will decrease. Under the No-Build Alternative, it is likely that existing travel patterns will change as travelers seeking to avoid traffic related delays take other routes. Travelers may resort to longer routes to avoid the congestion which will likely result in increased traffic and congestion along other area roads. As a result, it is expected that the No-Build Alternative will have long-term adverse effects on travel patterns along and in the vicinity of the LA 406/Woodland Highway.

With regard to traffic safety, the existing LA 406/Woodland Highway is primarily a two-lane highway with four-foot paved shoulders through the study corridor. Vehicles wanting to make left-turns across traffic must stop in the through-lane to wait for a traffic break and as a result, this section of highway experiences a high frequency rate of rear-end collisions. Under the No-Build Alternative condition, it is expected that the frequency of rear-end collisions will continue to remain high. As a result, it is anticipated that the No-Build Alterative will have both short and long-term adverse effects on traffic safety.

3.4.3.2 Build Alternative

The proposed improvements will accommodate the existing and projected future traffic volumes along the highway. In addition, traffic will be maintained along the highway during construction. As a result, it is expected that the proposed project will not alter traffic patterns in the short-term or long-term.

With regard to traffic safety, under the Build Alternative condition dedicated left-turn lanes will be incorporated into the center median at seven locations. The dedicated left-turn lanes will remove vehicles wanting to make left-turns from the through-lanes and as a result it is expected that the occurrence of rear-end collisions will be reduced. The proposed Build Alternative will also separate the directional traffic with an 18-foot median. The 18-foot median will reduce the likelihood of head-on collisions. As a result of these improvements, it is anticipated that the project will have both short-term and long-term beneficial effects on traffic safety.

3.4.4 Community Facilities

Community facilities and services adjacent to LA 406/Woodland Highway include residences, the Plaquemines Parish School Board Administration building, a church (Exceleration Church), and various utility facilities. The utility facilities include a sewage/water station and various structures associated with the Gulf South and Atmos Energy Gas pipelines located along the existing right-of-way of LA 406/Woodland Highway.

3.4.4.1 No-Build Alternative

The No-Build Alternative will not require the re-location of any existing community facilities. However, those facilities which are transportation dependent including the school board building, the church, emergency services and transportation resources serving area schools, senior centers, and other public facilities would be affected by the increase in congestion and decrease in the LOS of the highway. The safety concerns along the highway will also not be addressed. As a result, it is anticipated that the No-Build Alterative will have both short and long-term adverse effects on community facilities along the study corridor.

3.4.4.2 Build Alternative

Under the Build Alternative condition, facilities which are transportation dependent, *i.e.* the school board building, the church, and emergency services and transportation resources serving area schools, senior centers and other public facilities, would benefit by the increased capacity and safety of the widened highway. As a result, it is anticipated that the project will have short-term and long-term beneficial effects on community facilities along the study corridor.

3.4.5 Executive Order 12898 and FHWA Order 6640.23A Impacts to Minorities or Low-Income Populations

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations (February 11, 1994), specifies actions to be taken on a range of issues that are intended to promote nondiscrimination

in Federal actions and to provide minority and low-income communities equal access to public information regarding a Federal action, and to provide an opportunity for public participation in the evaluation of a Federal action in matters relating to human health and the environment. FHWA Order 6640.23A establishes policies and procedures for the FHWA to use in complying with EO 12898.

A profile of the Census Tracts that comprise the study corridor was compiled and analyzed to address the following questions posed by EO 12898 and FHWA Order 6640.23A:

- Does the potentially affected community include minority and/or low-income populations?
- Are the environmental impacts likely to fall disproportionately on minority and/or low-income members of the community and/or tribal resources?

Table 3-1, **Table 3-2**, and **Table 3-3** present data on the populations for the Census Tracts within the study corridor. Minority and/or low-income populations are located within the Census Tracts that comprise the potentially affected community. One Census Tract contains a majority population of low-income and/or minority population, Census Tract 6.17 of Orleans Parish, which is comprised of 88.4% minorities. The residential development located within this Census Tract is located across the ICWW from the LA 406/Woodland Highway corridor.

Table 3-4 presents a comparison of the median household incomes and average household sizes of the Census Tracts traversed by the Build Alternative to the HHS *Poverty Guidelines.* The comparison indicates that the median household incomes for the Census Tracts are above the HHS *Poverty Guidelines* for 2014.

3.4.5.1 No-Build Alternative

Under the No-Build Alternative condition as congestion increases and the LOS decreases, minority, low-income communities, and/or tribal resources located within the study corridor will experience both short-term and long-term adverse effects. The safety concerns along the highway will not be addressed and emergency response and access to community facilities and neighborhoods along the study corridor will also be impacted by the congestion and decreased LOS.

3.4.5.2 Build Alternative

The proposed project does not require relocations and the Build Alternative will reduce congestion and provide safety benefits to all communities along the highway, regardless of community composition or income level. The low-income and/or minority population located within the study corridor may experience some short-term impacts during construction such as traffic delay, fugitive dust, or construction-related noise but these impacts will not be disproportionate. As a result, it was determined that the Build Alternative will likely not result in short-term or long-term disproportionate adverse impacts on minority and/or low-income populations within the study corridor.

3.4.6 Title VI Assessment

Title VI of the Civil Rights Act of 1964, prohibits discrimination based upon race, color, and national origin. Specifically, 42 USC 2000d states that "no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving Federal financial assistance." The proposed project has been developed in accordance with the LADOTD's 2014 Title VI Program. A Public Involvement Meeting for the project was held on April 25, 2012, hosted by the LADOTD and the RPC. An open house format was utilized to display the proposed improvements, answer questions, and solicit for comments. A Public Hearing will be conducted after approval of the EA. Comments will be solicited from Federal, state, and local agencies tribal interest, business owners, and the public.

3.4.7 Emergency Response

3.4.7.1 No-Build Alternative

Congestion and the decrease in the LOS will adversely affect the response times of emergency services including medical, fire, and police. In addition, the existing highway does not allow for vehicles to safely move out of the travel lanes for emergency vehicles to pass. As a result, it is expected that the No-Build Alternative will have short-term and long-term adverse effects on emergency response times.

3.4.7.2 Build Alternative

The Build Alternative will address the current and future traffic demands by increasing the capacity of the highway, which will alleviate congestion and allow for quicker emergency response times. The additional travel lanes and improved shoulders will also allow for traffic to move safely out the way of emergency vehicles. As a result, it is anticipated that the project will have short-term and long-term beneficial effects on emergency response times.

3.4.8 Emergency Evacuation

LA 406/Woodland Highway is not a designated hurricane evacuation route. However, LA 23/Belle Chasse Highway at the project begin point is a designated hurricane evacuation route.

3.4.8.1 No-Build Alternative

Under the No-Build Alternative, the ability for residents to evacuate the study corridor will be adversely affected both in the short-term and long-term by the decrease in the LOS, increase in congestion, and the existing safety concerns.

3.4.8.2 Build Alternative

The proposed Build Alternative will increase the capacity and LOS of LA 406/Woodland Highway and will address the safety concerns and thereby, improve the short-term and long-term access to emergency evacuation routes including LA 23/Belle Chasse Highway.

3.5 Relocation Impacts

No relocations will be required for this project.

3.6 Economic Impacts

Several commercial and industrial facilities are located along LA 406/Woodland Highway. The commercial facilities include a gas station and the Belle Chasse Shopping Center. Commercial, industrial, and residential development is expected to occur along the highway and in the region in the future.

3.6.1 No-Build Alternative

The ability to transport or access goods and services is a vital component to the local and regional economy. Under the No-Build Alternative, traffic congestion and the decreased LOS and safety along the study corridor will restrict the ability of area residences and customers to access goods and services. As a result, it is expected that the No-Build Alternative will have both short-term and long-term adverse effects on the economy.

3.6.2 Build Alternative

The Build Alternative will not require the relocation of existing commercial facilities, and during construction access to the highway from businesses will be maintained. All work will occur within the existing right-of-way; minimizing adverse impacts to existing businesses. Any potential impacts to these businesses will be temporary and associated with construction activity. The increased safety of the highway and the capacity improvements will likely result in increased patronage of existing businesses and create an environment conducive to new commercial development. As a result, it is anticipated that the project will have both short-term and long-term beneficial effects on the area economy.

3.7 Air Quality Impacts

An *Air Quality Analysis Report* was prepared for the project in August 2012 to analyze the affects the Build Alternative would have on air quality. The analysis is included as **Appendix C**. National and state Ambient Air Quality Standards (NAAQS) were developed for specific (criteria) pollutants to protect public health, safety, and welfare as a result of the Federal Clean Air Act of 1970. The Clean Air Act Amendments of 1990 (CAAA) mandated a program by which air quality must be improved and maintained so as to meet the NAAQS, with frameworks for state and regional agency jurisdictions, accountability, and an established time schedule. This program involves on-going monitoring and reporting, from which regions are classified as to their attainment status with regard to each criteria pollutant.

The LDEQ Air Quality Assessment website states that Plaquemines and Orleans Parishes are in attainment for all criteria pollutants. A letter from the LDEQ dated December 29, 2011, confirms this, stating that “Currently, Plaquemines and Orleans Parishes are classified as attainment with the NAAQS and have no general conformity determination obligations” (see **Appendix B**). In addition, the proposed project is

included in the RPC's 2040 Metropolitan Transportation Plan (MTP) and the 2013-2016 Transportation Implementation Plan (TIP).

CO analyses performed, assuming worst-case scenarios, for projects similar to the proposed project have shown no violations of the NAAQS. It was determined that this project will not violate the NAAQS for CO, like similar projects modeled have previously demonstrated. In addition, the project does not involve modifications to signalized intersections and the traffic projections for the proposed Design Year 2038 will not exceed 140,000 vehicles per day (see **Table 1-1**). As a result, it was determined that air quality modeling for CO was not required and that the project will not result in short-term or long-term adverse effects on CO.

Project level ozone, nitrogen dioxide, $PM_{2.5}$, and PM_{10} analyses were also not conducted for the Build Alternative and No-Build Alternative because the area is in compliance with the NAAQS for these pollutants. No short-term or long-term adverse effects to these NAAQS pollutants are expected.

3.7.1 Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, the US Environmental Protection Agency (USEPA) also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries). The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

A qualitative MSAT analysis was performed for the No-Build Alternative and Build Alternative. The MSAT analysis is included in the *Air Quality Analysis Report* in **Appendix C.** The analysis determined that the proposed project has a "*Low Potential for MSAT Effects*" since the current and projected vehicle traffic do not exceed the FHWA threshold (140,000 vehicles per day). Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of USEPA's national control programs that are projected to reduce MSAT emissions by 72% between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, vehicle miles traveled (VMT) growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study corridor are likely to be lower in the future in nearly all cases. The results of the analysis concluded that the project will not result in short-term or long-term increases in MSATs emissions.

3.8 Noise Impacts

A *Noise Analysis Technical Report* was prepared for the project in September 2013 to address potential noise impacts that may result from the proposed LA 406/Woodland Highway widening project. The report is included as **Appendix D**. The noise levels were analyzed for the 2011 existing and future 2038 No-Build and proposed Build Alternative for the project.

The analysis addressed potential noise impacts that may result from the proposed LA 406/Woodland Highway widening project. The noise analysis was conducted in accordance with procedures for noise studies as set forth in Title 23 CFR Part 772 and the LADOTD's July 2011 *Highway Traffic Noise Policy*. The scope of the analysis was to determine and analyze the effect of traffic noise on properties near the proposed project and analyze noise abatement measures to mitigate potential impacts giving weight to the benefits and costs of abatement and to overall social, economic, and environmental effects.

3.8.1 Noise Analysis Results

Noise levels were modeled at 64 individual receptor sites representing 99 noise sensitive receptors using FHWA's TNM Version 2.5 within the LA 406/Woodland Highway widening study corridor. The receptor locations and TNM 2.5 results at each receptor are included in the *Noise Analysis Technical Report* in **Appendix D**.

3.8.1.1 2011 Existing Noise Levels

The 2011 existing noise model indicated 11 modeled receptor sites representing 11 individual residential noise receptors are currently experiencing noise levels above the NAC. The existing noise levels along the LA 406/Woodland Highway range from 49.9 dBA to 67.6 dBA.

3.8.1.2 2038 No-Build Alternative Noise Results

Under the 2038 No-Build Alternative conditions, noise impacts above the NAC were predicted to occur at 19 modeled receptor sites representing 20 residential noise receptors. The 2038 No-Build Alternative noise levels along the LA 406/Woodland Highway were predicted to range from 53.7 dBA to 72.1 dBA. The No-Build Alternative results also indicated no substantial increases in noise (10 dBA or greater) over the existing noise levels will occur.

3.8.1.3 2038 Build Alternative Noise Results

Under the 2038 Build Alternative conditions, noise impacts above the NAC were predicted to occur at 24 modeled receptor sites representing 26 residential noise receptors. The 2038 Build Alternative noise levels along the LA 406/Woodland Highway were predicted to range from 56.1 dBA to 72.9 dBA. The Build Alternative results also indicated no substantial increases in noise (10 dBA or greater) over the existing noise levels will occur.

3.8.2 Noise Mitigation Analysis

Noise abatement measures were evaluated at locations where impacts were predicted to occur under the 2038 Build Alternative scenario. The abatement measures were evaluated using FHWA's guidelines as promulgated by Title 23 CFR Part 772 and guidelines from LADOTD's *Highway Traffic Noise Policy*.

Several abatement measures were analyzed, and it was determined that traffic management measures, alteration of horizontal and vertical alignments, and the acquisition of property rights for the construction of noise barriers were not feasible or reasonable abatement techniques due to environmental, or design constraints. Insulation of public use or non-profit institutional structures was not considered since no impacts of this type are anticipated. Construction of noise barriers was analyzed, and it was determined that noise barriers are not reasonable according to the abatement and allowable cost per benefitted residence calculation criteria set forth by LADOTD's *Highway Traffic Noise Policy*.

3.9 Water Quality Impacts

3.9.1 Surface Water

The Industry Canal and Planters Canal are both crossed by LA 406/Woodland Highway. The locations of the crossings are illustrated on **Figure 7**. Both of these canals convey water to the ICWW via Belle Chasse I and II pump stations. The sources of hydrology to these canals are rainfall, sheet flow, and roadside runoff. The surface waters in and adjacent to the study corridor are located in LDEQ water quality sub-segment 020601 of the Barataria Water Quality Management Basin. This sub-segment consists of the ICWW from Bayou Villars to the Mississippi River. Designated uses in this sub-segment include primary contact recreation, secondary contact recreation, and fish and wildlife propagation. Based on the *2010 Louisiana Water Quality Inventory Integrated Report - Fulfilling the Requirements of the Federal Clean Water Act Sections 305(b) and 303(d)* (LDEQ, 2010), Sub-segment 020601 is not fully supporting its designated use for primary contact recreation or fish and wildlife propagation. This sub-segment is on LDEQ's 2010 §303(d) list of impaired water bodies for primary contact recreation use due to fecal coliform contamination and is impaired for fish and wildlife propagation due to turbidity. A total maximum daily load report (TMDL) has not been issued for this sub-segment.

3.9.1.1 No-Build Alternative

The No-Build Alternative will not result in additional short-term or long-term adverse effects on surface water quality.

0 1,500 3,000 Feet

1 inch = 3,000 feet

Note: This map is for presentation use only and not to be used for construction purposes.

Figure 7
Water Resources Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 7 Water Resources Map.mxd

3.9.1.2 Build Alternative

LA 406/Woodland Highway crosses over both the Industry Canal and Planters Canal. During construction, localized short-term impacts to these surface water canals at the crossings may occur. Additionally, the roadside drainage features will be filled to accommodate proposed improvements and subsurface drainage will be installed. Particulate runoff during construction will be regulated by LDEQ. Construction materials will be stored and disposed of in such a way that they are not discharged into surface waters. During construction, BMPs will be followed that will minimize water quality impacts to these canals; therefore, it is anticipated that short-term adverse impacts to surface waters will be minimal. No long-term adverse impacts to surface waters are anticipated.

3.9.2 Groundwater

A Sole Source Aquifer (SSA) is an aquifer that is used to supply 50% or more of the drinking water for residents within a particular area. The study corridor is located in the USEPA Region 6. A search of state and Federal databases revealed no SSAs are located in the study corridor. Southern Hills is the nearest SSA and it is located approximately 16 miles north of the study corridor. On June 19, 2012, the coordinator for the USEPA SSA Program responded that the proposed project does not lie within the boundaries of a designated SSA and is not eligible for review under the SSA program. A copy of the response is included in **Appendix B**.

A search was performed using the US Geological Survey (USGS) water wells and LDNR Strategic Online Natural Resources Information System (SONRIS) databases for registered water wells located within one mile of the study corridor. Of the three registered water wells located within the study corridor, none are within or adjacent to the study corridor. The locations of the registered water wells are illustrated on **Figure 7**. The registered water well search was conducted on May 18, 2012. Other unregistered waters wells may exist along the study corridor.

3.9.2.1 No-Build Alternative

The No-Build Alternative will not result in short-term or long-term adverse effects to existing groundwater quality or area water wells.

3.9.2.2 Build Alternative

The Build Alternative is not located over or near a SSA, nor are any water wells located within the existing LA 406/Woodland Highway right-of-way. As a result, it is expected that the project will not result in short-term or long-term adverse effects on groundwater. If any water wells are discovered during construction, they will be capped by the LADOTD so that groundwater is not impacted by the project.

3.10 Permits

The Build Alternative will involve the preparation and submittal of the following Federal and state permit applications:

3.10.1 Section 404/10 Permit

The USACE requires a permit under the authority of Section 404 of the Department of the Army CWA for impacts to waters of the US, including wetlands. Based on the *Wetlands Finding Report*, it is anticipated that the project will require a PCN for authorization under a PGP, be filed with the USACE MVD. This permit allows construction, expansion, modification, or improvement of linear transportation project within the coastal zone. In non-tidal waters the discharge cannot cause the loss of greater than ½-acre of waters of the US. Other waters of the US impacts associated with the project will not cause permanent loss to the resource, rather a conversion and should be authorized under this PGP. If the MVD views this activity as channelization they may subsequently require an individual standard permit application be submitted, however, this will be the ultimate decision of the MVD.

Additionally, the USACE requires a permit under the authority of Section 10 of the Rivers and Harbors Act for impacts to navigable waters. A permit must be submitted to USACE for all work in, over, or under navigable waters. The purpose of this permit is to prevent the obstruction or alteration of navigable waters of the US. The existing highway crosses the Industry Canal and Planters Canal. As discussed in Section 3.9.1, both of these canals are pumped and discharge into the ICWW via pump stations. The Wetland Finding Report classified these canals as being non-navigable waters. During the Section 404/10 process this information will be confirmed with USACE. The Wetland Finding Report is included as **Appendix E**.

3.10.2 Section 401 Water Quality Certification

The LDEQ must certify that any work placing dredged or fill material into waters of the state including wetlands will not violate the state's water quality standards. Section 401 of the CWA requires that a WQC be obtained in conjunction with the submittal of the Section 404 permit application. A complete copy of the Section 404 permit application is required to initiate the certification process. When applying for the Section 404 permit, the USACE will notify the applicant if they must obtain a project specific WQC, or waiver, before authorization of work in waters of the US.

3.10.3 Storm Water General Permit for Construction Activities

The LDEQ requires projects with discharges of storm water from construction activities to obtain a LPDES Storm Water General Permit for Construction Activities. Storm water runoff from construction activities anticipated with this project will require a LPDES permit since it results in the disturbance of greater than one acre. The development of a SWPPP is required under this permit. Specific BMPs for this project, along with maintenance procedures and an inspection process, will be detailed in this plan.

3.10.4 Coastal Use Permit

The LDNR, OCM requires that an application for a CUP be submitted for projects that involve dredging or filling within the coastal zone boundary. A Joint Permit Application (JPA) for this project will be submitted online to the OCM. The permit will initiate both the CUP and the Section 404 permit process with USACE. The JPA process provides a single public notice to cover the OCM, USACE and LDEQ. Comments were initially

solicited in December 2011 based on LADOTD's parish and state mailing list. Through the JPA process comments are solicited from additional agencies including: the Louisiana Department of Wildlife and Fisheries (LDWF), Coastal Protection and Restoration Authority (CPRA), National Oceanic and Atmospheric Administration (NOAA) Fisheries, US Fish and Wildlife Service (USFWS), levee boards, local parish, and state land office. A SOV was filed with the OCM in advance of the permit application. All comments received will be addressed and are located in **Appendix B**.

3.10.5 Flood Protection Levees and Floodgates

This project falls within the Algiers Levee District (ALD) which is managed by the SLFPAW. A levee permit is required for construction that includes any excavation within 300 feet or major excavation within 1,500 feet of any levee within SLFPAW. Levees and flood protection measures exist east of the study corridor along the ICWW and to the west along the Mississippi River. Only the levee along the ICWW, which is also referred to as the Algiers Alternate Route, is within 1,500 feet of the Build Alternative. The ALD will be notified of the project during the JPA process discussed in Section 3.10.4.

3.11 Wetland Impacts

The purpose of the wetland analysis was to identify and delineate any potential wetlands in the vicinity of the proposed project in accordance with USACE guidance found in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (USACE, 2010). The USACE and the USEPA jointly define wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands have the following characteristics: (1) vegetation consisting of macrophytes that are typically adapted to soil conditions found in wetland environments; (2) soils that have been classified as hydric or possess characteristics that are associated with reducing soil conditions; and (3) hydrology, meaning that the area is inundated either permanently or periodically at mean water depths less than or equal to 6.6 feet, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation.

On May 10, 2012, the study corridor was surveyed and field data was collected on the three diagnostic wetland parameters. The information in the *Wetlands Finding Report* is based on available information and observations made during field visits to the project study corridor. Ultimately, only the USACE has the authority to assume jurisdiction over wetlands. Positive evidence of all three diagnostic characteristics for jurisdictional wetlands was not found at any of the three sample locations established to characterize the study corridor; however approximately 5.95 acres of potential other waters of the US appear to be present within the existing right-of-way. Potential other waters of the US within the existing right-of-way are shown on **Figures 8a through 8f**. A copy of the *Wetlands Finding Report* is included as **Appendix E**.

3.11.1 No-Build Alternative

The No-Build Alternative will not impact existing wetlands and/or other waters of the US. As a result, the No-Build Alternative will not have short-term or long-term adverse effects on existing wetlands and/or other waters of the US within the study corridor.

3.11.2 Build Alternative

No wetlands were identified within the study corridor. As a result, it is anticipated that the proposed Build Alternative will not have short-term or long-term adverse effects on wetlands within the study corridor. During construction, particulate runoff will be regulated by LDEQ. Construction materials will be stored and disposed of in such a way that they are not discharged into surface waters. BMPs will also be followed that will minimize water quality impacts; therefore it is anticipated that adverse impacts to wetlands located outside the study corridor will also be minimal.

3.12 Water Body Modifications

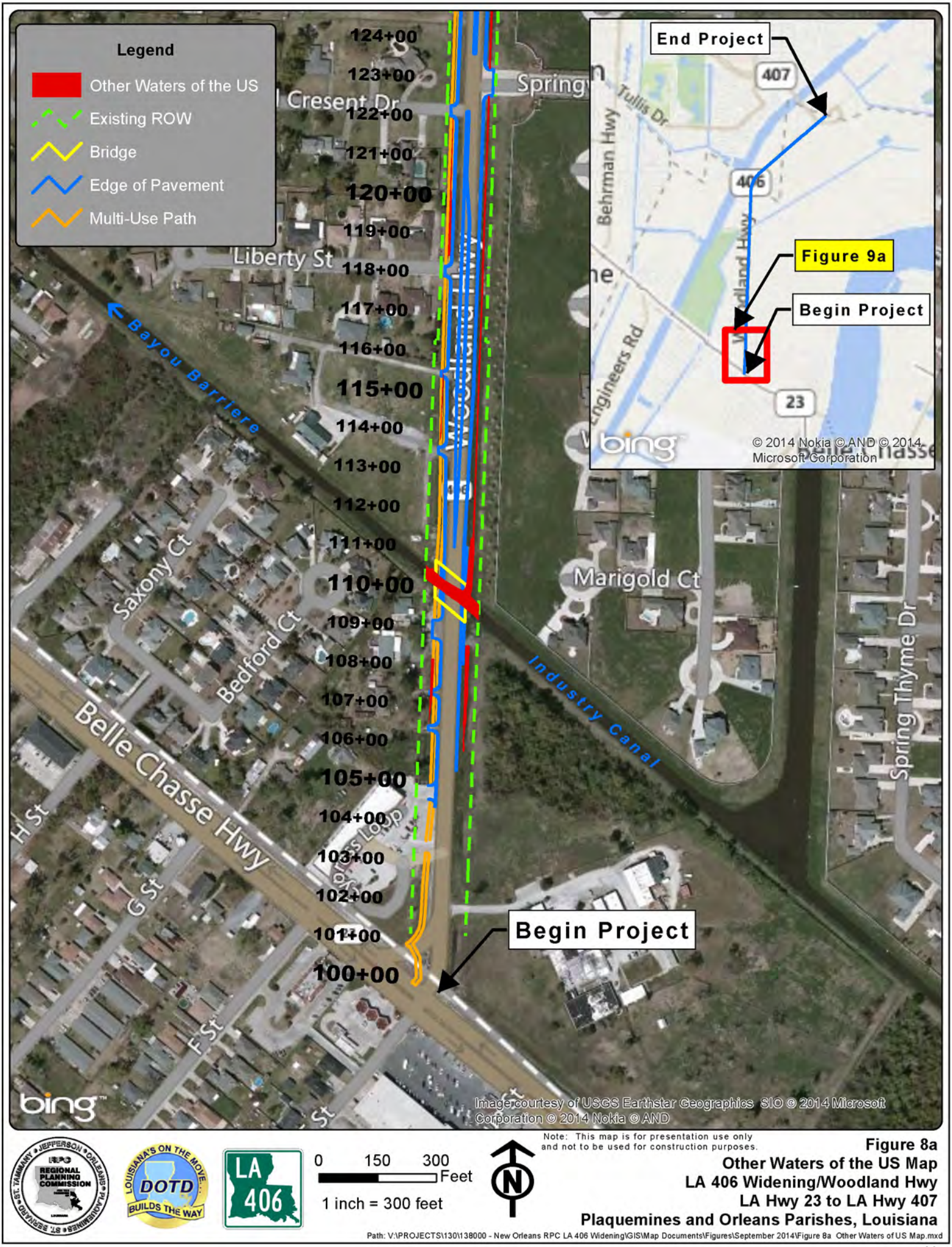
As discussed in Section 3.9.1, the water bodies in the study corridor include the Industry and Planters Canals, and roadside drainage ditches.

3.12.1 No-Build Alternative

The No-Build Alternative will not impact the Industry or Planters Canals or drainage ditches along the existing highway. As a result, the No-Build Alternative will not have short-term or long-term adverse effects on these resources.

3.12.2 Build Alternative

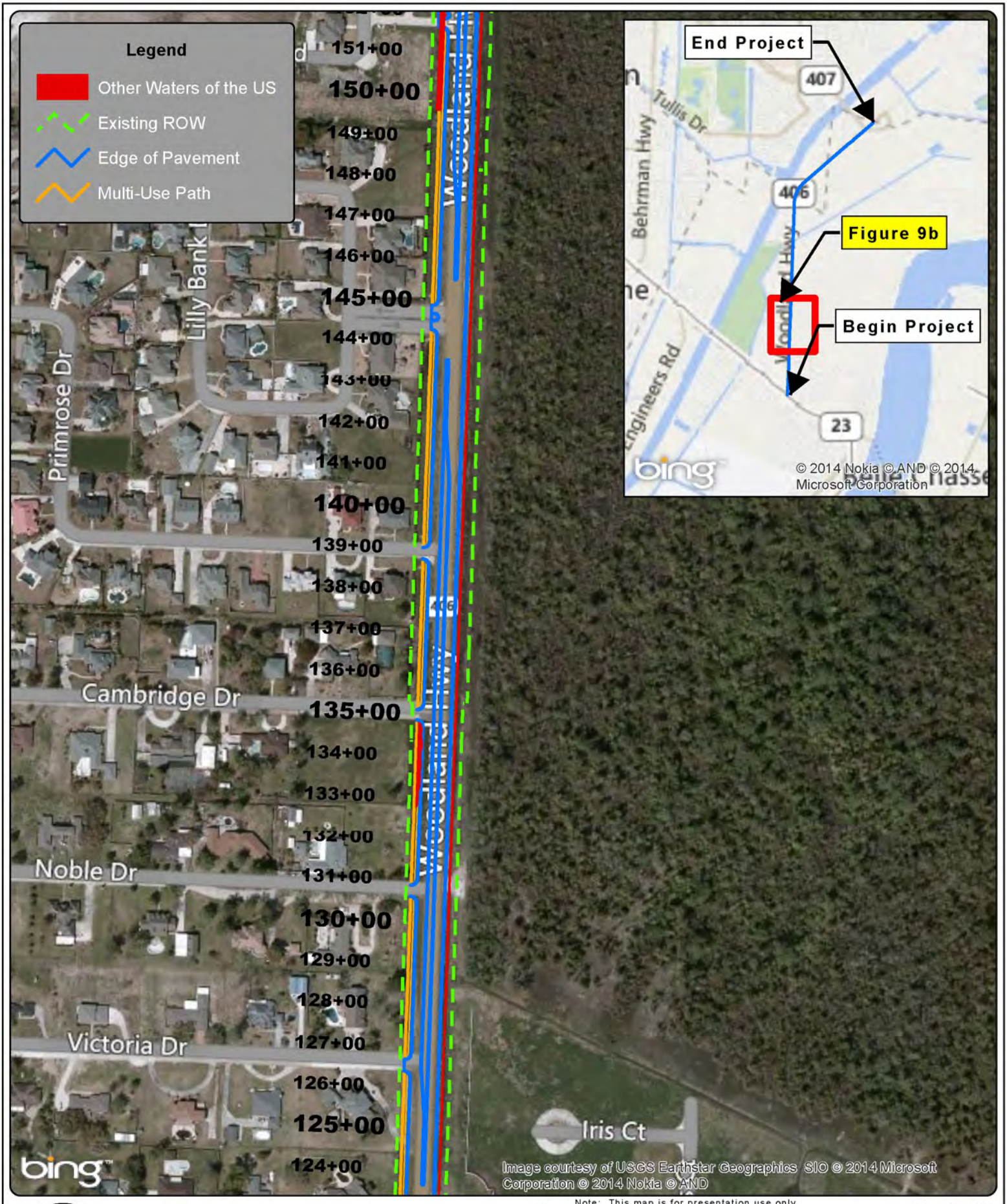
The Build Alternative will impact 5.95 acres of surface water within the study corridor. Modifications will occur to the drainage ditches along the east and west sides of the existing LA 406/Woodland Highway. These ditches will be filled and subsurface drainage will be installed. The impacts to these surface waters will not cause permanent loss, rather a conversion. The impacts to Industry and Planters Canals will also be temporary and no permanent water body modifications are anticipated to these two canals. As a result, it is anticipated that no long-term adverse effects as a result of the water body modifications will occur.



Note: This map is for presentation use only and not to be used for construction purposes.

Figure 8a
Other Waters of the US Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 8a Other Waters of US Map.mxd



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1 inch = 300 feet

Note: This map is for presentation use only and not to be used for construction purposes.

Figure 8b
Other Waters of the US Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

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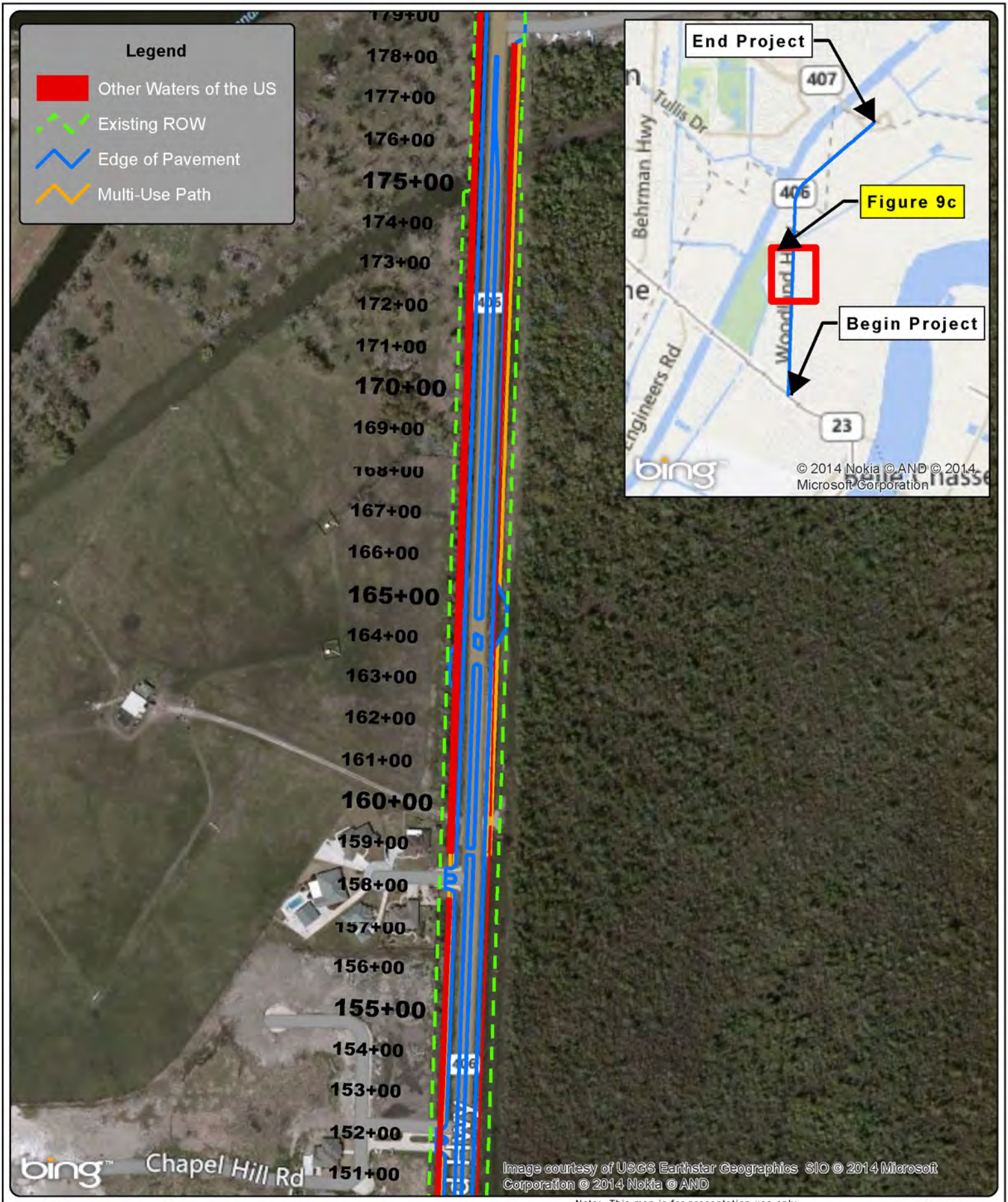

RPC REGIONAL PLANNING COMMISSION — JEFFERSON • ORLEANS • PLAQUEMINES • ST. BERNARD • ST. TAMMANY

DOTD — LOUISIANA'S ON THE MOVE... BUILDS THE WAY

LA 406

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1 inch = 300 feet

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Note: This map is for presentation use only and not to be used for construction purposes.

Figure 8c
Other Waters of the US Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

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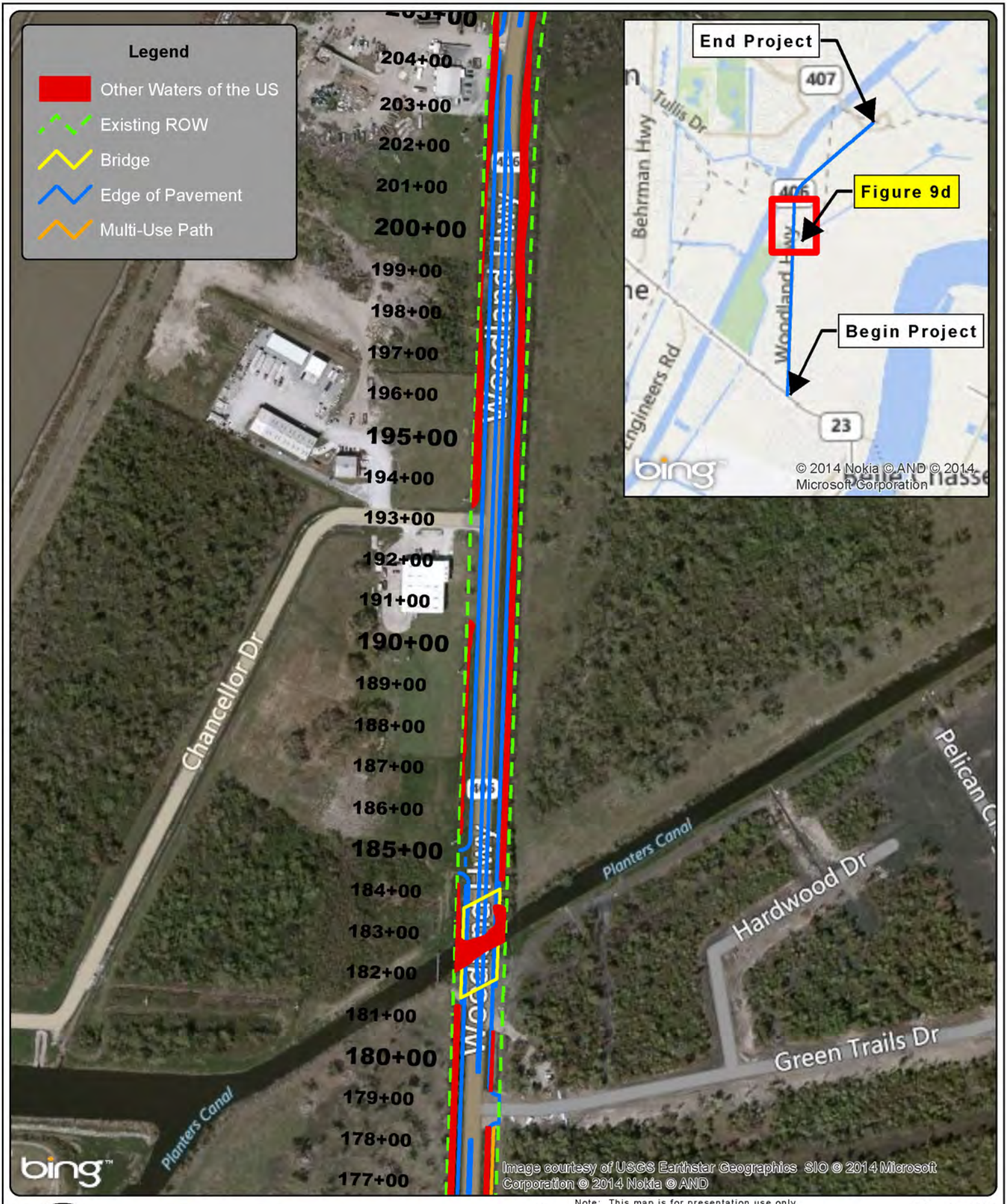

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Note: This map is for presentation use only and not to be used for construction purposes.

Figure 8d
Other Waters of the US Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

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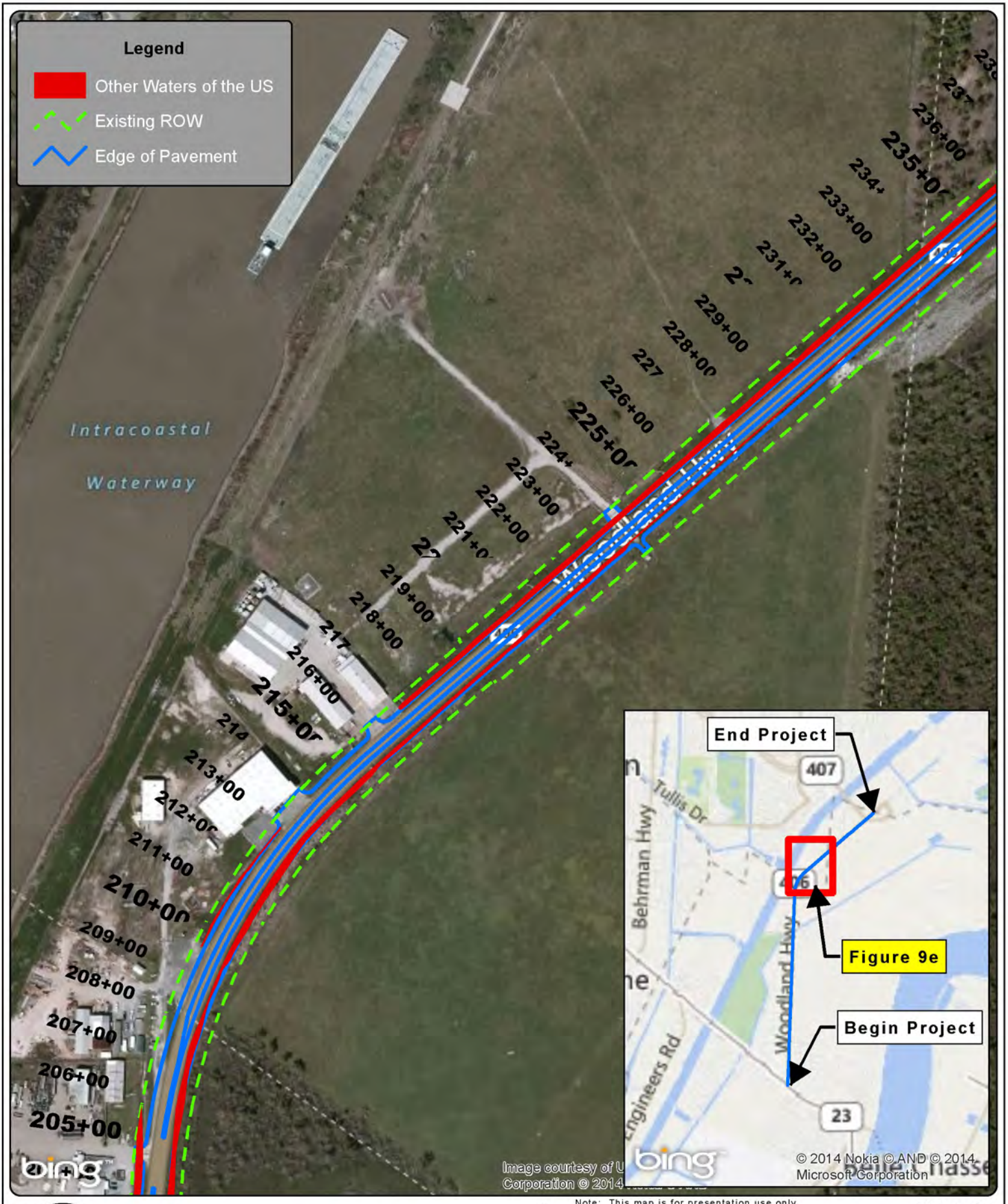

Note: This map is for presentation use only and not to be used for construction purposes.

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1 inch = 300 feet

Figure 8e
Other Waters of the US Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

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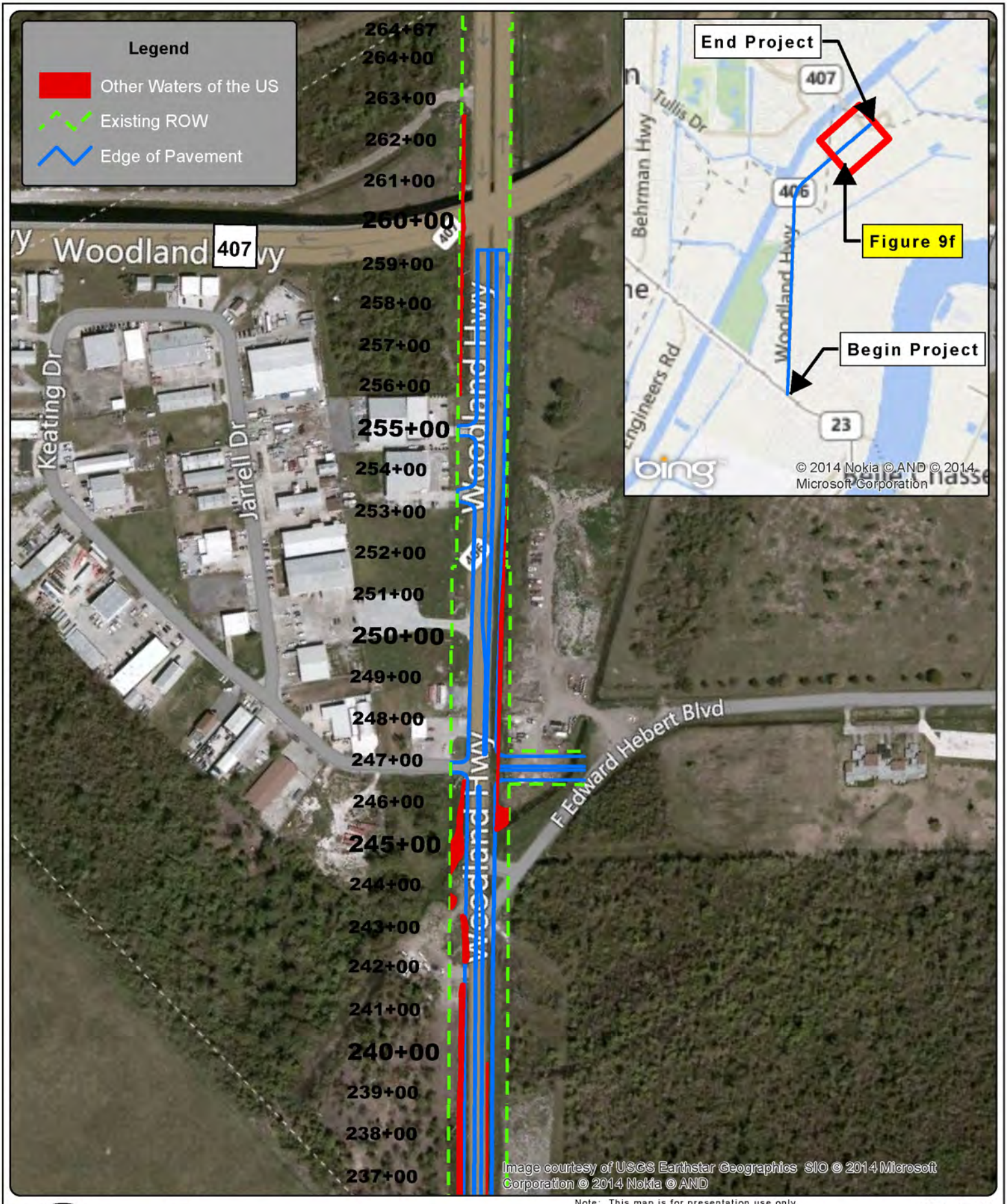

Note: This map is for presentation use only and not to be used for construction purposes.

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1 inch = 300 feet

Figure 8f
Other Waters of the US Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

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3.13 Floodplain Impacts

EO 11988 “Floodplain Management” requires Federal agencies to avoid actions, to the extent practicable that will result in the location of facilities within floodplains and/or affect floodplain values. Facilities located in a floodplain may be damaged or destroyed by a flood or may change the flood-handling capability of the floodplain or the pattern or magnitude of the flood flow. **Figure 9** shows the 100-year floodplain data for the study corridor. The data was obtained from the Flood Insurance Rate Maps (FIRMS) published by the Federal Emergency Management Agency (FEMA).

3.13.1 No-Build Alternative

The No-Build Alternative will have no short-term or long-term adverse effect on floodplains or future flooding in the study corridor.

3.13.2 Build Alternative

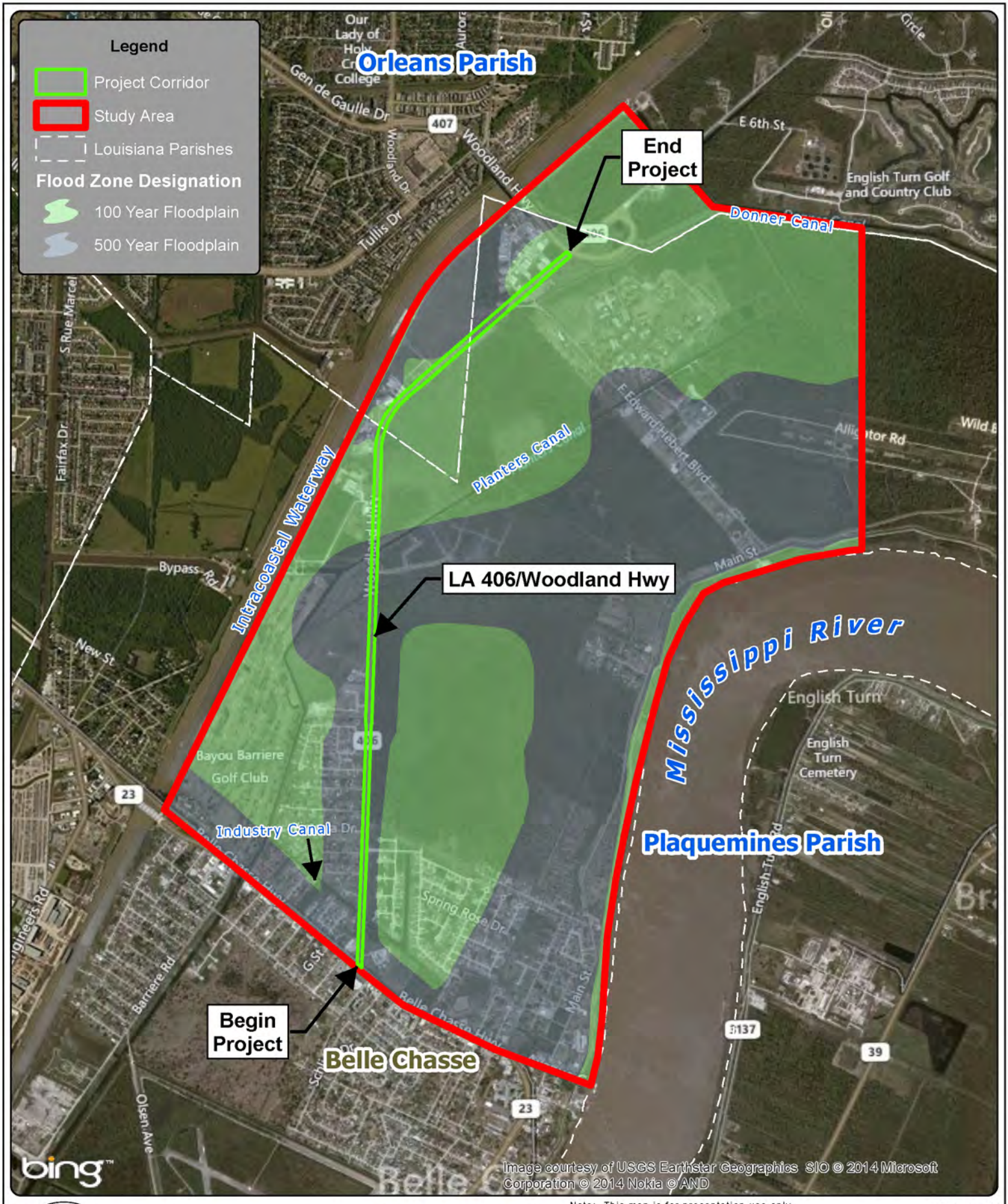
Approximately 21.5 acres of the 100-year floodplain are located within the existing right-of-way. The proposed Build Alternative will be constructed entirely within the existing right-of-way. Existing drainage structures will be replaced during the widening and new structures will be installed. All drainage structures will be designed to minimize impacts to the 100-year floodplain and an engineering “no-rise” certification will be obtained from the RPC Floodplain Administrator prior to construction. Therefore, it is anticipated that construction of the proposed Build Alternative will not result in short-term or long-term adverse effects to floodplains.

3.14 Biotic Community Impacts

The biotic community along the LA 406/Woodland Highway consists of a mowed and maintained habitat. The dominant species include: southern dewberry (*Rubus trivialis*), switchgrass (*Panicum virgatum*), Bermudas grass (*Cynodon dactylon*), Bahia grass (*Paspalum notatum*), and Johnson’s grass (*Sorghum halepense*).

3.14.1 No-Build Alternative

Under the No-Build Alternative, no disturbance of existing vegetation or wildlife will occur. Current highway maintenance activities associated with LA 406/Woodland Highway such as grass mowing and brush trimming will continue according to existing maintenance plans. As a result, it is expected that the No-Build Alternative will have no short-term or long-term adverse effects on biotic communities within the study corridor.


Legend
Project Corridor
Study Area
Louisiana Parishes
Flood Zone Designation
100 Year Floodplain
500 Year Floodplain
Orleans Parish
End Project
Donner Canal
English Turn Golf and Country Club
Planters Canal
Intracoastal Waterway
LA 406/Woodland Hwy
Mississippi River
English Turn
English Turn Cemetery
Bayou Barriere Golf Club
Industry Canal
Plaquemines Parish
Begin Project
Belle Chasse
Image courtesy of USGS Earthstar Geographics SIO © 2014 Microsoft Corporation © 2014 Nokia © AND
bing
0 1,250 2,500 Feet
1 inch = 2,500 feet
Note: This map is for presentation use only and not to be used for construction purposes.
Figure 9
Floodplains Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana
Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 9 Floodplains Map.mxd

3.14.2 Build Alternative

The Build Alternative will disturb grass shoulders and manmade drainage ditches along LA 406/Woodland Highway. These features do not provide unique or unusual habitat for wildlife. Construction activity will require that wildlife that inhabits these areas to relocate as their shelter and food resources would be disturbed or removed. Disturbed areas would be seeded and maintained in accordance with LADOTD's highway maintenance program. Once constructed, the preexistent habitat along the shoulder of the highway will likely be restored allowing for the return of wildlife that was displaced during construction. Therefore, it is anticipated that the proposed Build Alternative will have short-term and minimal adverse effects on biotic communities along the study corridor. No long-term adverse effect on biotic communities is anticipated.

3.15 Threatened and Endangered Species

According to the 2011 USFWS *Threatened and Endangered Species of Louisiana Parish List*, species listed in Plaquemines and Orleans Parishes include the West Indian manatee (*Trichechus manatus*), piping plover (*Charadrius melodus*), gulf sturgeon (*Acipenser oxyrhynchus desotoi*), pallid sturgeon (*Scaphirhynchus albus*), green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), Kemp's ridley (*Lepidochelys kempii*), leatherback sea turtle (*Dermochelys coriacea*), and the loggerhead sea turtle (*Caretta caretta*). Correspondence was sent to the Lafayette field office of the USFWS regarding threatened and endangered species in the vicinity of the project.

3.15.1 No-Build Alternative

The No-Build Alternative will not have short-term or long-term adverse effects on threatened or endangered species or their critical habitat.

3.15.2 Build Alternative

In a letter dated December 21, 2011 the USFWS determined that the proposed project will not result in short-term or long-term adverse effect on threatened or endangered species or their critical habitat. The correspondence from USFWS is included in **Appendix B**.

3.16 Natural and Scenic Rivers

The Louisiana Natural and Scenic River Act of 1970 established the Louisiana Natural and Scenic River System, a state river protection initiative to limit impacts to those rivers, streams, and bayous afforded protection through the Act. Louisiana's natural and scenic rivers system is one of the oldest and largest in the nation, with 64 rivers, streams and bayous receiving protection. The LDWF is charged with regulatory authority over the program. A search of state and Federal designated natural/wild and scenic rivers determined that none are located within the study corridor. As a result, it was determined that the No-Build and proposed Build Alternative will have no short-term or long-term adverse effect on natural or scenic rivers, as there are no Federally listed Wild and Scenic Rivers, or Louisiana Natural and Scenic Rivers in the project study corridor.

3.17 Historic and Archaeological Resources

A *Phase I Cultural Resources Survey* for the LA 406/Woodland Highway widening project was conducted in July 2013. The survey was performed to locate and record any structures 50 years of age or older within the study corridor and to evaluate these structures using NRHP criteria. The study corridor for the project was set as 0.25 mile along both sides of the LA 406/Woodland Highway centerline and encompassed approximately 47 acres. Research was also conducted to identify any archeological sites within the study corridor.

3.17.1 Historic Resources

No standing structures 50 years of age or older were located within the study corridor. As a result, it was determined that neither the No-Build nor Build Alternative will impact historic resources. The State Historic Preservation Officer (SHPO) concurred with the findings in a letter dated August 15, 2013. The August 15, 2013 concurrence is included in **Appendix B**.

3.17.2 Archaeological Resources

The archeological survey and research identified the remains of a late historic to modern landfill within the study corridor. It was determined that the site had no integrity for research potential and that it was not eligible for nomination to the NRHP. In a letter dated March 19, 2013 the SHPO determined that the proposed project will have no effect on archeological resources. The March 19, 2013 letter is included in **Appendix B**.

3.18 Potential Hazardous Waste Sites and Oil & Gas Wells

A search, of the Louisiana Oil Spill Coordinator's Office (LOSCO) was performed for potential hazardous waste sites and oil and gas wells located within one mile of the study corridor. Environmental Data Resources (EDR) was also contracted to review the study corridor to assist in identifying sites that contain or potentially contain hazardous or toxic materials and/or wastes. The search was performed using the standard American Society for Testing and Materials (ASTM) format for Phase I Environmental Site Assessments. EDR's report included regulatory agency record reviews and a search of Federal and state environmental compliance databases. Two types of sites were considered to be of particular interest for this project:

- Sites containing underground storage tanks (USTs), and
- Sites where hazardous materials or wastes are generated, stored, handled, or disposed.

These sites, should they be contaminated, have the potential to directly impact the study corridor if located in the existing right-of-way, or indirectly through migration of contamination off site and into the right-of-way.

One listed Facility Index System (FINDS) site, the Plaquemines Parish School Board Administration, was identified as the National Center for Education Statistics. This site is not an environmental concern. Woodlands Material Recovery located at 1042

Woodland Highway was identified in two systems within FINDS: the National Pollutant Discharge Elimination System (NPDES) and the Permit Compliance System. This site is also known as Environmental Operators LLC and is discussed below under this name. The remaining seven sites are also discussed below in greater detail. **Figure 11** shows the locations of Potential Hazardous Waste Sites and Oil & Gas Wells in the vicinity of the LA 406/Woodland Highway widening project.

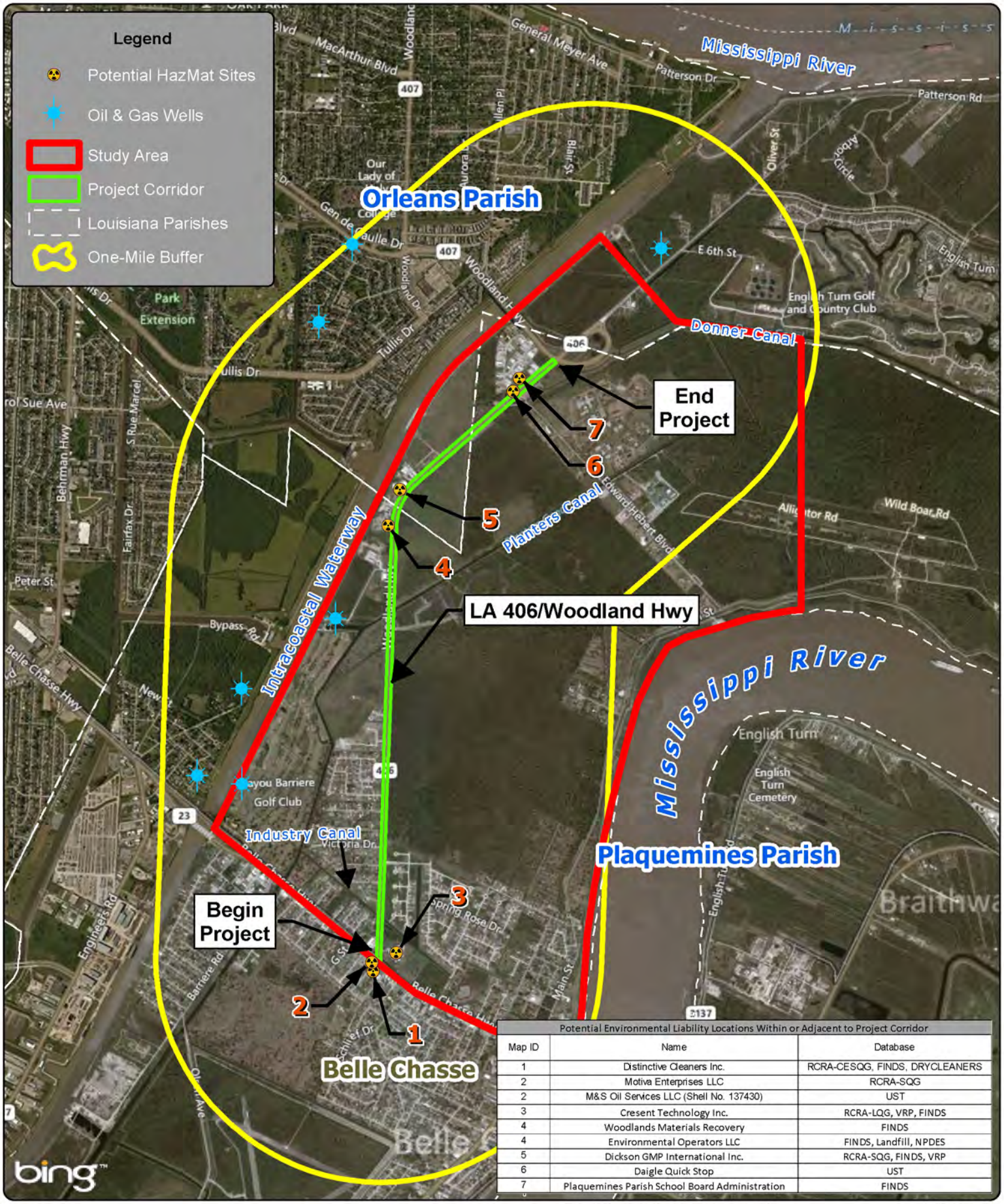
Two UST sites were identified in the EDR report. Four active 10,000 gallon gasoline USTs were identified at M&S Oil Services LLC (Agency Interest (AI) No. 71537) located at 7876 Belle Chasse Highway at the intersection of LA 23 (Belle Chasse Highway) and LA 406/Woodland Highway. Three additional gasoline USTs were identified at the Daigle Quick Shop (AI No. 68671) located near the intersection with LA 406/Woodland Highway at 102 Keating Street (two 4,000 gallon tanks and one 6,000 gallon tank). No Leaking Underground Storage Tanks (LUSTs) or Historical Incident Leaking Underground Storage Tanks (HIST LUSTs) were identified within or adjacent to the existing right-of-way.

Environmental Operators LLC (AI No. 30266) located at 1042 Woodland Highway was identified in two EDR databases: Solid Waste Facilities Landfill and NPDES. This site currently has a Wastewater Discharge Permit, Class I Sanitary Discharge General Permit (No. LAG 530950), and previously had a Type III Separation Facility Solid Waste Permit (No. P-0348). LDEQ performed a site inspection on February 28, 2012 to verify proper closure of the sites. Inspection notes stated the facility was no longer in use and the building was converted into a mechanic shop. No areas of concern were noted.

One Resource Conservation and Recovery Act – Conditionally Exempt Small Quantity Generator (RCRA-CESQG) was identified as Distinctive Cleaners Inc. (AI No. 5478) located at 7892 Belle Chasse Highway. A search of LDEQ's Electronic Document Management System (EDMS) showed asbestos removal via renovation occurred in 2011 at this site.

Three Resource Conservation and Recovery Act – Small Quantity Generators (RCRA-SQG) were identified: Motiva Enterprises LLC located at 7876 Belle Chasse Highway; Dickson GMP International Inc. (DGI, AI No. 249)) located at 4001 Woodland Highway; and, Crescent Technology, Inc. (CTI, AI No. 3384)) located at 101 Woodland Highway. The DGI site and the CTI site are also associated with LDEQ's Voluntary Remediation Program (VRP). This information was confirmed through EDMS.

Documents found in EDMS stated the DGI site was used in the 1960's to manufacture offshore oil field equipment. In August 2002, new owners were looking to redevelop the property as an industrial site and an investigation was conducted to analyze soil and groundwater data. The results of the investigation were submitted to LDEQ in September 2002 and showed benzo(a)pyrene, total petroleum hydrocarbons (TPH)-diesel, and arsenic present in the top three feet of soil.



Potential Environmental Liability Locations Within or Adjacent to Project Corridor		
Map ID	Name	Database
1	Distinctive Cleaners Inc.	RCRA-CESQG, FINDS, DRYCLEANERS
2	Motiva Enterprises LLC	RCRA-SQG
2	M&S Oil Services LLC (Shell No. 137430)	UST
3	Cresent Technology Inc.	RCRA-LQG, VRP, FINDS
4	Woodlands Materials Recovery	FINDS
4	Environmental Operators LLC	FINDS, Landfill, NPDES
5	Dickson GMP International Inc.	RCRA-SQG, FINDS, VRP
6	Daigle Quick Stop	UST
7	Plaquemines Parish School Board Administration	FINDS

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1 inch = 3,000 feet

Note: This map is for presentation use only and not to be used for construction purposes.

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Figures\September 2014\Figure 10 HazMat Sites Map.mxd

Figure 10
Potential Hazardous Waste Sites and Oil & Gas Wells Map
LA 406 Widening/Woodland Hwy
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

A second round of sampling was conducted in December 2002 and the Risk Evaluation/Corrective Action Program (RECAP) report was submitted in January 2003. A subsequent sampling investigation occurred in June 2003 and a second RECAP report was submitted in February 2004. On April 12, 2005, the LDEQ sent a letter stating no further action (NFA) required (see **Appendix B**).

A search on EDMS identifies the CTI site as a Large Quantity Generator (RCRA-LQG) as opposed to the results of the EDR report that identifies it as a RCRA-SQG. The 2011 Annual Hazardous Waste Report has not been submitted to LDEQ but the 2010 and 2009 reports indicate the site is classified as a RCRA-LQG. CTI is an analytical lab that analyzes mining products for gold by the fire assay method. The site generates contaminated fire assay lead-bearing waste. In June 2004, the site submitted an application for LDEQ's VRP. A RECAP work plan was also submitted to evaluate and determine the extent of remediation necessary within the site from the processing of nickel ore by the previous property owner. Tailings were generated as a result of the process and then stored on-site in cells. A one-acre portion of the 31-acre site was identified as contaminated as a result of a leaching process from 2,500 cubic yards of tailings that were store in cells on-site. On May 19, 2005, the LDEQ approved the Corrective Action Plan via on-site excavation. Approximately 5,000 cubic yards of soil were removed from the site and back filled. The LDEQ required NFA and a certificate of completion was issued in November 2005.

3.18.1 No-Build Alternative

The No-Build Alternative would have no impact on hazardous waste or oil and gas wells in the study corridor. However, contamination from hazardous waste sites and oil and gas wells adjacent to the highway may have contributed contaminants to soils within the existing right-of-way of LA 406/Woodland Highway.

3.18.2 Build Alternative

There are no active oil and gas wells within or adjacent to the study corridor. Based on the EDR results, nine potential environmental liability sites including two UST sites are located adjacent to the Build Alternative. Since all work will occur within the existing right-of-way, additional right-of-way will not be acquired from these sites. However, these sites are located in the vicinity of the highway and contaminants from the sites could have migrated into the right-of-way.

During construction, further evaluation and testing may be required to determine the presence or extent of contamination within the existing right-of-way. If contamination is confirmed, it will be handled in accordance with the LADOTD's standard procedures and the LDEQ's rules and regulations. If additional right-of-way will be required, then it is recommended that a supplemental Phase I Environmental Site Assessment be conducted.

3.19 Visual Impacts

The project setting consists of an existing highway, LA 406/Woodland Highway.

3.19.1 No-Build Alternative

The No-Build Alternative will not result in short-term or long-term adverse visual impacts on the study corridor.

3.19.2 Build Alternative

The proposed Build Alternative includes widening along an existing highway within the existing right-of-way of LA 406/Woodland Highway; therefore, no short-term or long-term adverse visual impacts are anticipated as a result of the project's construction.

3.20 Construction Impacts

The project setting consists of an existing highway, LA 406/Woodland Highway.

3.20.1 Traffic Congestion

Temporary traffic congestion will likely occur during construction. These short-term adverse impacts, however, should be minimal since construction will be phased so that traffic can be maintained along LA 406/Woodland Highway. In addition, construction will be limited to off-peak traffic hours. The greatest short-term impact will likely occur during the construction of the drainage systems or where utilities cross LA 406/Woodland Highway. Traffic congestion will be minimized when possible by scheduling these type activities to non-peak hours. No long-term adverse traffic congestion impacts are expected to occur as a result of the project's construction.

3.20.2 Air Quality Construction Impacts

Temporary impacts to air quality may occur during construction. Some fugitive dust may be generated from construction activities and could cause localized, short-term adverse impacts to air quality. No long-term adverse air quality impacts are expected to occur as a result of the project's construction.

3.20.3 Water Quality Construction Impacts

LA 406/Woodland Highway crosses over both the Industry Canal and Planters Canal within the study corridor. There is a potential for short-term adverse impacts to receiving waters during construction activities. As discussed in Section 3.10.3, LDEQ requires projects with discharges of storm water from construction activities to obtain a Storm Water General Permit for Construction Activities. The SWPPP required by this permit will discuss specific BMPs for the project that will reduce any short-term adverse impacts to water quality during construction. No long-term adverse water quality impacts are expected to occur as a result of the project's construction.

3.20.4 Construction Noise Impacts

The construction of the project will result in temporary noise increases at businesses and residences along LA 406/Woodland Highway. The short-term construction noise impacts will be generated primarily from heavy equipment used in hauling materials and widening the highway.

The construction contractor has the responsibility for protection of the general public in all aspects of construction through the duration of the project. All construction

equipment will be required to comply with Occupational Health and Safety Administration (OSHA) regulations as they apply to the employees' safety, and in accordance with the LADOTD Standard Specifications. All construction equipment used in the construction phase of the project should be properly muffled and all motor panels should be shut during operation. In order to minimize the potential for impacts of construction noise on the local businesses and residents, the contractor should operate, whenever possible, between the hours of 7:00 a.m. and 5:00 p.m. No long-term construction noise impacts are expected to occur as a result of the project's construction.

3.20.5 Public Health and Safety

Existing LA 406/Woodland Highway is primarily a two-lane highway with four-foot paved shoulders through the project limits. The existing highway currently experiences an inadequate LOS during periods of peak traffic and a high rate of rear-end collisions. Vehicles wanting to make left-turns across traffic must stop in the through-lane to wait for a traffic break and as a result, this section of highway experiences congestion and a high frequency rate of rear-end collisions. Temporary traffic congestion will likely occur during construction. Short-term construction-related traffic congestion will likely have an adverse effect on the response times of emergency vehicles traveling the highway. However, delays should be minimal since construction will be phased so that traffic can be maintained along LA 406/Woodland Highway. Under the Build Alternative condition, dedicated left-turn lanes and median U-Turn breaks will be incorporated into the center median at the following locations:

- Median will begin at Station 115+00 1,500 feet north of the LA 23/Belle Chasse Highway intersection,
- Station 123+00 at Springwood Drive at the Springwood Estates sub-division,
- Station 136+00 with paved U-Turn bulb-outs,
- Station 144+50 at Pleasant Ridge Drive at the Pleasant Ridge Estates sub-division,
- Station 164+00 with paved U-Turn bulb-outs,
- Station 179+00 at Green Trails Drive the entrance to the Parks of Plaquemine sub-division,
- Station 193+00 at Chancellor Drive,
- Station 202+00 paved U-Turn bulb-outs,
- Station 216+00 approximately 0.5 mile north of Chancellor Drive,
- Station 229+40 approximately 0.25 mile south of Herbert Boulevard,
- Station 247+00 at Herbert Boulevard and Keating Drive.

The dedicated left-turn lanes will remove the vehicles wanting to make left-turns across traffic from the through-lanes. As a result under the Build Alternative condition, it is anticipated that the occurrence of rear-end collisions will be reduced. In addition, through traffic (including emergency response vehicles) will not be delayed by the stopped traffic. The proposed Build Alternative will also separate the directional traffic with an 18-foot median. The 18-foot median will reduce the likelihood of head-on collisions. As a result of these improvements, it is anticipated that the health and safety of the public will benefit from the proposed project.

3.20.6 Vibration Impacts

The proposed Build Alternative will be constructed within the existing right-of-way. However, localized and temporary vibration impacts are likely to occur along the study corridor during construction. The short-term vibration will be generated primarily from heavy equipment used in hauling materials and building the highway improvements. Sensitive areas located close to the highway may temporarily experience increased vibration. These areas include the residential neighborhoods located along the southern portion of the highway near the project begin point at the intersection of LA 23/Belle Chasse Highway. Once the project is built, vibration from the highway is not expected to increase over that which would be experienced under the No-Build Alternative.

During construction, short-term vibration will be minimized to the greatest extent practicable through adherence to controls listed in the latest edition of LADOTD's Standard Specifications for highway construction. The construction contractor has the responsibility for protection of the general public in all aspects of construction through the duration of the project. All construction equipment will be required to comply with OSHA regulations as they apply to the employees' safety, and in accordance with the LADOTD Standard Specifications. All construction equipment used in the construction phase of the project should be properly muffled and all motor panels should be shut during operation. In order to minimize the potential for impacts of construction vibration on the local businesses and residents, the contractor should operate, whenever possible, between the hours of 7:00 a.m. and 5:00 p.m.

3.20.7 Construction Staging Areas

The proposed Build Alternative will be constructed within the existing right-of-way. No construction staging areas beyond the existing right-of-way will be required for the construction of the project.

3.20.8 Best Management Practices

To minimize the release of sediments and to control potential pollutants from the construction site to nearby canals, BMPs will be implemented prior to and during the construction phase, until final stabilization of the project is complete. Specific BMPs for the project, along with maintenance procedures and an inspection process, will be detailed in the SWPPP. These measures may include the use of sediment barriers, temporary and permanent vegetative cover for soil stabilization, dust control, and the use of riprap for the protection of soils from erosion. Implementation of BMPs will minimize environmental impacts during construction.

3.21 Coastal Zone Consistency

The study corridor is located within the Louisiana Coastal Zone. As required by Section 307 of the Coastal Zone Management Act of 1972, correspondence with the OCM regarding the project's potential effect on the coastal zone, as well as CUP requirements has been conducted.

3.21.1 No-Build Alternative

The No-Build Alternative will have no short-term or long-term adverse effects on the Louisiana Coastal Zone.

3.21.2 Build Alternative

The OCM sent two response letters; both are included in **Appendix B**. The OCM confirmed the Build Alternative is within the Louisiana Coastal Zone and is a use of state concern in accordance with Louisiana Revised Statue 4:214.5. The OCM stated a CUP is required and assigned the project a reference number of P20120815 for future correspondence. Once the detailed plans have been developed, a CUP application will be submitted to determine coastal zone impacts and potential mitigation requirements.

3.22 Essential Fish Habitat

Under the Magnuson-Stevens Fisheries Conservation and Management Act of 1996 (Public Law 104-297), the Gulf of Mexico Fishery Management Council identified Essential Fish Habitats (EFHs) for those species managed under its fishery management plans. EFH is defined as being "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity."

3.23.1 No-Build Alternative

The No-Build Alternative will have no short-term or long-term adverse effects on EFHs.

3.23.2 Build Alternative

The EFH Mapper on the NOAA Fisheries website was utilized to determine EFHs in the study corridor. No EFHs, habitat areas of particular concern, or EFH areas protected from fishing were identified in the study corridor. EFHs are associated with the nearby ICWW and Mississippi River; however these waterways will not experience short-term or long-term adverse effects as a result of the Build Alternative. During the JPA process comments will be solicited from NOAA Fisheries. Additionally, as part of the USACE Section 404/10 permit process, the National Marine Fisheries Service will be forwarded a copy of the PCN or individual application.

3.23 On-going, Proposed, and Future Projects in the Area

LA 406/Woodland Highway is included in the MPO TIP, 2011-2014, as a widening project. Improvements and maintenance projects in the area are also addressed. The proposed LA 406/Woodland Highway improvements are included in the LADOTD STIP (Highway Portion) for FY 2013, 2014, 2015, and 2016, as approved by FHWA September 27, 2012. The proposed project will not conflict with any other projects planned in the area.

One additional highway improvements project is located in the study corridor. The project includes improvements to Hebert Drive (Project No. 700-38-0109). The improvements include the re-alignment of Hebert Drive to intersect LA 406/Woodland Highway at the Keating Drive intersection.

3.24 Indirect and Cumulative Impacts

The Council of Environmental Quality's (CEQ) *Regulations for Implementing the Procedural Provisions of the NEPA* (40 CFR §1500-1508) requires that not only direct impacts, but indirect and cumulative impacts (ICI) also be evaluated for the Build Alternative condition. Sections 3.1 through 3.22 described the potential direct impacts the Build Alternative may have on resources located within the project study corridor. This section describes the potential ICI impacts the proposed project may have on resources in the vicinity of or outside the project study corridor.

3.24.1 Indirect Impacts

Indirect impacts are effects caused by an action that occur later in time than direct impacts or are farther removed in distance, but are still reasonably foreseeable (40 CFR 1508.8).

3.24.1.1 No-Build Alternative Indirect Impacts

The No-Build Alternative will have no short-term adverse impact on the potential for inducing changes in the patterns of land use or population density. The long-term rate of growth in the area may be adversely affected by the increase in congestion and decrease in safety as traffic volumes increase. However, growth in the area is projected to occur with or without the project.

3.24.1.2 Build Alternative Indirect Impacts

Potential indirect impacts to land use include new residential, commercial, or industrial developments on vacant land adjacent to or in the vicinity of the LA 406/Woodland Highway. Because the proposed improvements will be located along an existing well-established highway corridor, the indirect effects on land use associated with the proposed project are expected to be minor. In addition, the development and growth is expected to occur along the highway with or without the project being constructed and much of the land capable of being developed has already been converted to residential or agricultural uses. As a result, it is anticipated that the project will have little or no short-term or long-term adverse indirect effects. A potential beneficial indirect effect the project may have is a short-term boost to the economy in the study corridor during construction derived from an influx of construction related jobs and associated commercial activity. In addition, should new development arise in the study corridor, the proposed project would accommodate any additional traffic volumes more safely that the No-Build Alternative condition.

3.24.2 Cumulative Impacts

Cumulative impacts are defined as "the impacts on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

3.24.2.1 No-Build Alternative Cumulative Impacts

Under the No-Build Alternative condition, the deficiencies of the LA 406/Woodland Highway will not be addressed and as traffic volumes increase congestion will increase and the LOS will decrease. These conditions will likely contribute to higher crash rates and a decrease in safety along the study corridor. As previously discussed, the study corridor is predominantly rural residential and most residents must travel outside the study corridor to work and obtain goods or receive services. As traffic volumes increase, it will become more difficult for the public to travel the highway to reach destination points outside of the study corridor. The No-Build Alternative condition may also detract from new residents, businesses, or industries looking to possibly relocate to the area. As a result, it is likely that the No-Build Alternative would result in both short-term and long-term adverse cumulative impacts in the area.

3.24.2.2 Build Alternative Cumulative Impacts

Potential cumulative impacts include the combined impacts new residential, commercial, and industrial developments would have on currently vacant land adjacent to LA 407/Woodland Highway. Other transportation projects would also contribute to the cumulative impacts to resources in the area. No Federal or non-Federal transportation or private development projects are currently planned within or near the proposed project. However, once the project is constructed, it is possible that proposals for projects (especially private development projects) will emerge to take advantage of the improved access to under developed or undeveloped land adjacent to the study corridor. As previously mentioned, much of the land capable of being developed has already been converted to residential or agricultural uses. As a result, it is expected that the project will have minimal short-term or long-term adverse cumulative impacts to resources in the area.

4.0 COMMENTS AND COORDINATION

4.1 Advance Coordination

A SOV letter was sent to appropriate Federal, state, and local agencies as well as tribal interests on December 13, 2011. Responses received are included in **Appendix B**. Responses from resource and regulatory agencies will be addressed during the final design and permitting phase of the project.

4.2 Public Involvement

A Public Involvement Meeting for the project was held on April 25, 2012, hosted by the LADOTD and the RPC. An open house format was utilized to display the proposed improvements, answer questions, and solicit for comments. Five written comments were received and are included in **Appendix G**. A summary of the comments and responses are provided in the following paragraphs.

Comment:

"Regarding the purpose and need, U.S. Marines that reside at the Naval Air Station / Joint Reserve Base in Belle Chasse travel to their jobs on a daily basis on Woodland Highway / General De Gaulle Bridge to Marines Forces Reserve Command Facility in Algiers. Efficient access between Algiers and Belle Chasse supports the Department of Defense Missions, and this project is supportive in this regard."

Response:

Comment noted. The proposed project will improve access from LA 23 / Belle Chasse Highway to LA 407 / General De Gualle Highway.

Comment:

"Right turn off of Highway 23 to Woodland is a right turn only and does not provide any waiting area for vehicles to stack up in wait of right turn. A "stack" lane would really help alleviate the traffic problem in this area for at least 10 cars."

Response:

Comment noted. The proposed Build Alternative does not include improvements along LA 23 / Belle Chasse Highway or improvements to the intersection of LA 406 / Woodland Highway and LA 23 / Belle Chasse Highway.

Comment:

1. *Sheet #6 – Consider moving median cut thru away from Highway 23 @ 300' to center of property on east side.*
2. *Sheet #11 – Review drainage issues at slew on west side of highway.*
3. *Sheet #12 – Note that Planters Canal will need to be widened in the near future, therefore, bridge will need to be widened.*
4. *Sheet #13 – Consider moving median cut thru south, away from the curve and to allow for future development on east side of highway.*
5. *Sheet #10 – Consider moving turn around south 500' to subdivision entrance – 158+00.*

Response:

1. The proposed design has been updated and the center median in the updated design will not begin until 1,500' north of LA 23 Belle Chasse Highway.
2. The drainage ditches along LA 406 / Woodland Highway will be filled and replaced with an underground drainage system. The underground drainage system will be designed to accommodate runoff from the highway.
3. The bridge at Planters Canal will be designed to minimize impacts to the 100-year floodplain and an engineering "no-rise" certification will be obtained from the RPC Floodplain Administrator prior to construction. Therefore, it is anticipated that construction of the proposed Build Alternative will not result in short-term or long-term adverse effects to floodplains.
4. The median break at Station 204+00 is to allow left-turns to and from Woodland Highway. Woodland Highway serves several industries and heavy truck access is required at this intersection. The median break will accommodate access to these industries.
5. The median breaks are preliminary and will be reviewed during the final design stage of the project. The median break at Station 164+00 includes paved bulb-outs which will accommodate truck U-Turns. If the median break were moved to Station 158+00 at the intersection of Bailey Estates Drive, the entrance to the subdivision will be impacted and right-of-way would need to be acquired. Also, the new LADOTD design guidelines require median breaks to be at least ¼ mile apart. The intersection of Bailey Estates Drive is too close to the proposed median break with bulb-outs at Station 164+00.

Comment:

I am fully supportive of widening Woodland Highway for four lanes (plus turning lanes where needed) from Belle Chasse Highway to the Algiers Bridge, in order to help alleviate the serious traffic problems in Belle Chasse."

Response:

Comment noted. The proposed project will reduce traffic congestion and increase the LOS of the highway from LA 23 / Belle Chasse Highway to LA 407 / General De Gualle Highway.

Comment:

"My comments involve the intersection of Woodland Highway and Herbert Drive. I would request that your project include how to make this a safer intersection since it presently is unsafe and the traffic using it will continue to increase. One of the problems with the intersection is the angle motorists are at when driving from Hebert Drive to Woodland Highway, turning left. Basically a blind spot exists causing one to take too great a risk, especially if weather conditions are foggy or rainy (this particular area has ground fog) when entering Woodland Highway."

"I would suggest that Hebert Drive be connected to Woodland Highway opposite Keating Drive and that a "round-a-bout" intersection be used. This would do three things: Greatly reduce the likelihood of serious accidents, eliminate the need of

electronic traffic signals/lights, and all traffic to flow better especially during off-hours or light traffic times. An additional benefit give to round-a-bout intersections is that it saves fuel since you usually don't have to come to a complete stop."

Response:

Hebert Drive will be re-aligned to intersect LA 406 / Woodland Highway at the Keating Drive intersection perpendicularly as part of the F. Edward Hebert Road Improvements project (Project No. 700-38-0109). A median break will be provided at the new intersection. A round-a-bout at the Hebert Drive intersection would require additional right-of-way. As a result, the proposed Build Alternative does not include a round-a-bout at this location.

4.3 Business Community Meetings

Meetings will be held, as appropriate, during further project development. Input has been received from area businesses through development of the MPO TIP and other transportation planning activities.

4.4 Local Community Meetings

Input from the local community was received from the Public Involvement Meeting on April 25, 2012. Additional meetings will be conducted as appropriate.

4.5 Agency Meetings

No agency meetings have been held for the project. Agency meetings will be conducted as needed during the final design and permitting phases of the project.

4.6 Supplemental Coordination

No supplemental coordination has been conducted for the project. Supplemental coordination will be conducted on an as needed basis as project development continues.

4.6.1 Agency Coordination

A SOV packet was distributed on December 13, 2011 to everyone on the LADOTD State, Plaquemines Parish, and Orleans Parish mailing list. Two separate letters went out to USEPA SSA and LDNR OCM on June 5, 2012. A distribution list and a copy of these letters can be found in **Appendix A**. Agency responses received are included as **Appendix B**.

4.6.2 Business Owners

Coordination with businesses will continue through the development of the project. Issues related to access during construction will be evaluated to minimize adverse impacts.

4.6.3 Public Involvement

A Public Hearing will be conducted after approval of the Environmental Assessment. Comments will be solicited from Federal, state, and local agencies tribal interest, business owners, and the public.

5.0 REFERENCES

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6.0 ACRONYMS AND ABBREVIATIONS

ACS.....American Community Survey
ADT.....Average Daily Traffic
AI.....Agency Interest
ALD .....Algiers Levee District
AASHTO .....American Association of State Highway and Transportation Officials
ASTM .....American Society for Testing and Materials
BMPs.....Best Management Practices
CAAA .....Clean Air Act Amendments
CEQ .....Council of Environmental Quality
CESQG .....Conditionally Exempt Small Quantity Generators
CO.....Carbon Monoxide
CO_2..... Carbon Dioxide
CPRA .....Coastal Protection and Restoration Authority
CTI .....Crescent Technology, Inc.
CUP.....Coastal Use Permit
CWA.....Clean Water Act
DGI.....Dickson GMP International Inc.
EA .....Environmental Assessment
EDMS.....Electronic Document Management System
EDSM.....Engineering Directives and Standards Manual
EDR.....Environmental Data Resources
EFH.....Essential Fish Habitat
EIS .....Environmental Impact Statement
EJ.....Environmental Justice
EO.....Executive Order
FEMA .....Federal Emergency Management Agency
FHWA.....Federal Highway Administration
FINDS .....Facility Index System
FIRMS.....Flood Insurance Rate Maps
FONSI .....Finding of No Significant Impact
HIST LUSTs.....Historical Incident Leaking Underground Storage Tanks
ICI.....Indirect and Cumulative
ICWW.....Intracoastal Waterway
JPA.....Joint Permit Application
LAC .....Louisiana Administrative Code
LADOTD.....Louisiana Department of Transportation and Development
LDEQ .....Louisiana Department of Environmental Quality
LDNR .....Louisiana Department of Natural Resources
LDWF.....Louisiana Department of Wildlife
LRFD.....Load and Resistance Factor Design
LOS.....Level of Service
LOSCO.....Louisiana Oil Spill Coordinator's Office
LPDES .....Louisiana Pollutant Discharge Elimination System
LUSTs .....Leaking Underground Storage Tanks

LQG.....Large Quantity Generators
MPO.....Metropolitan Planning Organization
MSATs .....Mobile Source Air Toxics
MTP.....Metropolitan Transportation Plan
NAC.....Noise Abatement Criteria
NAAQS.....National Ambient Air Quality Standards
NEPA .....National Environmental Policy Act
NFA.....No Further Action
NOAA.....National Oceanic and Atmospheric Administration
MVD .....USACE New Orleans District
NPDES.....National Pollutant Discharge Elimination System
NRCS.....Natural Resources Conservation Service
NRHP .....National Register of Historic Places
OCM.....Office of Coastal Management
OSHA.....Occupational Health and Safety Administration
PCN.....Pre-Construction Notification
PGP.....Programmatic General Permit
PM.....Particulate Matter
RCRA.....Resource Conservation and Recovery Act
RECAP.....Risk Evaluation/Corrective Action Program
RPC.....New Orleans Regional Planning Commission
SHPO.....State Historic Preservation Officer
SLFPAW .....Southeast Louisiana Flood Protection Authority-West
SONRIS .....Strategic Online Natural Resources Information System
SOV.....Solicitation of View
SQG .....Small Quantity Generators
SSA.....Sole Source Aquifer
STIP .....State Transportation Improvement Program
SWPPP .....Storm Water Pollution Prevention Plan
TMDL .....Total Maximum Daily Load
TNM .....The Noise Model
TIP.....Transportation Implementation Plan
TPH.....Total Petroleum Hydrocarbons
UA-2.....Urban Arterial-2
USACE.....United States Army Corps of Engineers
USCB .....United States Census Bureau
USDA .....United States Department of Agriculture
USEPA.....United States Environmental Protection Agency
USFWS .....United States Fish and Wildlife Service
USGS.....United States Geological Survey
UST.....Underground Storage Tanks
VRP.....Voluntary Remediation Program
VMT.....Vehicle Miles Traveled
WQC .....Water Quality Certification

APPENDIX A

Solicitation of Views

VOLKERT

Volkert, Inc.
4640 South Carrollton Ave.,
Suite 240
New Orleans, LA 70119

Office 504.488.8002
Fax 504.488.8008

www.volkert.com

December 13, 2011

Re: **Solicitation of Views**
Woodland Highway (LA 406) Widening
Plaquemines and Orleans Parishes, Louisiana
State Project No. H.008220
Legacy Project No. 700-38-0106

Dear

The New Orleans Regional Planning Commission (NORPC), in conjunction with the Louisiana Department of Transportation and Development (LA DOTD), is in the early planning stages of a transportation project. Views from federal, state and local agencies, organizations, and individuals are being solicited at this time. The special expertise of these groups can assist NORPC and LA DOTD with the identification of possible adverse economic, social, or environmental effects or concerns. Your assistance in this regard is appreciated.

Over the next year, we will be conducting a Stage 1 Planning and Environmental Study for the Woodland Highway (LA 406) Widening project and respectfully request your comments. The project area is located in both Plaquemines and Orleans Parishes and is bounded generally by the Intracoastal Waterway to the west, English Turn Parkway to the north, the Mississippi River to the east, and Belle Chasse Highway (LA 23) to the south. A Stage 0 Feasibility Study was completed in March 2004 to assess the project's feasibility and establish the requirements for widening the LA 406 corridor to accommodate current and future demands in the Belle Chasse area. The study found that it is feasible to expand the corridor, add lanes, and improve safety. Now that the feasibility has been determined and we are moving forward into the Stage 1 process, we are soliciting views with federal and state agencies and public entities with jurisdiction over, or interested in, the project. To assist in your review attached is Figure 1 – Project Area.

The Purpose and Need for the project is to accommodate anticipated increases in travel demand along the corridor due to recent and future adjacent residential development, and due

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to the development of the Federal City project in Algiers, and the expansion of services at the Naval Air Station Joint Reserve Base in Belle Chasse, LA.

It is anticipated that the Class of Action for the Stage 1 Study will be an Environmental Assessment.

It is requested that you review the attached information and furnish us with your views and comments by January 13, 2012. Replies should be addressed to the following:

Volkert, Inc.
Attn: Patrick Owens, PE
4640 S. Carrolton Ave., Suite 240
New Orleans, Louisiana 70119

Please reference the captioned project in your reply.

Should you have any questions regarding this request, please contact me using the contact information below.

Sincerely,

Patrick A. Owens, PE
Assistant Vice President
Project Manager
Volkert, Inc.
pat.owens@volkert.com
504.488.8002
504.488.8008 Fax

Attachments

P:\Projects\138000.80 Woodland Hwy LA 406 Widening Stage 1\DESIGN\DRAWINGS\EXHIBITS\DWG\Study Map.dwg September 22, 2011 2:28 PM

REGIONAL PLANNING COMMISSION

VOLKERT

WOODLAND HIGHWAY / LA 406 WIDENING
(LA HWY 23 TO LA HWY 407)
STAGE 1 - ENVIRONMENTAL ASSESSMENT
PLAQUEMINES PARISH AND ORLEANS PARISH

RPC PROJECT NO. 406-EA

FIGURE 1
PROJECT AREA

STATE MAILING LIST
UPDATED November 5, 2013

US DEPARTMENT OF INTERIOR
NATIONAL PARK SERVICE
100 ALABAMA STREET, SW
NPS/ATLANTA FEDERAL CENTER
ATLANTA GA 30303

LA STATE MINERAL BOARD
P O BOX 2827
BATON ROUGE LA 70821-2827

US DEPT OF THE INTERIOR
OFFICE OF ENVIRONMENTAL
POLICY& COMPLIANCE
1001 INDIAN SCHOOL NW, SUITE 348
ALBUQUERQUE NM 87104

DEPT OF THE INTERIOR
GEOLOGICAL SURVEY
3535 SOUTH SHERWOOD FOREST, SUITE 120
BATON ROUGE, LA 70806

HONORABLE BUDDY CALDWELL
LA STATE ATTORNEY GENERAL
PO BOX 94005
BATON ROUGE, LA 70804-9095

SENATOR MARY LANDRIEU
(CLASS) II
UNITED STATES SENATE
707 FLORIDA BLVD
BATON ROUGE LA 70801

US FISH & WILDLIFE SERVICE
646 CAJUNDOME BLVD, SUITE 400
LAFAYETTE, LA 70506

MR GREG SOLVEY
FEMA REGION VI
800 NORTH LOOP 288
DENTON, TX 76201

SENATOR DAVID VITTER
UNITED STATES SENATE
2800 VETERANS MEMORIAL BLVD.
SUITE 201
METAIRIE, LA 70002

ENVIRONMENTAL ASSESSMENT
SIERRA CLUB / DELTA CLUB
PO BOX 52503
LAFAYETTE, LA 70505-2503

OFFICE OF STATE PARKS
DEPT OF CULTURE REC & TOURISM
PO BOX 44426
BATON ROUGE, LA 70804

US DEPT OF COMMERCE
ECONOMIC DEVELOPMENT ADMN
504 LAVACA STREET, SUITE 1100
AUSTIN, TX 78701-2858

TENNEY SIBLEY
DHH / OPH/ SANITARIAN
PO BOX 4489
BATON ROUGE LA 70821

DISTRICT COMMANDER
8TH COAST GUARD DISTRICT
HALE BOGGS FEDERAL BUILDING
500 POYDRAS
NEW ORLEANS, LA 70130

DEPT OF HEALTH & HOSPITALS
DIVISON OF ENVIRONMENTAL
HEALTHUUUU
ATTN: DOUG VINCENT, CHIEF ENGINEER
P O BOX 4489
BATON ROUGE, LA 70821

STEVEN PEYRONNIN, EXECUTIVE DIR.
COALITION TO RESTORE COASTAL LA
6160 PERKINS ROAD
BATON ROUGE LA 70808

MS BETH AHAZAN-DIXON
OFFICE OF THE SECRETARY
LA DEPT OF ENVIRONMENTAL QUALITY
P O BOX 4301
BATON ROUGE LA 70821

GREGG GOTHREAUX /LAF ECON
211 DEVALCOURT ST
LAFAYETTE, LA 70506-4121

CHARLES ST ROMAIN

DIVISION OF ADMINISTRATION
STATE LAND OFFICE
PO BOX 44124
BATON ROUGE, LA 70804

JAMES G WILKINS
SEA GRANT LEAGAL ADVISORY SERVICE
LOUISIANA STATE UNIVERSITY
227B SEA GRANT BUILDING
BATON ROUGE, LA 70803

FLOODPLAIN MANAGEMENT PGM
DOTD – CINDY O'NEAL
8900 JIMMY WEDELL
BATON ROUGE, LA 70807

MR MARK S DAVIS. DIRECTOR
TULANE INSTITURE ON WATER
6329 FRERET ST. SUITE 355 F
NEW ORLEANS, LA 70118

OFFICE OF INDIAN AFFAIRS
MARK FORD, DIRECTOR
PO BOX 94004
BATON ROUGE, LA 70804-9004

INTER-TRIBAL COUNCIL OF LA, INC
KEVIN BILLIOT, DIRECTOR
8281 GOODWOOD BLVD. SUITE I-2
BATON ROUGE, LA 70808

MR RANDY THIGPEN
3247 EMILY DRIVE
PORT ALLEN LA 70767

FEDERAL TRANSIT ADM
819 TAYLOR STREET
ROOM: 8A36
FORT WORTH, TX 76102

STATE PLANNING OFFICE
CAPITOL ANNEX BLDG. 2ND FLOOR
PO BOX 94095
BATON ROUGE, LA 70804

BILL CASSIDY
P.O. BOX 426
LIVINGSTON, LA 70754

COUSHATTA TRIBE OF LOUISIANA
P.O. BOX 818
ELTON, LA 70532

JENA BAND OF CHOCTAW INDIANS
P.O. BOX 14
JENA, LA 71342

KENNETH CARLETON, THPO
MISSISSIPPI BAND OF CHOCTAW INDIANS
P.O. BOX 6257
PHILADELPHIA, MS 39350

EARL J. BARBRY JR, THPO
TUNICA –BILOXI TRIBE OF LOUISIANA
P.O. BOX 1589
MARKSVILLE, LA 71351

PLAQUEMINE PARISH MAILING LIST
UPDATED November 5, 2013

PLAQUEMINES PARISH SCHOOL BOARD
557 F. EDWARD HEBERT BLVD
BELLE CHASSE, LA 70037

PLAQUEMINES PARISH SHERIFF
I.F HINGLE
302 MAIN STREET
BELLE CHASSE, LA 70037

CHAMBER OF COMMERCE
GREATER NEW ORLEANS, INC
1515 POYDRAS, STE 1010
NEW ORLEANS LA 70112

NATIONAL MARINE FISH SERVICE
HABITAT CONSERVATION DIVISION
LSU CENTER FOR WETLAND RES
BATON ROUGE LA 70803-7535

PLAQUEMINES PORT HARBOR &
TERMINAL DIST
124 EDNA LAFRANCE RAOD
BRAITHWAITE LA 70040-9743

MS. KAREN OBERLIES
DEPT OF THE ARMY – TECH SUPPORT
P O BOX 60267
NEW ORLEANS LA 70538

FLOODPLAIN ADMINISTRATOR
PLAQUEMINES PARISH DEPT OF PW
102 AVENUE G
BELLE CHASSE LA 70037

PLAQUEMINES PARISH DEPARTMENT OF
EMERGENCY SERVICES
8056 HIGHWAY 23, SUITE 308
BELLE CHASSE, LA 70037

NEW ORLEANS REGIONAL PLANNING
COMMISSION
10 VETERANS BLVD
NEW ORLEANS, LA 70124

HONORABLE BILL NUNGESSER
PLAQUEMINES PARISH PRESIDENT
8056 HIGHWAY 23, SUITE 200
BELLE CHASSE, LA 70037

CAPTAIN BILL SNYDER
NAVAL AIR STATION/JOINT RESERVE
BASE (NAS/JRB)
400 RUSSEL AVENUE
BELLE CHASSE, LA 70143

HONORABLE A.G. CROWE
THE STATE SENATE
(DISTRICT 1)
195 STRAWBERRY STREET
SLIDELL, LA 70460

HONORABLE DAVID HEITMEIER
THE STATE SENATE
(DISTRICT 7)
3501 HOLIDAY DRIVE, SUITE 225
NEW ORLEANS, LA 70114

HONORABLE ERNEST D. WOOTEN
LA HOUSE OF REPRESENTATIVES
(DISTRICT 105)
8018 HIGHWAY 23, SUITE 214
BELLE CHASSE, LA 70037

PLAQUEMINE SOIL & WATER
CONSERVATION DIST OF LA
499 HEBERT BLVD
BELLE CHASSE, LA 70037

PLAQUEMINES PARISH COUNCILS
106 AVENUE G
BELLE CHASSE, LA 70037

CHITIMACHA TRIBE
155 CHITIMACHA LOOP ROAD
CHARENTON, LA 70523

CHOCTAW NATION OF OKLAHOMA
P.O. BOX 1210
DURANT, OK 74702-1210

SOLICIT VIEWS ON-LINE

LA DEPT OF NATURAL RESOURCES
COASTAL MANAGEMENT DIVISON

ORLEANS PARISH MAILING LIST
UPDATED November 5, 2013

OFFICE OF EMERGENCY MANAGEMENT
1300 PERDIDO ST., STE 9E06
NEW ORLEANS LA 70112

PLANNING COMMISSION
ST BERNARD PARISH
8201 WEST JUDGE PEREZ DRIVE
CHALMETTE LA 70043

CITY PLANNING COMMISSION
1300 PERDIDO STREET
ROOM 9W03, CITY HALL
NEW ORLEANS LA 70112

HONORABLE JARED C. BROSSETT
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6305 ELYSIAN FIELDS AVE
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NEW ORLEANS LA 70122

LOUISIANA STATE POLICE
TROOP B
2101 I-10 SERVICE ROAD
KENNER LA 70065

ORLEANS PARISH CIVIL SHERIFF
421 LOYOLA AVENUE
NEW ORLEANS LA 70112

CRESCENT SOIL & WATER
CONSERVATION DISTRICT
P O BOX 531
BOUTTE LA 70039

ORLEANS PARISH CRIMINAL
SHERIFF
2800 GRAVIER
NEW ORLEANS LA 70119

HONORABLE NICHOLAS LORUSSO
LA HOUSE OF REPRESENTATIVES
(DISTRICT 94)
3535 CANAL STREET, SUITE 103
NEW ORLEANS, LA 70119

DEPT OF PUBLIC WORKS
OFFICE OF DIRECTOR
ROOM 6W03, CITY HALL
NEW ORLEANS LA 70112

ORLEANS PARISH SCHOOL BOARD
3510 GENERAL DEGAULLE DRIVE
NEW ORLEANS LA 70122

JEFFERSON PARISH PLANNING DEPT
DIRECTOR
1221 ELMWOOD PARK BOULEVARD
HARAHAN LA 70123

FLOODPLAIN ADMINISTRATOR
ORLEANS PARISH CITY COUNCIL
ROOM 2W02, CITY HALL
NEW ORLEANS LA 70112

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NEW ORLEANS, LA 70130

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NEW ORLEANS, LA 70114

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SEWERAGE & WATER BOARD OF NO
GENERAL SUPERINTENDENT
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NEW ORLEANS LA 70165

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TERRYTOWN LA 70056

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(DISTRICT 93)
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ST CHARLES PARISH CIVIL DEFENSE
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HAHNVILLE LA 70057

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(DISTRICT 103)
P.O. BOX 739
CHALMETTE, LA 70044

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AND ZONING COMMISSION
P O BOX 302
HAHNVILLE LA 70057

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HONORABLE MITCH LANDRIEU
MAYOR OF NEW ORLEANS
CITY HALL, ROOM 2E10
1300 PERDIDO STREET
NEW ORLEANS LA 70112

THE AMERICAN WATERWAYS
OPERATORS
1100 POYDRAS STREET, SUITE 2900
NEW ORLEANS LA 70163-2900

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(DISTRICT 99)
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433 METAIRIE RD
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N O & THE RIVER REGION
365 CANAL ST., SITE 2300
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HONORABLE CYNTHIA WILLARD LEWIS
THE SENATE OF LOUISIANA
(DISTRICT 2)
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NEW ORLEANS LA 70128

THE PORT OF NEW ORLEANS
MANAGING DIRECTOR
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NEW ORLEANS LA 70160

REGIONAL PLANNING COMMISSION
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NEW ORLEANS LA 70124

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(DISTRICT 100)
5555 BULLARD AVENUE, SUITE 101
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DEPT OF ENVIRON QUALITY
UST DIV
602 N. FIFTH STREET
BATON ROUGE LA 70802

N O REGIONAL TRANSIT AUTHORITY
GENERAL MANAGER
2817 CANAL STREET
NEW ORLEANS LA 70119

MS. KAREN OBERLIES
DEPT OF THE ARMY TECH SUPPORT
P O BOX 60267
NEW ORLEANS LA 70538

HONORABLE JEFFERY "JEFF" J. ARNOLD
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(DISTRICT 102)
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SUITE 3071
NEW ORLEANS LA 70114

HONORABLE WALKER HINES
LA HOUSE OF REPRESENTATIVES
(DISTRICT 95)
5500 PRYTANIA STREET#626
NEW ORLEANS, LA 70115

HONORABLE JOHN CAMERON HENRY JR.
LA HOUSE OF REPRESENTATIVES
(DISTRICT 82)
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NEW ORLEANS, LA 70123

HONORABLE KAREN CARTER PETERSON
THE STATE SENATE
(DISTRICT 5)
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NEW ORLEANS, LA 70163

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NATIONAL MARINE FISHERIES SER
SOUTHEAST REGIONAL OFFICE
HABITAT CONSERVATION DIV
C/O LSU
BATON ROUGE LA 70803

STATE OF LOUISIANA OFFICE OF
CULTURAL DEVELOPMENT
DIVISION OF HISTORIC PRESERVATION
P O BOX 44247
BATON ROUGE LA 70804

US DEPT OF TRANSPORTATION
FEDERAL RAILROAD ADMIN
4100 INTERNATIONAL PLAZA
SUITE 450
FORT WORTH TX 76109

DPET OF THE ARMY
N O DISTRICT COE REGULATORY BRAN
P O BOX 60267
NEW ORLEANS LA 70160

FEDERAL HIGHWAY ADMIN
LOUISIANA DIVISON
5304 FLANDERS DRIVE, SUITE A
BATON ROUGE LA 70808

HONORABLE NEIL ABRAMSON
LA HOUSE OF REPRESENTATIVES
(DISTRICT 98)
365 CANAL STREET, SUITE 2720
NEW ORLEANS, LA 70130

HONORABLE JEAN-PAUL MORRELL
THE STATE SENATE
(DISTRICT 3)
6305 ELYSIAN FIELDS AVENUE
SUITE 404
NEW ORLEANS, LA 70122

HONORABLE A.G. CROWE
THE STATE SENATE
(DISTRICT 1)
195 STRAWBERRY STREET
SLIDELL, LA 70460

MS TINA POWELL
FIELD ENVIRONMENTAL OFFICER
US DEPT OF HOUSING & URBAN DEV
HALE BOGGS BUILDING
501 MAGAZINE STREET, 9th FLOOR
NEW ORLEANS LA 70130-3099

CHITIMACHA TRIBE
155 CHITIMACHA LOOP ROAD
CHARENTON, LA 70523

ALABAMA COUSHATTA TRIBE OF TX
571 STATE PARK ST. 65
LIVINGSTON, TX 77351

QUAPAW TRIBE OF OKLAHOMA
JEAN ANN LAMBERT, TRIBAL HISTORIC
PRESERVATION OFFICER
P.O. BOX 765

QUAPAW, OK 74363-0765

CHOCTAW NATION OF OKLAHOMA
P.O. BOX 1210
DURANT, OK 74702-1210

SOLICIT VIEWS ON-LINE
LA DEPT OF NATURAL RESOURCES
COASTAL MANAGEMENT DIVISON

Volkert, Inc.
4640 South Carrollton Ave.,
Suite 240
New Orleans, LA 70119

Office 504.488.8002
Fax 504.488.8008

www.volkert.com

March 23, 2012

Mr. Quang Nguyen
Environmental Section
Lousiana Department of Transportation and Develoment
P.O. Box 94245
Baton Rouge, LA 70804-9245

Re: **Logical Termini**
State Project No. H.008220
Legacy Project No. 700-38-0106
RPC Project No. 406EA
Woodland Highway (LA 406) Widening
Plaquemines and Orleans Parishes, Louisiana

Dear Mr. Nguyen,

As required by the NEPA process, this letter is being sent to your office for both LADOTD and FWHA to review our proposed logcal termini for the the environmental assessment of the above referenced project.

The scope of the project is to widen LA 406 (Woodland Highway) between LA 23 (Belle Chasse Highway) and LA 407 (Gen. DeGaulle Blvd.) from the existing two lanes to four lanes with a median within the existing right-of-way. The project area is located in both Plaquemines and Orleans Parishes and is bounded generally by the Intracoastal Waterway to the west, English Turn Parkway to the north, the Mississippi River to the east, and Belle Chasse Highway (LA 23) to the south. A Stage 0 Feasibility Study was completed in March 2004 to assess the project's feasibility and establish the requirements for widening the LA 406 corridor to accommodate current and future demands in the Belle Chasse area. The study found that it is feasible to expand the corridor, add lanes, and improve safety. To assist in your review, attached is Figure 1 – Project Area.

The Purpose and Need for the project is to accommodate anticipated increases in travel demand along the corridor due to recent and future adjacent residential development, and due to the development of the Federal City project in Algiers, and the expansion of services at the Naval Air Station Joint Reserve Base in Belle Chasse, LA.

VOLKERT

The Regional Planning Commission for Jefferson, Orleans, Plaquemines, St. Bernard and St. Tammany Parishes has included this project in its 2011-20040 MTP as an urban arterial. Current traffic projections (see attached Figure 2) indicate that the travel demand for this segment of LA 406 will be approximately 26,000 VPD in 2038.

It is anticipated that no additional right-of-way will be required to add capacity to meet the purpose and need, and as such, it is anticipated that the Class of Action for the Stage 1 Study will be an Environmental Assessment.

As the limits of the proposed improvements will be connecting one existing four lane facility (LA 23) to another four lane facility (LA 407), these two proposed logical termini are rational endpoints for this proposed project.

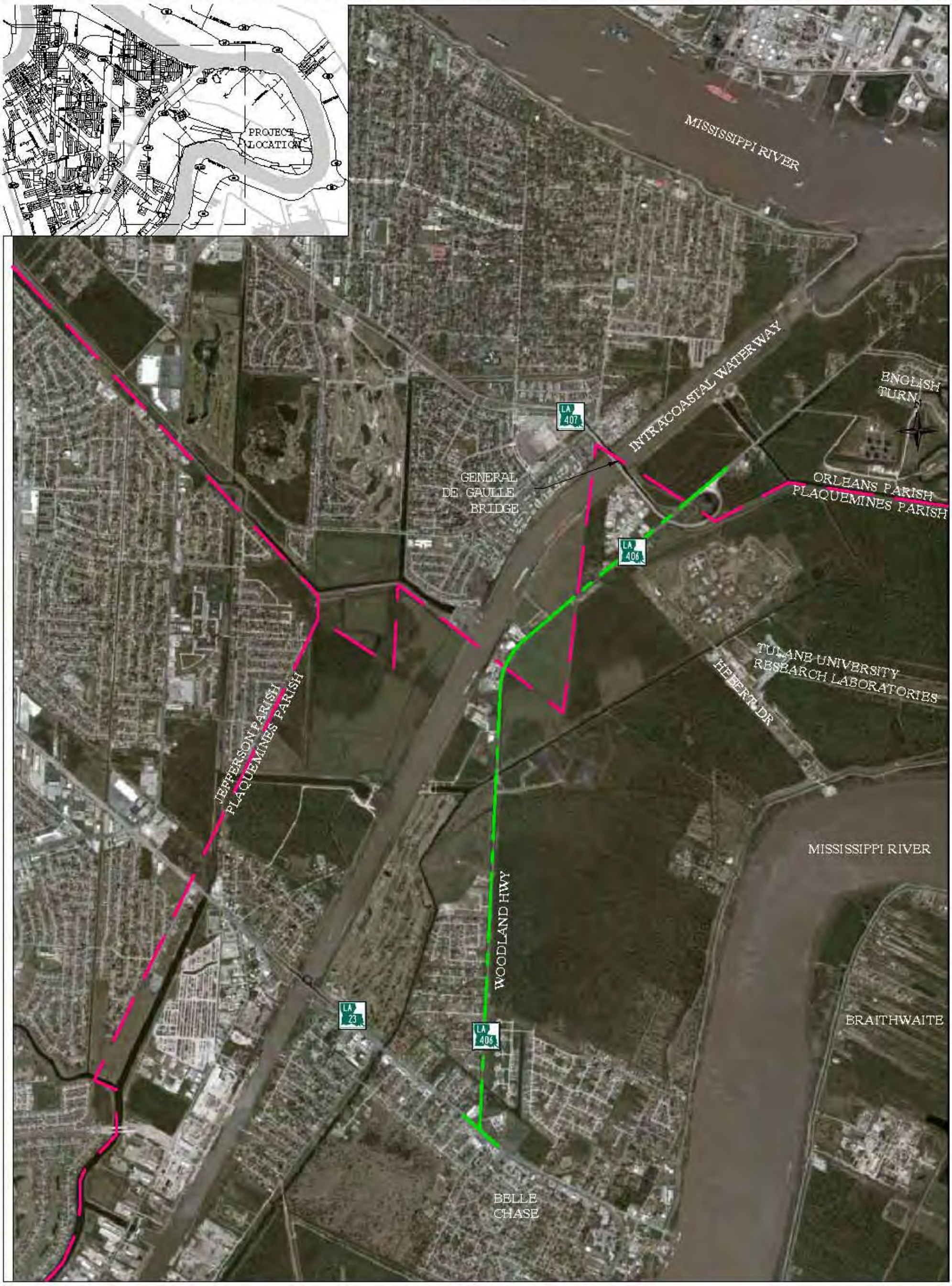
Should you have any questions or require additional information, please contact me using the contact information below.

Sincerely,

Patrick A. Owens, PE
Assistant Vice President
Project Manager
Volkert, Inc.
pat.owens@volkert.com
504.488.8002
504.488.8008 Fax

Attachments

P:\Projects\138000.80 Woodland Hwy LA 406 Widening Stage 1\DESIGN\DRAWINGS\EXHIBITS\DWG\Study Map.dwg September 22, 2011 2:28 PM



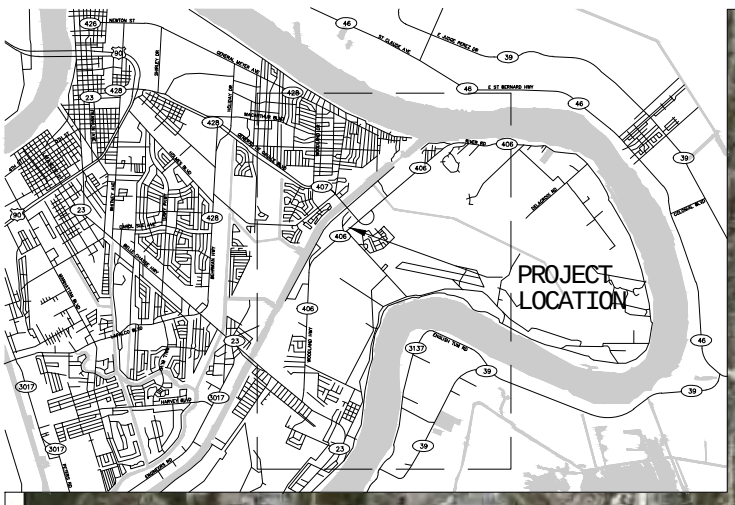
RPC REGIONAL PLANNING COMMISSION

VOLKERT

WOODLAND HIGHWAY / LA 406 WIDENING
(LA HWY 23 TO LA HWY 407)
STAGE 1 - ENVIRONMENTAL ASSESSMENT
PLAQUEMINES PARISH AND ORLEANS PARISH

RPC PROJECT NO. 406-EA

FIGURE 1
PROJECT AREA



MISSISSIPPI RIVER

EB ADT 9,563
WB ADT 10,101

ADT 5,710

INTRACOASTAL WATERWAY

ENGLISH TURN

EB ADT 9,563
WB ADT 10,101

ORLEANS PARISH
PLAQUEMINES PARISH

GENERAL DE GAULLE BRIDGE

NB ADT 7,768
SB ADT 8,320

HEBERT DR

ADT 5,710

TULANE UNIVERSITY RESEARCH LABORATORIES

NB ADT 7,774
SB ADT 7,288

JEFFERSON PARISH
PLAQUEMINES PARISH

MISSISSIPPI RIVER

EB ADT 27,776
WB ADT 26,865

WOODLAND HWY

NB ADT 13,463
SB ADT 12,985

BRAITHWAITE

EB ADT 19,484
WB ADT 19,051

BELLE CHASE

WOODLAND HIGHWAY / LA 406 WIDENING
(LA HWY 23 TO LA HWY 407)
STAGE 1- ENVIRONMENTAL ASSESSMENT
PLAQUEMINES PARISH AND ORLEANS PARISH

RPC PROJECT NO. 406-EA

FIGURE
TRAFFIC COUNT DATA
RPC 2038 MODEL

VOLKERT

June 5, 2012

Mr. Keith Lovell, Administrator
Office of Coastal Management, Interagency Affairs/Field Services Division
Louisiana Department of Natural Resources
P.O. Box 44487
Baton Rouge, Louisiana 70804-4487

Re: **Solicitation of Views**
Woodland Highway (LA 406) Widening
Plaquemines and Orleans Parishes, Louisiana
State Project No. H.008220
Legacy Project No. 700-38-0106

Dear Mr. Lovell,

The New Orleans Regional Planning Commission (NORPC), in conjunction with the Louisiana Department of Transportation and Development (LA DOTD), is in the early planning stages of a transportation project. Views from federal, state and local agencies, organizations, and individuals are being solicited at this time. The special expertise of these groups can assist NORPC and LA DOTD with the identification of possible adverse economic, social, or environmental effects or concerns. Your assistance in this regard is appreciated.

We are conducting a Stage 1 Planning and Environmental Study for the Woodland Highway (LA 406) Widening project and respectfully request your comments. The project area is located in both Plaquemines and Orleans Parishes and is bounded generally by the Intracoastal Waterway to the west, English Turn Parkway to the north, the Mississippi River to the east, and Belle Chasse Highway (LA 23) to the south. A Stage 0 Feasibility Study was completed in March 2004 to assess the project's feasibility and establish the requirements for widening the LA 406 corridor to accommodate current and future demands in the Belle Chasse area. The study found that it is feasible to expand the corridor, add lanes, and improve safety. Now that the feasibility has been determined and we are moving forward into the Stage 1 process, we are soliciting views with federal and state agencies and public entities with jurisdiction over, or interested in, the project. To assist in your review attached is Figure 1 – Project Area.

The Purpose and Need for the project is to accommodate anticipated increases in travel demand along the corridor due to recent and future adjacent residential development, and due to the development of the Federal City project in Algiers, and the expansion of services at the Naval Air Station Joint Reserve Base in Belle Chasse, LA.

It is anticipated that the Class of Action for the Stage 1 Study will be an Environmental Assessment.

Volkert, Inc.
4640 South Carrollton Ave.,
Suite 240
New Orleans, LA 70119

Office 504.488.8002
Fax 504.488.8008

www.volkert.com

It is requested that you review the attached information and furnish us with your views and comments by July 5, 2012. Replies should be addressed to the following:

Volkert, Inc.
Attn: William Purser, PE
4640 S. Carrolton Ave., Suite 240
New Orleans, Louisiana 70119

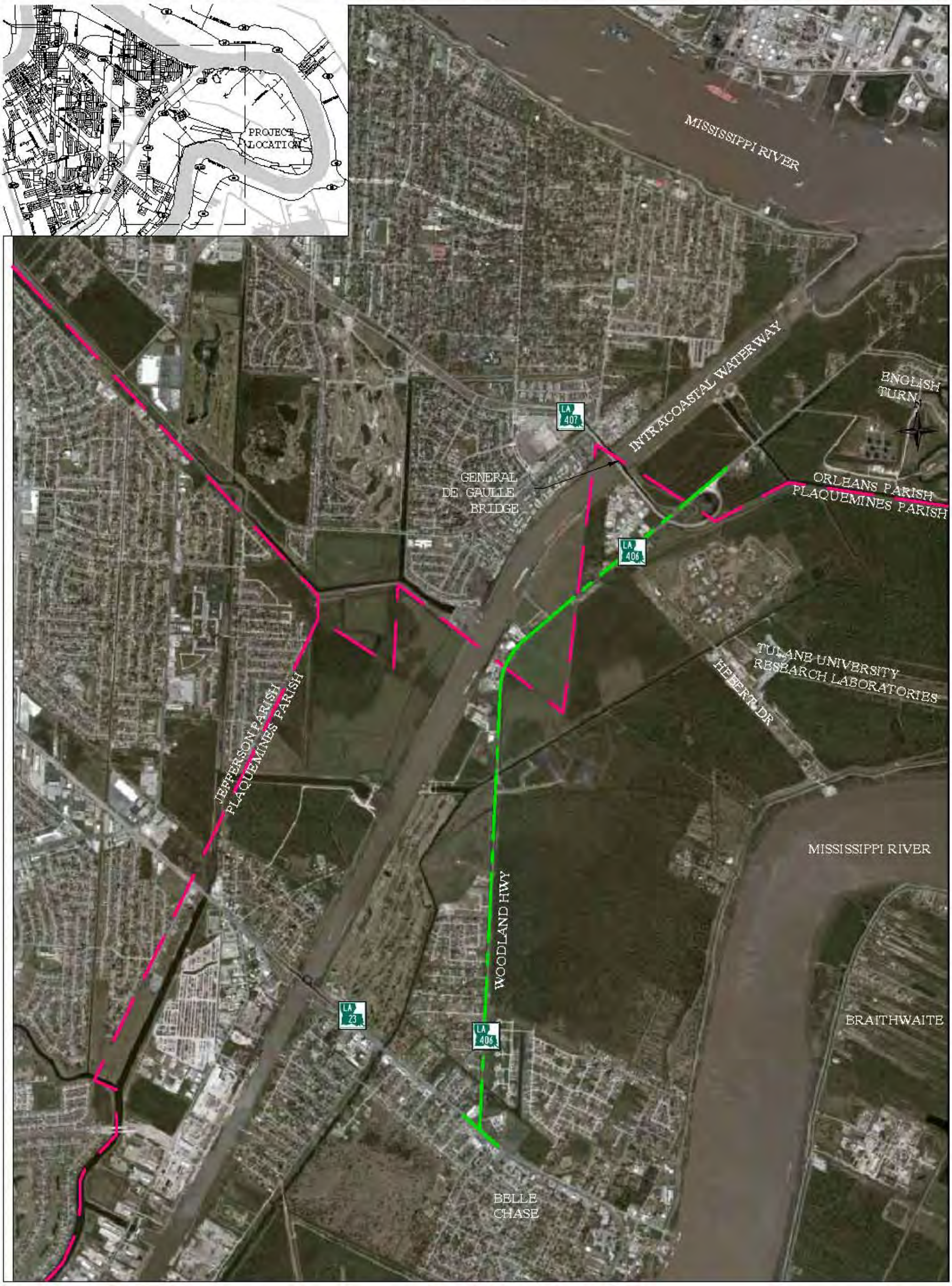
Please reference the captioned project in your reply.

Should you have any questions regarding this request, please contact me using the contact information below.

Sincerely,

William Purser, PE
Project Manager
Volkert, Inc.
william.purser@volkert.com
225.218.9440
225.218.9471 Fax
Attachments

P:\Projects\138000.80 Woodland Hwy LA 406 Widening Stage 1\DESIGN\DRAWINGS\EXHIBITS\DWG\Study Map.dwg September 22, 2011 2:28 PM



RPC REGIONAL PLANNING COMMISSION

VOLKERT

WOODLAND HIGHWAY / LA 406 WIDENING
(LA HWY 23 TO LA HWY 407)
STAGE 1 - ENVIRONMENTAL ASSESSMENT
PLAQUEMINES PARISH AND ORLEANS PARISH

RPC PROJECT NO. 406-EA

FIGURE 1
PROJECT AREA

VOLKERT

June 5, 2012

Mr. Michael Bechdol, Coordinator
Ground Water/UIC Section, Sole Source Aquifer Program
United States Environmental Protection Agency, Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: **Solicitation of Views**
Woodland Highway (LA 406) Widening
Plaquemines and Orleans Parishes, Louisiana
State Project No. H.008220
Legacy Project No. 700-38-0106

Dear Mr. Bechdol,

The New Orleans Regional Planning Commission (NORPC), in conjunction with the Louisiana Department of Transportation and Development (LA DOTD), is in the early planning stages of a transportation project. Views from federal, state and local agencies, organizations, and individuals are being solicited at this time. The special expertise of these groups can assist NORPC and LA DOTD with the identification of possible adverse economic, social, or environmental effects or concerns. Your assistance in this regard is appreciated.

We are conducting a Stage 1 Planning and Environmental Study for the Woodland Highway (LA 406) Widening project and respectfully request your comments. The project area is located in both Plaquemines and Orleans Parishes and is bounded generally by the Intracoastal Waterway to the west, English Turn Parkway to the north, the Mississippi River to the east, and Belle Chasse Highway (LA 23) to the south. A Stage 0 Feasibility Study was completed in March 2004 to assess the project's feasibility and establish the requirements for widening the LA 406 corridor to accommodate current and future demands in the Belle Chasse area. The study found that it is feasible to expand the corridor, add lanes, and improve safety. Now that the feasibility has been determined and we are moving forward into the Stage 1 process, we are soliciting views with federal and state agencies and public entities with jurisdiction over, or interested in, the project. To assist in your review attached is Figure 1 – Project Area.

The Purpose and Need for the project is to accommodate anticipated increases in travel demand along the corridor due to recent and future adjacent residential development, and due to the development of the Federal City project in Algiers, and the expansion of services at the Naval Air Station Joint Reserve Base in Belle Chasse, LA.

It is anticipated that the Class of Action for the Stage 1 Study will be an Environmental Assessment.

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4640 South Carrollton Ave.,
Suite 240
New Orleans, LA 70119

Office 504.488.8002
Fax 504.488.8008

www.volkert.com

It is requested that you review the attached information and furnish us with your views and comments by July 5, 2012. Replies should be addressed to the following:

Volkert, Inc.
Attn: William Purser, PE
4640 S. Carrolton Ave., Suite 240
New Orleans, Louisiana 70119

Please reference the captioned project in your reply.

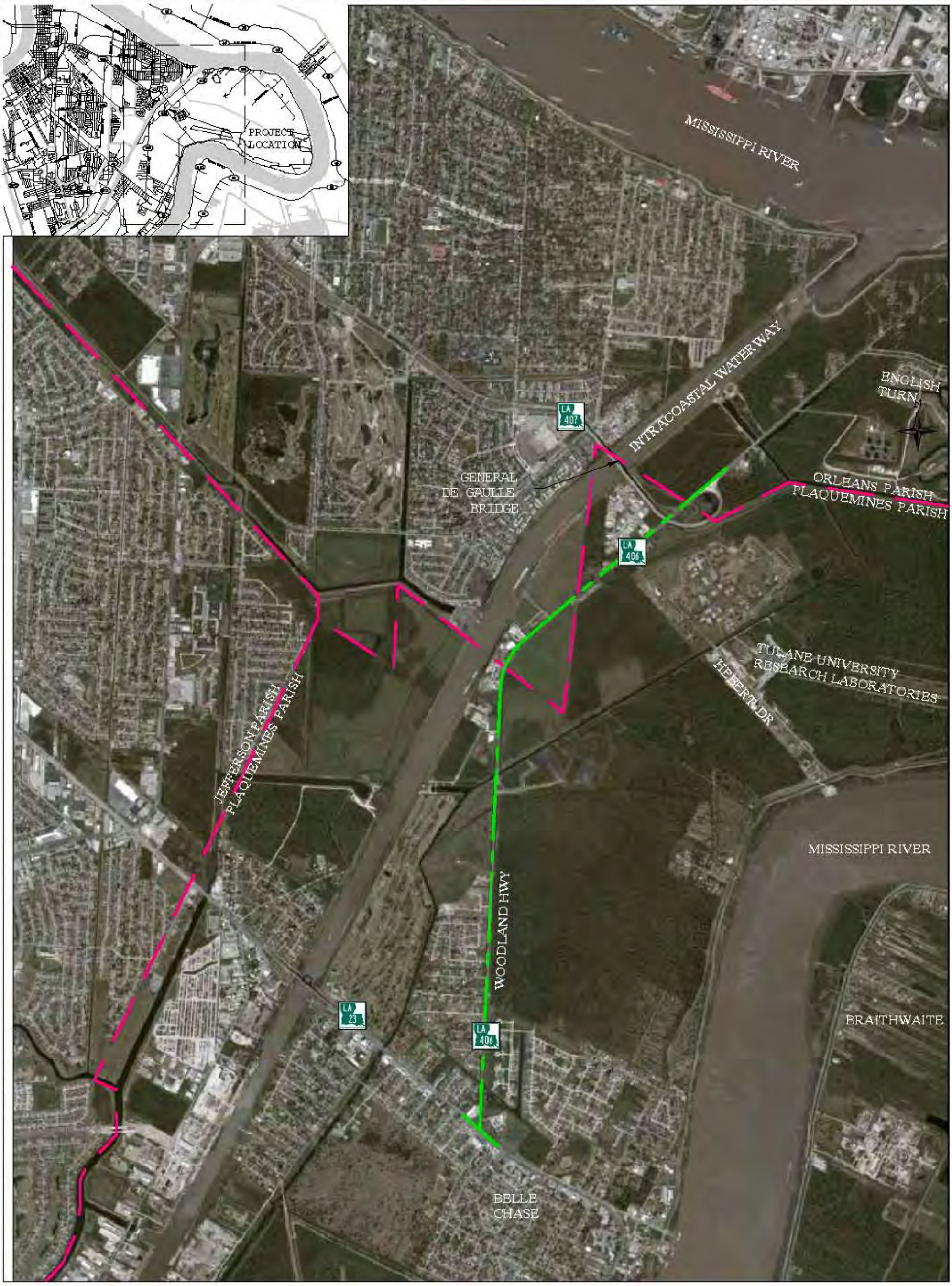
Should you have any questions regarding this request, please contact me using the contact information below.

Sincerely,

William Purser, PE
Project Manager
Volkert, Inc.
william.purser@volkert.com
225.218.9440
225.218.9471 Fax

Attachments

P:\Projects\138000.80 Woodland Hwy LA 406 Widening Stage 1\DESIGN\DRAWINGS\EXHIBITS\DWG\Study Map.dwg September 22, 2011 2:28 PM



RPC REGIONAL PLANNING COMMISSION

VOLKERT

WOODLAND HIGHWAY / LA 406 WIDENING
(LA HWY 23 TO LA HWY 407)
STAGE 1 - ENVIRONMENTAL ASSESSMENT
PLAQUEMINES PARISH AND ORLEANS PARISH

RPC PROJECT NO. 406-EA

FIGURE 1
PROJECT AREA

APPENDIX B

Agency Responses

State of Louisiana

Department of Environmental Quality

KATHLEEN BABINEAUX BLANCO
GOVERNOR

MIKE D. McDANIEL, Ph.D.
SECRETARY

APR 12 2005

Mr. Mitchell Chuoke
Chuoke Plumbing
5801 Broadway
Galveston, TX 77551

RE: No Further Action Notification
Agency Interest Name; **AI Number 249**
Chuoke Plumbing Site
4001 Woodlands Avenue
New Orleans, LA. Orleans Parish

Dear Mr. Chuoke:

The Louisiana Department of Environmental Quality – Remediation Services Division (LDEQ-RSD) has completed its review of your Risk Evaluation/Corrective Action Program (RECAP) Report, Corrective Action Implementation Report, dated October 1, 2004, for the above referenced area of investigation located at 4001 Woodlands Avenue, in Orleans Parish. Based on our review of this document and all previously submitted information, we have determined that no further action is necessary at this time. The Basis of Decision for this notification is attached.

If you have any questions or need further information, please call Rich Johnson at (225) 219-3200. Thank you for your cooperation in addressing this area.

Sincerely,

Keith L. Casanova

Keith L. Casanova, Administrator
Remediation Services Division

Attachment BOD

c: LDEQ File Scanning Room 144-IAS
Lagniappe Environmental, L.L.C./Randall Luwe
671 West Esplanade, Suite 211, Kenner, LA 70065

BASIS OF DECISION FOR NO FURTHER ACTION

Chuoke Plumbing
AI Number 249

The Louisiana Department of Environmental Quality – Remediation Services Division (LDEQ-RSD) has determined that Chuoke Plumbing Site requires No Further Action At This Time.

GMP Dickson and Transocean previously used the property to manufacture offshore oil field equipment, in the sixties and seventies. The subject site consists of two large metal buildings and two sets of manufacturing racks. Existing industrial businesses border the Subject Site on the north and south, with Woodlands Hwy. to the east and the Intracoastal Canal to the west.

Remedial activities were implemented at the site on September 22, 2004. The scope of work included excavation, transportation, and off-site disposal. Once the excavation was complete, Lagniappe Environmental, L.L.C. performed confirmation soil sampling, which met the approved remediation standards for the constituents of concern (COC) Benzo (a) pyrene and Benzo(a) fluoranthene. TPH-DRO and TPH-ORO were COCs and were evaluated using MO-2 standards. TPH-DRO did not exceed the MO-2RS of 2,550 mg/kg. The Hazard Index for TPH constituents was then calculated and determined to be less than 1, eliminating additivity and resulting in a TPH-ORO standard of 7,450 mg/kg, which represents the difference between the TPH-DRO, RS of 2,550 mg/kg and a total TPH concentration not to exceed 10,000 mg/kg.

The RCRA metals cadmium, chromium and lead were identified as COCs in soils because concentrations exceeded the limiting RECAP standards (Soil gw). The Synthetic precipitation leaching procedure (SPLP) was used to evaluate their potential to leach to groundwater. The resulting concentrations were compared to GW1 X DF Summer for each COC. Details are shown below. SPLP results were less that GW1 X DF Summer for each COC; therefore the COC in soil is protective of groundwater and Soili, becomes the limiting standard.

The Area of Investigation was closed in accordance with RECAP using Management Option 1 and 2, industrial standards and SPLP.

The constituents of concern present that now meet the approved remediation standard are noted in the following table. The media impacted by these constituents include soil and groundwater.

Constituent of Concern Soil	Maximum Concentration	Limiting RECAP Standard
Benzo(a) pyrene-soil	**ND** after excavation	0.33 mg/kg Soilni

Benzo(a)anthracene	0.907 mg/kg after excavation	3.6 mg/kg- MO1
Benzo(a)fluoranthene	1.04 mg/kg after excavation	3.6 mg/kg- MO1
TPH-DRO	667 mg/kg (corresponds to M0-2 HI of 0.131)	2,550 mg/kg-MO2
TPH-ORO	6,090 mg/kg (corresponds to M0-2 HI of 0.609)	7,450 mg/kg-M02
Chromium	60.9 mg/kg **(SPLP – ND)**	Soil SSgw is 100 mg/kg
Cadmium	7.6 mg/kg **(SPLP – ND)**	Soil SSgw is 20 mg/kg
Lead	1,150 mg/kg **SPLP – ND**	Soil SSgw 100 mg/kg **SPLP = .3 mg/L** **Soili 1,700 mg/kg**
Constituents of Concern Groundwater		**Limiting MO-1 Standard** (GW3dw)
TPH-DRO	4.7 mg/L	8.4 mg/L
TPH-ORO	4.0 mg/L	8.4 mg/L

The cumulative Hazard Index of TPH-DRO and TPH-ORO was determined to be less than 1. Therefore additivity is determined not to be a concern and the soili value becomes the limiting standard for TPH-O. All petroleum hydrocarbon ranges cannot exceed 10,000 in a single medium.

Groundwater was classified as GW3DW. Groundwater was encountered at approximately 6 feet bgs. Graphical solutions of the slug test results yielded a hydraulic conductivity of 7.8 x 10-5 cm/sec, which is a groundwater yield of approximately 403.2 gal/day. TDS data was collected and results show TDS values of 1600 to 1650 mg/L. Site is approximately 200 feet from the Intracoastal Canal.

Remedial actions taken included excavating soils contaminated with Benzo(a)pyrene, and PAH's , followed by confirmatory sampling which indicated Non Detect. Affected soil was loaded directly into trucks for transportation and off-site disposal. Approximately 27.98 tons of soil was removed. Disposal manifest, and TCLP test result and weight ticket accompanied truck. No Further Action At This Time is granted when contamination is reduced to the extent necessary to achieve the established standards.

Remediation to site-specific standards was conducted. In accordance with LAC 33:I. Chapter 13, if land use is going to be changed from industrial to non-industrial, the responsible party shall notify the LDEQ within thirty (30) days and the Area of Investigation shall be reevaluated to determine if conditions are appropriate for the proposed land use. Future use may dictate additional remedial activities. A conveyance notice has been filed with the Orleans Parish Clerk of Court noting that the site was closed under industrial standards. No contaminated soils may be moved from this location without written authorization from the LDEQ, unless they are removed and disposed at a permitted disposal facility.

STAMP COPY

CONVEYANCE NOTIFICATION

(CLOSED AOI-1)

Mitchell Chuoke, etal., hereby notifies the public that the following described AOI-1 located at Agency Interest Number 249 was closed with contaminant levels present that are acceptable for industrial/commercial use of the property as described in the Louisiana Department of Environmental Quality's (LDEQ) Risk Evaluation/Corrective Action Program (RECAP), June 20, 2000, Section 2.9. In accordance with LAC 33:I., Chapter 13, if land use changes from industrial to non-industrial, the responsible party shall notify the LDEQ within 30 days and the AOI-1 shall be reevaluated to determine if conditions are appropriate for the proposed land use.

This AOI-1 was closed in accordance with the Louisiana Administrative Code, Title 33:I., Chapter 13. Information regarding the AOI-1 is available in the LDEQ public record and may be obtained by contacting the LDEQ Records Manager at (225) 219-3168. Inquiries regarding the contents of the AOI-1 may be directed to Mr. Randall Luwe at Lagniappe Environmental, 671 West Esplanade, Suite 211, Kenner, Louisiana, 70065.

AOI-1 Description

AOI-1 is located at 4001 Woodlands Avenue, New Orleans, Louisiana. Said affected property is more or less described as: That 10' x 10' portion of land, situated on Section 61, Township 14 South, Range 24 East, Orleans Parish, Louisiana, addressed as 4001 Woodlands Avenue, New Orleans, Louisiana.

Other contaminants of concern discovered on the site were eliminated from further remedial action using risk assessment techniques of SPLP, MO-1, Additivity and Hazard Index. Table 1 provides the NFA summary for all contaminants of concern that remain on the property.

RECEIVED
JAN 26 2005
LA DEPT. OF ENV. QUALITY
REMEDIATION SERVICES DIVISION
LOG #81705-3362

Signature of Person Filing Parish Record

Marion D. Floyd
Attorney at Law/Notary Public
LSB# 22902
1213 Williams Blvd.
Kenner, La 70062
My Commission is for life.

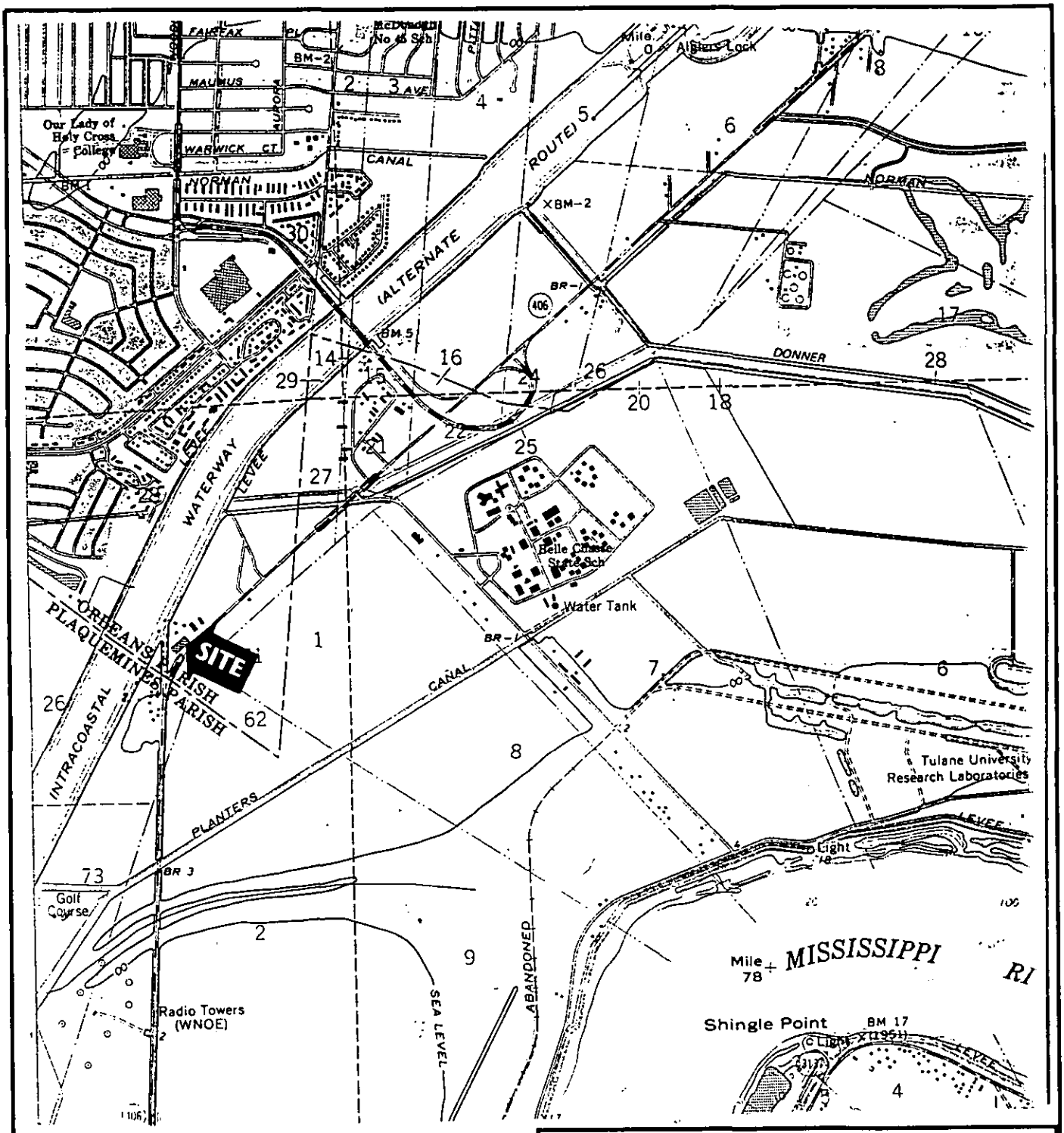
Typed Name and Title of Person Filing Parish Record

01/21/05

Date

Remediation Services Division
Manager: Burnett
Team Leader: Hofman
AI #: 249
TEMPO Task #:
Desk Copy File Room: SW

2005-04239 JA 21
PARISH OF ORLEANS



Source:

USGS 7.5 Minute
Topographic Quadrangle
Chalmette, LA (1967, revised 1989)

Marion D. Floyd
Attorney at Law/Notary Public
LSB# 22902
1213 Williams Blvd.
Kenner, La 70062
My Commission is for life.

NORTH

LAGNIAPPE ENVIRONMENTAL, L.L.C.

Chuoke Property

Former Industrial Site
4001 Woodlands Highway
New Orleans, Louisiana

Site Location Map

FIGURE 1

SOIL/GROUNDWATER RECAP
NFA SUMMARY TABLE

Chuoke Plumbing, New Orleans, LA

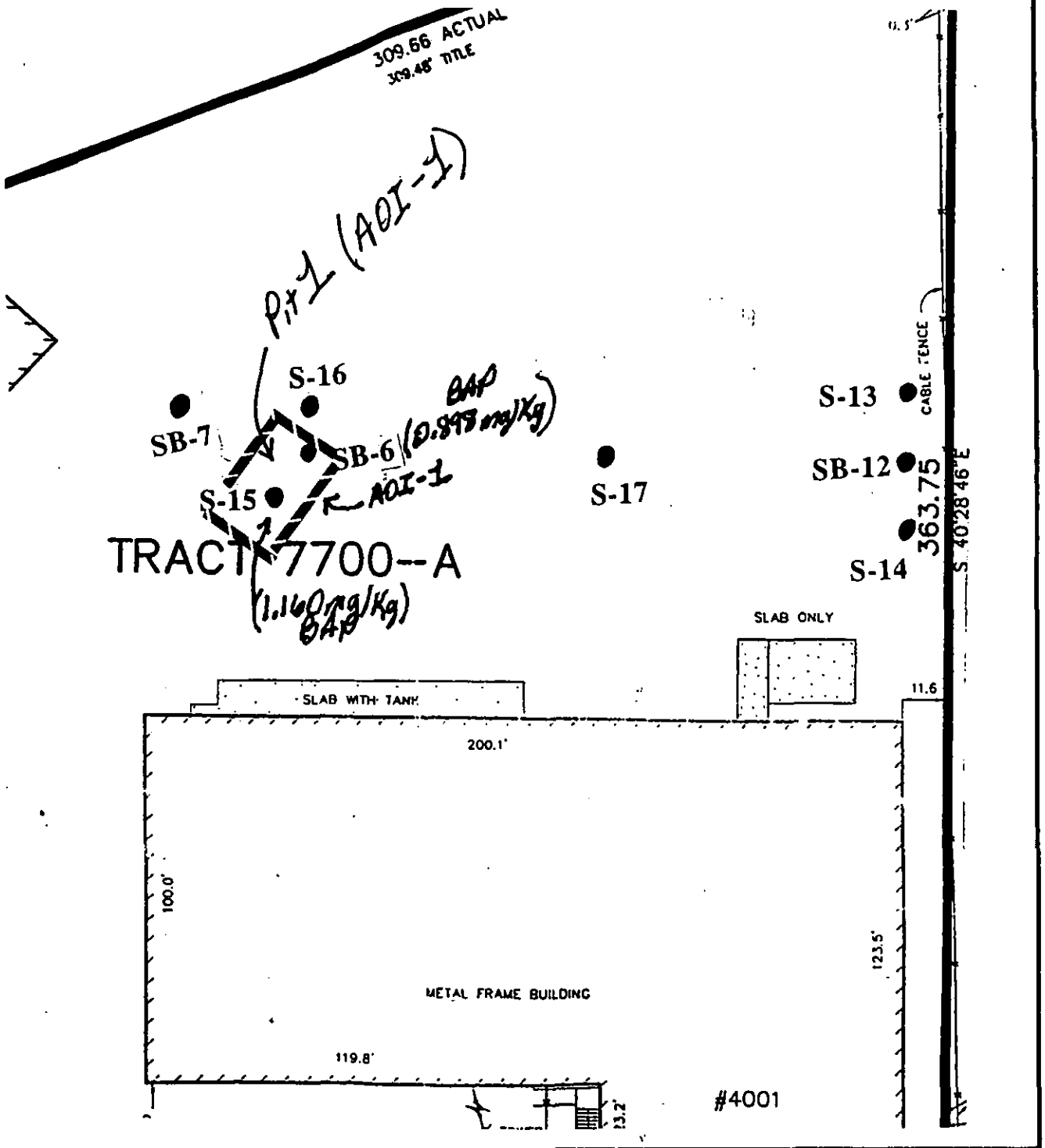
AI #249

Prepared 12/29/04

(units in mg/kg)

COC (Soil)	Boring	Limiting SS	Max Conc.	SPLP	Required Action	Action Level	Calculations	Calculated Value	Limitng Standard	Action
Benzo(a)pyrene	SB-6	0.33	1.160	x	CAP	Excavation	x	x	x	Remediated - 10/04
Benzo(a)anthracene	SB-6	2.9	0.907	x	CAP	Excavation	x	x	x	Remediated - 10/04
Benzo(b)fluoranthene	SB-6	2.9	1.04	x	CAP	Excavation	x	x	x	Remediated - 10/04
TPH-DRO	S-13	510	667	x	Hazard Index	5,100	0.131	0.131	1.0	Feb 2004 letter
TPH-ORO	S-13	2,500	6,090	x	Hazard Index	10,000	0.609	0.609	1.0	Feb 2004 letter
Chromium	SB-2	610	60.9	ND	NFA-ATT	x	x	x	SSi	Nov 2003 letter
Cadmium	SB-6	100	7.6	ND	NFA-ATT	x	x	x	SSi	Nov 2003 letter
Lead	SB-2	1,400	1,150	ND	NFA-ATT	x	x	x	SSi	Nov 2003 letter
(Groundwater)					Mac Conc	Gw3DW	DAF3	MO-1		
TPH-DRO	GW-5	0.15	4.7	x	4.7	1.0	8.4	8.4	NFA-ATT	Nov 2003 letter
TPH-ORO	GW-1	0.15	4.0	x	4.0	1.0	8.4	8.4	NFA-ATT	Nov 2003 letter

Marion D. Floyd
Attorney at Law/Notary Public
LSB# 22902
1213 Williams Blvd.
Kenner, La 70062
My Commission is for life.



NORTH

Source:

USGS 7.5 Minute
Topographic Quadrangle
Chalmette, LA (1967, revised 1989)

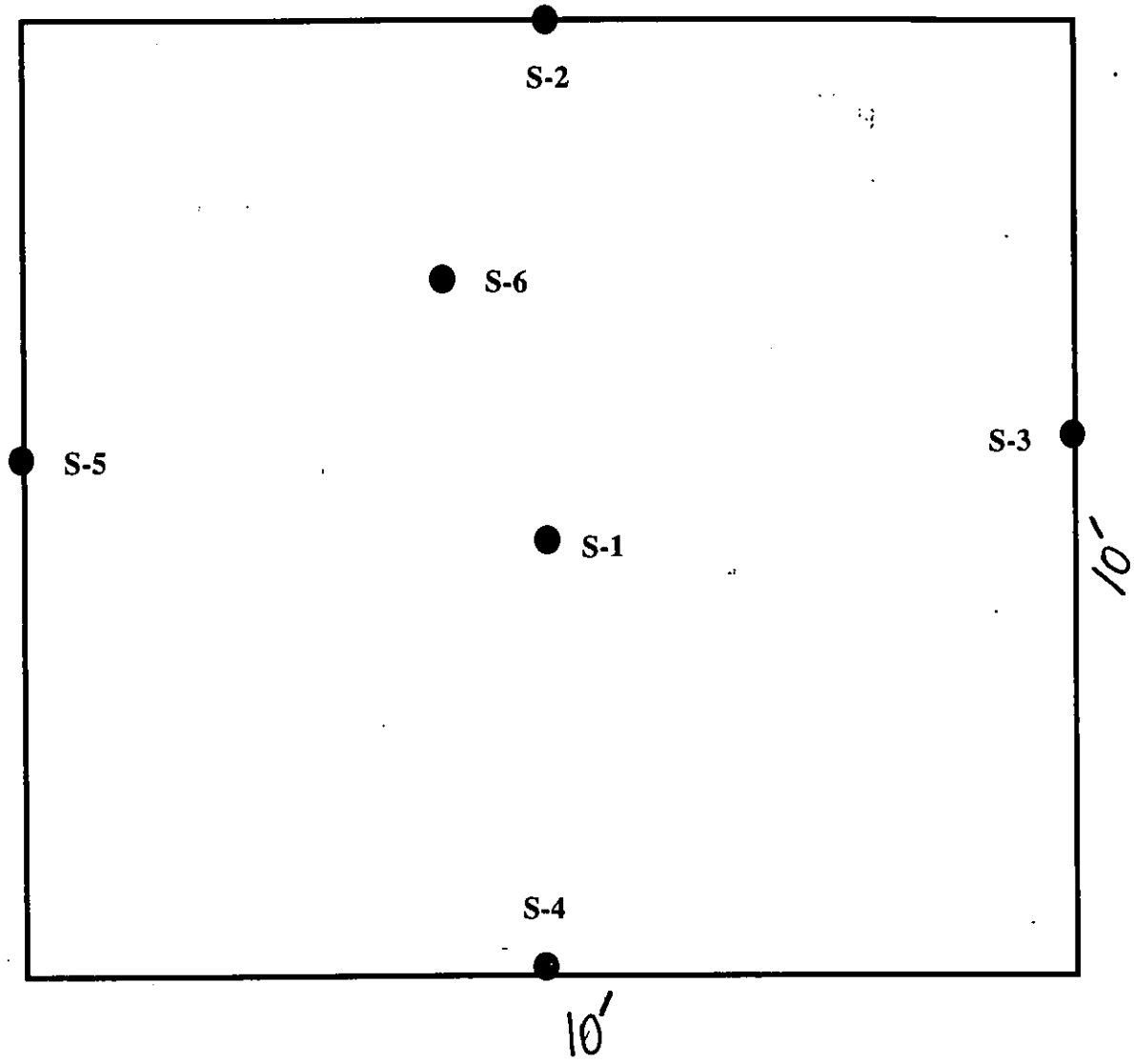
LAGNIAPPE ENVIRONMENTAL, L.L.C.

Chuoke Property

Former Industrial Site
4001 Woodlands Highway
New Orleans, Louisiana

Remedial Area Map

FIGURE 2



S-1 - 6 *PIT SAMPLING LOCATIONS*

LAGNIAPPE ENVIRONMENTAL, L.L.C.

Chuoke Property

Former Industrial Site
4001 Woodlands Highway
New Orleans, Louisiana

FIGURE 3

CONFIRMATORY SAMPLES SUMMARY
TABLE 1

Project: 4001 Woodlands, New Orleans, LA
AI# 249 **Prepared 9/30/04**

Units: ug/kg

Sept. 2004 Results	S-1	S-2	S-3	S-4	S-5	S-6	SSi	SSni	SSgw
benzo(a)anthracene	ND	ND	ND	ND	ND	ND	2.9	0.62	330
benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	2.9	0.62	220
benzo(a)pyrene	ND	ND	ND	ND	ND	ND	0.330	0.330	23

ND - Non Detect

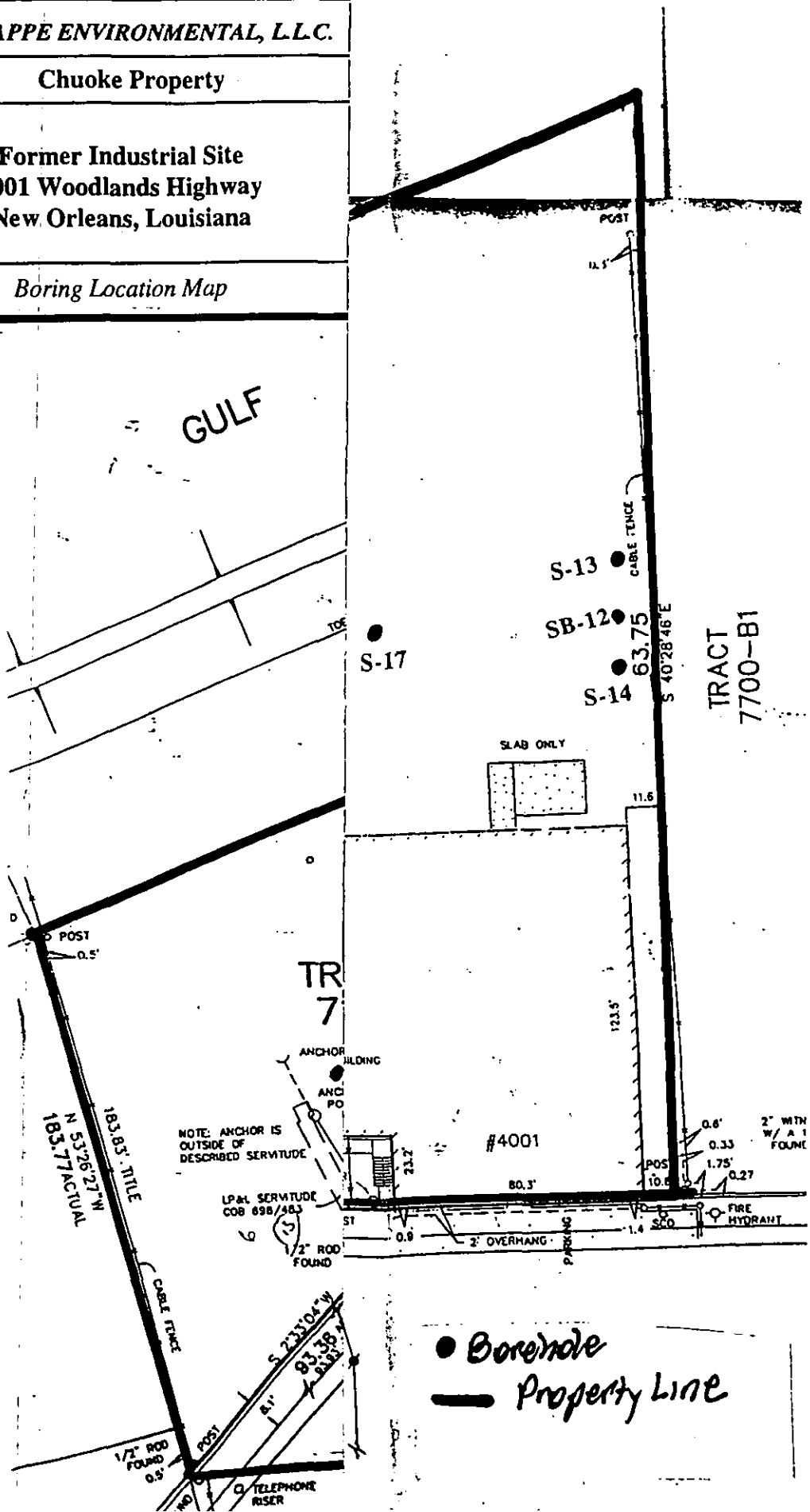
Exceeds RECAP SSi Screening Standards

LAGNIAPPE ENVIRONMENTAL, L.L.C.

Chuoke Property

Former Industrial Site
4001 Woodlands Highway
New Orleans, Louisiana

Boring Location Map



Louisiana Department of Environmental Quality
FIELD INTERVIEW FORM

Agency Interest #: 249 Inspection Date: 12/01/2004 Time of Arrival: 10:00 am
Departure Date: 12/01/2004 Time of Departure: 12:00 pm

Facility Name: Chuoke Plumbing Phone #: (504) 442-7676
Location: 4001 Woodlands Hwy. New Orleans, Louisiana

Parish Name:
Mailing Address: same LA
Street/P.O. Box City State Zip

Facility Representative: Randall Luwe Title: Environmental Consultant

Inspection Type: Semi-annual Program Involved: ☐ Air X Waste ☐ Water Other IAS

Inspector's Observations: (e.g. Areas and Equipment Inspected, Problems, Deficiencies, Remarks, Verbal Commitments from Facility Representatives)

Final inspection for preparation of NFA. Corrective Action Plan, has been completed, soil remediated and backfilled. RECAP Investigation, Assessment indicates that the site has been cleaned up to Industrial Stds.

Areas of Concern	Explanation	Resolved?
Soils	AOI has been excavated and sampled.	X YES ☐ NO
	NFA to follow.	☐ YES ☐ NO
		☐ YES ☐ NO
		☐ YES ☐ NO

Photos Taken? X YES NO Samples Taken? ☐ YES ☐ NO (Attach Chain-of-Custody)

Received by: Signature: To be mailed Title:

Print Name: Sent by US postal service
(NOTE: Signature DOES NOT indicate agreement with Inspector's Notes)

Inspector(s): Rich Johnson
Bradley Taylor

Attachments:

Reviewer:

NOTE: The information contained on this form reflects only the preliminary observations of the inspector(s). It should not be interpreted as a final determination by the Department of Environmental Quality or any of its officers or personnel as to any matter, including, but not limited to, a determination of compliance or lack thereof by the facility operator with any requirements of statutes regulations or permits. Each day of non-compliance constitutes a separate violation of the regulations and/or the Louisiana Environmental Quality Act.

I As File
Type 12/1/04

Photo #: 1 Date: 12/01/2004
Chuoke Plumbing final inspection.

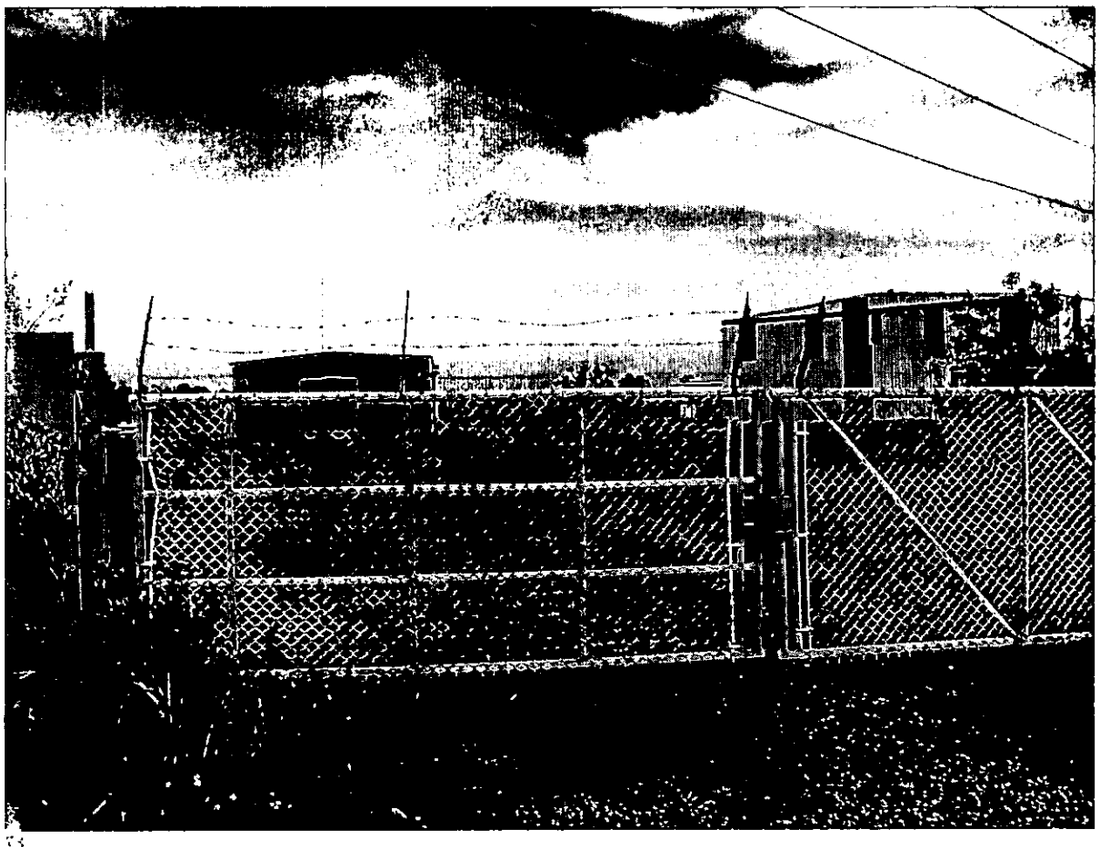


Photo #: 2 Date: 12/01/2004
Description: General Site Picture with empty buildings at Chuoke Plumbing

VOLKERT

Volkert, Inc.
4640 South Carrollton Ave.,
Suite 240
New Orleans, LA 70119

Office 504.488.8002
Fax 504.488.8008

www.volkert.com

RECEIVED FEMA REGION VI
2011 DEC 20 A 10:08

December 15, 2011

MR GREG SOLVEY
FEMA REGION VI
800 NORTH LOOP 288
DENTON, TX 76201

Re: **Solicitation of Views**
Woodland Highway (LA 406) Widening
Plaquemines and Orleans Parishes, Louisiana
State Project No. H.008220
Legacy Project No. 700-38-0106

Dear Participant,

The New Orleans Regional Planning Commission (NORPC), in conjunction with the Louisiana Department of Transportation and Development (LA DOTD), is in the early planning stages of a transportation project. Views from federal, state and local agencies, organizations, and individuals are being solicited at this time. The special expertise of these groups can assist NORPC and LA DOTD with the identification of possible adverse economic, social, or environmental effects or concerns. Your assistance in this regard is appreciated.

Over the next year, we will be conducting a Stage 1 Planning and Environmental Study for the Woodland Highway (LA 406) Widening project and respectfully request your comments. The project area is located in both Plaquemines and Orleans Parishes and is bounded generally by the Intracoastal Waterway to the west, English Turn Parkway to the north, the Mississippi River to the east, and Belle Chasse Highway (LA 23) to the south. A Stage 0 Feasibility Study was completed in March 2004 to assess the project's feasibility and establish the requirements for widening the LA 406 corridor to accommodate current and future demands in the Belle Chasse area. The study found that it is feasible to expand the corridor, add lanes, and improve safety. Now that the feasibility has been determined and we are moving forward into the Stage 1 process, we are soliciting views with federal and state agencies and public entities with jurisdiction over, or interested in, the project. To assist in your review attached is Figure 1 – Project Area.

The Purpose ad Need for the project is to accommodate anticipated increases in travel demand along the corridor due to recent and future adjacent residential development, and due to the

development of the Federal City project in Algiers, and the expansion of services at the Naval Air Station Joint Reserve Base in Belle Chasse, LA.

It is anticipated that the Class of Action for the Stage 1 Study will be an Environmental Assessment.

It is requested that you review the attached information and furnish us with your views and comments by January 15, 2012. Replies should be addressed to the following:

Volkert, Inc.
Attn: Patrick Owens, PE
4640 S. Carrolton Ave., Suite 240
New Orleans, Louisiana 70119

Please reference the captioned project in your reply.

Should you have any questions regarding this request, please contact me using the contact information below.

Sincerely,

Patrick A. Owens, PE
Assistant Vice President
Project Manager
Volkert, Inc.
pat.owens@volkert.com
504.488.8002
504.488.8008 Fax

Attachments

VOLKERT

RECEIVED
DEC 16 2011
FISH & WLDL. SERV
LAFAYETTE, LA.

Volkert, Inc.
4640 South Carrollton Ave.,
Suite 240
New Orleans, LA 70119

Office 504.488.8002
Fax 504.488.8008

www.volkert.com

This project has been reviewed for effects to Federal trust resources under our jurisdiction and currently protected by the Endangered Species Act of 1973 (Act). The project, as proposed,
(✓) Will have no effect on those resources
( ) Is not likely to adversely affect those resources.
This finding fulfills the requirements under Section 7(a)(2) of the Act.

Acting Supervisor — Date: Dec 21, 2011
Louisiana Field Office
U.S. Fish and Wildlife Service

December 15, 2011

US FISH & WILDLIFE SERVICE
646 CAJUNDOME BLVD, SUITE 400
LAFAYETTE, LA 70506

SITE MAY CONTAIN WETLANDS
Contact the U.S. Army Corps of Engineers for a jurisdictional determination.

District: New Orleans

Telephone No. 504-862-2274

Re: **Solicitation of Views**
Woodland Highway (LA 406) Widening
Plaquemines and Orleans Parishes, Louisiana
State Project No. H.008220
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New Orleans, Louisiana 70119

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Sincerely,

Patrick A. Owens, PE
Assistant Vice President
Project Manager
Volkert, Inc.
pat.owens@volkert.com
504.488.8002
504.488.8008 Fax

Attachments

U. S. Department of Homeland Security
FEMA Region 6
800 North Loop 288
Denton, TX 76209-3698

FEMA

FEDERAL EMERGENCY MANAGEMENT AGENCY
REGION VI
MITIGATION DIVISION

PUBLIC NOTICE REVIEW/ENVIRONMENTAL CONSULTATION

☐ We have no comments to offer. ☒ We offer the following comments:

WE WOULD REQUEST THAT THE PARISHES FLOODPLAIN ADMINISTRATORS BE CONTACTED FOR THE REVIEW AND POSSIBLE PERMIT REQUIREMENTS FOR THIS PROJECT.

If project Federally Funded, we request project to be compliant with EP 11988 & 11990.

Mike Metcalf
Permit Officer
Plaquemines Parish
102 Ave. G, Suite C
Belle Chasse, LA 70037
mmetcalf@plaqueminesparish.com
504-297-5342

Patrick Trainor
FPA
Orleans Parish
1300 Perdido St.
City Hall
New Orleans, LA 70112
504-658-7200

REVIEWER:

Mayra G. Diaz
Floodplain Management and Insurance Branch
Mitigation Division
(940) 898-5541

DATE: December 22, 2011

Pat Owens

From: Beth Altazan-Dixon [Beth.Dixon@LA.GOV]
Sent: Thursday, December 29, 2011 9:58 AM
To: pat.owens@volkert.com
Subject: DEQ SOV 700-38-0106/3510 Woodland Highway-LA 406-Widening

December 29, 2011

Patrick A. Owens, PE, Asst. VP
Volkert, Inc.
4640 S. Carrolton Ave, Suite 240
New Orleans, LA 70119
pat.owens@volkert.com

RE: 700-38-0106/3510 Woodland Highway-LA 406-Widening
H.008220 LADOTD Funding
Plaquemines and Orleans Parishes

Dear Mr. Owens:

The Department of Environmental Quality (LDEQ), Business and Community Outreach Division has received your request for comments on the above referenced project.

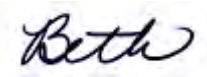
After reviewing your request, the Department has no objections based on the information provided in your submittal. However, for your information, the following general comments have been included. Please be advised that if you should encounter a problem during the implementation of this project, you should immediately notify LDEQ's Single-Point-of-contact (SPOC) at (225) 219-3640.

- Please take any necessary steps to obtain and/or update all necessary approvals and environmental permits regarding this proposed project.
- If your project results in a discharge to waters of the state, submittal of a Louisiana Pollutant Discharge Elimination System (LPDES) application may be necessary.
- If the project results in a discharge of wastewater to an existing wastewater treatment system, that wastewater treatment system may need to modify its LPDES permit before accepting the additional wastewater.
- All precautions should be observed to control nonpoint source pollution from construction activities. LDEQ has stormwater general permits for construction areas equal to or greater than one acre. It is recommended that you contact the LDEQ Water Permits Division at (225) 219-3181 to determine if your proposed project requires a permit.
- If your project will include a sanitary wastewater treatment facility, a Sewage Sludge and Biosolids Use or Disposal Permit application or Notice of Intent must be submitted no later than June 1, 2011. Additional information may be obtained on the LDEQ website at http://www.deq.louisiana.gov/portal/tabid/2296/Default.aspx or by contacting the LDEQ Water Permits Division at (225) 219- 3181.
- If any of the proposed work is located in wetlands or other areas subject to the jurisdiction of the U.S. Army Corps of Engineers, you should contact the Corps directly regarding permitting issues. If a Corps permit is required, part of the application process may involve a water quality certification from LDEQ.
- All precautions should be observed to protect the groundwater of the region.
- Please be advised that water softeners generate wastewaters that may require special limitations depending on local water quality considerations. Therefore if your water system improvements include water softeners, you are advised to contact the LDEQ Water Permits to determine if special water quality-based limitations will be necessary.
- Any renovation or remodeling must comply with LAC 33:III.Chapter 28, Lead-Based Paint Activities; LAC 33:III.Chapter 27, Asbestos-Containing Materials in Schools and State Buildings (includes all training and accreditation); and LAC 33:III.5151, Emission Standard for Asbestos for any renovations or demolitions.
- If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's Single-Point-of-Contact (SPOC) at (225) 219-3640 is required. Additionally, precautions should be taken to protect workers from these hazardous constituents.

Currently, Plaquemines and Orleans Parishes are classified as attainment with the National Ambient Air Quality Standards and have no general conformity determination obligations.

Please send all future requests to my attention. If you have any questions, please feel free to contact me at (225) 219-3958 or by email at beth.dixon@la.gov.

Sincerely,



Beth Altazan-Dixon, EPS III
Performance Management
LDEQ/Office of the Secretary
Business and Community Outreach and Incentives Division
P.O. Box 4301 (602 N. 5th Street)
Baton Rouge, LA 70821-4301
Phone: 225-219-3958
Fax: 225-325-8148
Email: ***beth.dixon@la.gov***

Choctaw Nation of Oklahoma

P.O. Box 1210 • Durant, OK 74702-1210 • (580) 924-8280

Gregory E. Pyle
Chief

Gary Batton
Assistant Chief

January 5, 2012

Volkert, Inc.
Attn: Patrick Owens, PE
4640 S. Carrollton Ave
Suite 240
New Orleans, LA 70119

Dear Patrick Owens, PE:

We have reviewed the following proposed project (s) as to its effect regarding religious and/or cultural significance to historic properties that may be affected by an undertaking of the projects area of potential effect.

RE: ***Woodland Highway (LA 406) Widening***
Plaquemines and Orleans Parish, Louisiana
State Project No. H.008220
Legacy Project No. 700-38-0106

Comments: Based on the information provided to the best of our knowledge it will have **no adverse** effect on any historic properties in the project's area of potential effect. However, should construction expose buried archaeological or building materials such as chipped stone, tools, pottery, bone, historic crockery, glass or metal items, or should it uncover evidence of buried historic building materials such as rock foundations, brick, or hand poured concrete, this office should be contacted immediately @ 1-800-522-6170 ext. 2216.

Sincerely,

Ian Thompson PhD, RPA
Director Historic Preservation Department
Tribal Archaeologist, NAGPRA Specialist
Choctaw Nation of Oklahoma

By: _____
Caren A. Johnson
Administrative Assistant

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
3737 Government Street
Alexandria, LA 71302

(318) 473-7751
Fax: (318) 473-7626

January 9, 2012

Patrick Owens
Volkert, Inc.
4640 S. Carrolton Avenue, Suite 240
New Orleans, Louisiana 70119

RE: Woodland Highway – LA 406 Widening

Dear Patrick:

I have reviewed the above referenced project for potential requirements of the Farmland Protection Policy Act (FPPA) and potential impact to Natural Resource Conservation Service projects in the immediate vicinity.

Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a federal agency or with assistance from a federal agency. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements can be forest land, pastureland, cropland, or other land, but not water or urban built-up land.

The project map submitted with your request indicates that the proposed construction areas will not impact prime farmland and therefore is exempt from the rules and regulations of the Farmland Protection Policy Act (FPPA)—Subtitle I of Title XV, Section 1539-1549. Furthermore, we do not predict impacts to NRCS work in the vicinity.

For specific information about the soils found in the project area, please visit our Web Soil Survey at the following location:

http://websoilsurvey.nrcs.usda.gov/

Please direct all future correspondence to me at the address shown above.

Respectfully,

Kevin D. Norton
State Conservationist

ACTING FOR

DEPARTMENT OF THE NAVY
NAVAL AIR STATION
JOINT RESERVE BASE
400 RUSSELL AVE
NEW ORLEANS LA 70143-5012

IN REPLY REFER TO:
11210
Ser N1/020
12 Jan 12

Volkert, Inc.
Attn: Patrick Owens, PE
4640 S. Carrolton Ave., Suite 240
New Orleans, LA 70119

Dear Mr. Owens,

SUBJECT: SUPPORT FOR WOODLAND HIGHWAY (LA 406) WIDENING PROJECT (STATE PROJECT - H.008220/LEGACY PROJECT- 700-38-0106)

In response to your Solicitation of Views letter dated December 15, 2011, as Commanding Officer of the Naval Air Station(NAS), Joint Reserve Base(JRB) located on Highway 23 in Belle Chasse, Louisiana, I want to add my full support for Woodland Highway widening project. When complete, it would better ensure safe and efficient flow of the base traffic that travels daily between the Marine Corps Support Facility New Orleans at Federal City in Algiers and the Air Station in Belle Chasse.

As you are likely aware, hundreds of Marines who live onboard the Air Station in Belle Chasse commute to their jobs at the Marine Forces Reserve Headquarters at Federal City utilizing Woodland Highway. Further, the 2,500-plus Marines that work at Federal City (no matter where they domicile) must travel to the Air Station for their medical, dental and shopping needs throughout the day. Additionally, a large portion of the 6,000-plus military and civilian employees and contractors that commute to the base daily from Jefferson and Orleans Parishes use Woodland Highway. The frequent raising of the Highway 23 Bridge adds further traffic to Woodland Highway.

In summary, widening Woodland Highway would be an enhancement to daily military efficiency and would increase NAS, JRB, New Orleans' readiness to respond rapidly to national and regional emergencies. This project has my full support.

Sincerely,

T. W. LUSCHER

CITY OF NEW ORLEANS
DEPARTMENT OF PUBLIC WORKS
1300 PERDIDO ST., ROOM 6W03 - NEW ORLEANS, LA. 70112
(504) 658-8000 - FAX 658-8007

MITCHELL J. LANDRIEU
MAYOR

Mark D. Jernigan, P.E., LTC (RET)
DIRECTOR

January 12, 2012

Mr. Patrick A. Owens, PE
Volkert, Inc.
4640 S. Carrollton Ave., Suite 240
New Orleans, Louisiana 70119

RE: Solicitation of Views
Woodland Highway (LA 406) Widening
Plaquemines and Orleans Parishes, Louisiana
STATE PROJECT NO: H.008220
Legacy Project No. 700-38-0106

Dear Mr. Owens:

We are in receipt of your letter dated December 15, 2011 for the project listed above. After a thorough review, we have no comments.

Sincerely,

Mark D. Jernigan, P.E., LTC (RET)
Director, Department of Public Works

CITY PLANNING COMMISSION
CITY OF NEW ORLEANS

MITCHELL J. LANDRIEU
MAYOR

YOLANDA W. RODRIGUEZ
EXECUTIVE DIRECTOR

LESLIE T. ALLEY
DEPUTY DIRECTOR

January 13, 2012

Volkert, Inc.
Attn: Patrick Owens, PE
4640 S. Carrolton Avenue., Suite 240
New Orleans, LA 70119

Mr. Owens,

Thank you for the opportunity to provide input on this project. The New Orleans City Planning Commission staff has examined the documents provided by you, has conducted a site visit as well as reviewed guiding documents such as the City's Comprehensive Zoning Ordinance and the Master Plan, and has determined that the City Planning Commission has no major concerns with the portion of this project that is located within Orleans Parish, noting that there are no plans for the taking of private property.

In the event that any taking of private property occurs, then non-compliance with the provisions of the Comprehensive Zoning Ordinance concerning minimum front and side yard setbacks, and the reduction of any private property owner's buildable land area will be of concern.

Also, as this is a state highway, we hope that any work being done will be in compliance with the State's Complete Streets Policy.

Yours truly,

Yolanda Rodriguez
Executive Director

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60267
NEW ORLEANS, LOUISIANA 701600267

JAN 17 2012

REPLY TO
ATTENTION OF

Operations Division
Operations Manager,
Completed Works

Mr. Patrick Owens, P.E.
Volkert, Inc.
4640 S. Carrolton Avenue
Suite 240
New Orleans, Louisiana 70119

Dear Mr. Owens:

This is in response to the Solicitation of Views request dated December 15, 2011, concerning the Woodland Highway Widening Project, in Orleans and Plaquemines Parishes, Louisiana.

We have reviewed your request for potential Department of the Army regulatory requirements and impacts on any Department of the Army projects.

We do not anticipate any adverse impacts to any Corps of Engineers projects.

Based on a previous determination dated November 17, 2009, we have determined that part of the property is wetland and subject to Corps' of Engineers jurisdiction. A Department of the Army (DA) permit under Section 404 of the Clean Water Act will not be required for the deposition or redistribution of dredged or fill material on this site. Additionally, a DA permit will be required if you propose to deposit dredged or fill material into the un-named drainage conveyances located in the project area.

Please be advised that this property is in the Louisiana Coastal Zone. For additional information regarding coastal use permit requirements, contact Ms. Christine Charrier, Coastal Management Division, Louisiana Department of Natural Resources at (225) 342 7591.

You are advised that the previous approved jurisdictional determination is valid for a period of 5 years from the date of issuance unless new information warrants revision prior to the expiration date or the District Commander has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.

Off-site locations of activities such as borrow, disposals, haul-and detour-roads and work mobilization site developments may be subject to Department of the Army regulatory requirements and may have an impact on a Department of the Army project.

Please contact Mr. Robert Heffner, of our Regulatory Branch by telephone at (504) 862-1288, or by e-mail at Robert.A.Heffner@usace.army.mil for questions concerning wetlands determinations or need for on-site evaluations. Questions concerning regulatory permit requirements may be addressed to Mr. Michael Farabee by telephone at (504) 862-2292 or by e-mail at Michael.V.Farabee@usace.army.mil.

Future correspondence concerning this matter should reference our account number MVN-2012-00021-SE. This will allow us to more easily locate records of previous correspondence, and thus provide a quicker response.

Sincerely,

Karen L. Oberlies

Karen L. Oberlies
Solicitation of Views Manager

Copy Furnished:

Ms. Christine Charrier
Coastal Zone Management
Department of Natural Resources
Post Office Box 44487
Baton Rouge, Louisiana 70804-4487

PLAQUEMINES
Association of Business & Industry

Mike Ford
2011 Chairman

Robert L. Thomas
Executive Director

Bart Breland
Immediate Past Chairman
Reid McLellan
2011 Chairman Elect
Kevin J. Guidry
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Bruce Keller
Cathy Madere
David Pavlovich
George Pivach, II
John A. Tesvich
Kim Turlich-Vaughn
Borden Wallace
Jeff White

January 18, 2012

Volkert, Inc.
Attn: Patrick Owens, PE
4640 S. Carrolton Ave., Suite 240
New Orleans, LA 70119

Re: Support of Woodland Highway (LA 406) Widening Project
(State Project - H.008220 / Legacy Project- 700-38-0106)

Dear Mr. Owens,

In response to your Solicitation of Views letter dated December 15, 2011, as Chairman of the Plaquemines Association of Business & Industry (PABI), I wanted to include for the record of this project that the widening of Woodland Highway is a good project from the perspective of business and industry in Plaquemines Parish. I feel because when completed it would better ensure safe and efficient flow of traffic that travels daily between Algiers and Belle Chasse.

The Woodland Highway corridor is a direct link from the current Interstate Highway System and will also link to future Interstate Highway 49 terminating at Louisiana Highway 23, a vital four-lane highway to the critical energy Port of Venice, LA. In addition there is an immediate need to complete this project to accommodate increases in travel demand due to recent and future adjacent commercial and residential development. Also, as you are likely aware, hundreds of the Marines that live onboard the Air Station in Belle Chasse travel daily to their jobs at the Marine Forces Reserve Command (MARFORRES) Headquarters at Federal City, utilizing Woodland Highway and the Gen. De Gaulle Bridge to do so. Additionally, a large portion of the 6,000 -plus military and civilian employees and contractors that commute to the base daily to/from Jefferson and Orleans Parishes use Woodland Highway as well.

In summary, widening Woodland Highway would be an enhancement to the economic, civic and cultural environment and advance the quality of life in Plaquemines Parish. As such, the project has my full support.

Sincerely,

Mike Ford, Chairman
Plaquemines Association of Business & Industry

8207-A Hwy. 23, P.O. Box 908, Belle Chasse, Louisiana 70037 • (504) 393-2999
WWW.PABIGROUP.COM

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Lighthouse Lodge, LLC
Madere & Sons Towing
Nairn Concrete, Inc.
New Orleans Iron Works, Inc.
Pivach, Pivach, Hufft & Thriffiley, LLC
Print-ALL, Inc.
Regions Bank
Southland Rental, Tools, Inc.
Zu Carpenter Photography

BOBBY JINDAL
GOVERNOR

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
P.O. Box 94245
Baton Rouge, Louisiana 70804-9245
www.dotd.la.gov
225-379-3005

SHERRI LEBAS
SECRETARY

January 24, 2012

STATE PROJECT NO.: H.008220
PROJECT NAME: WOODLAWN HIGHWAY (LA406) WIDENING
PARISH: PLAQUEMINES AND ORLEANS
LEGACY PROJECT NO.: 700-38-0106

Mr. Patrick A. Owens
Assistant Vice President
Volkert, Inc.
4640 S. Carrollton Ave., Suite 240
New Orleans, LA 70119

Subject: Solicitation of Views

Dear Mr. Owens:

Enclosed is a copy of the current effective Flood Insurance Rate Map (FIRM) for Plaquemines and Orleans Parish.

During and after the project, consideration must be given for the occurrence of a base flood inundation. At this time, consideration should also be given to the responsibility for clearing debris and keeping the area cleared so as not to interfere with its function.

In order to assure compliance with Plaquemines and Orleans Parish requirements for the National Flood Insurance Program (NFIP), and so that appropriate permits are obtained, please contact the floodplain administrators for Plaquemines and Orleans Parish. The contact persons are listed respectively: Mr. Mike Metcalf, 102 Ave. G, Ste. C, Belle Chase, LA 70037 and telephone no. 504-297-5342, Mr. Pat Trainor, 1300 Perdido Street, 7E05, New Orleans, LA 70112 and telephone no. 504-658-7200.

We thank you for the opportunity to comment on this project. If you need additional information, please contact our office, (225) 274-4354.

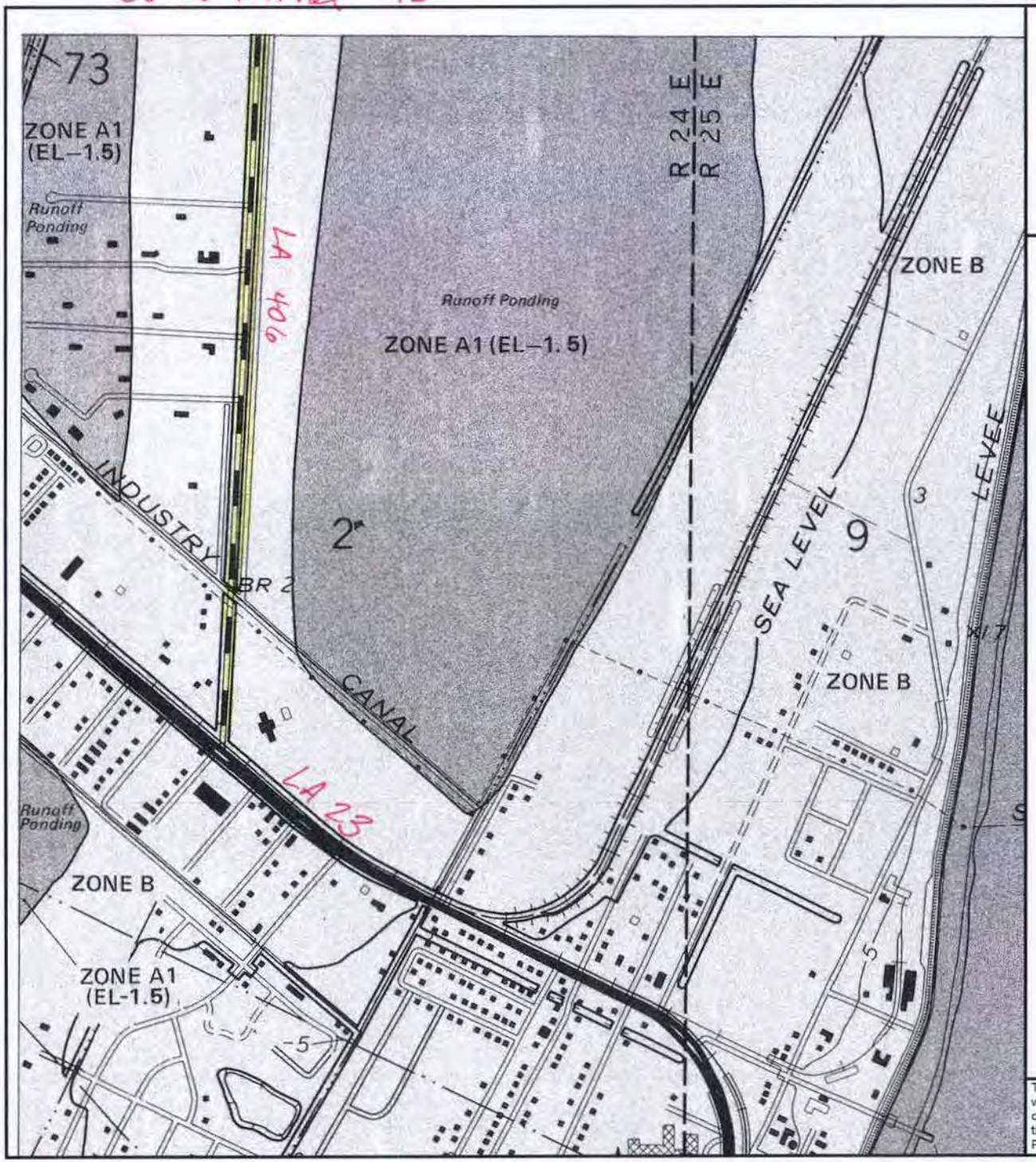
Sincerely,

Susan Veillon

Susan Veillon, CFM
Floodplain Management Program Coordinator

pc: Mr. Mike Metcalf, CFM
Mr. Pat Trainor, CFM

Joins Panel 15



APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

PLAQUEMINES PARISH, LOUISIANA
(UNINCORPORATED AREAS)

PANEL 55 OF 1400
(SEE MAP INDEX FOR PANELS NOT PRINTED)

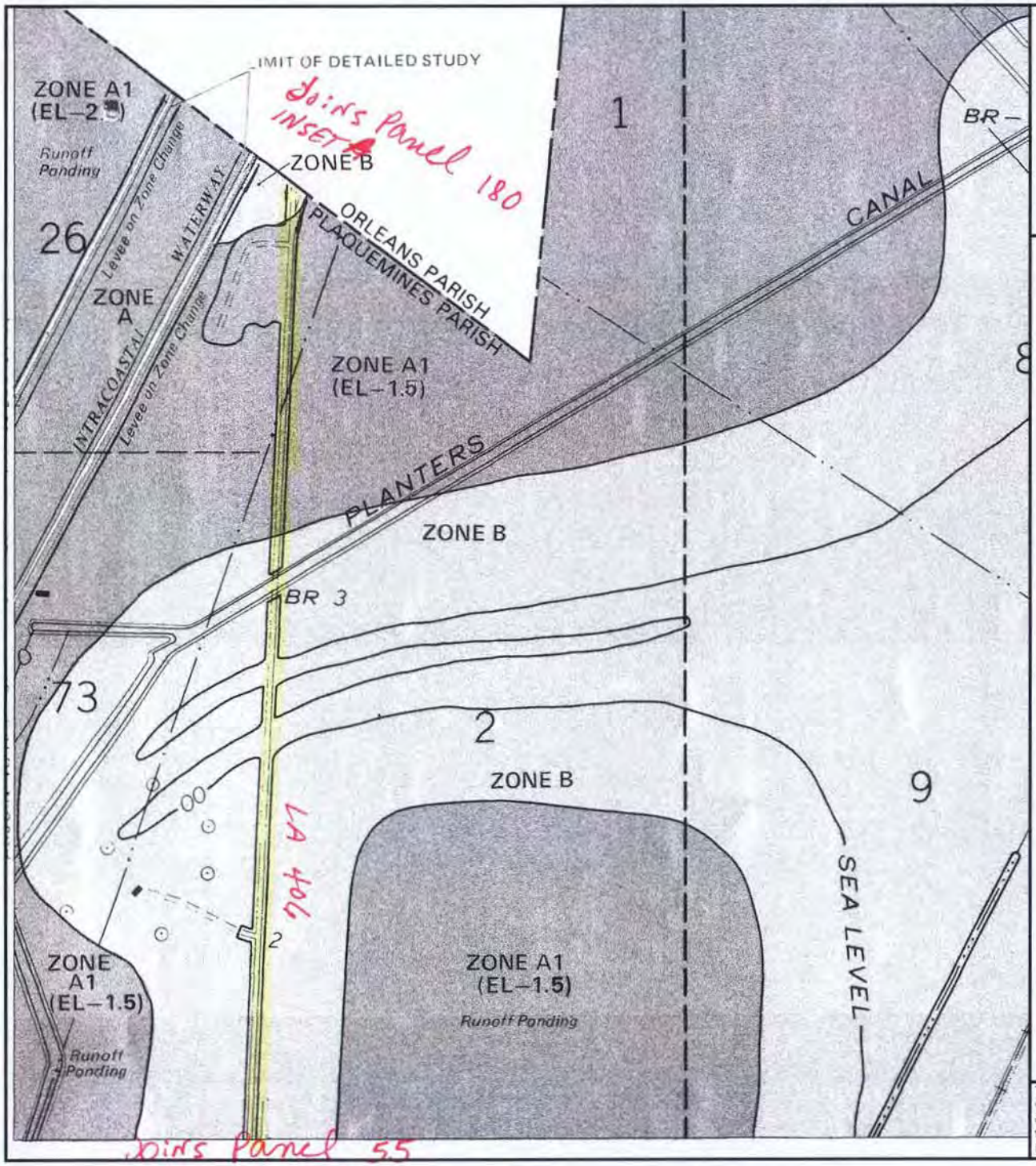
COMMUNITY-PANEL NUMBER
220139 0055 B

EFFECTIVE DATE:
MAY 1, 1985

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

MAP 1 of 5



N

APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

PLAQUEMINES PARISH, LOUISIANA

(UNINCORPORATED AREAS)

PANEL 15 OF 1400

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER

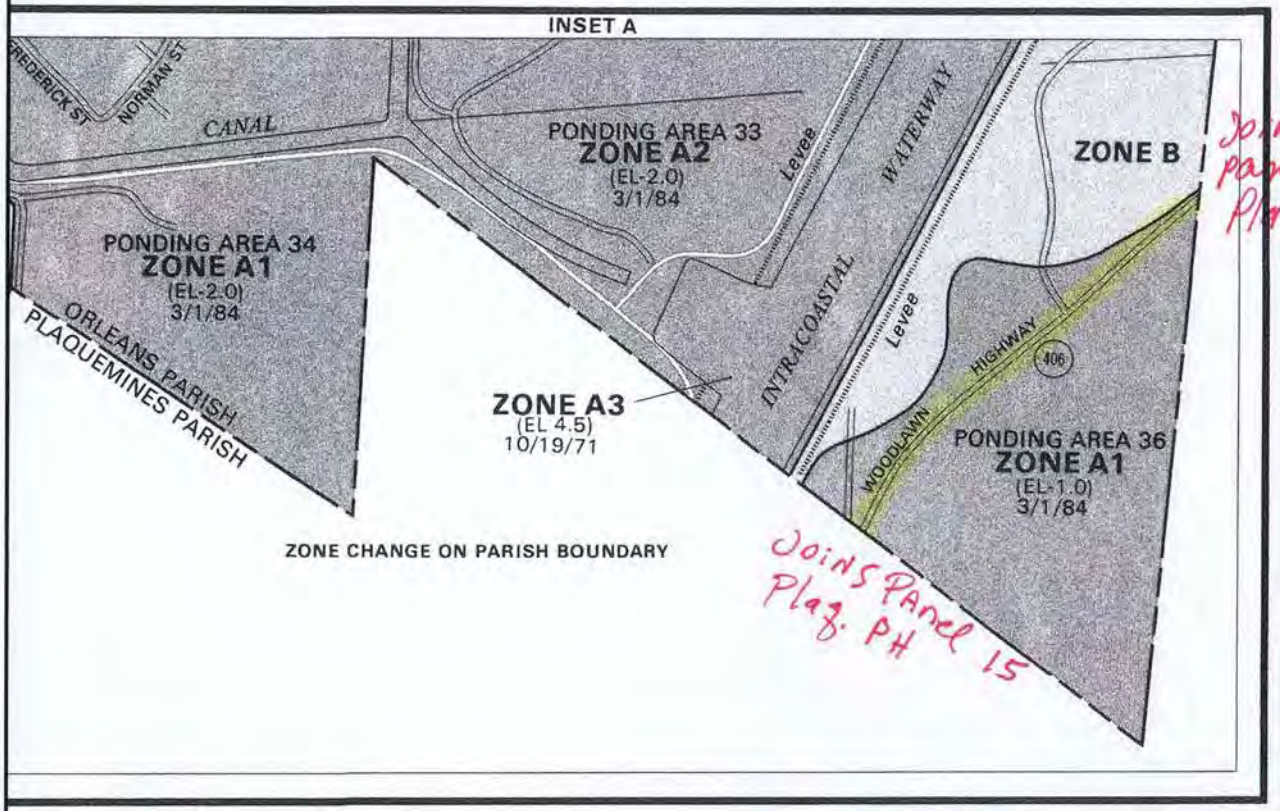
220139 0015 B

EFFECTIVE DATE:

MAY 1, 1985

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP 3 of 5

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
NEW ORLEANS AND ORLEANS PARISH, LOUISIANA

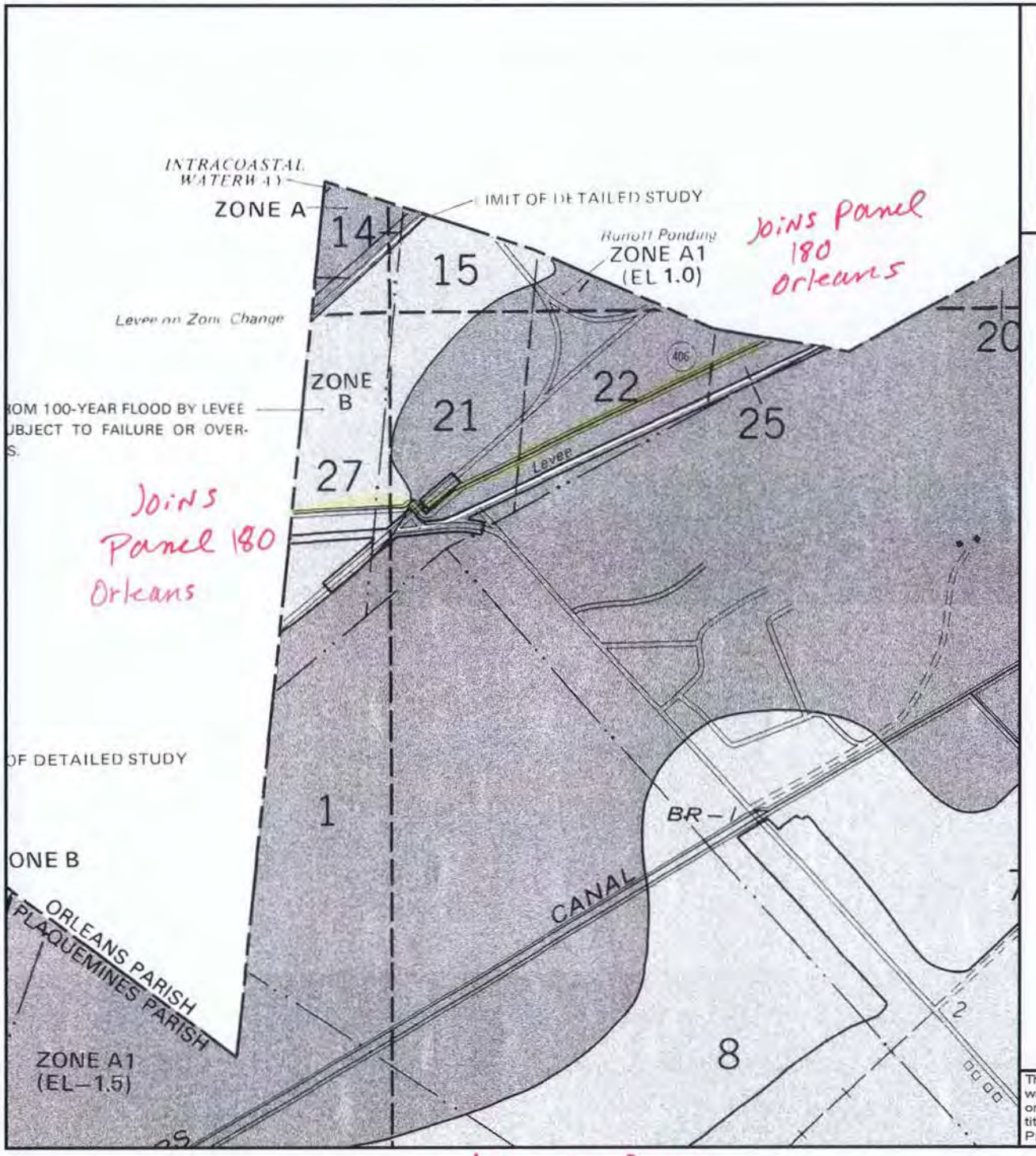
PANEL 180 OF 185
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
225203 0180 E

MAP REVISED:
MARCH 1, 1984

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

PLAQUEMINES PARISH, LOUISIANA

(UNINCORPORATED AREAS)

PANEL 15 OF 1400

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER

220139 0015 B

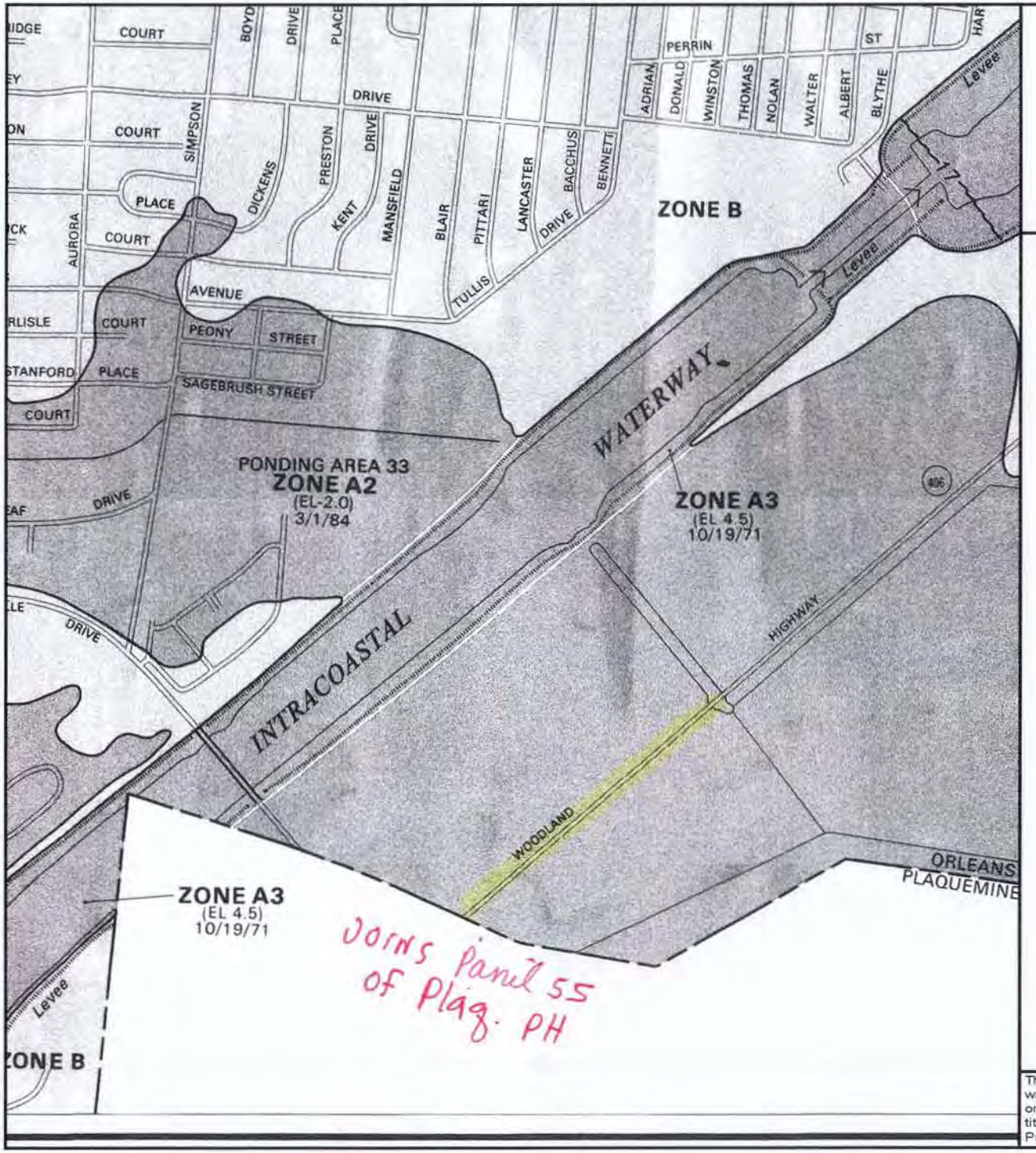
EFFECTIVE DATE:

MAY 1, 1985

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

MAP 4 of 5



APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
NEW ORLEANS AND
ORLEANS PARISH,
LOUISIANA

PANEL 180 OF 185
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
225203 0180 E

MAP REVISED:
MARCH 1, 1984

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

MAP 5

Bobby Jindal
GOVERNOR

Bruce D. Greenstein
SECRETARY

State of Louisiana

Department of Health and Hospitals
Office of Public Health

February 6, 2012

Volkert, Inc.
Attention: Patrick Owens, P.E.
4640 S, Carrolton Ave., Suite 240
New Orleans, LA 70119

Re: State project H.008220; Woodland Highway (LA 406) Widening, Plaquemines and Orleans Parishes

This office is in receipt of your Solicitation of View regarding the above referenced project(s).

Based upon the information received from the applicant we have no objection to the referenced project(s) at this time. The applicant shall be aware of and comply with any and all applicable Louisiana State Sanitary Code regulations (LAC 51, as applicable). Furthermore, should additional project data become available to this office that in any way amend the information upon which this office's response has been based, we reserve the right of additional comment on the referenced project(s).

In the event of any future discovery of evidence of non-compliance with the Louisiana Administrative Code Title 51 (Public Health-Sanitary Code) and the Title 48 (Public Health-General) regulations or any applicable public health laws or statutes which may have escaped our awareness during the course of this cursory review, please be advised that this office's preliminary determination on this Solicitation of View of the project(s) shall not be construed as absolving the applicant of responsibility, if any, with respect to compliance with the Louisiana Administrative Code Title 51 (Public Health-Sanitary Code) and the Title 48 (Public Health-General) regulations or any other applicable public health laws or statutes.

Respectfully,

Johan Forsman
Geologist
Louisiana Department of Health and Hospitals, Office of Public Health
Center for Environmental Health Services
Telephone: (225) 342-7309
Electronic mail: johan.forsman@la.gov

MAP

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
P.O. Box 94245
Baton Rouge, Louisiana 70804-9245
www.dotd.la.gov

April 25, 2012

BOBBY JINDAL
GOVERNOR

SHERRI LEBAS, P.E.
SECRETARY

STATE PROJECT NO. H.008220.2 /700-38-0106
F.A.P NO. H008220
LA 406/WOODLAND HWY (FROM LA 23 TO LA 407)
ROUTE LA 406
ORLEANS AND PLAQUEMINES PARISHES

APPROVED
CARL M. HIGHSMITH
PROJECT DELIVERY TEAM LEADER
FEDERAL HIGHWAY ADMINISTRATION
DATE 5-8-12

Mr. Wes Bolinger
Division Administrator
Federal Highway Administration
5304 Flanders Drive, Suite A
Baton Rouge, Louisiana 70808

Attention: Mr. Mark Stinson

SUBJECT: Logical Termini for Environmental Assessment

Dear Mr. Bolinger:

The Regional Planning Commission (RPC) in cooperation with the Louisiana Department of Transportation and Development (LADOTD) are planning to prepare an Environmental Assessment (E.A.) for the captioned project. Our recommendations for the logical termini for the studied E.A. are the intersection of LA 406 (Woodland Hwy) and LA 23(Belle Chasse Hwy) and the intersection of LA 406 (Woodland Hwy) and LA 407 (Gen. DeGaulle Blvd). The anticipated completion date for the E.A. is December 31, 2012, that includes a Finding of No Significant Impacts (FONSI).

We appreciate your concurrence and/or comments. If you have any questions, please call Mr. Wayne Nguyen at (225) 242-4513.

Sincerely,

Robert Scott

for Noel Ardoin
Environmental Engineer Administrator

NA/qvn STL
Attachment

BOBBY JINDAL
GOVERNOR

SCOTT A. ANGELLE
SECRETARY

State of Louisiana
DEPARTMENT OF NATURAL RESOURCES
OFFICE OF COASTAL MANAGEMENT

06/11/2012

VOLKERT, INC.
4640 S. CARROLTON AVE., SUITE 240
NEW ORLEANS, LA 70119
Attn: William Purser

RE: P20120815, Solicitation of Views
LA DOTD
Description: Conduct Stage 1 planning and environmental study for the Woodland Highway (LA 406) Widening project (State Project No. H.008220)
Location: Lat ° ' "N / Long ° ' "W;
Orleans, Plaquemines Parishes, LA

Dear William Purser:

You are hereby advised that your application for a Coastal Use Permit (CUP) has been determined to be complete and review by the State for compliance with the Louisiana Coastal Resource Program (LCRP) and consistency with the federal Coastal Zone Management Act (CZMA) has begun. Additionally, it has been determined that your proposed activity is a use of state concern in accordance with Louisiana Revised Statue 49:214.5.

All correspondence and calls regarding this application should reference the Coastal Use Permit Number (P#) indicated above. Please note that all information concerning your application is in our database and is updated throughout the day as changes to the status of the application occur.
Your application can be found on our Webpage.

Should you have any questions, please check the online database or contact the assigned permit analyst: Vickie Amedee at (225) 342-3781 or vickie.amedee@la.gov. Be sure to reference the above Coastal Use Permit Number.

Permit Coordinator

CM

Post Office Box 44487 • Baton Rouge, Louisiana 70804-4487
617 North Third Street • 10th Floor • Suite 1078 • Baton Rouge, Louisiana 70802
(225) 342-7591 • Fax (225) 342-9439 • http://www.dnr.louisiana.gov
An Equal Opportunity Employer

cc: Pete Serio, COE

LA DOTD

From: Frank Cole
Sent: Tuesday, June 12, 2012 9:59 AM
To: Vickie Amedee
Subject: FW: P20120815 - ORIGINAL - Application Distribution

Hi Vickie, it appears that this proposed project area is entirely contained within a fastland(s).

Frank Cole
Coastal Resources Scientist
Louisiana Dept. of Natural Resources
CERM, Suite 309
2045 Lakeshore Drive
New Orleans, LA 70122
Office: 504-280-4064
Cell: 504-460-3789

From: Office of Coastal Management [bpel.mail@la.gov]
Sent: Monday, June 11, 2012 1:54 PM
To: Jamie Phillippe; Tim Killeen; Frank Cole
Subject: P20120815 - ORIGINAL - Application Distribution

[http://sonris-www.dnr.state.la.us/sonris-images/banner-dnr-main.gif]

PLEASE DO NOT REPLY TO THIS EMAIL. THIS ACCOUNT IS NOT MONITORED FOR INCOMING MAIL. If you
would like to talk to someone about this application please call 225-342-7591 or 1-800-267-4019.

Coastal Use Permit Application Information

Applicant: LA DOTD
Project: Woodland Highway (LA 406) Widening
Project Parish(es): ORLEANS, PLAQUEMINES

OCM Analyst: Vickie Amedee
Preliminary Determination: SOV Application Required
Application Modification: N/A

The Office of Coastal Management has reviewed the attached application (P20120815) and has determined it to be complete.

You can view the application online at:

Application<http://sonris-www.dnr.state.la.us/sundown/cart_prod/cart_crm_application_his?pcup_num=P20120815>
Make Comments<http://sonris-www.dnr.state.la.us/sundown/cart_prod/cart_crm_gnl_cmnt?pcup_num=P20120815&pcomment_code=>

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TX 75202-2733

June 19, 2012

Mr. William Purser, PE
Project Manager
Volkert, Inc.
4640 S. Carrolton Avenue
Ste. 240
New Orleans, LA 70119

Dear Mr. Purser:

We have received your June 5, 2012, letter requesting our evaluation of the potential environmental impacts that might result from the following project:

Highway Widening
Woodland HWY (LA 406)
SP No. H.008220
LP No. 700-38-0106
Plaquemines & Orleans
Parishes, Louisiana

In administering the sole source aquifer (SSA) program under Section 1424 of the Safe Drinking Water Act our Office performs evaluations of projects with federal financial assistance which are located over a designated sole source aquifer.

Based on the information provided, we have concluded that the project does not lie within the boundaries of a designated sole source aquifer and is thus not eligible for review under the SSA program.

If you did not include the Parish/County; a legal description; project location and the latitude and longitude if available, please do so in future Sole Source Aquifer correspondence.

If you have any questions on this letter or the sole source aquifer program please contact me at (214) 665-7133.

Sincerely yours,

Michael Bechdol, Coordinator
Sole Source Aquifer Program
Ground Water/UIC Section

cc: Jesse Means, LDEQ
Noel Ardoin, LDoTD

JAY DARDENNE
LIEUTENANT GOVERNOR

State of Louisiana

OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT

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19 March 2013

Donna Stone
Senior Researcher
Earth-Search, Inc.
PO Box 770336
New Orleans, LA 70177-0336

Re: Draft Report
La Division of Archaeology Report No. 22-4207
Negative Findings Report for the Phase I Survey of the Woodland Highway (LA 406) Widening Project, Orleans and Plaquemines Parishes, Louisiana

Dear Ms. Stone:

We acknowledge receipt of your letter dated 4 March 2013and two copies of the above referenced report. We have completed our review of this report and have offer the following comments.

Please include the acreage surveyed in the Abstract.

Our office would appreciate a site form being filled out for the historic landfill. We recognize its modern context and lack of eligibility (and are grateful no artifacts were collected), but think it important to document this cultural deposit. Given that we would certainly record a 1700s or 1800s landfill, we can think of no good reason to discriminate against a more recent example.

Our office concurs that no historic properties will be impacted by this project. Our office has no further concerns for this project.

We look forward to receiving two bound copies of the final report along with a pdf of the report. If you have any questions, please contact Chip McGimsey in the Division of Archaeology by email at cmcgimsey@crt.la.gov or by phone at 225-219-4598.

Sincerely,

Pam Breaux

Pam Breaux
State Historic Preservation Office

PB:crm

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Environmental Section
PO Box 94245 | Baton Rouge, LA 70804-9245
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Bobby Jindal, Governor
Sherri H. LeBas, P.E., Secretary

August 7, 2013

STATE PROJECT NO.: H.008220
F.A.P. NO.: H008220
WOODLAND HWY (LA 406) WIDENING (LA 23 to LA 407)
LADOA NO. 22-4207
ORLEANS AND PLAQUEMINE PARISHES

The Final Report has been reviewed and accepted. 22-4207

Pam Breaux 15 Aug 2013
Pam Breaux
State Historic Preservation Officer
Date

Ms. Pam Breaux
State Historic Preservation Officer
Department of Culture, Recreation and Tourism
Office of Cultural Development
P.O. Box 44247, Capitol Station
Baton Rouge, LA 70804

AUG - 8 2013

SUBJECT: Phase I Cultural Resources Survey-No Historic Properties Affected

Dear Ms. Breaux:

Enclosed for your library are two final copies of the phase I cultural resources survey report titled "*Phase I Survey of the Woodland Highway (LA 406) Widening Project, Orleans and Plaquemine Parishes, Louisiana*", dated July 2013, prepared by Earth Search, Inc. (ESI) under contract for Volkert, for the above captioned project. A previous version of this report was sent to your office for review by the consultant and all recommended changes have been addressed.

The Louisiana Department of Transportation and Development (LADOTD) is proposing a project to widen Woodland Highway (LA 406). The Area of Potential Effect (APE) extends from Belle Chasse Highway (LA 23) to LA 407; paralleling LA 406 for a distance of approximately 5.3 km (3.3 mi). The proposed highway right-of-way (ROW) width varies from 30.5-36.8 m (100-120 ft). In total, the APE encompasses approximately 19.1 ha (47.2 A).

An architectural survey was performed to locate and record any structures approaching 50 years of age within the APE and to evaluate these structures using National Register of Historic Places (NRHP) criteria. The APE for the purposes of the architectural survey was set at a .25 mi (400 m) diameter buffer of the project centerline (i.e. 200 m to either side of the centerline). No standing structures approaching 50 years of age are located in or adjacent to the project area.

The archaeological investigation identified one archaeological site, 16OR666/16PL270. This site is located in both Orleans and Plaquemines Parishes and therefore received site numbers from both parishes. The sites represent the remains of a late historic to modern landfill. The site has no integrity or research potential and ESI recommends that it is not eligible for nomination to the NRHP. The proposed roadway construction will have no effect on historic properties and no additional cultural resources investigations are recommended.

APPENDIX C

Air Quality Analysis

AUGUST 2012

WOODLAND HIGHWAY/LA 406 WIDENING
STATE PROJECT NO. H.008220
PLAQUEMINES AND ORLEANS PARISHES, LA

LA HWY 23 TO LA HWY 407

AIR QUALITY ANALYSIS REPORT

LEGACY NO. 700-38-0106
FAP NO. STP-3803(501)
RPC NO. LA406EA
VOLKERT NO. 138000.80

Prepared By:

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PROVIDENCE

ACRONYMS AND ABBREVIATIONS

ACRO	Acrolein
AADT	Annual Average Daily Traffic
BENZ	Benzene
BUTA	1,3-Butadiene
CO_2	Carbon Dioxide
CO	Carbon Monoxide
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CFR	Code of Federal Regulations
DPM	Diesel Particulate Matter
DOTD	Department of Transportation and Development
FHWA	Federal Highways Administration
FORM	Formaldehyde
GHG	Greenhouse Gas
PB	Lead
MTP	Metropolitan Transportation Plan
MSATs	Mobile Source Air Toxics
MOVES	Motor Vehicle Emission Simulator
NAAQS	National Ambient Air Quality Standards
NAPH	Naphthalene
NHTSA	National Highway Traffic Safety Administration
NO_2	Nitrogen Dioxide
O_3	Ozone
PM	Particulate Matter
PM_{10}	Particulate Matter (diameter between 2.5 and 10 micrometers)
$PM_{2.5}$	Particulate Matter (diameter of 2.5 micrometers or smaller)
RPC	Regional Planning Commission
ROW	Right-of-Way
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
TIP	Transportation Implementation Plan
USEPA	United States Environmental Protection
VMT	Vehicle Miles Traveled

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1.0 INTRODUCTION

Air quality is measured by the type and level of pollutants in the air. The 1990 Clean Air Act (CAA) amendment requires the United States Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) (40 Code of Federal Regulations (CFR) Part 50) for pollutants considered harmful to public health and the environment. The USEPA has set NAAQS for six principal pollutants, which are called "criteria" pollutants as shown in **Table 1-1**.

Table 1-1 Criteria Pollutants

Pollutant Name	Chemical Abbreviation
Ozone	O_3
Carbon Monoxide	CO
Particulate Matter	PM
Nitrogen Dioxide	NO_2
Sulfur Dioxide	SO_2
Lead	Pb

Highway agencies are required to consider the impacts of transportation improvement projects on a regional level in the Transportation Conformity analysis and at a statewide level in the State Implementation Plan (SIP). Since this project is in an attainment/unclassifiable area, an air quality conformity analysis to conform to the SIP for attainment and maintenance of the NAAQS is not required.

1.1 Existing Condition and Proposed Build

Currently, Woodland Highway (Louisiana Highway (LA) 406) is a two lane, bi-directional facility. The majority of the facility is located in Plaquemines Parish, with a small portion extending into Orleans Parish. The volume on this facility is projected to increase due to continued residential and commercial development along LA 406 as well as area developments, including the Federal City project in Algiers and the expansion of services at the Naval Air Station Joint Reserve Base in Belle Chasse. Taking this into consideration, the Louisiana Department of Transportation and Development (DOTD) and the New Orleans Regional Planning Commission (RPC) propose the widening of LA 406 from Belle Chasse Highway (LA 23) to General de Gaulle Drive (LA 407) in Belle Chasse, within Plaquemines and Orleans Parishes, Louisiana. The proposed improvements will widen LA 406 from a two lane, bi-directional facility to a four-lane divided facility. The total length of the project is approximately 3.27 miles. **Figure 1** shows the project area. Annual average daily traffic (AADT) for the 2010 and projected for 2038 for different sections of the facility is shown in the **Table 1-2**.

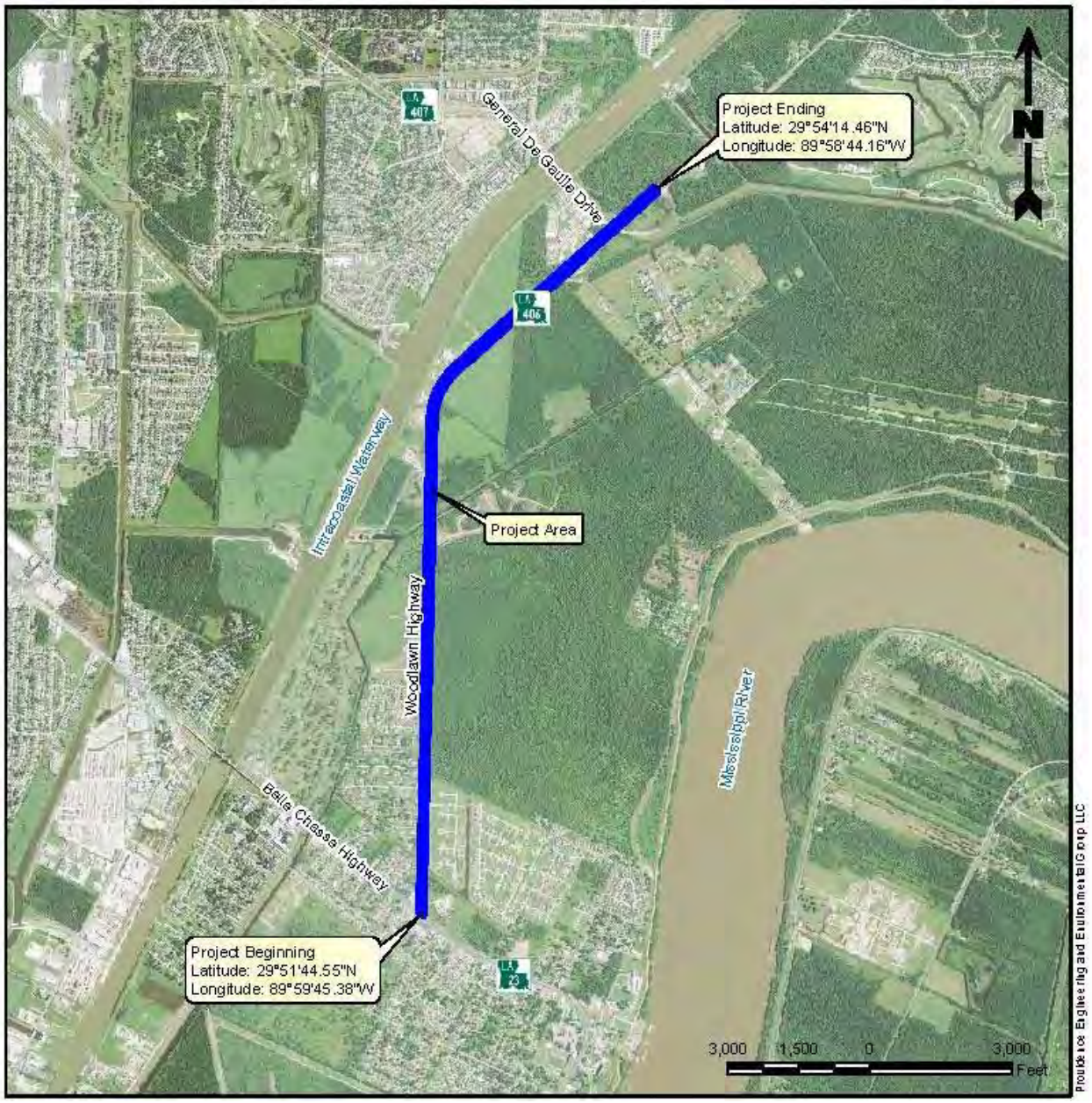

Figure 1 Project Area Map

Table 1-2 Traffic Volumes for Existing and Future Build Conditions

Link ID	Description	Annual Average Daily Traffic (vehicles per day)	
		2010 Base Case	2038 Build Case
1	LA 406 Northbound (Section 1)	4,639	13,463
2	LA 406 Southbound (Section 1)	4,639	12,985
3	LA 406 Northbound (Section 2)	4,179	7,774
4	LA 406 Southbound (Section 2)	4,179	7,288
5	LA 406 Northbound (Section 3)	2,393	7,768
6	LA 406 Southbound (Section 3)	2,393	8,320

2.0 AIR QUALITY ANALYSIS

For this project, a quantitative analysis of Carbon Dioxide (CO_2) emissions was conducted using Environmental Protection Agency's latest model, Motor Vehicle Emission Simulator (MOVES) 2010b. In addition, a qualitative mobile source air toxics (MSATs) analysis has been conducted in accordance with 2009 Federal Highways Administration (FHWA) Interim Guidance. The findings of the analyses are presented in this report.

2.1 Carbon Monoxide

CO is a colorless, odorless gas emitted from combustion processes. Nationally and, particularly in urban areas, the majority of CO emissions to ambient air come from mobile sources. CO is toxic because it combines with the hemoglobin of the blood to produce carboxyhemoglobin which reduces the blood's ability to carry oxygen.[1] At extremely high levels, CO can cause death. Since 1990, there has been a decrease in maximum CO concentrations measured across the US. With the decline in the magnitude of maximum ambient CO concentrations nationwide, there has been a subsequent decline in the number of stations reporting observations that exceed the NAAQS.[2]

Louisiana has been in attainment statewide for CO. The proposed action is consistent with the RPC's 2040 Metropolitan Transportation Plan (MTP) and the 2013-2016 Transportation Implementation Plan (TIP). The traffic projections for the proposed action as shown in **Table 1-2** do not exceed 140,000 vehicles per day. CO analyses performed, assuming worst-case scenarios, for projects similar to the proposed project have shown

[1] Environmental Protection Agency, http://www.epa.gov/air/carbonmonoxide/
[2] Jeffrey Houk & Michael Claggett, Federal Highway Administration, *"Survey of Screening Procedures for Project-Level Conformity Analyses"* , April 2004

no violations of the NAAQS. It was determined that this proposed project will not violate the NAAQS for CO, like similar projects modeled have previously demonstrated. Hence, air quality modeling for CO will not be required.

2.2 Particulate Matter

PM is a complex mixture of extremely small particles and liquid droplets. PM is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. PM includes inhalable coarse particles (PM_{10}) and fine particles ($PM_{2.5}$). PM_{10} are between 2.5 micrometers and 10 micrometers in diameter and can be found near roadways and dusty industries. $PM_{2.5}$ are 2.5 micrometers and smaller in diameter and are directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries and automobiles react in the air.[3] The project is located in the parishes of Plaquemines and Orleans, an area designated as attainment for PM_{10} and $PM_{2.5}$. Therefore, no hot-spot analysis is necessary, since the area has not been identified as nonattainment or maintenance and is in compliance with the NAAQS.

2.3 Mobile Source Air Toxics Analysis (MSAT)

In addition to the criteria air pollutants for which there are NAAQS, the USEPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries). The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

Controlling air toxic emissions became a national priority with the passage of the CAA Amendments (CAAA) of 1990, whereby Congress mandated that the USEPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/ncea/iris/index.html). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases, formaldehyde, naphthalene, and polycyclic organic matter.[4]

[3] Environmental Protection Agency, http://www.epa.gov/pm/
[4] Federal Highway Administration, http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/100109guidmem.cfm

This project will have no or low potential MSAT effect since it is not adding substantial new capacity. The amount of MSAT emitted would be proportional to the vehicle miles traveled (VMT). The VMT estimated for the 2038 build scenario is higher than the 2010 base case which can be attributed to change in land use, increase population, and the efficiency of the roadway. **Table 2-1** shows the VMT for years 2010 and 2038. This increase in VMT would lead to higher MSAT emissions for 2038 along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds. According to USEPA's MOBILE6.2 model, emissions of all of the priority MSAT except for diesel PM decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Table 2-1 Vehicle Miles of Travel for Existing and Future Build Conditions

Link ID	Description	Vehicle Miles of Travel (miles/day)	
		2010 Base Case	2038 Build Case
1	LA 406 Northbound (Section 1)	6,634	19,252
2	LA 406 Southbound (Section 1)	6,634	18,569
3	LA 406 Northbound (Section 2)	5,432	10,106
4	LA 406 Southbound (Section 2)	5,432	9,474
5	LA 406 Northbound (Section 3)	1,292	4,195
6	LA 406 Southbound (Section 3)	1,292	4,493

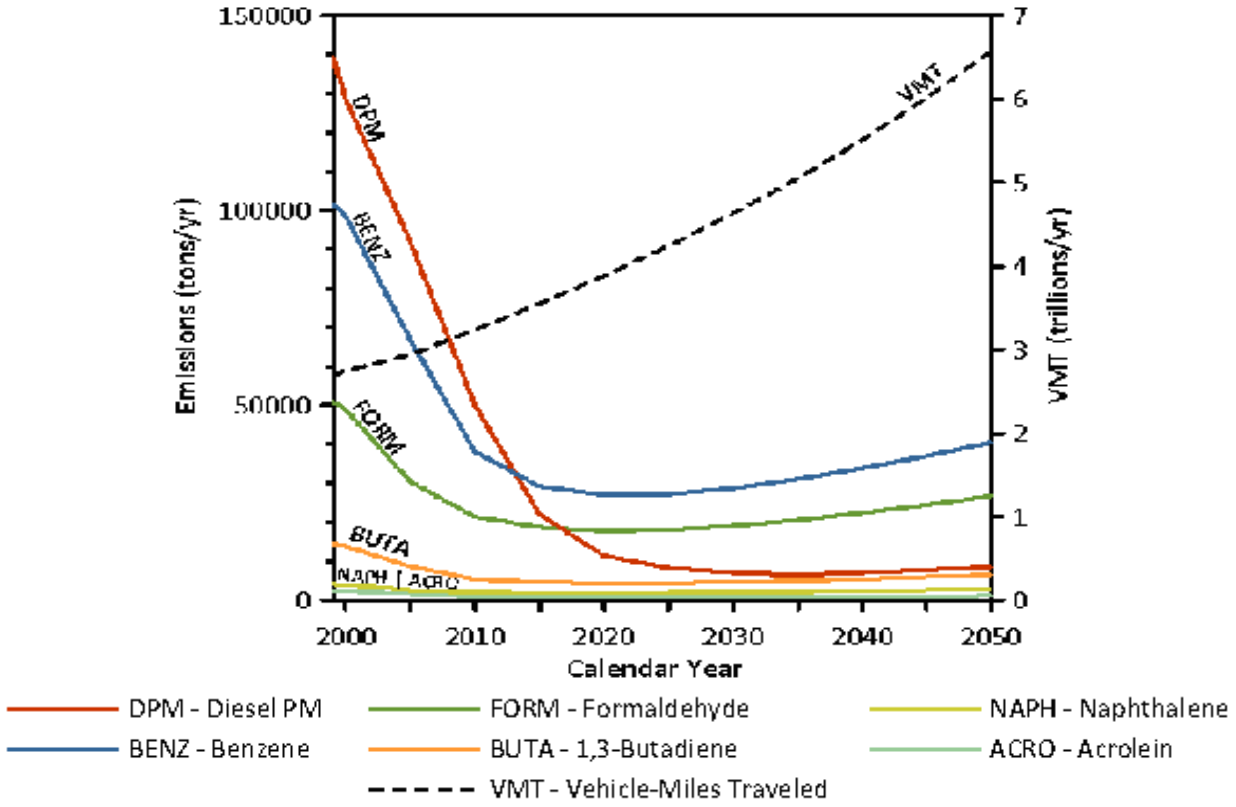

Figure 2 National MSAT Emission Trends 1999 – 2050 for Vehicles Operating on Roadways Using USEPA's MOBILE6.2 Model

Emissions for the year 2038 will likely be lower than 2010 levels as a result of USEPA's national control programs that are projected to reduce annual MSAT emissions by 72% between 1999 and 2050 as shown in the **Figure 2**. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

MSAT could be higher under Build Alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections. However, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In summary, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, USEPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions

that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.[5]

2.3.1 Sensitive Receptor Analysis

Sensitive receptors within the project limits were identified, and the distance from the right-of-way (ROW) to each receptor was measured and noted. Sensitive receptors include public and private schools, hospitals, senior citizen/skilled-nursing care facilities, and licensed daycare facilities. Community facilities and services adjacent to LA 406 include several commercial facilities, residences, public facilities, churches, and various utility facilities. Two sensitive receptor is found within 500 meters of the ROW. See **Table 2-2** for sensitive receptor summary.

Table 2-2 Sensitive Receptors within Half Mile from the Project Area

ID	Facility	Address	City	Zip Code	Distance from ROW* (ft)
SR1	Plaquemines Parish Alternative School	115 Keating Drive	Belle Chasse	70037	400
SR2	Exceleration Church	202 Woodland Highway	Belle Chasse	70037	350

Source: USEPA NEPAssist
* Distance provided is an approximation from centerline

2.4 Carbon Dioxide Analysis

CO_2 is the primary greenhouse gas (GHG) emitted through human activities. In 2010, CO_2 accounted for about 84% of all GHG emissions from human activities in the United States. CO_2 is naturally present in the atmosphere as part of the Earth's carbon cycle (the natural circulation of carbon among the atmosphere, oceans, soil, plants, and animals). The combustion of fossil fuels, such as gasoline and diesel to transport people and goods, is the second largest source of CO_2 emissions accounting for about 31% of total CO_2 emissions and 26% of total GHG emissions in the United States in 2010. This category includes transportation sources such as highway vehicles, air travel, marine transportation, and rail. USEPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles, through reduced GHG emissions and improved fuel use from on-road vehicles and engines, from the smallest cars to the largest trucks.[6]

Project level quantitative CO_2 emission analysis was performed for this study using USEPA's latest model, MOVES2010b. Compared to previous tools, MOVES

[5] Federal Highway Administration, http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/100109guidmem.cfm
[6] Environmental Protection Agency, http://www.epa.gov/climatechange/ghgemissions/gases/co2.html

incorporates the latest emissions data, more sophisticated calculation algorithms, increased user flexibility, new software design, and significant new capabilities. USEPA recommends state and local agencies estimating GHG emissions in the transportation planning process consider using the latest version of MOVES for GHG emissions analyses. **Figure 4** shows CO_2 emission factors by speed estimated using MOVES 2010b. These emission factors are used to estimate emissions for various sections of the project.

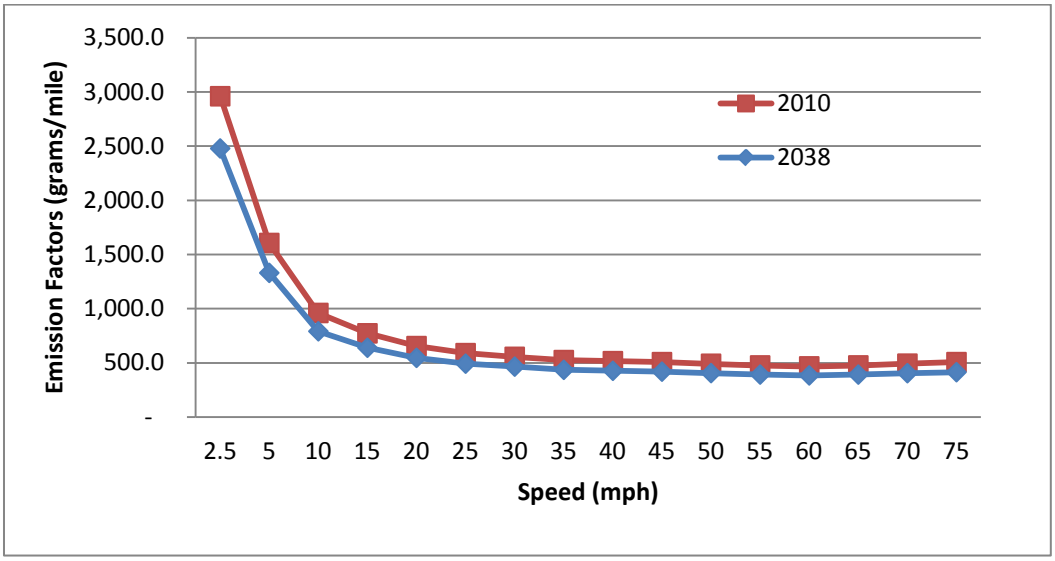

Figure 4 Carbon Dioxide Emission Factors by Speed

Table 2-3 CO2 Emissions for Existing and Future Build Conditions

Link ID	Description	CO_2 Emissions (tons/day)	
		2010 Base Case	2038 Build Case
1	LA 406 Northbound (Section 1)	3.39	8.11
2	LA 406 Southbound (Section 1)	3.39	7.81
3	LA 406 Northbound (Section 2)	3.20	4.90
4	LA 406 Southbound (Section 2)	3.20	4.59
5	LA 406 Northbound (Section 3)	1.88	5.03
6	LA 406 Southbound (Section 3)	1.88	5.39
Total		16.93	35.83

As shown in the **Table 2-3**, CO_2 emissions for 2038 is higher than 2010. This increase in CO_2 emissions can be attributed to an increase in VMT. If this analysis were compared

between the 2038 Build Alternative and the 2038 No Build Alternative, the localized level of emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in. Also, CO_2 will be lower in other locations when traffic shifts away from them.

Even though CO_2 emissions increase between 2010 base case and 2038 build scenarios, the average emission per vehicle is lower in 2038 when compared to 2010 scenario as shown in **Figure 5**. This can be attributed to USEPA's vehicle and fuel regulations, coupled with fleet turnover that causes substantial reductions.

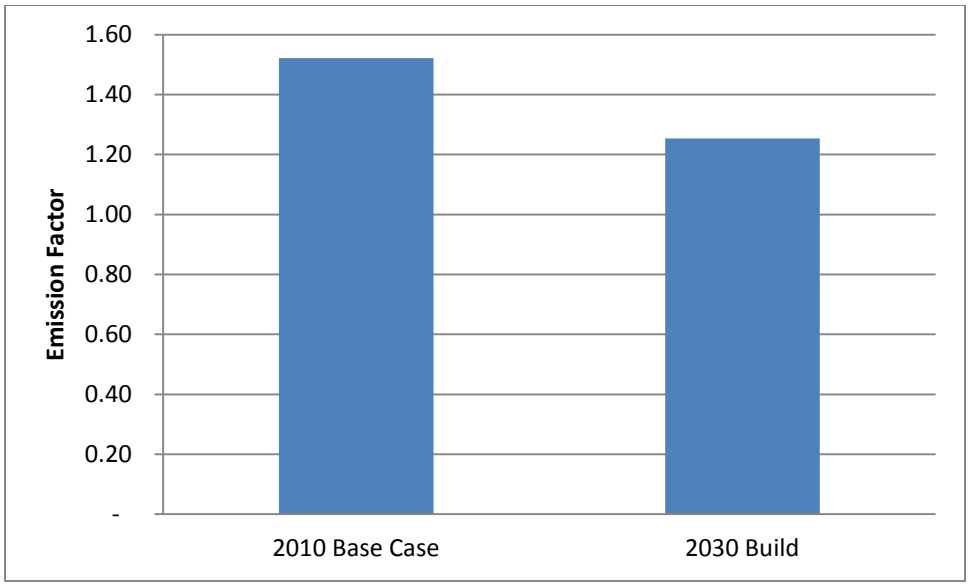

Figure 5 Average Carbon Dioxide Emissions per Vehicle

2.5 Construction Impacts

During the construction phase of this project, temporary increases in air pollutant emissions may occur from construction activities. PM (fugitive dust) from site preparation will be the primary construction-related emissions. These emissions are only occurring during construction phase. The potential impacts of PM emissions will be minimized by using fugitive dust control measures such as covering or treating disturbed areas with dust suppression techniques, sprinkling, covering loaded trucks, and other dust abatement controls, as appropriate.

3.0 CONCLUSIONS

Table 3-1 provides a summary of the results of the air quality analysis for this project. Detailed explanations of these findings can be found in the previous sections of the document. Air quality modeling for CO will not be required. No hot-spot analysis is necessary, since the area has not been identified as nonattainment or maintenance and is in compliance with the NAAQS. The project has low potential MSAT effects since the current and projected vehicle traffic does not

exceed the FHWA threshold (140,000 vehicles per day). Also emissions for the year 2038 will likely be lower than 2010 levels as a result of USEPA's national control programs that are projected to reduce annual MSAT. There is minimal impact of CO_2 emissions according to the quantitative analysis. The analysis also shows that 2030 emissions per vehicle will be lower than 2010. Based on the results of the air quality analysis, the project is not expected to cause or contribute to any violations of the NAAQS.

Table 3-1 Summary of Air Quality Analysis for LA406 Project

Analysis	Results
CO Hotspot	Not Required
PM Hotspot	Not Required
MSATs	Low Impacts
Quantitative CO_2 Analysis	Low Impacts
Construction Impacts	Temporary & Low Impacts

APPENDIX D

Traffic Noise Analysis

Noise Analysis Technical Report

For The

Woodland Highway/LA 406 Widening Project
LA Highway 23 to LA Highway 407

LDOTD Project No. H.008220
RPC Project No. LA406EA
Orleans and Plaquemines Parishes
Belle Chasse, Louisiana

Prepared For:

September 2013

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LDOTD Project No. H.008220
RPC Project No. LA406EA

Woodland Highway/LA 406 Widening Project
LA Highway 23 to LA Highway 407
Orleans and Plaquemines Parishes, Louisiana

Noise Analysis Technical Report

Executive Summary

The noise levels were analyzed for the 2011 Existing, and future 2038 No-Build and one (1) proposed Build Alternative for the Woodland Highway/LA 406 Widening project. The Louisiana Department of Transportation and Development (DOTD) and the New Orleans Regional Planning Commission (RPC) propose widening of Woodland Highway/ Louisiana Highway (LA 406) for a distance of approximately 3.27 miles in Belle Chasse, within Plaquemines and Orleans Parishes, Louisiana.

A map of the study corridor is shown on **Figure 1.**

This report addresses potential noise impacts that may result from the proposed Woodland Highway/LA 406 Widening project. This noise analysis was conducted in accordance with procedures for noise studies as set forth in Title 23 CFR Part 772. The scope of this analysis was to determine and analyze the effect of traffic noise on properties near the proposed project and analyze noise abatement measures to mitigate potential impacts giving weight to the benefits and costs of abatement and to overall social, economic, and environmental effects. Included in this analysis are the modeled 2011 Existing and 2038 No-Build and Build Alternative traffic noise results.

The noise analysis was performed using the Federal Highway Administration's (FHWA) Traffic Noise Model (TNM) Version 2.5. The noise barrier analyses were also performed using the TNM model. TNM predicted noise impacts that approach or exceed the Noise Abatement Criteria (NAC) at 24 modeled receptor sites representing 26 individual noise sensitive receptor sites for the 2038 Build Alternative. As a result, noise mitigation measures were evaluated at several locations along the study corridor. Several mitigation and abatement measures were analyzed, and it was determined that traffic management measures, the alteration of horizontal and vertical alignments, and the acquisition of real property or interests therein to serve as a buffer zone to preempt development are not reasonable abatement techniques. Noise insulation of Activity Category D land uses was not analyzed because no impacts were predicted to occur at this land use type. Construction of noise barriers was analyzed for the 2038 Build Alternative and it was determined that noise barriers are feasible at several locations along the corridor. Where noise barriers were found to be feasible, a reasonableness analysis was conducted. None of the noise barriers were found to be reasonable. As a result, it was determined that noise barriers are not reasonable for the proposed project.

1 Introduction

The purpose and need of the proposed widening of Woodland Highway/LA 406 from LA 23 to LA 407 is to reduce existing congestion and to accommodate current and future traffic demands along the corridor created by continued residential and commercial development along the highway as well as area developments, including the Federal City project in Algiers and the expansion of services at the Naval Air Station Joint Reserve Base in Belle Chasse.

1.1 Existing Land Use and Transportation Network

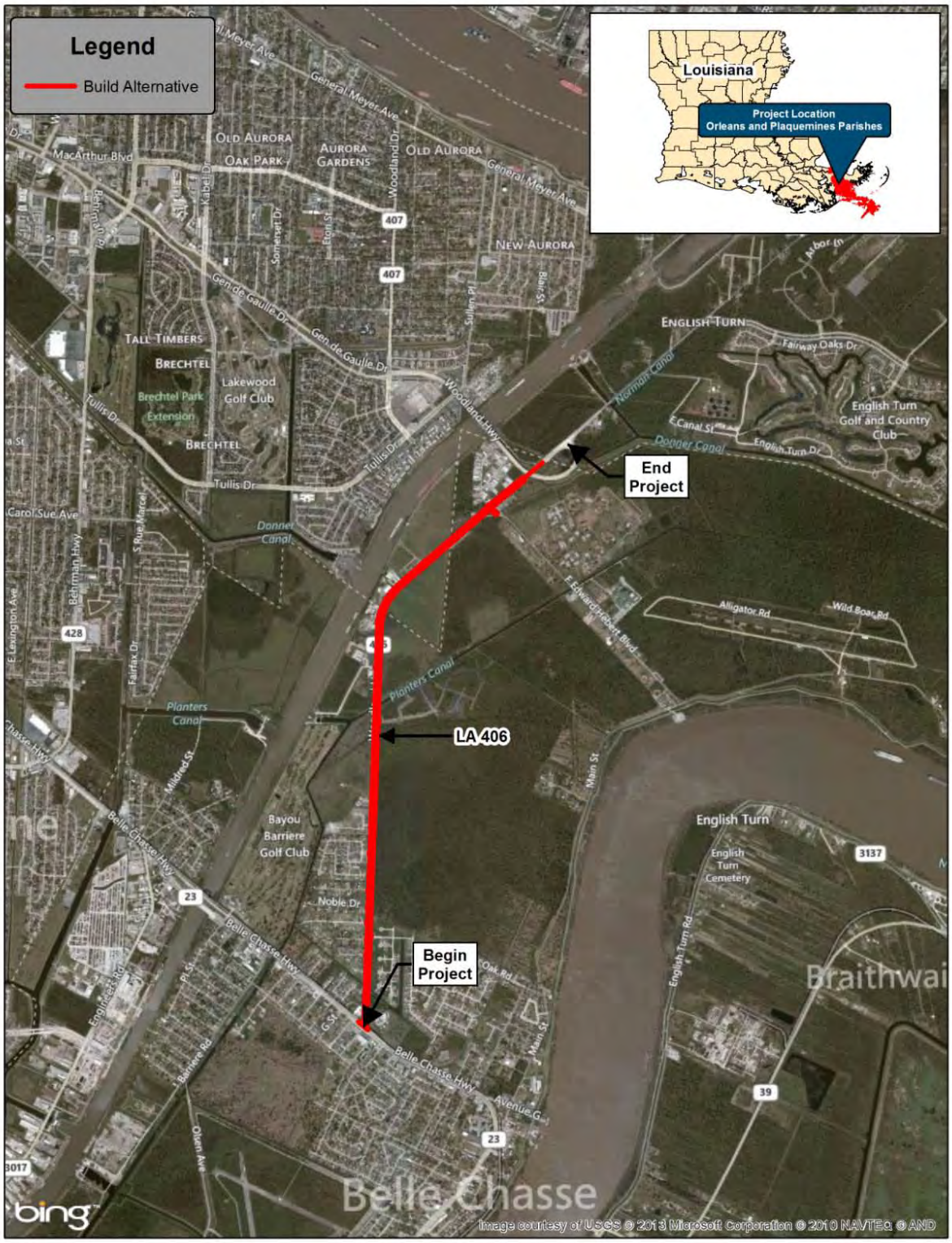
The existing land use in the Woodland Highway/LA 406 Widening project corridor consists primarily of residential development from the project begin point at LA 23 north to approximately midway through the corridor. The land use changes to primarily commercial and industrial midway through the corridor north to the project termini at LA 407. The existing transportation network in the area includes LA 406, LA 23, F. Edward Herbert Blvd, and LA 407.

1.2 Build Alternative

The proposed Build Alternative evaluated in this noise assessment included a four lane divided highway with a raised center median. The improved highway would include two 12-foot travel lanes in each direction as well as a 19-foot wide raised median with four-foot shoulders. Seven intermittent left turn bays will also be constructed at the following locations:

- Just north of the LA 23 intersection
- Springwood Drive
- Pleasant Ridge
- Station 163+00
- Entrance to the Parks of Plaquemine
- Station 205+00
- Herbert Boulevard

Figure 1: Project Location



2 Data Input

2.1 Traffic

Existing noise levels were determined using 2011 average daily traffic (ADT) volumes. For the design year 2038 noise analyses, noise levels at receptors were predicted for the No-Build and Build Alternative scenarios using projected ADT traffic data.

2.2 Receptor Locations

A receptor is defined as a location where noise levels are calculated using a model. Receptors are located at sites where noise sensitive activities occur within a corridor. **Table 3-1** defines noise sensitive activities typically encountered within a corridor. A total of 64 receptor sites were modeled along the Woodland Highway/LA 406 Widening project study area. The 64 modeled sites represent 99 individual noise sensitive receiver sites in the study area. The locations of the receptors are illustrated on **Figures A-1** through **A-7** included in **Appendix A**.

3 Methodology and Regulations

3.1 Methodology of Noise Modeling

The traffic noise analysis conducted for this project consists of a comparison of computer modeled noise levels for existing and future conditions. The computer software used for the noise analysis was the FHWA's approved TNM Version 2.5 program. Traffic data, roadway geometry, and receptor site location information were entered into this computer model. The TNM model results yield an hourly equivalent steady-state sound level at each receptor.

3.2 Terminology and Sound Theory

The TNM program represents noise levels as $Leq_{(h)}$. Leq is defined as the equivalent steady-state sound level which, in a stated period of time, contains the same acoustic energy as the time-varying sound level during the same period. $Leq_{(h)}$ is the hourly value of Leq. $Leq_{(h)}$ is based on the more commonly known decibel (dB) and "A-weighted" decibel (dBA) units. Decibels are logarithmic units as opposed to the more common linear units. Consequently, a one dB increase in sound energy results in a much larger increase in magnitude than normally expected. For instance, an increase in three dB from a noise source results in a doubling of sound energy.

Noise is composed of different frequencies, each of which is perceived differently by the human ear. Human hearing is not sensitive to low and very high frequencies. To compensate for low and high-end frequency insensitivity and render noise levels readings more meaningful, an "A-weighting" scale is used to approximate the response of the human ear. The A-weighted decibel (dBA) unit measures perceptible sound energy and factors out the fringe frequencies.

Three dBA is the smallest change in sound level an average person can detect under ideal conditions. Usually, an observer cannot detect an increase of sound level of 3 to 4 dBA if the increase takes place at a uniform rate over several years. Research has indicated that a difference of 10 dBA is perceived half as loud or twice as loud to an average listener. In addition, the listener typically has difficulty determining if the sound changed at all when the difference was only one dBA and the two observations were separated by an interlude of a few seconds of quiet (FHWA, 2011).

3.3 TNM Description

The TNM program predicts noise levels taking into account roadway geometry, traffic volume, traffic composition, traffic speed, and source-receiver path characteristics such as barriers, topography, and ground absorption. TNM analyzes the three-dimensional, spatial relationship between the roadway and receivers using a grid system and calculates the resulting traffic noise level that would exist at each receiver. The roadway geometry is entered as x, y, and z coordinates and reduced to a series of straight-line segments.

The TNM model also analyzes barrier designs helping the user design the most functional, cost effective noise barrier. TNM determines the noise level at the various receptors for different noise barrier designs. The model also calculates the area (in square feet) of different barrier designs and calculates the cost. Based on the effectiveness of the noise barrier (in terms of the lowering of the dBA at the receiver) and the cost of the various barrier heights, TNM calculates the cost effectiveness ratio of various barrier designs. The program allows the user to determine feasibility and reasonableness of utilizing a noise barrier for noise mitigation.

3.4 Regulations

The FHWA policies and procedures, as promulgated in the Title 23 CFR Part 772, served as the procedural guidelines for this analysis. Incorporated into Title 23 Part CFR 772 are NAC that are based on the type of land use and activities performed at receptors (**Table 3-1**). For example, at residences, churches, and schools, noise abatement measures must be examined and evaluated if an equivalent steady state sound level for an hourly period is approached (66 dBA) or exceeded (67 dBA). In accordance with the FHWA Title 23 CFR Part 772 guidelines, LDOTD defines noise impacts as occurring under the following circumstances:

- when noise levels approach one dBA below the NAC values or exceed values defined by the NAC, or
- when noise levels increase over the existing condition by 10 dBA, regardless of the NAC.

The FHWA defines seven noise activity categories based on land uses and existing sound levels. Each land use has its own NAC. If the project would result in $Leq_{(h)}$ levels higher than the NAC, abatement measures must be evaluated.

Table 3-1: FHWA Noise Abatement Criteria
Hourly "A-weighted" Sound Level - Decibels (dBA)

Activity Category	$L_{Aeq}(h)$	*Evaluation Location*	*Description of Activity Category*
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[(1)]	67	Exterior	Residential.
C[(1)]	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structure, radio stations, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structure, radio studios, recording studios, schools, and television studios.
E[(1)]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D, or F.
F	–––	–––	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	–––	–––	Undeveloped lands that are not permitted.

(1) Includes undeveloped lands permitted for this activity category.
Source: FHWA, 23 CFR, Part 722

In addition to defining noise impacts, LDOTD's Highway Traffic Noise Policy provides guidance when determining the feasibility and reasonableness of noise abatement measures. To be considered feasible, noise abatement measures must reduce the noise level by a minimum of 5 dBA at 75 percent or more of the first row impacted receptors. In order for noise abatement measures to be considered reasonable, the following criteria must be achieved: A reduction in noise of 8 dBA must be achieved by a least one receptor, the cost of the abatement measure must be equal to or less than $35,000 per benefited receptor, and 50 percent or more of benefitted receptor responses must be positive.

3.5 Construction Noise

Construction noise is expected to have temporary impacts upon all of the receptors in the area. Receptors located within 500 feet of the project are of particular concern. It is recommended that all construction operations be restricted to working hours whenever possible.

Measures to minimize construction noise should be employed whenever possible. All construction equipment such as pumps, compressors, generators, bulldozers, cranes, trucks, etc., should be properly muffled and all motor panels should be closed to reduce the noise impacts. Section 107.14 of the Louisiana Standard Specification for Roads and Bridges, 2006 edition, and the FHWA Highway Construction Noise Handbook (FHWA-HEP-06-015, August 2006) can be referenced for further details on the sources and abatement of construction noise.

4 Model Validation Analysis

Noise measurements were collected at two (2) locations in the project area between the hours of 8 AM and 11 AM on July 23rd, 2013. **Table 1** summarizes the average existing sound level at each measurement location.

Multiple 15-minute noise measurements were collected at each location. The results from the noise measurements were averaged to determine the existing measured sound level at each site. Unusual background noise (i.e. dog barking, sirens, airplanes, etc.) during each measurement period was noted, and when necessary, anomalies in the corresponding measurement data were removed.

Sound levels vary through the day depending on the proximity of noise-sensitive land uses to local roads and to other noise sources. Sound levels can also vary with environmental changes, including shifts in wind speed and direction and changes in the vertical temperature profile.

Table 4-1: Model Validation Results

5 Measurement Location	Distance from the 6 Existing Edge-of-Pavement (*Feet*)	Average Measured Sound Levels | TNM Modeled Sound Levels (dBA) (Rounded)	Difference between Rounded Measured and Modeled Sound Levels (dBA)
Site 1	~20 feet from LA 406	65.4 | 67.3	1.9*
Site 2	~13 feet from LA 406	65.3 | 67.6	2.3*

*Difference is between rounded measurements and rounded model results.

The validation procedure includes the comparison of field noise measurement results with the existing conditions modeled using TNM 2.5. The validation results were found to be within the three (3) dBA tolerance limit considered acceptable by LDOTD. Therefore, it was determined that the model is capable of accurately portraying existing and future conditions.

10 Noise Analysis Results

Noise levels were modeled at 64 individual receptor sites representing 99 noise sensitive receptors within the Woodland Highway/LA 406 Widening project study corridor. The TNM results at each receptor are included in **Table 5-1**. The locations where impacts were predicted to occur are illustrated on the figures included in **Appendix A.**

10.1 2011 Existing Noise Results

The 2011 existing noise model indicated 11 modeled receptor sites representing 11 individual residential noise receptors are currently experiencing noise levels above the NAC.

10.2 2038 No-Build Alternative Noise Results

For the 2038 No-Build Alternative scenario, noise impacts above the NAC are predicted to occur at 19 modeled receptor sites representing 20 residential noise receptors. The No-Build results also indicate no substantial increases in noise (10 dBA or greater) over the existing noise levels will occur.

10.3 2038 Build Alternative Noise Results

For the proposed 2038 Build Alternative scenario, noise impacts above the NAC are predicted to occur at 24 modeled receptor sites representing 26 individual residential noise sensitive receptor sites. The Build Alternative results also indicate no substantial increases in noise (10 dBA or greater) over the existing noise levels will occur.

Table 5-1: Woodland Highway/LA 406 Widening Noise Analysis Results

			Existing Alignment				**2038 Build Alternative**			
Site	No. of Receivers Represented	Activity Category	Dist. From Existing Align. (feet)	2011 Noise Level (dBA)	2038 No Build Level (dBA)	Noise Impact ?	Dist. From Build Alt. (feet)	2038 Build Level (dBA)	Diff. Between Existing and Bld. Noise (dBA)	Noise Impact?
Res 1 (Residential)	1	B	201	57.3	61.3	No	194	62.9	5.6	No

			Existing Alignment				**2038 Build Alternative**			
Site	No. of Receivers Represented	Activity Category	Dist. From Existing Align. (feet)	2011 Noise Level (dBA)	2038 No Build Level (dBA)	Noise Impact ?	Dist. From Build Alt. (feet)	2038 Build Level (dBA)	Diff. Between Existing and Bld. Noise (dBA)	Noise Impact?
Res 2 (Residential)	1	B	287	54.4	58.4	No	273	60.2	5.8	No
Res 3 (Residential)	1	B	347	52.8	56.6	No	332	58.7	5.9	No
Res 4 (Residential)	1	B	433	50.6	54.5	No	419	57.0	6.4	No
Res 5 (Residential)	1	B	474	49.9	53.7	No	460	56.1	6.2	No
Res 6 (Residential)	1	B	438	50.7	54.5	No	423	57.0	6.3	No
Res 7 (Residential)	1	B	405	51.5	55.3	No	390	57.7	6.2	No
Res 8 (Residential)	1	B	120	61.3	65.6	No	105	**68.9**	7.6	***Yes***
Res 9 (Residential)	1	B	345	53.1	57.0	No	328	58.9	5.8	No
Res 10 (Residential)	1	B	296	54.5	58.5	No	278	60.2	5.7	No
Res 11 (Residential)	1	B	105	62.9	**67.2**	***Yes***	86	**70.1**	7.2	***Yes***
Res 12 (Residential)	1	B	80	64.9	**69.3**	***Yes***	61	**71.5**	6.6	***Yes***
Res 13 (Residential)	1	B	227	57.2	61.3	No	207	62.5	5.3	No
Res 14 (Residential)	1	B	187	58.9	63.1	No	167	64.4	5.5	No
Res 15 (Residential)	1	B	188	58.7	62.9	No	175	64.0	5.3	No
Res 16 (Residential)	1	B	464	50.6	54.5	No	445	56.8	6.2	No
Res 17 (Residential)	1	B	457	51.0	54.8	No	437	57.1	6.1	No
Res 18 (Residential)	1	B	406	52.2	56.1	No	384	58.1	5.9	No

			Existing Alignment				**2038 Build Alternative**			
Site	No. of Receivers Represented	Activity Category	Dist. From Existing Align. (feet)	2011 Noise Level (dBA)	2038 No Build Level (dBA)	Noise Impact ?	Dist. From Build Alt. (feet)	2038 Build Level (dBA)	Diff. Between Existing and Bld. Noise (dBA)	Noise Impact?
Res 19 (Residential)	1	B	355	53.3	57.2	No	338	59.0	5.7	No
Res 20 (Residential)	1	B	252	56.1	60.2	No	244	61.3	5.2	No
Res 21 (Residential)	1	B	268	55.9	60.0	No	239	61.1	5.2	No
Res 22 (Residential)	1	B	331	54.3	58.3	No	308	59.9	5.6	No
Res 23 (Residential)	1	B	308	54.9	59.0	No	288	60.2	5.3	No
Res 24 (Residential)	1	B	297	55.3	59.4	No	277	60.5	5.2	No
Res 25 (Residential)	3	B	402	52.3	56.3	No	382	58.9	6.6	No
Res 26 (Residential)	4	B	399	52.4	56.3	No	377	59.1	6.7	No
Res 27 (Residential)	1	B	289	55.6	59.7	No	268	60.6	5.0	No
Church 28 (Church)	1	C	291	55.0	59.0	No	282	60.2	5.2	No
Church 29 (Church)	1	C	349	53.3	57.2	No	342	58.9	5.6	No
Res 30 (Residential)	1	B	53	**67.5**	**71.9**	***Yes***	46	**72.9**	5.4	***Yes***
Res 31 (Residential)	1	B	59	**67.2**	**71.7**	***Yes***	52	**72.5**	5.3	***Yes***
Res 32 (Residential)	2	B	145	61.7	**66.1**	***Yes***	138	**66.4**	4.7	***Yes***
Res 33 (Residential)	2	B	261	56.1	60.2	No	253	61.0	4.9	No
Res 34 (Residential)	4	B	341	53.5	57.5	No	333	59.1	5.6	No
Res 35 (Residential)	2	B	458	50.7	54.5	No	451	56.9	6.2	No

			Existing Alignment				2038 Build Alternative			
Site	No. of Receivers Represented	Activity Category	Dist. From Existing Align. (feet)	2011 Noise Level (dBA)	2038 No Build Level (dBA)	Noise Impact ?	Dist. From Build Alt. (feet)	2038 Build Level (dBA)	Diff. Between Existing and Bld. Noise (dBA)	Noise Impact?
Res 36 (Residential)	1	B	78	**66.2**	**70.7**	***Yes***	71	**71.2**	5.0	***Yes***
Res 37 (Residential)	1	B	92	65.6	**70.0**	***Yes***	85	**70.2**	4.6	***Yes***
Res 38 (Residential)	1	B	78	**66.3**	**70.7**	***Yes***	70	**71.1**	4.8	***Yes***
Res 39 (Residential)	1	B	114	64.2	**68.6**	***Yes***	105	**69.0**	4.8	***Yes***
Res 40 (Residential)	1	B	156	61.2	65.5	No	147	65.7	4.5	No
Res 41 (Residential)	1	B	173	60.2	64.5	No	165	64.6	4.4	No
Res 42 (Residential)	6	B	328	53.9	57.9	No	319	59.5	5.6	No
Res 43 (Residential)	1	B	78	**66.2**	**70.7**	***Yes***	71	**71.1**	4.9	***Yes***
Res 44 (Residential)	1	B	55	**67.5**	**71.9**	***Yes***	47	**72.7**	5.2	***Yes***
Res 45 (Residential)	3	B	162	60.8	65.1	No	154	65.3	4.5	No
Res 46 (Residential)	1	B	52	**67.6**	**72.1**	***Yes***	44	**72.9**	5.3	***Yes***
Res 47 (Residential)	1	B	57	**67.3**	**71.8**	***Yes***	49	**72.6**	5.3	***Yes***
Res 48 (Residential)	1	B	99	65.2	**69.7**	***Yes***	91	**69.9**	4.7	***Yes***
Res 49 (Residential)	6	B	279	55.5	59.5	No	270	60.9	5.4	No
Res 50 (Residential)	9	B	423	51.5	55.4	No	414	58.2	6.7	No
Res 51 (Residential)	1	B	63	**67.0**	**71.5**	***Yes***	55	**72.2**	5.2	***Yes***
Res 52 (Residential)	1	B	74	**66.5**	**70.9**	***Yes***	66	**71.5**	5.0	***Yes***
Res 53 (Residential)	1	B	169	60.4	64.7	No	158	**66.2**	5.8	***Yes***
Res 54 (Residential)	1	B	175	60.1	64.4	No	158	**66.6**	6.5	***Yes***
Res 55 (Residential)	1	B	118	64.0	**68.4**	***Yes***	100	**69.5**	5.5	***Yes***

			Existing Alignment				2038 Build Alternative			
Site	No. of Receivers Represented	Activity Category	Dist. From Existing Align. (feet)	2011 Noise Level (dBA)	2038 No Build Level (dBA)	Noise Impact ?	Dist. From Build Alt. (feet)	2038 Build Level (dBA)	Diff. Between Existing and Bld. Noise (dBA)	Noise Impact?
Res 56 (Residential)	1	B	175	60.2	64.5	No	157	**67.3**	7.1	***Yes***
Res 57 (Residential)	4	B	262	56.2	60.3	No	243	63.4	7.2	No
Res 58 (Residential)	1	B	369	52.9	56.8	No	349	60.5	7.6	No
Res 59 (Residential)	1	B	448	51.0	54.9	No	430	59.0	8.0	No
Res 60 (Residential)	1	B	90	65.8	**70.3**	***Yes***	72	**70.8**	5.0	***Yes***
Res 61 (Residential)	1	B	68	**66.9**	**71.4**	***Yes***	50	**72.0**	5.1	***Yes***
Res 62 (Residential)	1	B	258	56.3	60.5	No	240	63.6	7.3	No
Res 63 (Residential)	2	B	188	59.5	63.8	No	170	**66.6**	7.1	***Yes***
Res 64 (Residential)	1	B	367	53.5	57.5	No	330	62.1	8.6	No

11 Noise Mitigation Analysis

11.1 Introduction

Noise abatement measures were evaluated at locations where impacts were predicted to occur under the 2038 Build Alternative scenario. The abatement measures were evaluated using FHWA's guidelines as promulgated by Title 23 CFR Part 772. The abatement measures evaluated included traffic management measures, the alteration of horizontal and vertical alignments, the acquisition of property rights, the construction of noise barriers, the acquisition of real property or interests therein, and noise insulation.

11.2 Traffic Management Measures (e.g., traffic control devices and signing for prohibition of certain vehicle types, time use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations)

Traffic management measures applied for the purpose of noise abatement would be inconsistent with the purpose of this project (i.e. to improve traffic operations on the Woodland Highway/LA 406 corridor). Use restrictions, including the restriction of vehicle types and time use restrictions, would prohibit certain traffic from using Woodland Highway/LA 406 which would be inconsistent with the purpose of the project. The installation of traffic control devices, the modification of speed limits, or exclusive

lane designations would result in an increase in congestion and decreased efficiency of the proposed facility. Therefore, the implementation of the traffic management measures for the purpose of noise abatement is not deemed reasonable or likely for this project.

11.3 Alteration of Horizontal and Vertical Alignments

The scope of the project is to widen the existing roadway within the existing right-of-way. Effective horizontal and/or vertical shifts of the Woodland Highway/LA 406 corridor would require additional right-of-way, would likely require relocations, and noise impacts would likely occur to sensitive receptors currently not affected by the proposed project. As a result, alterations of horizontal and vertical alignments are not deemed reasonable or likely noise abatement measures for this project.

11.4 Acquisition of Real Property or Interests therein (predominantly unimproved property) to serve as a Buffer Zone to Preempt Development.

The acquisition of real property rights to act as a buffer zone would include the acquisition of the affected sites along the developed portion of the corridor. The purchase of these properties to serve as a buffer zone does not appear to be an economically reasonable mitigation measures for the project.

11.5 Construction of Noise Barriers (including landscaping for aesthetic purposes) Whether Within or Outside the Right-of-Way

LDOTD's Highway Traffic Noise Policy provides guidance when determining the feasibility and reasonableness of noise barriers. To be considered feasible, noise abatement measures must reduce the noise level by a minimum of 5 dBA for 75 percent or more of the first row impacted receptors. In order for noise abatement measures to be considered reasonable, the following criteria must be achieved: A reduction in noise of 8 dBA must be achieved by a least one receptor, the cost of the abatement measure must be equal to or less than $35,000 per benefited receptor, and 50 percent or more of benefitted receptor responses are positive.

For a noise barrier to effectively shield receptors, the barrier design must be relatively continuous. Numerous driveways and cross streets intersect Woodland Highway/LA 406 along the developed portions of the project corridor. For a barrier to effectively shield receptors, the design must be continuous. Gaps incorporated into the design to accommodate access roads, subdivision entrance roads, or driveways render the barrier ineffective. The proposed build alternative will maintain existing accesses to the highway. Therefore, construction of noise barriers for the purpose of the noise abatement was not considered feasible at impacted receptors Res 8, Res 11, Res 12, Res 37, and Res 38. Too many driveways and cross streets currently exist at these locations to allow for effective noise barriers.

Noise barriers were modeled at five locations where impacts were predicted to occur under the 2038 Build Alternative scenario. At four locations, noise barriers were determined to be feasible. Noise barriers were determined not feasible at one location.

The four feasible barriers were analyzed relative to the LDTOD's reasonableness criteria. All of the barriers were found to meet the 8 dBA reduction goal; however, none were able to meet the LDOTD's $35,000 cost-per-benefitted-receptor goal. Therefore, it was determined that noise barriers were not reasonable for the proposed Woodland Highway/LA 406 project.

The feasibility and reasonableness worksheets for Barrier 1 through Barrier 5 are located in **Appendix F**.

11.6 Noise Insulation of Activity Category D Land Use Facilities listed in Table 3-1.

Exterior noise impacts to Activity Category D land uses are not predicted to occur at any locations for the 2038 Build Alternative scenario. **Table 6-1** summarizes the exterior noise results at the Activity Category D land uses along the LA 406 Widening Project.

Table 6-1: Woodland Highway/LA 406 Widening Exterior Noise Results at Activity Category D Land Uses

Receptor	No. of Receptors Rep.	Construction Materials	2011 Existing Noise Level (Exterior dBA)	2038 No-Build Noise Level (Exterior dBA)	2038 Build Noise Level (Exterior dBA)	Structural Insertion Loss	Adj. 2011 Existing Noise Level (Interior dBA)	Adj. 2038 No-Build Noise Level (Interior dBA)	Adj. 2038 Build Noise Level (Interior dBA)
Church 28	1	Masonry/ Double Glazed Windows	55.0	59.0	60.2	35	20.0	24.0	25.2
Church 29	1	Masonry/ Double Glazed Windows	53.3	57.2	58.9	35	18.3	22.2	23.9

The predicted exterior noise levels at the Activity Category D land uses are predicted to be 60.2 dBA and 58.9 dBA. Given that the primary activities at these sites are indoor activities and the structures are of recent construction and are climate controlled, it is expected that the interior noise levels would be well below the NAC at these sites. Therefore, noise insulation at Activity Category D land uses was not considered for the project.

12 Undeveloped Land Analysis

There are two areas of where undeveloped land analyses for Activity Category G land uses were performed within the Woodland Highway/LA 406 Widening project study area. Noise contours were generated at these locations for the 66 dBA and 71 dBA noise levels.

Locations of the undeveloped land analyses are shown on **Figure A-4** and **Figure A-6** in **Appendix A.** The results from the Undeveloped Land Analysis are included in **Table 7-1**. This information is included for local officials to be aware of anticipated highway noise so that future development can be compatible with traffic noise. For example if a residence is planned with an NAC criteria of 66 dBA, officials may choose to locate the development 155 to 180 feet from the proposed project. If a business is planned with an NAC criteria of 71 dBA, officials may choose to locate the development 45 to 55 feet from the proposed project.

Table 7-1: Undeveloped Land Analysis

	2038 Build Alternative	
Site	66 dBA Contour Distance from Edge-of-Pavement (feet)	71 dBA Contour Distance from Edge-of-Pavement (feet)
UL 1	180	55
UL 2	155	45

13 References

Louisiana Department of Transportation and Development, Highway Traffic Noise Policy. July 2011.

U.S. National Archives and Records Administration, Office of Federal Register. Title 23, Code of Federal Regulations, Part 772. Procedures for Abatement of Highway Traffic Noise and Construction Noise. 2010.

U.S. Department of Transportation, Federal Highway Administration. Highway Traffic Noise: Analysis and Abatement Guidance. December 2011.

APPENDIX A
Woodland Highway/LA 406 Widening Noise Report
Figures A-1 – A-7

Intracoastal Waterway (Alternate Route)

LA 23

Begin Project

A-2

A-3

LA 406

A-4

A-5

LA 406

A-6

LA 407

End Project

A-7

F Edward Hebert Blvd

LA 23

Mississippi River

Legend

Noise Figure Key

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, User Community

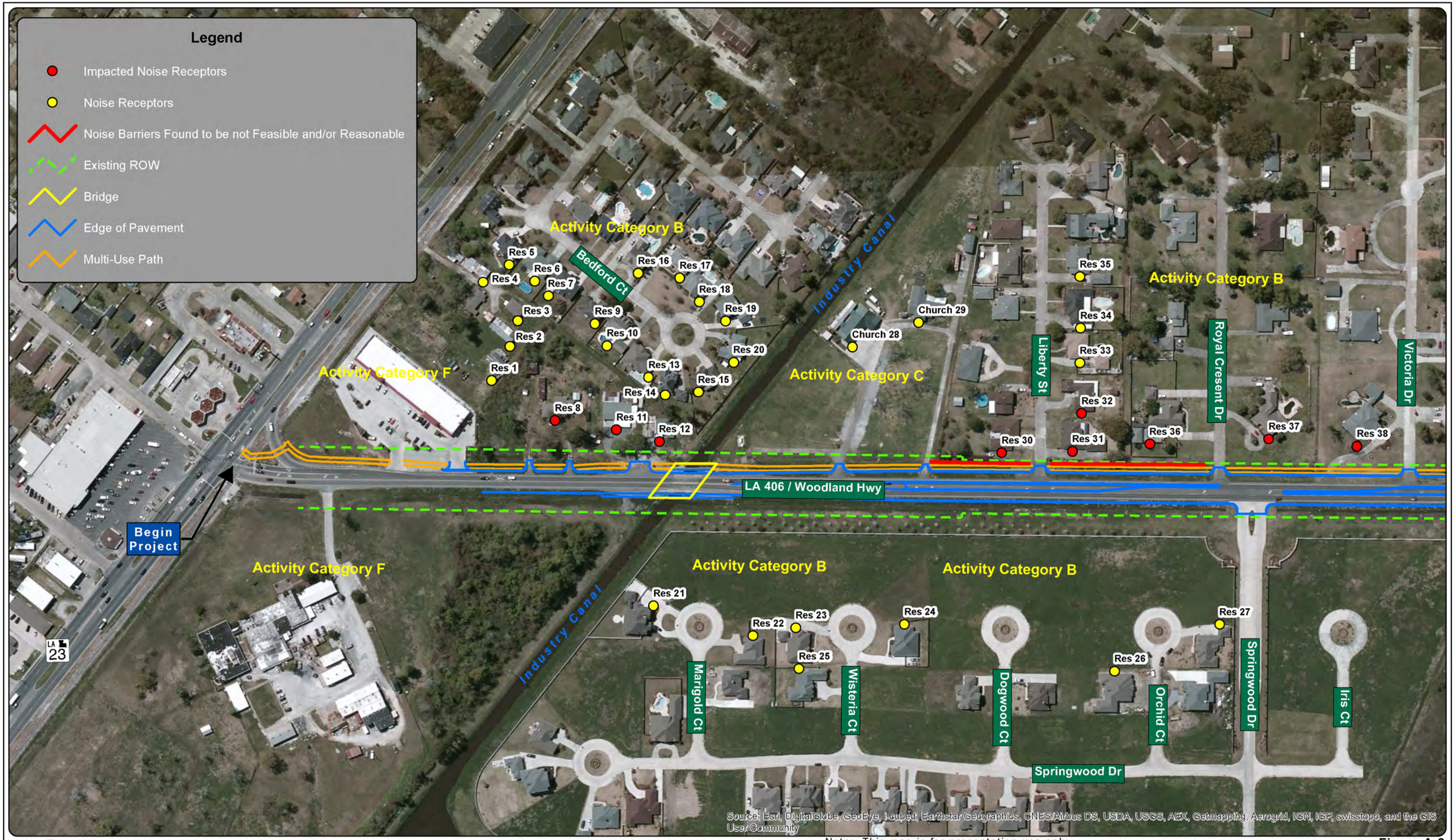
0 1,500 3,000 Feet

1 inch = 1,500 feet

Note: This map is for presentation use only and not to be used for construction purposes.

Path: V:\PROJECTS\130\138000 - New Orleans RPC LA 406 Widening\GIS\Map Documents\Noise Figures\September 2014\Noise Figure A-1.mxd

Figure A-1
Noise Figure Key Sheet
Noise Analysis Results
LA 406 Widening / Woodland Highway
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana



0 200 400 Feet

1 inch = 200 feet

Note: This map is for presentation use only and not to be used for construction purposes.

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Figure A-2
Noise Receptors
Noise Analysis Results
LA 406 Widening / Woodland Highway
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

Legend

- Impacted Noise Receptors
- Noise Receptors
- Noise Barriers Found to be not Feasible and/or Reasonable
- Existing ROW
- Edge of Pavement
- Multi-Use Path

Activity Category B

Activity Category B

Activity Category B

Activity Category B

Activity Category B

Activity Category G

Activity Category G

Activity Category G

Activity Category G

Activity Category G

Victoria Dr

Noble Dr

Cambridge Dr

Primose Dr

Lily Bank Dr

Pleasant Ridge Dr

Chapel Hill Rd

LA 406 / Woodland Hwy

Res 39

Res 40

Res 41

Res 42

Res 43

Res 44

Res 45

Res 46

Res 47

Res 48

Res 49

Res 50

Res 51

Res 52

Res 53

Res 54

Res 55

Res 56

Res 57

Res 58

Res 59

Res 60

Res 62

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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1 inch = 200 feet

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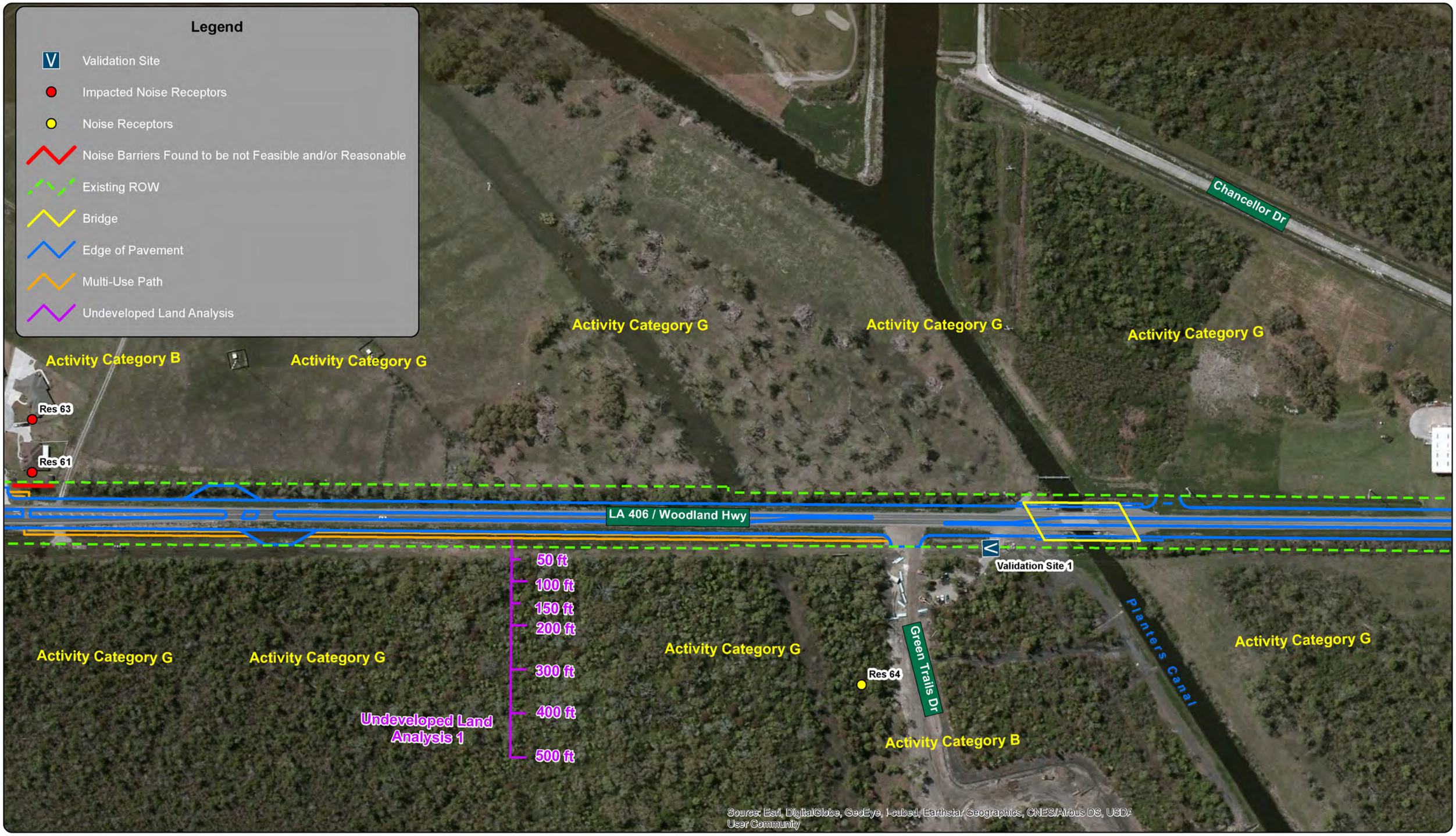
Figure A-3
Noise Receptors
Noise Analysis Results
LA 406 Widening / Woodland Highway
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana



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Note: This map is for presentation use only and not to be used for construction purposes.

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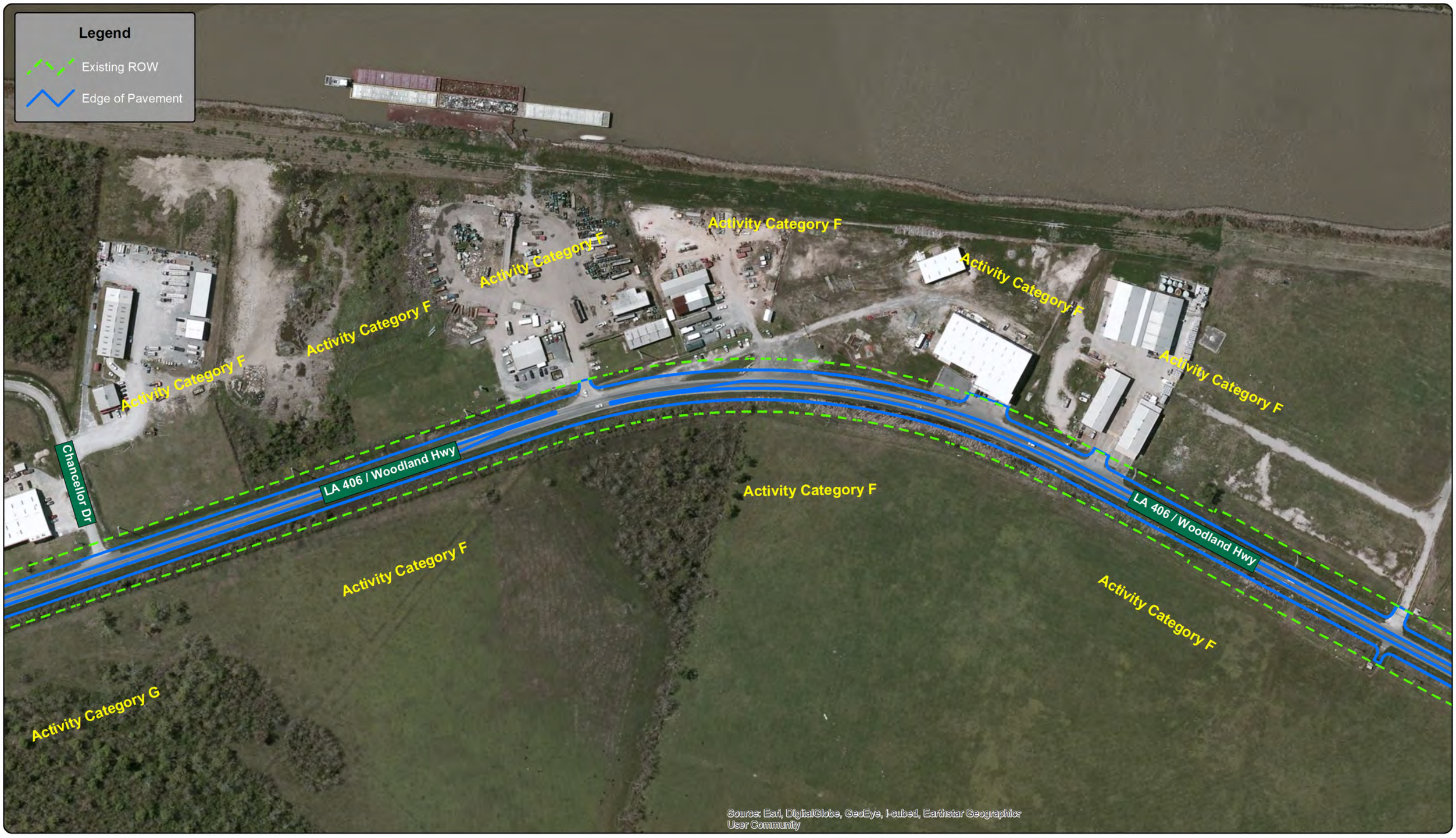
Figure A-4
Noise Receptors
Noise Analysis Results
LA 406 Widening / Woodland Highway
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana



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1 inch = 200 feet

Note: This map is for presentation use only and not to be used for construction purposes.

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Figure A-5
Noise Receptors
Noise Analysis Results
LA 406 Widening / Woodland Highway
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

0 200 400 Feet

1 inch = 200 feet

Note: This map is for presentation use only and not to be used for construction purposes.

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Figure A-6
Noise Receptors
Noise Analysis Results
LA 406 Widening / Woodland Highway
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

0 200 400 Feet

1 inch = 200 feet

Note: This map is for presentation use only and not to be used for construction purposes.

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Figure A-7
Noise Receptors
Noise Analysis Results
LA 406 Widening / Woodland Highway
LA Hwy 23 to LA Hwy 407
Plaquemines and Orleans Parishes, Louisiana

APPENDIX B
Woodland Highway/LA 406 Widening Noise Report
LDOTD's Highway Traffic Noise Policy

STATE OF LOUISIANA

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

HIGHWAY TRAFFIC NOISE POLICY

July 2011

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INTRODUCTION

This document contains the Louisiana Department of Transportation and Development's (DOTD) policy on highway traffic noise. This policy describes the implementation of the requirements of the Federal Highway Administration (FHWA) noise regulations for Federal-aid projects found in 23 Code of Federal Regulations Part 772 (23 CFR Part 772).[1] DOTD developed this policy in accordance with FHWA regulations and guidance, and FHWA reviewed and approved this policy for implementation.

In the 1972 Federal-aid Highway Act, Congress required FHWA to develop a noise standard for new Federal-aid highway projects. In accordance with 23 United States Code section 109(i) (23 USC 109(i)), FHWA promulgated noise regulations which applied to Federal-aid projects. In June 1995, FHWA mandated that state transportation agencies adopt a written Highway Traffic Noise Policy consistent with the regulations and their June 1995 guidance. DOTD complied, with its first written policy approved by FHWA in August 1996. Since its initial approval, the DOTD highway traffic noise policy has been revised three times, in 1997, 2004 and 2009. Each revision required FHWA review and approval prior to implementation. On July 13, 2010, FHWA published their new noise regulations in the Federal Register[2] and mandated that state transportation agencies rewrite their noise policies to be consistent with the new regulations. The states were given until January 2011 to submit proposed policies for FHWA review. To assist states in rewriting their policies, FHWA published guidance dated June 2010 and revised January 2011 which can be found on FHWA's web site.[3] The effective date of the new regulations is July 13, 2011.

The policy herein contains information on how highway traffic noise impacts are defined, how noise abatement is evaluated, and how noise abatement decisions are made in Louisiana. **This policy as written assumes that the noise analyst is familiar with the provisions of the Federal regulation on which this policy is based.** If you need further information regarding the policy, contact the DOTD Environmental Section at (225) 242-4502.

PURPOSE

The purpose of this written policy is to outline DOTD's policy and procedures for compliance with the FHWA Noise regulations found at 23 CFR 772.

[1] Access CFR regulations from http://www.gpoaccess.gov/cfr/retrieve.html
[2] Access Federal Register, Vol. 75, page 39820 from FR Main page at http://www.gpoaccess.gov/fr/index.html
[3] Access FHWA noise guidance, regulations, and related material from http://www.fhwa.dot.gov/environment/noise/

DEFINITIONS

Reference is made to the definitions contained in the regulations (23 CFR 772.5). Defined below are some of the terms specifically referenced in the policy or which require additional refinement.

Benefited Receptor - a recipient of an abatement measure, whether impacted or not, receiving 5 dBA or more reduction in the noise level as a result of the proposed abatement.

Common Noise Environment – a group of receptors within the same Activity Category in Table 1 that are exposed to similar noise sources and levels; traffic volumes, traffic mix, and speed; and topographic features.

Date of Public Knowledge - the date of approval of the Record of Decision, Finding of No Significant Impact, or Categorical Exclusion. The date of public knowledge is the date at which the DOTD will no longer be responsible for providing noise abatement for new development which occurs adjacent to the proposed project. Provision of such abatement measures becomes the responsibility of the local communities or private developers.

Design Year – the future year used to estimate the probable traffic volume for which a highway is designed. The design year will normally be 20 years from the projected start of project construction.

Existing Noise Levels – the worst noise hour, resulting from the natural and mechanical sources and human activity, usually present in a particular area.

Leq – the equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as a time-varying sound level during the same period.

Leq(h) – the hourly value of Leq.

Multifamily Dwelling – A residential structure containing more than one residence. Each residence in a multifamily dwelling shall be counted as one receptor when determining impacted and benefited receptors.

Noise Reduction Design Goal – the optimum desired noise reduction determined from calculating the difference between future build noise levels with abatement to future build noise levels without abatement. The noise reduction design goal in Louisiana is 8 dBA.

Permitted – A definite commitment to develop land with an approved specific design of land use activities as evidenced by the issuance of a building permit.

Property Owner – an individual or group of individuals that hold a title, deed, or other legal documentation of ownership of a property or a residence.

Receptor – A discrete or representative location of a noise sensitive area(s), for any of the land uses listed in Table 1.

Residence – a dwelling unit. Either a single family residence or each dwelling unit in a multifamily dwelling.

Statement of Likelihood – A statement provided in an environmental document based on the feasibility and reasonableness analysis at the time the document is being approved.

Traffic Noise Impacts – design year build condition noise levels that *approach* or exceed the FHWA Noise Abatement Criteria for the future build condition, or design year build condition noise levels that exceed the existing noise levels by 10 dBA. (*Approach* is defined as 1 dBA less than the FHWA Noise Abatement Criteria.)

Type I Project –
(1) The construction of a highway on new location; or
(2) The physical alteration of an existing highway where there is either:
    (a) Substantial Horizontal Alteration (a project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition), or
    (b) Substantial Vertical Alteration (a project that removes shielding therefore exposing the line-of-sight between the receptor and the traffic noise source by altering the vertical alignment of the highway or by altering the topography); or
(3) The addition of a through-traffic lane. This includes the addition of a through-traffic lane that functions as a HOV, HOT, bus, or truck climbing lane; or
(4) The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane; or
(5) The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or
(6) Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or
(7) The addition of a new or substantial alteration of a weight station, rest stop, ride-share lot or toll plaza.
*Note that if a project is determined to be a Type I project, then the entire project area as defined in the environmental document is a Type I project.

Type II Project – a proposed project to provide noise abatement on an existing highway. DOTD does not have a Type II program.

Type III Project – a proposed project that does not meet the classification of a Type I or Type II project. Type III projects do not require a noise analysis.

APPLICABILITY

This policy applies to all Federal highway projects in the State of Louisiana; that is, any projects that receive Federal-aid funds or are otherwise subject to FHWA approval.

This policy also applies to the construction of <u>new</u> control of access highways that are funded through DOTD with no FHWA involvement.

Type II programs to provide noise abatement along existing highways are voluntary. DOTD does not have a Type II program; therefore, DOTD will not consider Type II projects.

DOTD will consider and construct barriers when sufficient funds (Federal or State) are appropriated by either State or Federal legislature specific to the construction of a barrier. These legislative mandated barriers may or may not be part of a Type I project. These barriers will be designed in accordance with the legislation as to location, height, and other parameters. If the design parameters are not specified in the legislation, the barrier will be designed to achieve a reasonable noise reduction in accordance with this policy.

This policy shall not prohibit the application of visual screens or security fences. Visual screens and security fences are not eligible for Federal-aid funding as noise abatement.

TRAFFIC NOISE ANALYSIS

The traffic noise analysis will include the steps listed below for each alternative under detailed study. Note that if any segment or component of an alternative meets the definition of a Type I project, then the entire alternative is considered to be Type I and is subject to the noise analysis requirements below.

1. **Identification of Existing Land Uses Affected by Noise:** The following types of activities and land uses affected by noise from the highway will be identified for analysis:
    a. Category A: Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose;
    b. Category B: residential;
    c. Category C: active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings;
    d. Category D: auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios;
    e. Category E: hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F;
    f. Category F: agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing; and
    g. Category G: undeveloped lands that are not permitted.

    Justification for the designation of lands as Category A must be submitted to FHWA on a case-by-case basis for concurrence. Justifications will be submitted through the FHWA Division Office to FHWA Headquarters.

2. **Determination of Existing Noise Levels:** The determination of existing noise levels will be made utilizing field measurements of actual noise levels. A log will be kept noting the time of day, meteorological conditions, calibration results, and any unusual ambient noise sources experienced during each measurement.

Noise measurements will be taken utilizing ANSI Type 1 or Type 2 Sound Level Meters used in accordance with the manufacturer's operations manual. Meters are to be calibrated before and after each measurement. Meters should have valid factory calibration certification. Measurements should be done in accordance with the FHWA publication entitled, "Measurement of Highway – Related Noise," dated May 1996.[4]

Noise measurements will be taken in time intervals no shorter than 15 minutes and no longer than one hour unless alternate intervals are given prior approval by DOTD.

Actual traffic counts will be made during each field measurement. These traffic counts will be categorized according to the following vehicle classes:

Automobiles (A) – all vehicles with two axles and four wheels designed primarily for transportation of nine or less passengers or transportation of cargo.

Medium Trucks (MT) – all vehicles with two axles and six wheels designed for the transportation of cargo.

Heavy Trucks (HT) – all vehicles having three or more axles designed for the transportation of cargo.

Buses (B) – all vehicles designed to carry more than nine passengers.

Motorcycles (M) – all vehicles with two or three wheels and an open-air driver/passenger compartment.

Sites selected for field measurements will receive prior approval of DOTD. These sites will represent noise sensitive receptors in each Activity Category which are likely to be affected by the project. Sites outside of the immediate vicinity of the project may also be chosen to determine the ambient noise levels unaffected by the roadway. For proposed highways on new alignments where no highway currently exists, measurements must be taken at representative receptor locations. Unless specifically approved by DOTD, field measurements will be taken to represent exterior activities only.

Field measurements will be taken at approved sites at peak and off-peak times. Peak hour noise levels will be the hour with the highest noise levels, not necessarily the hour with the highest traffic volumes.

Upon the consent of the Environmental Engineer Administrator, existing noise levels may be determined by utilizing other methodology, including computer models consistent with the current FHWA highway traffic noise prediction model. Traffic characteristics, data, selection of receptor locations, and other input parameters utilized will be at the discretion of DOTD.

[4] Located on web at http://www.fhwa.dot.gov/environment/noise/measurement/measure.cfm

3. **Prediction of Traffic Noise Levels:** Any traffic noise prediction methodology is approved for use in any traffic noise analysis required by this policy if the methodology used at the time the noise study is consistent with the requirements of 23 CFR 772.9.[5]

   Report predicted noise levels in the noise report and related documents in the same format as reported by the model used.[6]

   To validate model results, it is necessary to compare the noise levels measured in the field to the noise levels predicted by the model using the roadway parameters and traffic data collected in the field. If the modeled results are within 3 dBA of the measured noise levels, no further action is required, and the model can be used to determine future noise levels. If the modeled results are not within 3 dBA of the measured noise levels, then further investigation is warranted into the reason(s) for the discrepancy prior to using the model to determine future noise levels.

   In predicting noise levels and assessing noise impacts, traffic characteristics that will yield the worst hourly traffic noise impact on a regular basis for the design year will be used. The period with the highest sound levels may not be at the peak traffic hour but instead, during some period when traffic volumes are lower but the truck mix or vehicle speeds are higher.

   Future noise levels will be based on modeling results utilizing data for the design year. This data, including traffic volumes, composition and speed, other reasonably foreseeable development, and the implementation of other transportation projects, will be based on accepted engineering practice and local planning assumptions.

4. **Determination of Traffic Noise Impacts:** Traffic noise impacts occur when the future (predicted, design year, build condition) noise levels *approach or exceed* the FHWA Noise Abatement Criteria, or when the future (predicted, design year, build condition) noise levels exceed the existing noise levels at any sensitive receptor by 10 dBA. FHWA requires that the States define *approach* as at least 1 dBA below their Noise Abatement Criteria.

[5] The approved model in effect on July 13, 2011, the effective date of the regulations, is FHWA TNM version 2.5. When running the TNM 2.5 model, average pavement type must be used for prediction of future noise levels unless FHWA approves use of another type.

[6] The current approved model, TNM, reports results in tenths, a decimal format (##.#).

FHWA Noise Abatement Criteria
Hourly A-weighted Sound Level decibels (dBA)

Activity category	Activity Leq (h)	Evaluation Location	Activity Description	In Louisiana, Impact occurs when Noise Level ***IS EQUAL TO OR GREATER THAN*** the values below*
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.	**56**
B	67	Exterior	Residential (includes undeveloped lands permitted for residential).	**66**
C	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings. (Includes undeveloped lands permitted for these activities).	**66**
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.	**51**
E	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F. (Includes undeveloped lands permitted for these activities).	**71**
F	------	------	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.	**n/a**
G	------	------	Undeveloped lands that are not permitted.	**n/a**

*These values are consistent with the FHWA's requirement for consideration of traffic noise impacts 1 dBA below their noise abatement criteria.

The noise analysis must include analysis for each type of receptor present in the study area. Noise contour lines shall not be used to determine noise impacts, but noise contour lines can be used for project alternative screening or for land use planning purposes.

In determining and abating traffic noise impacts, primary consideration is to be given to exterior areas of frequent human use. Examples of possible receptor locations for residential receivers are patios, courtyards, front or back yard, pool areas, etc. Generally, the receptor location which lies between the noise source and the receiver is chosen as the location to model. If the circumstances of a particular receiver are atypical, contact the DOTD Environmental Section Coordinator for guidance.

In determining the number of receptors impacted/benefited, the number will include all dwelling units (i.e., owner-occupied, rental units, mobile homes, etc.). Each unit in a multifamily building is counted as one receptor.

For hotels, motels, offices, and other developed lands, receptor locations will be sited at outdoor areas of frequent human use such as patios, courtyards, pool areas, locations of outdoor seating, etc.

For parks and recreational areas, model each designated use area as a receptor location. For example, the park may have ball fields, basketball courts, playground equipment, tennis courts, picnic area, pool, etc. Each of these specific activity areas would be modeled to determine noise impact at each of these locations.

In those situations where there are no exterior activities to be affected by the traffic noise, or where exterior activities are far from or physically shielded from the roadway in a manner that prevents an impact on exterior activities, the interior criterion, Activity Category D, shall be used as the basis of determining noise impacts. An indoor analysis shall only be done after exhausting all outdoor analysis options. Interior noise level predictions may be estimated by using the information in Table 6 of FHWA's guidance document entitled, "Highway Traffic Noise: Analysis and Abatement Guidance," dated June 2010 and revised January 2011.[7]

When applying the interior criterion, consideration is given to the impact and abatement of interior rooms facing the roadway that are occupied frequently with a use that would benefit from a reduction in noise. For example, a classroom, prayer room, or meeting room would benefit from a reduction in noise, but a storage room or boiler room would not. When determining the cost for reasonableness, one building is one receptor, although multiple rooms may be insulated or provided noise reduction windows.

For Category F, no highway noise analysis is required under 23 CFR 772.

For Category G, if the undeveloped land is not permitted for development by the date of public knowledge, the noise levels are determined in accordance with 23 CFR 772.17(a) and results are documented in the environmental document.

[7] On-line guidance available at FHWA website, http://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/

5. **<u>Evaluation of Noise Abatement</u>:** When traffic noise impacts are identified, noise abatement shall be considered and evaluated for *feasibility* and *reasonableness*. Traffic noise impacts will be determined and alternative noise abatement measures analyzed by giving weight to the benefits and cost of abatement, and to the overall social, economic and environmental impacts.

   In abating traffic noise impacts, primary consideration is given to exterior areas where frequent human use occurs and a lowered noise level would be of benefit.

   The noise abatement measures listed below may be incorporated into Type I Federal or Federal-aid projects to reduce traffic noise impacts.

   (1) Construction of noise barriers, including acquisition of property rights, either within or outside the highway right-of-way. Landscaping is not a viable noise barrier;

   (2) Traffic management measures (e.g., traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits and exclusive lane designations);

   (3) Alteration of horizontal and vertical alignments;

   (4) Acquisition of property rights (predominantly unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise;

   (5) Noise insulation of Activity Category D land use facilities listed in Table 1. Post-installation maintenance and operational costs for noise insulation are not eligible for Federal-aid funding.

   Feasibility:

   For a noise barrier to be considered acoustically feasible, 75% of the first row of impacted receptors adjacent to the barrier must achieve at least a 5 dBA reduction in highway traffic noise.

   Other feasibility factors that will be considered are safety, barrier height, topography, drainage, utilities, maintenance of the abatement measure, and access to adjacent properties.

   DOTD will not build noise barriers that it considers unsafe to the traveling public or adjacent properties. Topography and drainage may impact the design of the barrier or make the barrier unfeasible to construct. Utilities may render a barrier unfeasible when a conflict between the utility and barrier exists and the utility cannot be moved or cannot be moved without creating other insurmountable problems. (Note that the cost to relocate a utility will be added to the cost of the barrier when the relocation is necessary for the construction of the barrier. If this relocation cost is large, the barrier, although feasible, may become unreasonable due to cost.) DOTD must be able to access the barrier for maintenance purposes. If access cannot be obtained, the barrier is unfeasible. When access to adjacent properties must be maintained, a barrier may be unfeasible if it cannot be designed to provide the needed access. Noise barriers

that block existing driveways are considered unfeasible; however, there may be situations whereby the property owners agree in writing to forfeit their access eliminating this concern. Situations may arise whereby access is needed for seasonal activities such as maintenance or management of adjacent properties. These situations will be considered on case by case basis.

Noise barriers on bridges are limited to a maximum height of 14 feet, measured from top of noise barrier to bridge slab. Costs associated with mounting the barrier to the bridge, including the cost to modify the bridge structure to support the barrier, will be added to the cost of the barrier for determining reasonableness.

Reasonableness:

For abatement measure to be considered reasonable all of the following three criteria must be met: (a) achievement of the noise reduction design goal, (b) cost effectiveness, and (c) concurrence of benefited receptors.

(a) Noise Reduction Design Goal: When noise abatement measures are being considered, every effort will be made to obtain a substantial noise reduction of at least 8 dBA. At a minimum, at least one receptor must receive an 8 dBA reduction for the noise abatement system to be reasonable. For noise barriers meeting the abovementioned criteria, the height and length of the barrier will be optimized using the cost/benefited receptor ratio.

(b) Cost Effectiveness: The cost estimate of the noise abatement measure (including but not limited to the costs of real estate acquisition, construction servitude or utility relocation) should be equal to or less than $35,000 per benefited receptor. The unit cost used to estimate the cost of likely barriers will be updated regularly (at least every five years) and published on DOTD's web site. *The final analysis regarding cost effectiveness will occur during design when more detail information is available regarding the cost of the barrier system*, and

(c) Consideration of Viewpoints: As part of the NEPA public involvement process, viewpoints from the community, including benefited receptors, will be solicited for all aspects of the project, including noise impacts and abatement. Public Involvement will be tailored to the project. If no relevant objections to the proposed noise abatement are made at this level of public involvement, this criterion is deemed met and abatement considered reasonable from the viewpoint of benefited receptors. If relevant objections are identified, a follow-up solicitation will occur with property owners and residents of the benefited receptors. The abatement measure will be considered reasonable from the viewpoint of benefitting receptors if 50% or more of the responses received are positive. *Follow-up coordination with benefited receptors may occur during the design stage when more detail information is available regarding barrier design*.

<u>Follow-up Coordination with Benefited Receptors during Final Design</u>

For noise barriers, the most common type of abatement, the Department will contact benefited receptors when the barrier design changes substantially from what was

presented in the NEPA document. The abatement measure will be considered reasonable from the viewpoint of benefitting receptors if 50% or more of the responses received are positive.

To ascertain desires, property owners and residents may be invited to attend a meeting specifically to discuss the proposed barrier, or they may be asked to complete a survey (paper, electronic, phone, etc.). Contact may be made through a variety of means such as in person, letters, flyers left at the receptor site, public notices, web sites, phone calls, emails or other reliable means or combination of means. Names and/or addresses may be obtained from the tax assessor's roll, clerk of court records, neighborhood associations, local government databases, reliable internet sources, or other reliable sources or combination of sources. Those who do not respond as requested will be deemed as not interested in the barrier. DOTD will give more weight to the desire of the property owner than to the desire of the lessee. (When conflicting responses are received, DOTD will consider the property owner's response over that of the lessee's.)

The criteria above must be met collectively for a noise abatement measure to be deemed reasonable. Failure to achieve all criteria collectively will result in the noise abatement measure being deemed not reasonable. **During stage 1 of project development (NEPA stage), the analysis will identify noise abatement measures that are likely to be incorporated into the project's design. The final determination of any proposed noise abatement measure will be made during the design stage.** During the design stage, only abatement measures identified in stage 1 as likely will be reevaluated for reasonableness. If the decision to provide an abatement measure changes during final design, the Department will inform the public.

The following optional factors are considered when determining justification for additional cost allowances to an already determined reasonable barrier:

- date of development (implementation requires public outreach),
  Favorable consideration will be given to residential developments that existed prior to the initial construction of the highway. (This factor applies to projects along existing highways and not to new alignments.)

Residential development existed prior to the original construction of the highway	Added to Reasonableness Criteria (b)
No	$0
Yes	$2,000

- changes between existing and future build-conditions,
  Favorable consideration will be given to impacted receptors that experience future build noise levels that are 30 dBA more than future no-build noise levels.

Incremental Increase in Noise Level Between the Future No-build and the Future Build Noise Levels Before Noise Abatement	Added to Reasonableness Criteria (b)
Less than 30 dBA	$0
30 dBA or greater	$2,000

- exposure to higher absolute highway traffic noise levels,
  Favorable consideration will be given to impacted receptors that have predicted future noise levels above 76 dBA

Predicted Future Build Noise Level Before Noise Abatement	Added to Reasonableness Criteria (b)
66-75 dBA	$0
76-79 dBA	$1,000
80 dBA or greater	$2,000

and

- use of noise compatible planning concepts by the local government,
  Favorable consideration will be given to areas that have noise compatible (relevant to highway noise) zoning requirements in place that include the project area.

Noise compatible zoning in place for study area	Added to Reasonableness Criteria (b)
No	$0
Yes, in place for 1 to 2 years	$1,000
Yes, in place for 2 or more years	$1,500

DOCUMENTATION

The noise study report will document the results of the noise study. This report may be a standalone document incorporated into the NEPA document by reference, or it may be included in the appendix of the NEPA document.

Before adoption of a Final Environmental Impact Statement, Finding of No Significant Impact, or Categorical Exclusion, for Federal-aid projects, the DOTD will identify noise abatement measures which

are both reasonable and feasible and likely to be incorporated in the project. The statement of likelihood included in the environmental document will give the locations and physical description of the noise abatement measures as well as explain that the final recommendation will be determined during final design with input from benefited receptors. The DOTD will also identify noise impacts for which no apparent solution is available.

MISCELLANEOUS PROVISIONS

Third party funding is not allowed if the funding is required to make the abatement measure feasible or reasonable. Third party funding is acceptable to make functional enhancements such as absorptive treatment, access doors, or aesthetic enhancements to a noise abatement measure already determined to be both reasonable and feasible.

DOTD allows the use of either absorptive or reflective barriers. DOTD generally assumes reflective barriers in its noise analyses. This does not preclude the use of absorptive barriers or absorptive treatments. For example, a contractor may be given the option of using any barrier system on the Qualified Products List (QPL)[8] for construction. The QPL includes both reflective and absorptive systems. Therefore, the contract may choose either an absorptive or a reflective system as long as the system is on the QPL. Using an absorptive barrier when a reflective barrier was assumed for modeling purposes is not considered a substantial change in design for the purposes of soliciting viewpoints of benefited receptors. Note that decorative features often requested for visual enhancements may preclude use of absorptive treatments or some QPL barrier systems. If separate absorptive treatments are requested, the cost for the treatment will be added to the cost of the barrier system to determine reasonableness. If the additional absorptive treatment increases the cost above the maximum cost/benefited receptor value, it will not be considered for implementation unless the optional reasonableness factors apply. Use of absorptive barriers or treatments on a project is discretionary.

Cost averaging is used when a common noise environment exists. Common noise environments occur when the traffic mix and speeds are the same. For instance, a common noise environment could occur along a road segment between interchanges on a controlled access highway if the traffic speed is constant. Application requires that no single common noise environment exceeds $70,000/benefited receptor and that collectively all common noise environments being averaged do not exceed $35,000/benefited receptor.

Information for Local Officials: In an effort to prevent future traffic noise impacts on currently undeveloped lands, DOTD will inform local officials, within whose jurisdiction the highway project is located, of the best estimation of future noise levels for both developed and undeveloped lands or properties in the immediate vicinity of the project and information that may be useful to local communities to limit future land development to that which will be compatible with anticipated highway noise levels.

A copy of the environmental document (with included noise study) and/or noise study report (if one is prepared) will be provided to local officials upon approval of the environmental document. Local

[8] QPL 69, Noise Reduction Systems (Noise Barriers), can be found at http://www.dotd.la.gov/highways/construction/lab/qpl/tableofcontents.shtml

officials or agencies, which may have jurisdiction, include the Mayor's office, city/town/parish council, parish police jury, and metropolitan planning organization, as applicable.

Construction Noise: The following general steps are to be performed for all Type I projects:

a. Identify land uses or activities that may be affected by noise from the construction of the project. The identification is to be performed during the project development studies.

b. Determine the measures that are needed in the plans and specifications to minimize or eliminate adverse construction noise impacts to the community including alternate designs to keep noise levels to a minimum (e.g. the use of drilled shafts vs. driven piles in noise sensitive areas).[9] This determination will include a weighing of benefits achieved and the overall adverse social, economic, and environmental effects and costs of abatement measures.

c. Incorporate the needed abatement measures in the plans and specifications, as appropriate.

When practicable, DOTD will construct any permanent noise abatement measures as the first phase of a highway construction project to abate construction noise impacts of subsequent phases of the same project.

Revision: DOTD may revise this policy as necessary to keep current with the state-of-the-art technology, legislation, regulation, and guidance, as well as construction cost indices in the fields of highway traffic noise prediction, impact, and abatement.

The unit cost used in the noise analysis for determining reasonableness of noise abatement measures will be updated regularly at least every five years. It is the responsibility of the analyst to ensure that they are using the correct unit cost. Contact the DOTD Environmental Coordinator for more information.

Revisions to this policy affecting Federal or Federal-aid projects must be concurred with by the FHWA prior to adoption.

DOTD and FHWA are not responsible for notification of revisions to this policy. Inquiries as to the latest revision that may be applicable should be made in writing to:

Environmental Engineer Administrator
Louisiana Department of Transportation and Development
Post Office Box 94245
Baton Rouge, Louisiana 70804-9245

Implementation Plan: This policy will become effective July 13, 2011. It will apply to all projects started on or after the above effective date, and to all projects currently being evaluated pursuant to NEPA that do not have a completed noise study. A noise study is deemed completed if it was reviewed and commented on by DOTD and/or FHWA and considered final.

[9] The FHWA Roadway Construction Noise Model (FHWA RCNM) may be used to model construction noise at a sensitive receptor. For highly complex and controversial projects in urban areas, the "Highway Construction Noise: Measurement, Prediction and Mitigation" (HICNOM) method may be used, but requires specific input.

For noise studies performed under past policies: If, during later stages of project development, changes occur that affect only a portion of the project requiring a reevaluation of the noise study for that portion, the policy in effect at the time of the original study will be applicable. When these situations arise, DOTD will consult with FHWA Division office on the project specific issues to ensure that FHWA is in agreement.

APPENDIX C
Woodland Highway/LA 406
Widening Noise Report
TNM Inputs

Volkert
Thomas Lee

23 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Existing Peak
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 1	2	1	0.0	57.3	66	57.3	10	----	57.3	0.0	8	-8.0
Res 2	3	1	0.0	54.4	66	54.4	10	----	54.4	0.0	8	-8.0
Res 3	4	1	0.0	52.8	66	52.8	10	----	52.8	0.0	8	-8.0
Res 4	5	1	0.0	50.6	66	50.6	10	----	50.6	0.0	8	-8.0
Res 5	6	1	0.0	49.9	66	49.9	10	----	49.9	0.0	8	-8.0
Res 6	7	1	0.0	50.7	66	50.7	10	----	50.7	0.0	8	-8.0
Res 7	8	1	0.0	51.5	66	51.5	10	----	51.5	0.0	8	-8.0
Res 8	9	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
Res 9	10	1	0.0	53.1	66	53.1	10	----	53.1	0.0	8	-8.0
Res 10	11	1	0.0	54.5	66	54.5	10	----	54.5	0.0	8	-8.0
Res 11	12	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
Res 12	13	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
Res 13	14	1	0.0	57.2	66	57.2	10	----	57.2	0.0	8	-8.0
Res 14	15	1	0.0	58.9	66	58.9	10	----	58.9	0.0	8	-8.0
Res 15	16	1	0.0	58.7	66	58.7	10	----	58.7	0.0	8	-8.0
Res 16	17	1	0.0	50.6	66	50.6	10	----	50.6	0.0	8	-8.0
Res 17	18	1	0.0	51.0	66	51.0	10	----	51.0	0.0	8	-8.0
Res 18	19	1	0.0	52.2	66	52.2	10	----	52.2	0.0	8	-8.0
Res 19	20	1	0.0	53.3	66	53.3	10	----	53.3	0.0	8	-8.0
Res 20	21	1	0.0	56.1	66	56.1	10	----	56.1	0.0	8	-8.0
Res 21	22	1	0.0	55.9	66	55.9	10	----	55.9	0.0	8	-8.0
Res 22	23	1	0.0	54.3	66	54.3	10	----	54.3	0.0	8	-8.0
Res 23	24	1	0.0	54.9	66	54.9	10	----	54.9	0.0	8	-8.0

Res 24	25	1	0.0	55.3	66	55.3	10	----	55.3	0.0	8	-8.0
Res 25	26	3	0.0	52.3	66	52.3	10	----	52.3	0.0	8	-8.0
Res 26	27	4	0.0	52.4	66	52.4	10	----	52.4	0.0	8	-8.0
Res 27	28	1	0.0	55.6	66	55.6	10	----	55.6	0.0	8	-8.0
Church 28	29	1	0.0	55.0	66	55.0	10	----	55.0	0.0	8	-8.0
Church 29	30	1	0.0	53.3	66	53.3	10	----	53.3	0.0	8	-8.0
Res 30	31	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0
Res 31	32	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	8	-8.0
Res 32	33	2	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
Res 33	34	2	0.0	56.1	66	56.1	10	----	56.1	0.0	8	-8.0
Res 34	35	4	0.0	53.5	66	53.5	10	----	53.5	0.0	8	-8.0
Res 35	36	2	0.0	50.7	66	50.7	10	----	50.7	0.0	8	-8.0
Res 36	37	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
Res 37	38	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
Res 38	39	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
Res 39	40	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
Res 40	41	1	0.0	61.2	66	61.2	10	----	61.2	0.0	8	-8.0
Res 41	42	1	0.0	60.2	66	60.2	10	----	60.2	0.0	8	-8.0
Res 42	43	6	0.0	53.9	66	53.9	10	----	53.9	0.0	8	-8.0
Res 43	44	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
Res 44	45	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0
Res 45	46	3	0.0	60.8	66	60.8	10	----	60.8	0.0	8	-8.0
Res 46	47	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
Res 47	48	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
Res 48	49	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
Res 49	50	6	0.0	55.5	66	55.5	10	----	55.5	0.0	8	-8.0
Res 50	51	9	0.0	51.5	66	51.5	10	----	51.5	0.0	8	-8.0
Res 51	52	1	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
Res 52	53	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	8	-8.0
Res 53	54	1	0.0	60.4	66	60.4	10	----	60.4	0.0	8	-8.0
Res 54	55	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
Res 55	56	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
Res 56	57	1	0.0	60.2	66	60.2	10	----	60.2	0.0	8	-8.0
Res 57	58	4	0.0	56.2	66	56.2	10	----	56.2	0.0	8	-8.0
Res 58	59	1	0.0	52.9	66	52.9	10	----	52.9	0.0	8	-8.0
Res 59	60	1	0.0	51.0	66	51.0	10	----	51.0	0.0	8	-8.0
Res 60	61	1	0.0	65.8	66	65.8	10	----	65.8	0.0	8	-8.0
Res 61	62	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
Res 62	63	1	0.0	56.3	66	56.3	10	----	56.3	0.0	8	-8.0
Res 63	64	2	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0

Res 64	65	1	0.0	53.5	66	53.5	10	----	53.5	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	99	0.0	0.0	0.0
All Impacted	11	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Volkert
Thomas Lee

23 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: No-Build Peak
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 1	2	1	57.3	61.7	66	4.4	10	----	61.7	0.0	8	-8.0
Res 2	3	1	54.4	58.8	66	4.4	10	----	58.8	0.0	8	-8.0
Res 3	4	1	52.8	57.2	66	4.4	10	----	57.2	0.0	8	-8.0
Res 4	5	1	50.6	55.1	66	4.5	10	----	55.1	0.0	8	-8.0
Res 5	6	1	49.9	54.3	66	4.4	10	----	54.3	0.0	8	-8.0
Res 6	7	1	50.7	55.2	66	4.5	10	----	55.2	0.0	8	-8.0
Res 7	8	1	51.5	55.9	66	4.4	10	----	55.9	0.0	8	-8.0
Res 8	9	1	61.3	65.8	66	4.5	10	----	65.8	0.0	8	-8.0
Res 9	10	1	53.1	57.5	66	4.4	10	----	57.5	0.0	8	-8.0
Res 10	11	1	54.5	58.9	66	4.4	10	----	58.9	0.0	8	-8.0
Res 11	12	1	62.9	67.3	66	4.4	10	Snd Lvl	67.3	0.0	8	-8.0
Res 12	13	1	64.9	69.3	66	4.4	10	Snd Lvl	69.3	0.0	8	-8.0
Res 13	14	1	57.2	61.6	66	4.4	10	----	61.6	0.0	8	-8.0
Res 14	15	1	58.9	63.3	66	4.4	10	----	63.3	0.0	8	-8.0
Res 15	16	1	58.7	63.2	66	4.5	10	----	63.2	0.0	8	-8.0
Res 16	17	1	50.6	55.1	66	4.5	10	----	55.1	0.0	8	-8.0
Res 17	18	1	51.0	55.4	66	4.4	10	----	55.4	0.0	8	-8.0
Res 18	19	1	52.2	56.6	66	4.4	10	----	56.6	0.0	8	-8.0
Res 19	20	1	53.3	57.7	66	4.4	10	----	57.7	0.0	8	-8.0
Res 20	21	1	56.1	60.6	66	4.5	10	----	60.6	0.0	8	-8.0
Res 21	22	1	55.9	60.3	66	4.4	10	----	60.3	0.0	8	-8.0
Res 22	23	1	54.3	58.7	66	4.4	10	----	58.7	0.0	8	-8.0
Res 23	24	1	54.9	59.4	66	4.5	10	----	59.4	0.0	8	-8.0

Res 24	25	1	55.3	59.8	66	4.5	10	----	59.8	0.0	8	-8.0
Res 25	26	3	52.3	56.8	66	4.5	10	----	56.8	0.0	8	-8.0
Res 26	27	4	52.4	56.8	66	4.4	10	----	56.8	0.0	8	-8.0
Res 27	28	1	55.6	60.1	66	4.5	10	----	60.1	0.0	8	-8.0
Church 28	29	1	55.0	59.4	66	4.4	10	----	59.4	0.0	8	-8.0
Church 29	30	1	53.3	57.7	66	4.4	10	----	57.7	0.0	8	-8.0
Res 30	31	1	67.5	71.9	66	4.4	10	Snd Lvl	71.9	0.0	8	-8.0
Res 31	32	1	67.2	71.6	66	4.4	10	Snd Lvl	71.6	0.0	8	-8.0
Res 32	33	2	61.7	66.2	66	4.5	10	Snd Lvl	66.2	0.0	8	-8.0
Res 33	34	2	56.1	60.5	66	4.4	10	----	60.5	0.0	8	-8.0
Res 34	35	4	53.5	57.9	66	4.4	10	----	57.9	0.0	8	-8.0
Res 35	36	2	50.7	55.1	66	4.4	10	----	55.1	0.0	8	-8.0
Res 36	37	1	66.2	70.7	66	4.5	10	Snd Lvl	70.7	0.0	8	-8.0
Res 37	38	1	65.6	70.0	66	4.4	10	Snd Lvl	70.0	0.0	8	-8.0
Res 38	39	1	66.3	70.7	66	4.4	10	Snd Lvl	70.7	0.0	8	-8.0
Res 39	40	1	64.2	68.6	66	4.4	10	Snd Lvl	68.6	0.0	8	-8.0
Res 40	41	1	61.2	65.6	66	4.4	10	----	65.6	0.0	8	-8.0
Res 41	42	1	60.2	64.6	66	4.4	10	----	64.6	0.0	8	-8.0
Res 42	43	6	53.9	58.4	66	4.5	10	----	58.4	0.0	8	-8.0
Res 43	44	1	66.2	70.6	66	4.4	10	Snd Lvl	70.6	0.0	8	-8.0
Res 44	45	1	67.5	71.9	66	4.4	10	Snd Lvl	71.9	0.0	8	-8.0
Res 45	46	3	60.8	65.2	66	4.4	10	----	65.2	0.0	8	-8.0
Res 46	47	1	67.6	72.0	66	4.4	10	Snd Lvl	72.0	0.0	8	-8.0
Res 47	48	1	67.3	71.8	66	4.5	10	Snd Lvl	71.8	0.0	8	-8.0
Res 48	49	1	65.2	69.6	66	4.4	10	Snd Lvl	69.6	0.0	8	-8.0
Res 49	50	6	55.5	59.9	66	4.4	10	----	59.9	0.0	8	-8.0
Res 50	51	9	51.5	55.9	66	4.4	10	----	55.9	0.0	8	-8.0
Res 51	52	1	67.0	71.5	66	4.5	10	Snd Lvl	71.5	0.0	8	-8.0
Res 52	53	1	66.5	70.9	66	4.4	10	Snd Lvl	70.9	0.0	8	-8.0
Res 53	54	1	60.4	64.9	66	4.5	10	----	64.9	0.0	8	-8.0
Res 54	55	1	60.1	64.5	66	4.4	10	----	64.5	0.0	8	-8.0
Res 55	56	1	64.0	68.4	66	4.4	10	Snd Lvl	68.4	0.0	8	-8.0
Res 56	57	1	60.2	64.6	66	4.4	10	----	64.6	0.0	8	-8.0
Res 57	58	4	56.2	60.6	66	4.4	10	----	60.6	0.0	8	-8.0
Res 58	59	1	52.9	57.3	66	4.4	10	----	57.3	0.0	8	-8.0
Res 59	60	1	51.0	55.4	66	4.4	10	----	55.4	0.0	8	-8.0
Res 60	61	1	65.8	70.2	66	4.4	10	Snd Lvl	70.2	0.0	8	-8.0
Res 61	62	1	66.9	71.4	66	4.5	10	Snd Lvl	71.4	0.0	8	-8.0
Res 62	63	1	56.3	60.8	66	4.5	10	----	60.8	0.0	8	-8.0
Res 63	64	2	59.5	63.9	66	4.4	10	----	63.9	0.0	8	-8.0

Res 64	65	1	53.5	58.0	66	4.5	10	----	58.0	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	99	0.0	0.0	0.0
All Impacted	20	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Volkert
Thomas Lee

23 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Build Peak
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 1	1	1	57.3	62.9	66	5.6	10	----	62.9	0.0	8	-8.0
Res 2	2	1	54.4	60.2	66	5.8	10	----	60.2	0.0	8	-8.0
Res 3	3	1	52.8	58.7	66	5.9	10	----	58.7	0.0	8	-8.0
Res 4	4	1	50.6	57.0	66	6.4	10	----	57.0	0.0	8	-8.0
Res 5	5	1	49.9	56.1	66	6.2	10	----	56.1	0.0	8	-8.0
Res 6	6	1	50.7	57.0	66	6.3	10	----	57.0	0.0	8	-8.0
Res 7	7	1	51.5	57.7	66	6.2	10	----	57.7	0.0	8	-8.0
Res 8	8	1	61.3	68.9	66	7.6	10	Snd Lvl	68.9	0.0	8	-8.0
Res 9	9	1	53.1	58.9	66	5.8	10	----	58.9	0.0	8	-8.0
Res 10	10	1	54.5	60.2	66	5.7	10	----	60.2	0.0	8	-8.0
Res 11	11	1	62.9	70.1	66	7.2	10	Snd Lvl	70.1	0.0	8	-8.0
Res 12	12	1	64.9	71.5	66	6.6	10	Snd Lvl	71.5	0.0	8	-8.0
Res 13	13	1	57.2	62.5	66	5.3	10	----	62.5	0.0	8	-8.0
Res 14	14	1	58.9	64.4	66	5.5	10	----	64.4	0.0	8	-8.0
Res 15	15	1	58.7	64.0	66	5.3	10	----	64.0	0.0	8	-8.0
Res 16	16	1	50.6	56.8	66	6.2	10	----	56.8	0.0	8	-8.0
Res 17	17	1	51.0	57.1	66	6.1	10	----	57.1	0.0	8	-8.0
Res 18	18	1	52.2	58.1	66	5.9	10	----	58.1	0.0	8	-8.0
Res 19	19	1	53.3	59.0	66	5.7	10	----	59.0	0.0	8	-8.0
Res 20	20	1	56.1	61.3	66	5.2	10	----	61.3	0.0	8	-8.0
Res 21	21	1	55.9	61.1	66	5.2	10	----	61.1	0.0	8	-8.0
Res 22	22	1	54.3	59.9	66	5.6	10	----	59.9	0.0	8	-8.0
Res 23	23	1	54.9	60.2	66	5.3	10	----	60.2	0.0	8	-8.0

Res 24	24	1	55.3	60.5	66	5.2	10	----	60.5	0.0	8	-8.0
Res 25	25	3	52.3	58.9	66	6.6	10	----	58.9	0.0	8	-8.0
Res 26	26	4	52.4	59.1	66	6.7	10	----	59.1	0.0	8	-8.0
Res 27	27	1	55.6	60.6	66	5.0	10	----	60.6	0.0	8	-8.0
Church 28	28	1	55.0	60.2	66	5.2	10	----	60.2	0.0	8	-8.0
Church 29	29	1	53.3	58.9	66	5.6	10	----	58.9	0.0	8	-8.0
Res 30	30	1	67.5	72.9	66	5.4	10	Snd Lvl	72.9	0.0	8	-8.0
Res 31	31	1	67.2	72.5	66	5.3	10	Snd Lvl	72.5	0.0	8	-8.0
Res 32	32	2	61.7	66.4	66	4.7	10	Snd Lvl	66.4	0.0	8	-8.0
Res 33	33	2	56.1	61.0	66	4.9	10	----	61.0	0.0	8	-8.0
Res 34	34	4	53.5	59.1	66	5.6	10	----	59.1	0.0	8	-8.0
Res 35	35	2	50.7	56.9	66	6.2	10	----	56.9	0.0	8	-8.0
Res 36	36	1	66.2	71.2	66	5.0	10	Snd Lvl	71.2	0.0	8	-8.0
Res 37	37	1	65.6	70.2	66	4.6	10	Snd Lvl	70.2	0.0	8	-8.0
Res 38	38	1	66.3	71.1	66	4.8	10	Snd Lvl	71.1	0.0	8	-8.0
Res 39	39	1	64.2	69.0	66	4.8	10	Snd Lvl	69.0	0.0	8	-8.0
Res 40	40	1	61.2	65.7	66	4.5	10	----	65.7	0.0	8	-8.0
Res 41	41	1	60.2	64.6	66	4.4	10	----	64.6	0.0	8	-8.0
Res 42	42	6	53.9	59.5	66	5.6	10	----	59.5	0.0	8	-8.0
Res 43	43	1	66.2	71.1	66	4.9	10	Snd Lvl	71.1	0.0	8	-8.0
Res 44	44	1	67.5	72.7	66	5.2	10	Snd Lvl	72.7	0.0	8	-8.0
Res 45	45	3	60.8	65.3	66	4.5	10	----	65.3	0.0	8	-8.0
Res 46	46	1	67.6	72.9	66	5.3	10	Snd Lvl	72.9	0.0	8	-8.0
Res 47	47	1	67.3	72.6	66	5.3	10	Snd Lvl	72.6	0.0	8	-8.0
Res 48	48	1	65.2	69.9	66	4.7	10	Snd Lvl	69.9	0.0	8	-8.0
Res 49	49	6	55.5	60.9	66	5.4	10	----	60.9	0.0	8	-8.0
Res 50	50	9	51.5	58.2	66	6.7	10	----	58.2	0.0	8	-8.0
Res 51	51	1	67.0	72.2	66	5.2	10	Snd Lvl	72.2	0.0	8	-8.0
Res 52	52	1	66.5	71.4	66	4.9	10	Snd Lvl	71.4	0.0	8	-8.0
Res 53	53	1	60.4	66.2	66	5.8	10	Snd Lvl	66.2	0.0	8	-8.0
Res 54	54	1	60.1	66.6	66	6.5	10	Snd Lvl	66.6	0.0	8	-8.0
Res 55	55	1	64.0	69.5	66	5.5	10	Snd Lvl	69.5	0.0	8	-8.0
Res 56	56	1	60.2	67.3	66	7.1	10	Snd Lvl	67.3	0.0	8	-8.0
Res 57	57	4	56.2	63.4	66	7.2	10	----	63.4	0.0	8	-8.0
Res 58	58	1	52.9	60.5	66	7.6	10	----	60.5	0.0	8	-8.0
Res 59	59	1	51.0	59.0	66	8.0	10	----	59.0	0.0	8	-8.0
Res 60	60	1	65.8	70.8	66	5.0	10	Snd Lvl	70.8	0.0	8	-8.0
Res 61	61	1	66.9	72.0	66	5.1	10	Snd Lvl	72.0	0.0	8	-8.0
Res 62	62	1	56.3	63.6	66	7.3	10	----	63.6	0.0	8	-8.0
Res 63	63	2	59.5	66.6	66	7.1	10	Snd Lvl	66.6	0.0	8	-8.0

Res 64	64	1	53.5	62.1	66	8.6	10	----	62.1	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	99	0.0	0.0	0.0
All Impacted	26	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX D
Woodland Highway/LA 406
Widening Noise Report
TNM Outputs

Volkert
Thomas Lee

23 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Existing Peak
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 1	2	1	0.0	57.3	66	57.3	10	----	57.3	0.0	8	-8.0
Res 2	3	1	0.0	54.4	66	54.4	10	----	54.4	0.0	8	-8.0
Res 3	4	1	0.0	52.8	66	52.8	10	----	52.8	0.0	8	-8.0
Res 4	5	1	0.0	50.6	66	50.6	10	----	50.6	0.0	8	-8.0
Res 5	6	1	0.0	49.9	66	49.9	10	----	49.9	0.0	8	-8.0
Res 6	7	1	0.0	50.7	66	50.7	10	----	50.7	0.0	8	-8.0
Res 7	8	1	0.0	51.5	66	51.5	10	----	51.5	0.0	8	-8.0
Res 8	9	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
Res 9	10	1	0.0	53.1	66	53.1	10	----	53.1	0.0	8	-8.0
Res 10	11	1	0.0	54.5	66	54.5	10	----	54.5	0.0	8	-8.0
Res 11	12	1	0.0	62.9	66	62.9	10	----	62.9	0.0	8	-8.0
Res 12	13	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
Res 13	14	1	0.0	57.2	66	57.2	10	----	57.2	0.0	8	-8.0
Res 14	15	1	0.0	58.9	66	58.9	10	----	58.9	0.0	8	-8.0
Res 15	16	1	0.0	58.7	66	58.7	10	----	58.7	0.0	8	-8.0
Res 16	17	1	0.0	50.6	66	50.6	10	----	50.6	0.0	8	-8.0
Res 17	18	1	0.0	51.0	66	51.0	10	----	51.0	0.0	8	-8.0
Res 18	19	1	0.0	52.2	66	52.2	10	----	52.2	0.0	8	-8.0
Res 19	20	1	0.0	53.3	66	53.3	10	----	53.3	0.0	8	-8.0
Res 20	21	1	0.0	56.1	66	56.1	10	----	56.1	0.0	8	-8.0
Res 21	22	1	0.0	55.9	66	55.9	10	----	55.9	0.0	8	-8.0
Res 22	23	1	0.0	54.3	66	54.3	10	----	54.3	0.0	8	-8.0
Res 23	24	1	0.0	54.9	66	54.9	10	----	54.9	0.0	8	-8.0

Res 24	25	1	0.0	55.3	66	55.3	10	----	55.3	0.0	8	-8.0
Res 25	26	3	0.0	52.3	66	52.3	10	----	52.3	0.0	8	-8.0
Res 26	27	4	0.0	52.4	66	52.4	10	----	52.4	0.0	8	-8.0
Res 27	28	1	0.0	55.6	66	55.6	10	----	55.6	0.0	8	-8.0
Church 28	29	1	0.0	55.0	66	55.0	10	----	55.0	0.0	8	-8.0
Church 29	30	1	0.0	53.3	66	53.3	10	----	53.3	0.0	8	-8.0
Res 30	31	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0
Res 31	32	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	8	-8.0
Res 32	33	2	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
Res 33	34	2	0.0	56.1	66	56.1	10	----	56.1	0.0	8	-8.0
Res 34	35	4	0.0	53.5	66	53.5	10	----	53.5	0.0	8	-8.0
Res 35	36	2	0.0	50.7	66	50.7	10	----	50.7	0.0	8	-8.0
Res 36	37	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
Res 37	38	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
Res 38	39	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
Res 39	40	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
Res 40	41	1	0.0	61.2	66	61.2	10	----	61.2	0.0	8	-8.0
Res 41	42	1	0.0	60.2	66	60.2	10	----	60.2	0.0	8	-8.0
Res 42	43	6	0.0	53.9	66	53.9	10	----	53.9	0.0	8	-8.0
Res 43	44	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
Res 44	45	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0
Res 45	46	3	0.0	60.8	66	60.8	10	----	60.8	0.0	8	-8.0
Res 46	47	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
Res 47	48	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
Res 48	49	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
Res 49	50	6	0.0	55.5	66	55.5	10	----	55.5	0.0	8	-8.0
Res 50	51	9	0.0	51.5	66	51.5	10	----	51.5	0.0	8	-8.0
Res 51	52	1	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
Res 52	53	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	8	-8.0
Res 53	54	1	0.0	60.4	66	60.4	10	----	60.4	0.0	8	-8.0
Res 54	55	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
Res 55	56	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
Res 56	57	1	0.0	60.2	66	60.2	10	----	60.2	0.0	8	-8.0
Res 57	58	4	0.0	56.2	66	56.2	10	----	56.2	0.0	8	-8.0
Res 58	59	1	0.0	52.9	66	52.9	10	----	52.9	0.0	8	-8.0
Res 59	60	1	0.0	51.0	66	51.0	10	----	51.0	0.0	8	-8.0
Res 60	61	1	0.0	65.8	66	65.8	10	----	65.8	0.0	8	-8.0
Res 61	62	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
Res 62	63	1	0.0	56.3	66	56.3	10	----	56.3	0.0	8	-8.0
Res 63	64	2	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0

Res 64	65	1	0.0	53.5	66	53.5	10	----	53.5	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	99	0.0	0.0	0.0
All Impacted	11	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Volkert
Thomas Lee

23 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: No-Build Peak
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 1	2	1	57.3	61.7	66	4.4	10	----	61.7	0.0	8	-8.0
Res 2	3	1	54.4	58.8	66	4.4	10	----	58.8	0.0	8	-8.0
Res 3	4	1	52.8	57.2	66	4.4	10	----	57.2	0.0	8	-8.0
Res 4	5	1	50.6	55.1	66	4.5	10	----	55.1	0.0	8	-8.0
Res 5	6	1	49.9	54.3	66	4.4	10	----	54.3	0.0	8	-8.0
Res 6	7	1	50.7	55.2	66	4.5	10	----	55.2	0.0	8	-8.0
Res 7	8	1	51.5	55.9	66	4.4	10	----	55.9	0.0	8	-8.0
Res 8	9	1	61.3	65.8	66	4.5	10	----	65.8	0.0	8	-8.0
Res 9	10	1	53.1	57.5	66	4.4	10	----	57.5	0.0	8	-8.0
Res 10	11	1	54.5	58.9	66	4.4	10	----	58.9	0.0	8	-8.0
Res 11	12	1	62.9	67.3	66	4.4	10	Snd Lvl	67.3	0.0	8	-8.0
Res 12	13	1	64.9	69.3	66	4.4	10	Snd Lvl	69.3	0.0	8	-8.0
Res 13	14	1	57.2	61.6	66	4.4	10	----	61.6	0.0	8	-8.0
Res 14	15	1	58.9	63.3	66	4.4	10	----	63.3	0.0	8	-8.0
Res 15	16	1	58.7	63.2	66	4.5	10	----	63.2	0.0	8	-8.0
Res 16	17	1	50.6	55.1	66	4.5	10	----	55.1	0.0	8	-8.0
Res 17	18	1	51.0	55.4	66	4.4	10	----	55.4	0.0	8	-8.0
Res 18	19	1	52.2	56.6	66	4.4	10	----	56.6	0.0	8	-8.0
Res 19	20	1	53.3	57.7	66	4.4	10	----	57.7	0.0	8	-8.0
Res 20	21	1	56.1	60.6	66	4.5	10	----	60.6	0.0	8	-8.0
Res 21	22	1	55.9	60.3	66	4.4	10	----	60.3	0.0	8	-8.0
Res 22	23	1	54.3	58.7	66	4.4	10	----	58.7	0.0	8	-8.0
Res 23	24	1	54.9	59.4	66	4.5	10	----	59.4	0.0	8	-8.0

Res 24	25	1	55.3	59.8	66	4.5	10	----	59.8	0.0	8	-8.0
Res 25	26	3	52.3	56.8	66	4.5	10	----	56.8	0.0	8	-8.0
Res 26	27	4	52.4	56.8	66	4.4	10	----	56.8	0.0	8	-8.0
Res 27	28	1	55.6	60.1	66	4.5	10	----	60.1	0.0	8	-8.0
Church 28	29	1	55.0	59.4	66	4.4	10	----	59.4	0.0	8	-8.0
Church 29	30	1	53.3	57.7	66	4.4	10	----	57.7	0.0	8	-8.0
Res 30	31	1	67.5	71.9	66	4.4	10	Snd Lvl	71.9	0.0	8	-8.0
Res 31	32	1	67.2	71.6	66	4.4	10	Snd Lvl	71.6	0.0	8	-8.0
Res 32	33	2	61.7	66.2	66	4.5	10	Snd Lvl	66.2	0.0	8	-8.0
Res 33	34	2	56.1	60.5	66	4.4	10	----	60.5	0.0	8	-8.0
Res 34	35	4	53.5	57.9	66	4.4	10	----	57.9	0.0	8	-8.0
Res 35	36	2	50.7	55.1	66	4.4	10	----	55.1	0.0	8	-8.0
Res 36	37	1	66.2	70.7	66	4.5	10	Snd Lvl	70.7	0.0	8	-8.0
Res 37	38	1	65.6	70.0	66	4.4	10	Snd Lvl	70.0	0.0	8	-8.0
Res 38	39	1	66.3	70.7	66	4.4	10	Snd Lvl	70.7	0.0	8	-8.0
Res 39	40	1	64.2	68.6	66	4.4	10	Snd Lvl	68.6	0.0	8	-8.0
Res 40	41	1	61.2	65.6	66	4.4	10	----	65.6	0.0	8	-8.0
Res 41	42	1	60.2	64.6	66	4.4	10	----	64.6	0.0	8	-8.0
Res 42	43	6	53.9	58.4	66	4.5	10	----	58.4	0.0	8	-8.0
Res 43	44	1	66.2	70.6	66	4.4	10	Snd Lvl	70.6	0.0	8	-8.0
Res 44	45	1	67.5	71.9	66	4.4	10	Snd Lvl	71.9	0.0	8	-8.0
Res 45	46	3	60.8	65.2	66	4.4	10	----	65.2	0.0	8	-8.0
Res 46	47	1	67.6	72.0	66	4.4	10	Snd Lvl	72.0	0.0	8	-8.0
Res 47	48	1	67.3	71.8	66	4.5	10	Snd Lvl	71.8	0.0	8	-8.0
Res 48	49	1	65.2	69.6	66	4.4	10	Snd Lvl	69.6	0.0	8	-8.0
Res 49	50	6	55.5	59.9	66	4.4	10	----	59.9	0.0	8	-8.0
Res 50	51	9	51.5	55.9	66	4.4	10	----	55.9	0.0	8	-8.0
Res 51	52	1	67.0	71.5	66	4.5	10	Snd Lvl	71.5	0.0	8	-8.0
Res 52	53	1	66.5	70.9	66	4.4	10	Snd Lvl	70.9	0.0	8	-8.0
Res 53	54	1	60.4	64.9	66	4.5	10	----	64.9	0.0	8	-8.0
Res 54	55	1	60.1	64.5	66	4.4	10	----	64.5	0.0	8	-8.0
Res 55	56	1	64.0	68.4	66	4.4	10	Snd Lvl	68.4	0.0	8	-8.0
Res 56	57	1	60.2	64.6	66	4.4	10	----	64.6	0.0	8	-8.0
Res 57	58	4	56.2	60.6	66	4.4	10	----	60.6	0.0	8	-8.0
Res 58	59	1	52.9	57.3	66	4.4	10	----	57.3	0.0	8	-8.0
Res 59	60	1	51.0	55.4	66	4.4	10	----	55.4	0.0	8	-8.0
Res 60	61	1	65.8	70.2	66	4.4	10	Snd Lvl	70.2	0.0	8	-8.0
Res 61	62	1	66.9	71.4	66	4.5	10	Snd Lvl	71.4	0.0	8	-8.0
Res 62	63	1	56.3	60.8	66	4.5	10	----	60.8	0.0	8	-8.0
Res 63	64	2	59.5	63.9	66	4.4	10	----	63.9	0.0	8	-8.0

Res 64	65	1	53.5	58.0	66	4.5	10	----	58.0	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	99	0.0	0.0	0.0
All Impacted	20	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Volkert
Thomas Lee

23 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Build Peak
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 1	1	1	57.3	62.9	66	5.6	10	----	62.9	0.0	8	-8.0
Res 2	2	1	54.4	60.2	66	5.8	10	----	60.2	0.0	8	-8.0
Res 3	3	1	52.8	58.7	66	5.9	10	----	58.7	0.0	8	-8.0
Res 4	4	1	50.6	57.0	66	6.4	10	----	57.0	0.0	8	-8.0
Res 5	5	1	49.9	56.1	66	6.2	10	----	56.1	0.0	8	-8.0
Res 6	6	1	50.7	57.0	66	6.3	10	----	57.0	0.0	8	-8.0
Res 7	7	1	51.5	57.7	66	6.2	10	----	57.7	0.0	8	-8.0
Res 8	8	1	61.3	68.9	66	7.6	10	Snd Lvl	68.9	0.0	8	-8.0
Res 9	9	1	53.1	58.9	66	5.8	10	----	58.9	0.0	8	-8.0
Res 10	10	1	54.5	60.2	66	5.7	10	----	60.2	0.0	8	-8.0
Res 11	11	1	62.9	70.1	66	7.2	10	Snd Lvl	70.1	0.0	8	-8.0
Res 12	12	1	64.9	71.5	66	6.6	10	Snd Lvl	71.5	0.0	8	-8.0
Res 13	13	1	57.2	62.5	66	5.3	10	----	62.5	0.0	8	-8.0
Res 14	14	1	58.9	64.4	66	5.5	10	----	64.4	0.0	8	-8.0
Res 15	15	1	58.7	64.0	66	5.3	10	----	64.0	0.0	8	-8.0
Res 16	16	1	50.6	56.8	66	6.2	10	----	56.8	0.0	8	-8.0
Res 17	17	1	51.0	57.1	66	6.1	10	----	57.1	0.0	8	-8.0
Res 18	18	1	52.2	58.1	66	5.9	10	----	58.1	0.0	8	-8.0
Res 19	19	1	53.3	59.0	66	5.7	10	----	59.0	0.0	8	-8.0
Res 20	20	1	56.1	61.3	66	5.2	10	----	61.3	0.0	8	-8.0
Res 21	21	1	55.9	61.1	66	5.2	10	----	61.1	0.0	8	-8.0
Res 22	22	1	54.3	59.9	66	5.6	10	----	59.9	0.0	8	-8.0
Res 23	23	1	54.9	60.2	66	5.3	10	----	60.2	0.0	8	-8.0

Res 24	24	1	55.3	60.5	66	5.2	10	----	60.5	0.0	8	-8.0
Res 25	25	3	52.3	58.9	66	6.6	10	----	58.9	0.0	8	-8.0
Res 26	26	4	52.4	59.1	66	6.7	10	----	59.1	0.0	8	-8.0
Res 27	27	1	55.6	60.6	66	5.0	10	----	60.6	0.0	8	-8.0
Church 28	28	1	55.0	60.2	66	5.2	10	----	60.2	0.0	8	-8.0
Church 29	29	1	53.3	58.9	66	5.6	10	----	58.9	0.0	8	-8.0
Res 30	30	1	67.5	72.9	66	5.4	10	Snd Lvl	72.9	0.0	8	-8.0
Res 31	31	1	67.2	72.5	66	5.3	10	Snd Lvl	72.5	0.0	8	-8.0
Res 32	32	2	61.7	66.4	66	4.7	10	Snd Lvl	66.4	0.0	8	-8.0
Res 33	33	2	56.1	61.0	66	4.9	10	----	61.0	0.0	8	-8.0
Res 34	34	4	53.5	59.1	66	5.6	10	----	59.1	0.0	8	-8.0
Res 35	35	2	50.7	56.9	66	6.2	10	----	56.9	0.0	8	-8.0
Res 36	36	1	66.2	71.2	66	5.0	10	Snd Lvl	71.2	0.0	8	-8.0
Res 37	37	1	65.6	70.2	66	4.6	10	Snd Lvl	70.2	0.0	8	-8.0
Res 38	38	1	66.3	71.1	66	4.8	10	Snd Lvl	71.1	0.0	8	-8.0
Res 39	39	1	64.2	69.0	66	4.8	10	Snd Lvl	69.0	0.0	8	-8.0
Res 40	40	1	61.2	65.7	66	4.5	10	----	65.7	0.0	8	-8.0
Res 41	41	1	60.2	64.6	66	4.4	10	----	64.6	0.0	8	-8.0
Res 42	42	6	53.9	59.5	66	5.6	10	----	59.5	0.0	8	-8.0
Res 43	43	1	66.2	71.1	66	4.9	10	Snd Lvl	71.1	0.0	8	-8.0
Res 44	44	1	67.5	72.7	66	5.2	10	Snd Lvl	72.7	0.0	8	-8.0
Res 45	45	3	60.8	65.3	66	4.5	10	----	65.3	0.0	8	-8.0
Res 46	46	1	67.6	72.9	66	5.3	10	Snd Lvl	72.9	0.0	8	-8.0
Res 47	47	1	67.3	72.6	66	5.3	10	Snd Lvl	72.6	0.0	8	-8.0
Res 48	48	1	65.2	69.9	66	4.7	10	Snd Lvl	69.9	0.0	8	-8.0
Res 49	49	6	55.5	60.9	66	5.4	10	----	60.9	0.0	8	-8.0
Res 50	50	9	51.5	58.2	66	6.7	10	----	58.2	0.0	8	-8.0
Res 51	51	1	67.0	72.2	66	5.2	10	Snd Lvl	72.2	0.0	8	-8.0
Res 52	52	1	66.5	71.4	66	4.9	10	Snd Lvl	71.4	0.0	8	-8.0
Res 53	53	1	60.4	66.2	66	5.8	10	Snd Lvl	66.2	0.0	8	-8.0
Res 54	54	1	60.1	66.6	66	6.5	10	Snd Lvl	66.6	0.0	8	-8.0
Res 55	55	1	64.0	69.5	66	5.5	10	Snd Lvl	69.5	0.0	8	-8.0
Res 56	56	1	60.2	67.3	66	7.1	10	Snd Lvl	67.3	0.0	8	-8.0
Res 57	57	4	56.2	63.4	66	7.2	10	----	63.4	0.0	8	-8.0
Res 58	58	1	52.9	60.5	66	7.6	10	----	60.5	0.0	8	-8.0
Res 59	59	1	51.0	59.0	66	8.0	10	----	59.0	0.0	8	-8.0
Res 60	60	1	65.8	70.8	66	5.0	10	Snd Lvl	70.8	0.0	8	-8.0
Res 61	61	1	66.9	72.0	66	5.1	10	Snd Lvl	72.0	0.0	8	-8.0
Res 62	62	1	56.3	63.6	66	7.3	10	----	63.6	0.0	8	-8.0
Res 63	63	2	59.5	66.6	66	7.1	10	Snd Lvl	66.6	0.0	8	-8.0

Res 64	64	1	53.5	62.1	66	8.6	10	----	62.1	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	99	0.0	0.0	0.0
All Impacted	26	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX E
Woodland Highway/LA 406
Widening Noise Report
TNM Model Validation Results

Reading __1_ of __3_ at this receptor location.

Project: Woodland Highway / LA 406 Volkert #238300.80

Receptor Location (or #): Site #1

Landuse Characteristics: Residential / Wooded /open fields

Equipment:	Meter:	Rion NL-21	Calibrator:	Norsonic type 1251
Calibration:	Start Cal: (dB)	114.0 db	Finish Cal: (dB)	114.0 dB
Response:	Fast:	NA	Slow:	YES
	A-Weighting?	YES	Battery Check?:	YES
	Date:	7/23/2013	Time:	8:33
Weather Data:	Wind:	5 mph	Temperature:	79°
	Weather:	partly cloudy		

Start Time: 8:33 **End Time:** 8:48

Traffic Count Data

Road:	Primary Noise Source	Other (Intersecting Street)	Other (Intersecting Street)
Automobiles:	148		
Medium Trucks:	5		
Heavy Trucks	7		
Buses	1		
Motorcycles	1		

Distance to Primary Noise Source: 20'

North:

Background Noise: crickets

Major Sources: Road traffic

Unusual Events:

Other Notes: Speed Limit 55 mph, Data file Au1_0001

Reading __2_ of __3_ at this receptor location.

Project: Woodland Highway / LA 406 Volkert #238300.80

Receptor Location (or #): Site #1

Landuse Characteristics: Residential / Wooded /open fields

Equipment:	Meter:	Rion NL-21	Calibrator:	Norsonic type 1251
Calibration:	Start Cal: (dB)	114.0 db	Finish Cal: (dB)	114.0 dB
Response:	Fast:	NA	Slow:	YES
	A-Weighting?	YES	Battery Check?:	YES
	Date:	7/23/2013	Time:	8:59
Weather Data:	Wind:	5 mph	Temperature:	79°
	Weather:	partly cloudy		

Start Time: 8:59 **End Time:** 9:14

Traffic Count Data

Road:	Primary Noise Source	Other (Intersecting Street)	Other (Intersecting Street)
Automobiles:	119		
Medium Trucks:	3		
Heavy Trucks	5		
Buses	0		
Motorcycles	0		

Distance to Primary Noise Source: 20'

North:

Background Noise: crickets

Major Sources: Road traffic

Unusual Events: Airplane in distance at aprox. 3:22 minutes in

Other Notes: Speed Limit 55 mph, Data file Au1_0002

Reading __3_ of __3_ at this receptor location.

Project: Woodland Highway / LA 406 Volkert #238300.80

Receptor Location (or #): Site #1

Landuse Characteristics: Residential / Wooded /open fields

Equipment:	Meter:	Rion NL-21	Calibrator:	Norsonic type 1251
Calibration:	Start Cal: (dB)	114.0 db	Finish Cal: (dB)	114.0 dB
Response:	Fast:	NA	Slow:	YES
	A-Weighting?	YES	Battery Check?:	YES
	Date:	7/23/2013	Time:	9:18
Weather Data:	Wind:	5 mph	Temperature:	82°
	Weather:	partly cloudy		

Start Time: 9:18 **End Time:** 9:33

Traffic Count Data

Road:	Primary Noise Source	Other (Intersecting Street)	Other (Intersecting Street)
Automobiles:	109		
Medium Trucks:	6		
Heavy Trucks	5		
Buses	0		
Motorcycles	0		

Distance to Primary Noise Source: 20'

North:

Background Noise: crickets

Major Sources: Road traffic

Unusual Events:

Other Notes: Speed Limit 55 mph, Data file Au1_0003

Reading __1_ of __3_ at this receptor location.

Project:	**Woodland Highway / LA 406 Volkert #238300.80**	
Receptor Location (or #):	Site #2	
Landuse Characteristics:	Pasture / open fields / land fill & industrial (further away)	

Equipment:	Meter:	Rion NL-21	Calibrator:	Norsonic type 1251
Calibration:	Start Cal: (dB)	114.0 db	Finish Cal: (dB)	114.0 dB
Response:	Fast:	NA	Slow:	YES
	A-Weighting?	YES	Battery Check?:	YES
	Date:	7/23/2013	Time:	10:07
Weather Data:	Wind:	5 mph	Temperature:	84°
	Weather:	partly cloudy		

Start Time: 10:07 **End Time:** 10:22

Traffic Count Data

Road:	Primary Noise Source	Other (Intersecting Street)	Other (Intersecting Street)
Automobiles:	95		
Medium Trucks:	1		
Heavy Trucks	8		
Buses	0		
Motorcycles	1		

Distance to Primary Noise Source: 13'

North:

Background Noise:
Major Sources: Road traffic
Unusual Events:
Other Notes: Speed Limit 55 mph, Data file Au1_0004 centerline has rumble strips

Reading __2_ of __3_ at this receptor location.

Project:	**Woodland Highway / LA 406 Volkert #238300.80**
Receptor Location (or #):	Site #2
Landuse Characteristics:	Pasture / open fields / land fill & industrial (further away)

Equipment:	Meter:	Rion NL-21	Calibrator:	Norsonic type 1251
Calibration:	Start Cal: (dB)	114.0 db	Finish Cal: (dB)	114.0 dB
Response:	Fast:	NA	Slow:	YES
	A-Weighting?	YES	Battery Check?:	YES
	Date:	7/23/2013	Time:	10:25
Weather Data:	Wind:	5 mph	Temperature:	86°
	Weather:	partly cloudy		

Start Time: 10:25 **End Time:** 10:40

Traffic Count Data

Road:	Primary Noise Source	Other (Intersecting Street)	Other (Intersecting Street)
Automobiles:	117		
Medium Trucks:	9		
Heavy Trucks	3		
Buses	1		
Motorcycles	1		

Distance to Primary Noise Source: 13'

North:

Background Noise:

Major Sources: Road traffic

Unusual Events: At aprox. 9 minutes in a dump truck was heard in distance, (not loud)

Other Notes: Speed Limit 55 mph, Data file Au1_0005 Centerline has rumble strips

Reading __3_ of __3_ at this receptor location.

Project:	**Woodland Highway / LA 406 Volkert #238300.80**
Receptor Location (or #):	Site #2
Landuse Characteristics:	Pasture / open fields / land fill & industrial (further away)

Equipment:	Meter:	Rion NL-21	Calibrator:	Norsonic type 1251
Calibration:	Start Cal: (dB)	114.0 db	Finish Cal: (dB)	114.0 dB
Response:	Fast:	NA	Slow:	YES
	A-Weighting?	YES	Battery Check?:	YES
	Date:	7/23/2013	Time:	10:42
Weather Data:	Wind:	5 mph	Temperature:	86°
	Weather:	partly cloudy		

Start Time: 10:42 **End Time:** 10:57

Traffic Count Data

Road:	Primary Noise Source	Other (Intersecting Street)	Other (Intersecting Street)
Automobiles:	115		
Medium Trucks:	6		
Heavy Trucks	2		
Buses	1		
Motorcycles	0		

Distance to Primary Noise Source: 13'

North:

Background Noise:
Major Sources: Road traffic
Unusual Events:
Other Notes: Speed Limit 55 mph, Data file Au1_0006 Centerline has rumble strips

Volkert
Thomas Lee

20 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Validation Site 1 Reading 1
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Validation Site 1	1	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	1	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Volkert
Thomas Lee

20 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Validation Site 1 Reading 2
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Validation Site 1	1	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	1	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Volkert
Thomas Lee

20 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Validation Site 1 Reading 3
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Validation Site 1	1	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	1	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Volkert
Thomas Lee

20 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Validation Site 2 Reading 1
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Validation Site 2	1	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	1	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Volkert
Thomas Lee

20 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Validation Site 2 Reading 2
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Validation Site 2	1	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	1	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Volkert
Thomas Lee

20 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Validation Site 2 Reading 3
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Validation Site 2	1	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	1	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX F
Woodland Highway/LA 406 Widening Noise Report Noise Barrier Feasibility and Reasonableness Worksheets

Feasibility Worksheet			
Project	ID number H.008220	Route Location LA 406 Woodland Hwy	
Barrier	Location Barrier 1	Length (feet) 574	Height (feet) 5 (avg)
Number of first row receptors (receptors adjacent to barrier): 3	Number of *first row* receptors that achieve at least a 5dBA reduction in noise with barrier: 3		% that achieve ≥ 5 dBA reduction: 100
Are there any additional feasibility issues to consider?	*Explain:* No		
Based on the above, is the barrier feasible?	Circle Yes or No *Explain:* The barrier provides the required 5 dBA reduction at 75% of the first row impacted receptors.		

Volkert
Thomas Lee

20 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Barrier 1
BARRIER DESIGN: Feasibility
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 30	30	1	67.5	73.0	66	5.5	10	Snd Lvl	68.0	5.0	8	-3.0
Res 31	31	1	67.2	72.6	66	5.4	10	Snd Lvl	67.3	5.3	8	-2.7
Res 36	36	1	66.2	71.3	66	5.1	10	Snd Lvl	66.2	5.1	8	-2.9
Res 32	32	1	61.7	66.5	66	4.8	10	Snd Lvl	63.0	3.5	8	-4.5
Res 33	33	1	56.1	61.0	66	4.9	10	----	59.1	1.9	8	-6.1
Barrier 1A	65	1	0.0	66.8	66	66.8	10	Snd Lvl	63.9	2.9	8	-5.1
Barrier 1B	66	1	0.0	60.3	66	60.3	10	----	58.8	1.5	8	-6.5
Barrier 1C	67	1	0.0	62.7	66	62.7	10	----	61.1	1.6	8	-6.4

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	8	1.5	3.4	5.3
All Impacted	5	2.9	4.4	5.3
All that meet NR Goal	0	0.0	0.0	0.0

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20 September 2013
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: LA 406
RUN: Barrier 1
BARRIER DESIGN: Feasibility

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier11	W	4.00	5.44	6.00	349	1897				0
Barrier10	W	4.00	4.66	6.00	225	1048				0
Barrier9	W	3.00	3.00	3.00	80	239				0
Barrier8	W	3.00	3.00	3.00	80	239				0
Barrier4	W	3.00	3.00	3.00	60	181				0
Barrier3	W	3.00	3.00	3.00	60	180				0
Barrier2	W	3.00	3.00	3.00	61	182				0
Barrier1	W	3.00	3.00	3.00	60	180				0
									Total Cost:	0

Reasonableness Worksheet **DURING NEPA**				
Project	ID number	Route	Parish/City	
	H.008220	LA 406	Orleans and Plaquemines	
Barrier	Length	Height	Location	
	574 ft	11 and 4 ft	Barrier 1	
Criterion 1: Cost				
Total Square Feet	Cost per Square Foot	Total Cost	Number of Benefited Receptors	Cost per Benefited Receptor
4,685	$26 and $53	$221,359	3	$73,786
Criterion 2: Design Goal				
At least an 8dBA reduction at 1 Receptor?	Circle: Yes or No			
	Notes:			
Criterion 3: Desires of Benefited Receptors				
Public Involvement events showing *Likely* barrier	Event(s) and date(s):			
	Notes:			
Benefitted Receptors' viewpoint of barrier	Circle: Positive or Negative			
	Notes:			
Separate Query of Benefitted Receptors	Circle: Yes or No			
	If Yes, note type and results (% of responses for barrier):			
Reasonableness criteria met?	Criterion 1 (yes or no)	Criterion 2 (yes or no)	Criterion 3 (yes or no)	Date 9/20/13

Volkert
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17 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Barrier 1
BARRIER DESIGN: Reasonableness
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 30	30	1	67.5	73.0	66	5.5	10	Snd Lvl	68.0	5.0	8	-3.0
Res 31	31	1	67.2	72.6	66	5.4	10	Snd Lvl	65.8	6.8	8	-1.2
Res 36	36	1	66.2	71.3	66	5.1	10	Snd Lvl	63.3	8.0	8	0.0
Res 32	32	1	61.7	66.5	66	4.8	10	Snd Lvl	62.0	4.5	8	-3.5
Res 33	33	1	56.1	61.0	66	4.9	10	----	58.4	2.6	8	-5.4
Barrier 1A	65	1	0.0	66.8	66	66.8	10	Snd Lvl	63.8	3.0	8	-5.0
Barrier 1B	66	1	0.0	60.3	66	60.3	10	----	58.1	2.2	8	-5.8
Barrier 1C	67	1	0.0	62.7	66	62.7	10	----	61.0	1.7	8	-6.3

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	8	1.7	4.2	8.0
All Impacted	5	3.0	5.5	8.0
All that meet NR Goal	1	8.0	8.0	8.0

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20 September 2013
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: LA 406
RUN: Barrier 1
BARRIER DESIGN: Reasonableness

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier11	W	8.00	10.57	12.00	349	3687				0
Barrier10	W	4.00	4.44	6.00	225	998				0
Barrier9	W	3.00	3.00	3.00	80	239				0
Barrier8	W	3.00	3.00	3.00	80	239				0
Barrier4	W	3.00	3.00	3.00	60	181				0
Barrier3	W	3.00	3.00	3.00	60	180				0
Barrier2	W	3.00	3.00	3.00	61	182				0
Barrier1	W	3.00	3.00	3.00	60	180				0
									Total Cost:	0

Feasibility Worksheet			
Project	ID number H.008220	Route Location LA 406 Woodland Hwy	
Barrier	Location Barrier 2	Length (feet) 346	Height (feet) 12
Number of first row receptors (receptors adjacent to barrier): 1	Number of *first row* receptors that achieve at least a 5dBA reduction in noise with barrier: 1		% that achieve ≥ 5 dBA reduction: 100
Are there any additional feasibility issues to consider?	*Explain:* No		
Based on the above, is the barrier feasible?	Circle Yes or No *Explain:*		

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20 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Barrier 2
BARRIER DESIGN: Feasibility Anaylsis
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 39	39	1	64.2	69.0	66	4.8	10	Snd Lvl	64.0	5.0	8	-3.0
Res 40	40	1	61.2	65.8	66	4.6	10	----	61.9	3.9	8	-4.1
Barrier 2A	65	1	0.0	59.6	66	59.6	10	----	57.7	1.9	8	-6.1
Barrier 2B	66	1	0.0	58.7	66	58.7	10	----	56.9	1.8	8	-6.2

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	4	1.8	3.1	5.0
All Impacted	1	5.0	5.0	5.0
All that meet NR Goal	0	0.0	0.0	0.0

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20 September 2013
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: LA 406
RUN: Barrier 2
BARRIER DESIGN: Feasibility Anaylsis

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier10	W	12.00	12.00	12.00	346	4147				0
									Total Cost:	0

Reasonableness Worksheet **DURING NEPA**				
Project	ID number	Route	Parish/City	
	H.008220	LA 406	Orleans and Plaquemines	
Barrier	Length	Height	Location	
	346	30	Barrier 2	
Criterion 1: Cost				
Total Square Feet	Cost per Square Foot	Total Cost	Number of Benefited Receptors	Cost per Benefited Receptor
10,368	$207	$2,146,176	1	$2,146,176
Criterion 2: Design Goal				
At least an 8dBA reduction at 1 Receptor?	Circle: Yes or No			
	Notes:			
Criterion 3: Desires of Benefited Receptors				
Public Involvement events showing *Likely* barrier	Event(s) and date(s):			
	Notes:			
Benefitted Receptors' viewpoint of barrier	Circle: Positive or Negative			
	Notes:			
Separate Query of Benefitted Receptors	Circle: Yes or No			
	If Yes, note type and results (% of responses for barrier):			
Reasonableness criteria met?	Criterion 1 (yes or no)	Criterion 2 (yes or no)	Criterion 3 (yes or no)	Date 9/20/13

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17 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Barrier 2
BARRIER DESIGN: Reasonableness Anaylsis
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 39	39	1	64.2	69.0	66	4.8	10	Snd Lvl	63.6	5.4	8	-2.6
Res 40	40	1	61.2	65.8	66	4.6	10	----	61.4	4.4	8	-3.6
Barrier 2A	65	1	0.0	59.6	66	59.6	10	----	57.4	2.2	8	-5.8
Barrier 2B	66	1	0.0	58.7	66	58.7	10	----	56.7	2.0	8	-6.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	4	2.0	3.5	5.4
All Impacted	1	5.4	5.4	5.4
All that meet NR Goal	0	0.0	0.0	0.0

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20 September 2013
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: LA 406
RUN: Barrier 2
BARRIER DESIGN: Reasonableness Anaylsis

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier10	W	30.00	30.00	30.00	346	10368				0
									Total Cost:	0

Feasibility Worksheet			
Project	ID number	Route Location	
	H.008220	LA 406 Woodland Hwy	
Barrier	Location	Length (feet)	Height (feet)
	Barrier 3	6,187	8
Number of first row receptors (receptors adjacent to barrier):	Number of *first row* receptors that achieve at least a 5dBA reduction in noise with barrier:		% that achieve ≥ 5 dBA reduction:
5	4		80
Are there any additional feasibility issues to consider?	*Explain:* No		
Based on the above, is the barrier feasible?	Circle Yes or No		
	Explain: The barrier provides the required 5 dBA reduction at 75% of the first row impacted receptors.		

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20 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Barrier 3
BARRIER DESIGN: Feasibility Analysis
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 43	43	1	66.2	71.2	66	5.0	10	Snd Lvl	65.8	5.4	8	-2.6
Res 44	44	1	67.5	72.8	66	5.3	10	Snd Lvl	67.1	5.7	8	-2.3
Res 46	46	1	67.6	73.0	66	5.4	10	Snd Lvl	67.6	5.4	8	-2.6
Res 47	47	1	67.3	72.7	66	5.4	10	Snd Lvl	65.3	7.4	8	-0.6
Res 48	48	1	65.2	70.0	66	4.8	10	Snd Lvl	66.5	3.5	8	-4.5
Res 45	45	1	60.8	65.4	66	4.6	10	----	62.3	3.1	8	-4.9
Barrier 3A	65	1	0.0	65.1	66	65.1	10	----	62.6	2.5	8	-5.5
Barrier 3B	66	1	0.0	64.7	66	64.7	10	----	61.7	3.0	8	-5.0
Barrier 3C	67	1	0.0	60.7	66	60.7	10	----	58.6	2.1	8	-5.9
Barrier 3D	68	1	0.0	61.6	66	61.6	10	----	59.1	2.5	8	-5.5
Barrier 3E	69	1	0.0	60.9	66	60.9	10	----	59.1	1.8	8	-6.2
Barrier 3F	70	1	0.0	59.2	66	59.2	10	----	57.7	1.5	8	-6.5

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	12	1.5	3.7	7.4
All Impacted	5	3.5	5.5	7.4
All that meet NR Goal	0	0.0	0.0	0.0

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20 September 2013
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: LA 406
RUN: Barrier 3
BARRIER DESIGN: Feasibility Analysis

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier11	W	8.00	8.00	8.00	467	3735				0
Barrier10	W	8.00	8.00	8.00	307	2452				0
									Total Cost:	0

Reasonableness Worksheet **DURING NEPA**				
	ID number	Route	Parish/City	
Project	H.008220	LA 406	Orleans and Plaquemines	
	Length	Height	Location	
Barrier	721	8 (avg)	Barrier 3	
Criterion 1: Cost				
Total Square Feet	Cost per Square Foot	Total Cost	Number of Benefited Receptors	Cost per Benefited Receptor
5,923	$26	$153,998	4	$38,500
Criterion 2: Design Goal				
At least an 8dBA reduction at 1 Receptor?	Circle: Yes or No			
	Notes:			
Criterion 3: Desires of Benefited Receptors				
Public Involvement events showing *Likely* barrier	Event(s) and date(s):			
	Notes:			
Benefitted Receptors' viewpoint of barrier	Circle: Positive or Negative			
	Notes:			
Separate Query of Benefitted Receptors	Circle: Yes or No			
	If Yes, note type and results (% of responses for barrier):			
Reasonableness criteria met?	Criterion 1 (yes or no)	Criterion 2 (yes or no)	Criterion 3 (yes or no)	Date 9/18/13

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20 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Barrier 3
BARRIER DESIGN: Reasonableness Analysis
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 43	43	1	66.2	71.2	66	5.0	10	Snd Lvl	66.2	5.0	8	-3.0
Res 44	44	1	67.5	72.8	66	5.3	10	Snd Lvl	66.0	6.8	8	-1.2
Res 46	46	1	67.6	73.0	66	5.4	10	Snd Lvl	67.2	5.8	8	-2.2
Res 47	47	1	67.3	72.7	66	5.4	10	Snd Lvl	64.7	8.0	8	0.0
Res 48	48	1	65.2	70.0	66	4.8	10	Snd Lvl	68.2	1.8	8	-6.2
Res 45	45	1	60.8	65.4	66	4.6	10	----	62.1	3.3	8	-4.7
Barrier 3A	65	1	0.0	65.1	66	65.1	10	----	62.7	2.4	8	-5.6
Barrier 3B	66	1	0.0	64.7	66	64.7	10	----	61.6	3.1	8	-4.9
Barrier 3C	67	1	0.0	60.7	66	60.7	10	----	58.5	2.2	8	-5.8
Barrier 3D	68	1	0.0	61.6	66	61.6	10	----	59.0	2.6	8	-5.4
Barrier 3E	69	1	0.0	60.9	66	60.9	10	----	59.4	1.5	8	-6.5
Barrier 3F	70	1	0.0	59.2	66	59.2	10	----	57.7	1.5	8	-6.5

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	12	1.5	3.7	8.0
All Impacted	5	1.8	5.5	8.0
All that meet NR Goal	1	8.0	8.0	8.0

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20 September 2013
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: LA 406
RUN: Barrier 3
BARRIER DESIGN: Reasonableness Analysis

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier11	W	2.00	8.24	10.00	414	3410				0
Barrier10	W	2.00	8.20	10.00	307	2513				0
									Total Cost:	0

Feasibility Worksheet			
Project	ID number	Route Location	
	H.008220	LA 406 Woodland Hwy	
Barrier	Location	Length (feet)	Height (feet)
	Barrier 4	565	30
Number of first row receptors (receptors adjacent to barrier):	Number of *first row* receptors that achieve at least a 5dBA reduction in noise with barrier:		% that achieve ≥ 5 dBA reduction:
4	2		50
Are there any additional feasibility issues to consider?	*Explain:* No		
Based on the above, is the barrier feasible?	Circle Yes or (No)		
	Explain: The barrier does not achieve the LDOTD goal of a 5 dBA reduction at 75% or more of the first row impacted receptors.		

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20 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Barrier 4
BARRIER DESIGN: Feasibility Analysis
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 51	51	1	67.0	72.3	66	5.3	10	Snd Lvl	66.5	5.8	8	-2.2
Res 52	52	1	66.5	71.6	66	5.1	10	Snd Lvl	61.8	9.8	8	1.8
Res 53	53	1	60.4	66.2	66	5.8	10	Snd Lvl	61.7	4.5	8	-3.5
Res 54	54	1	60.1	66.7	66	6.6	10	Snd Lvl	62.8	3.9	8	-4.1
Res 49	49	1	55.5	60.9	66	5.4	10	----	59.1	1.8	8	-6.2
Barrier 4A	65	1	0.0	61.1	66	61.1	10	----	58.3	2.8	8	-5.2
Barrier 4B	66	1	0.0	61.3	66	61.3	10	----	57.7	3.6	8	-4.4
Barrier 4C	67	1	0.0	61.1	66	61.1	10	----	57.7	3.4	8	-4.6
Barrier 4D	68	1	0.0	62.5	66	62.5	10	----	59.4	3.1	8	-4.9
Barrier 4E	69	1	0.0	63.5	66	63.5	10	----	61.4	2.1	8	-5.9

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	10	1.8	4.1	9.8
All Impacted	4	3.9	6.0	9.8
All that meet NR Goal	1	9.8	9.8	9.8

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20 September 2013
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: LA 406
RUN: Barrier 4
BARRIER DESIGN: Feasibility Analysis

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier10	W	30.00	30.00	30.00	179	5378				0
Barrier11	W	30.00	30.00	30.00	386	11573				0
									Total Cost:	0

Feasibility Worksheet			
Project	ID number H.008220	Route Location LA 406 Woodland Hwy	
Barrier	Location Barrier 5	Length (feet) 533	Height (feet) 10
Number of first row receptors (receptors adjacent to barrier): 4	Number of *first row* receptors that achieve at least a 5dBA reduction in noise with barrier: 3		% that achieve ≥ 5 dBA reduction: 75
Are there any additional feasibility issues to consider?	*Explain:* No		
Based on the above, is the barrier feasible?	Circle Yes or No *Explain:* The barrier provides the required 5 dBA reduction at 75% of the first row impacted receptors.		

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20 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Barrier 5
BARRIER DESIGN: Feasibility Analysis
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 55	55	1	64.0	69.6	66	5.6	10	Snd Lvl	62.7	6.9	8	-1.1
Res 56	56	1	60.2	67.3	66	7.1	10	Snd Lvl	62.0	5.3	8	-2.7
Res 58	58	1	52.9	60.5	66	7.6	10	----	58.1	2.4	8	-5.6
Res 60	60	1	65.8	70.9	66	5.1	10	Snd Lvl	65.8	5.1	8	-2.9
Res 61	61	1	66.9	72.1	66	5.2	10	Snd Lvl	71.9	0.2	8	-7.8
Res 62	62	1	56.3	63.7	66	7.4	10	----	61.7	2.0	8	-6.0
Res 57	57	1	56.2	63.4	66	7.2	10	----	60.2	3.2	8	-4.8
Res 63	63	1	59.5	66.6	66	7.1	10	Snd Lvl	65.7	0.9	8	-7.1
Barrier 5A	65	1	0.0	66.5	66	66.5	10	Snd Lvl	63.2	3.3	8	-4.7
Barrier 5B	66	1	0.0	62.4	66	62.4	10	----	59.4	3.0	8	-5.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	10	0.2	3.2	6.9
All Impacted	6	0.2	3.6	6.9
All that meet NR Goal	0	0.0	0.0	0.0

Volkert
Thomas Lee

20 September 2013
TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: LA 406
RUN: Barrier 5
BARRIER DESIGN: Feasibility Analysis

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier11	W	10.00	10.00	10.00	533	5332				0
Barrier10	W	0.00	0.00	0.00	0	0				0
									Total Cost:	0

Reasonableness Worksheet **DURING NEPA**				
Project	ID number H.008220	Route LA 406	Parish/City Orleans and Plaquemines	
Barrier	Length 619	Height 13(avg) and 4	Location Barrier 5	
Criterion 1: Cost				
Total Square Feet	Cost per Square Foot	Total Cost	Number of Benefited Receptors	Cost per Benefited Receptor
7,413	$53 and $26	$383,628	3	$127,876
Criterion 2: Design Goal				
At least an 8dBA reduction at 1 Receptor?	Circle: Yes or No *Notes:*			
Criterion 3: Desires of Benefited Receptors				
Public Involvement events showing *Likely* barrier	Event(s) and date(s): *Notes:*			
Benefitted Receptors' viewpoint of barrier	Circle: Positive or Negative *Notes:*			
Separate Query of Benefitted Receptors	Circle: Yes or No *If Yes, note type and results (% of responses for barrier):*			
Reasonableness criteria met?	Criterion 1 (yes or no)	Criterion 2 (yes or no)	Criterion 3 (yes or no)	Date 9/18/13

Volkert
Thomas Lee

18 September 2013
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: LA 406
RUN: Barrier 5
BARRIER DESIGN: Reasonableness Anaylsis

ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Res 55	55	1	64.0	69.6	66	5.6	10	Snd Lvl	61.6	8.0	8	0.0
Res 56	56	1	60.2	67.3	66	7.1	10	Snd Lvl	60.6	6.7	8	-1.3
Res 58	58	1	52.9	60.5	66	7.6	10	----	57.3	3.2	8	-4.8
Res 60	60	1	65.8	70.9	66	5.1	10	Snd Lvl	65.0	5.9	8	-2.1
Res 61	61	1	66.9	72.1	66	5.2	10	Snd Lvl	69.6	2.5	8	-5.5
Res 62	62	1	56.3	63.7	66	7.4	10	----	60.7	3.0	8	-5.0
Res 57	57	1	56.2	63.4	66	7.2	10	----	59.3	4.1	8	-3.9
Res 63	63	1	59.5	66.6	66	7.1	10	Snd Lvl	64.8	1.8	8	-6.2
Barrier 5A	65	1	0.0	66.5	66	66.5	10	Snd Lvl	62.1	4.4	8	-3.6
Barrier 5B	66	1	0.0	62.4	66	62.4	10	----	58.2	4.2	8	-3.8

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	1.8	4.4	8.0
All Impacted	6	1.8	4.9	8.0
All that meet NR Goal	1	8.0	8.0	8.0

Volkert 20 September 2013
Thomas Lee TNM 2.5

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: LA 406
RUN: Barrier 5
BARRIER DESIGN: Reasonableness Anaylsis

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
Barrier11	W	10.00	13.26	14.00	533	7070				0
Barrier10	W	4.00	4.00	4.00	86	343				0
									Total Cost:	0

APPENDIX E

Wetlands Finding Report

MAY 2012

WOODLAND HIGHWAY (LA 406) WIDENING
STATE PROJECT NO. H.008220
PLAQUEMINES AND ORLEANS PARISHES, LA

WETLANDS FINDING REPORT

LEGACY NO. 700-38-0106
FAP NO. STP-3803(501)
RPC NO. LA406EA
VOLKERT NO. 138000.80

Prepared by:

Providence Engineering and Environmental Group LLC
1201 Main Street
Baton Rouge, Louisiana 70802
(225) 766-7400
www.providenceeng.com
Project Number 788-001

TABLE OF CONTENTS

Section		Page No.
1.0	BACKGROUND	1
2.0	PROJECT LOCATION AND DESCRIPTION	1
3.0	SOILS	1
4.0	VEGETATION	2
5.0	HYDROLOGY	2
6.0	CONCLUSIONS	2

LIST OF FIGURES

Figure

1 Site Location Map
2 Site Plan
3 Aerial Photograph
4 Soils Map

LIST OF EXHIBITS

Exhibit

1 Copies of Site Photographs
2 Wetland Determination Data Forms – Atlantic and Gulf Coastal Plain Region

On behalf of Volkert, Inc, Providence conducted a wetland analysis for the proposed widening of LA 406 (Woodland Highway) from LA 23 to LA 407 in Orleans and Plaquemines Parishes, Louisiana.

1.0 BACKGROUND

The purpose of this report is to present field data on the three diagnostic characteristics of wetlands and other waters of the United States for the proposed widening of LA 406 (Site). This report was prepared in accordance with guidance found in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (U.S. Army Corps of Engineers, Wetland Regulatory Assistance Program 2010).

On May 10, 2012, Providence personnel visited the Site and collected field data on the three diagnostic wetland parameters – soils, vegetation, and hydrology. Providence reviewed the Natural Resources Conservation Service (NRCS) Web Soil Survey, USGS 7.5-minute topographic maps, and 1998, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, and 2011 aerial photography. To assist your staff, included are **Figure 1** – Site Location Map, **Figures 2a** through **2q** – Site Plans, **Figures 3a & 3b** – Aerial Photograph, **Figure 4** – Soils Map, **Exhibit 1** –Copies of Site Photographs, and **Exhibit 2** – Wetland Determination Data Forms – Atlantic and Gulf Coastal Plain Region.

2.0 PROJECT LOCATION AND DESCRIPTION

The Site is in Belle Chase, Louisiana and incorporates a portion of LA 406 between its junction with LA 23 and intersection with LA 407. The project begins at Latitude 29º51’44.55”N and Longitude 89º59’45.38”W and terminates at Latitude 29º54’14.46”N and Longitude 89º58’44.16”W. This approximate three-mile span of LA 406 is proposed for widening between LA 23 and LA 407. All of the proposed widening will be conducted within existing rights-of-way; which primarily consists of mowed-and maintained road slopes and drainage as well as industrial and commercial property.

3.0 SOILS

Providence collected soil samples between the surface and approximately 16 inches. The depth of each sample was sufficient to determine changes in upper horizons and to observe field indicators of hydric soils. The NRCS’s Web Soil Survey was used to determine mapped soil series. Revised official series descriptions were used to confirm profile matrix, redox features, and texture of soils underlying the Site. The Web Soil Survey shows that the Site maybe underlain by Westwego clay.

Field data indicate that the Site is underlain by Westwego clay which is listed as a hydric soil on both the local list (NRCS Web Soil Survey 2012) and national list (NRCS 2012 National Hydric Soils List by State). The wetland criterion for hydric soils was met at all three sample locations established by Providence to characterize the Site.

4.0 VEGETATION

Dominant species identified on site primarily consists of early successional species indicative of the mowed-and-maintained habitat and existing development. Dominant species include: southern dewberry (*Rubus trivialis*, FAC), switchgrass (*Panicum virgatum*, FAC), Bermuda grass (*Cynodon dactylon*, FACU), Bahia grass (*Paspalum notatum*, FACU), and Johnson's grass (*Sorghum halepense*, FACU). The wetland criterion for a prevalence of hydrophytic vegetation was met at one of the three sample locations established by Providence to characterize the Site.

5.0 HYDROLOGY

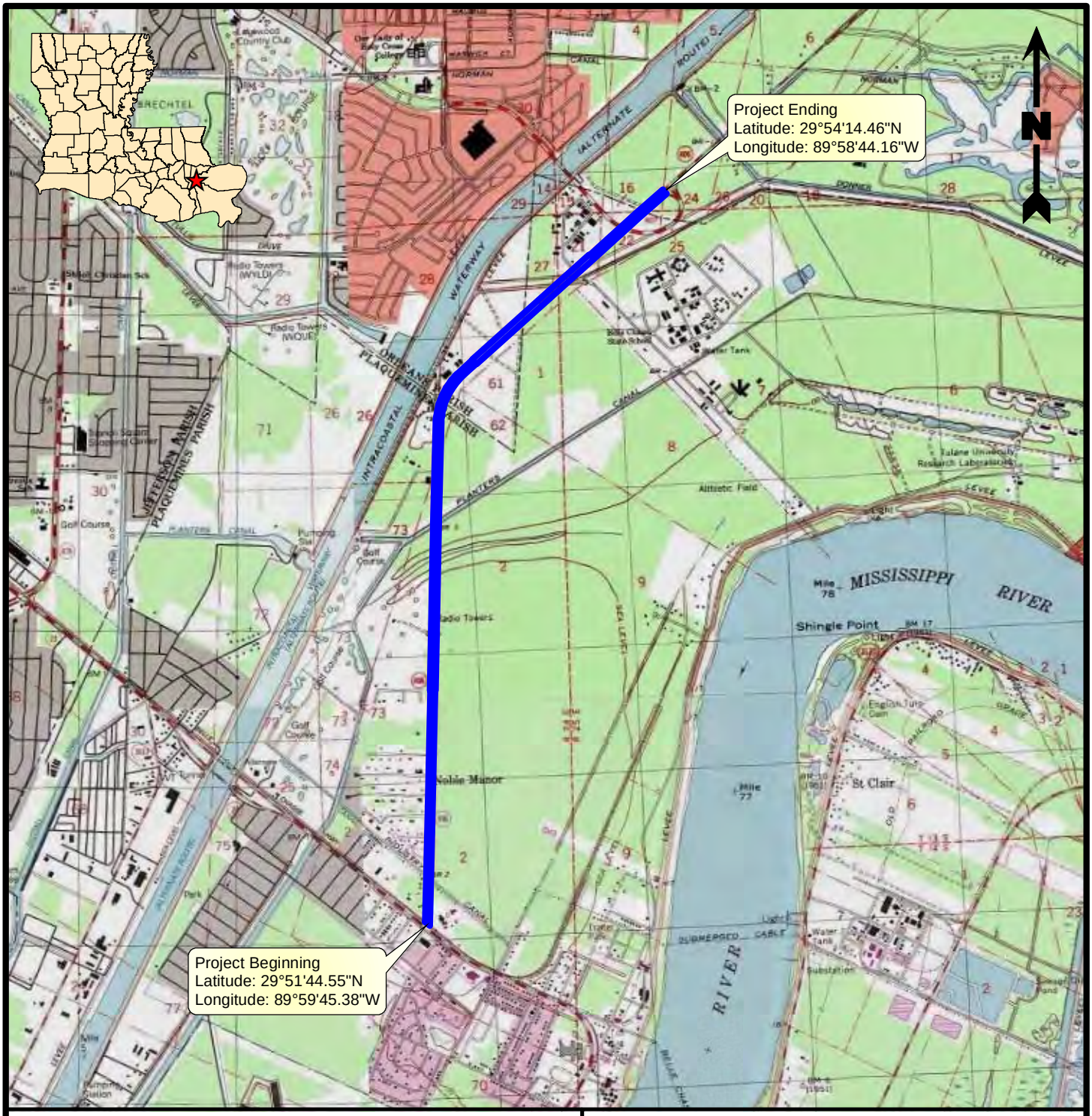
The Site is in the East Central Louisiana Coastal watershed within USGS Hydrologic Cataloguing Unit 08090301. The Site drains primarily east to west into the Planters and Industry Canals which are both under pump and empty into the Gulf Intercoastal Waterway (Alternate Route) via a pump station on Planters Canal. The sources of hydrology to the Site are rainfall, sheet flow, and roadside runoff. No primary or secondary indicators of wetland hydrology were observed on the Site. The wetland criterion for hydrology was not met at any of the sample locations established by Providence to characterize the Site.

6.0 CONCLUSIONS

Positive evidence of all three diagnostic characteristics for jurisdictional wetlands was not found at any of the three sample locations established to characterize the Site; however approximately 5.95 acres of potential other waters of the U.S. appear to be present on the Site.

FIGURE 1

SITE LOCATION MAP



3,000 1,500 0 3,000 Feet

Legend

Project Area (46.79 Acres)

Reference

Base map comprised of U.S.G.S. 7.5 minute topographic maps, "New Orleans East, LA", "Chalmette, LA", "Bertrandville, LA" and "Belle Chasse, LA".

Site Location Map

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

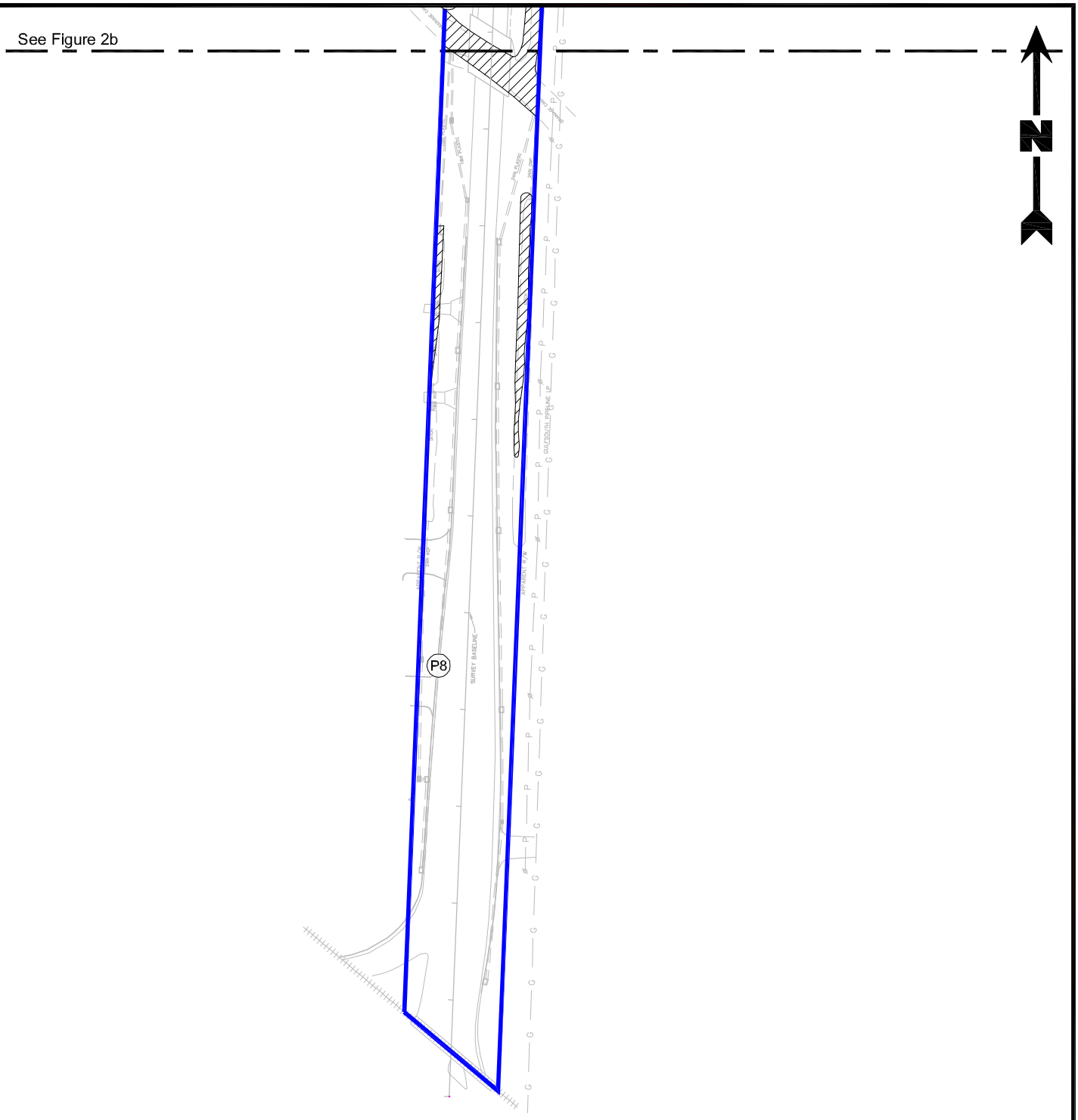
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number	788-001
Drawing Number	788-001-A014
1	Figure

Providence Engineering and Environmental Group LLC

FIGURE 2a-2q

SITE PLAN



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetland Analysis Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

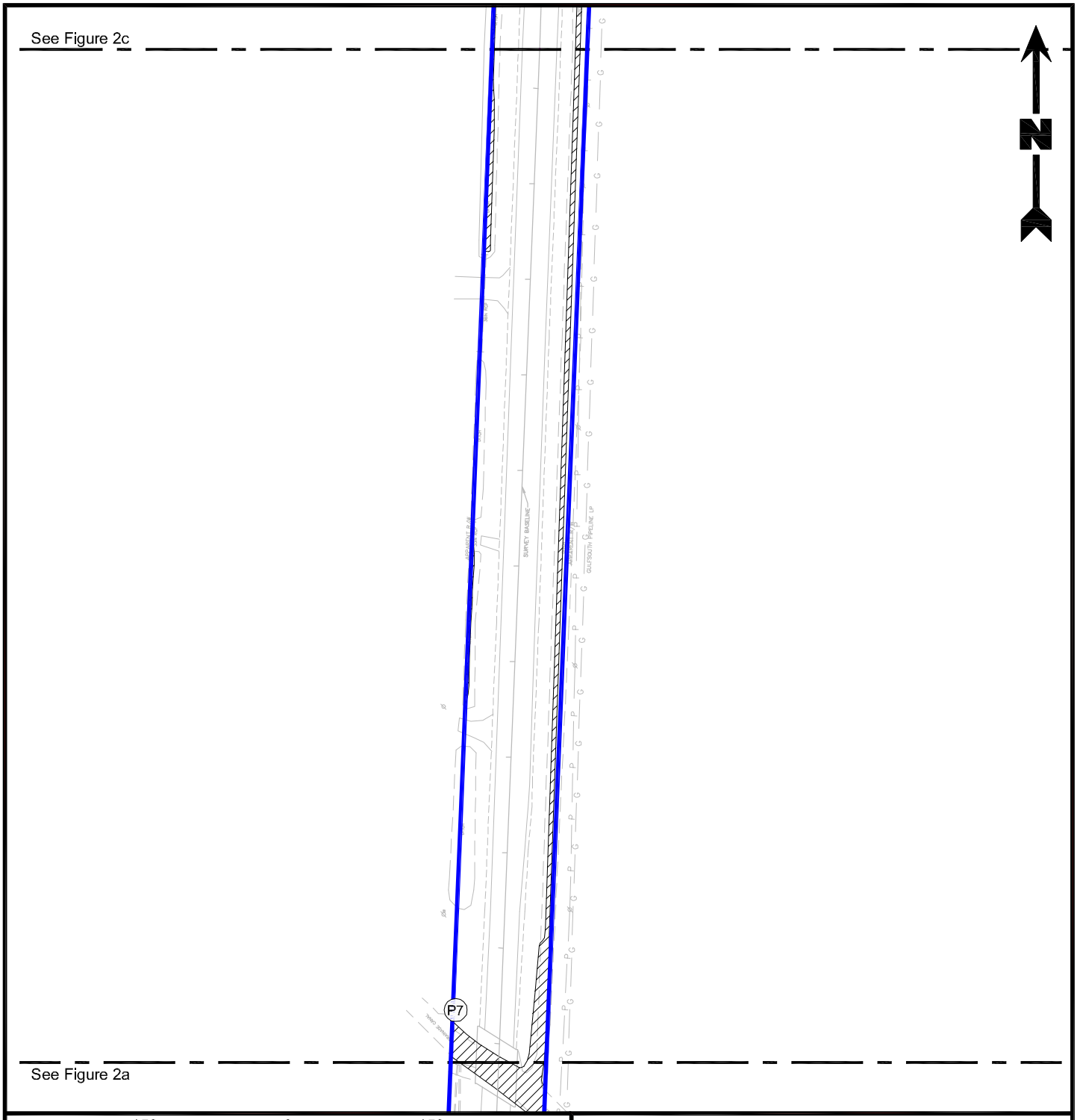
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A015

2a Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

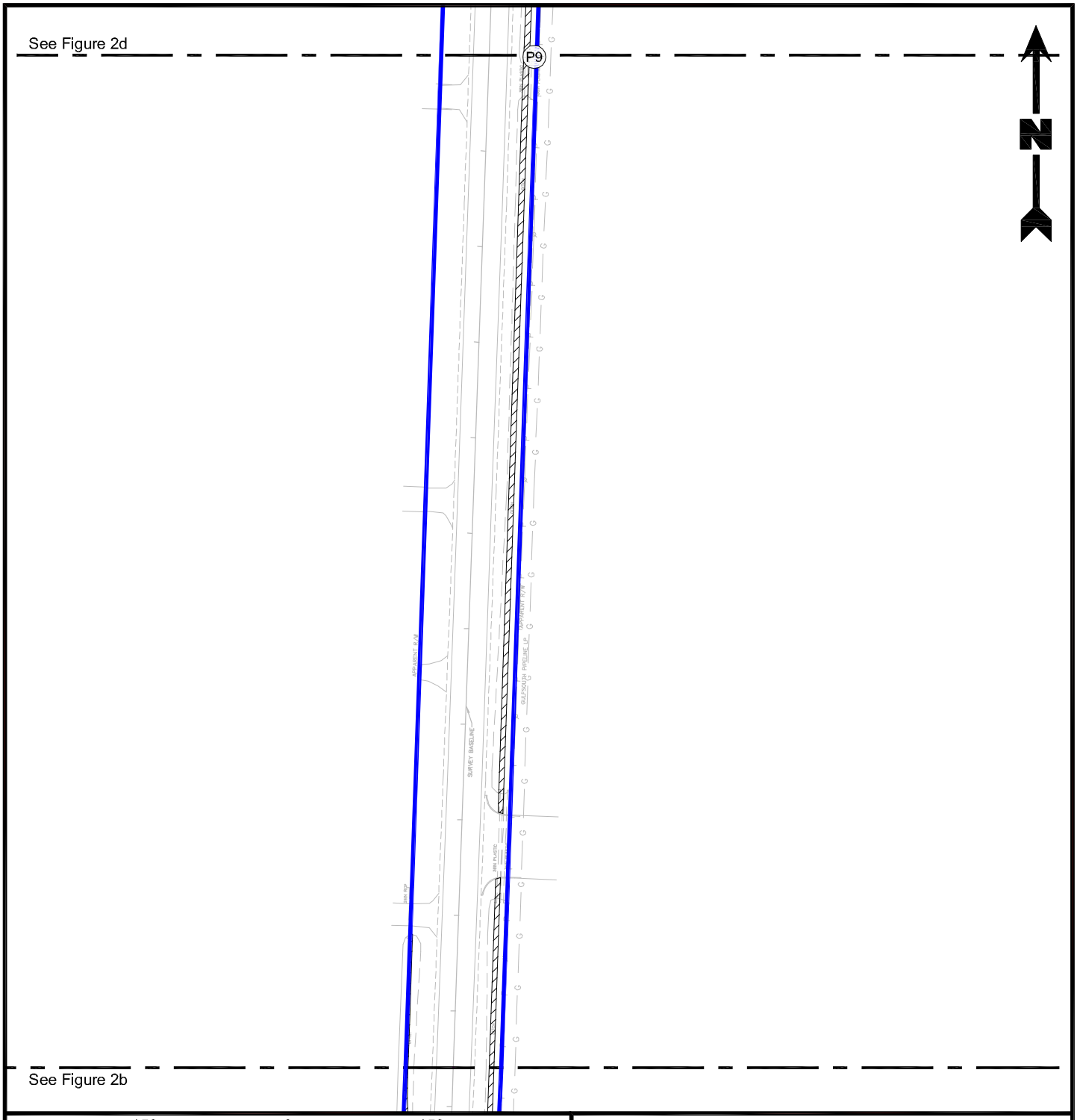
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A016

2b Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

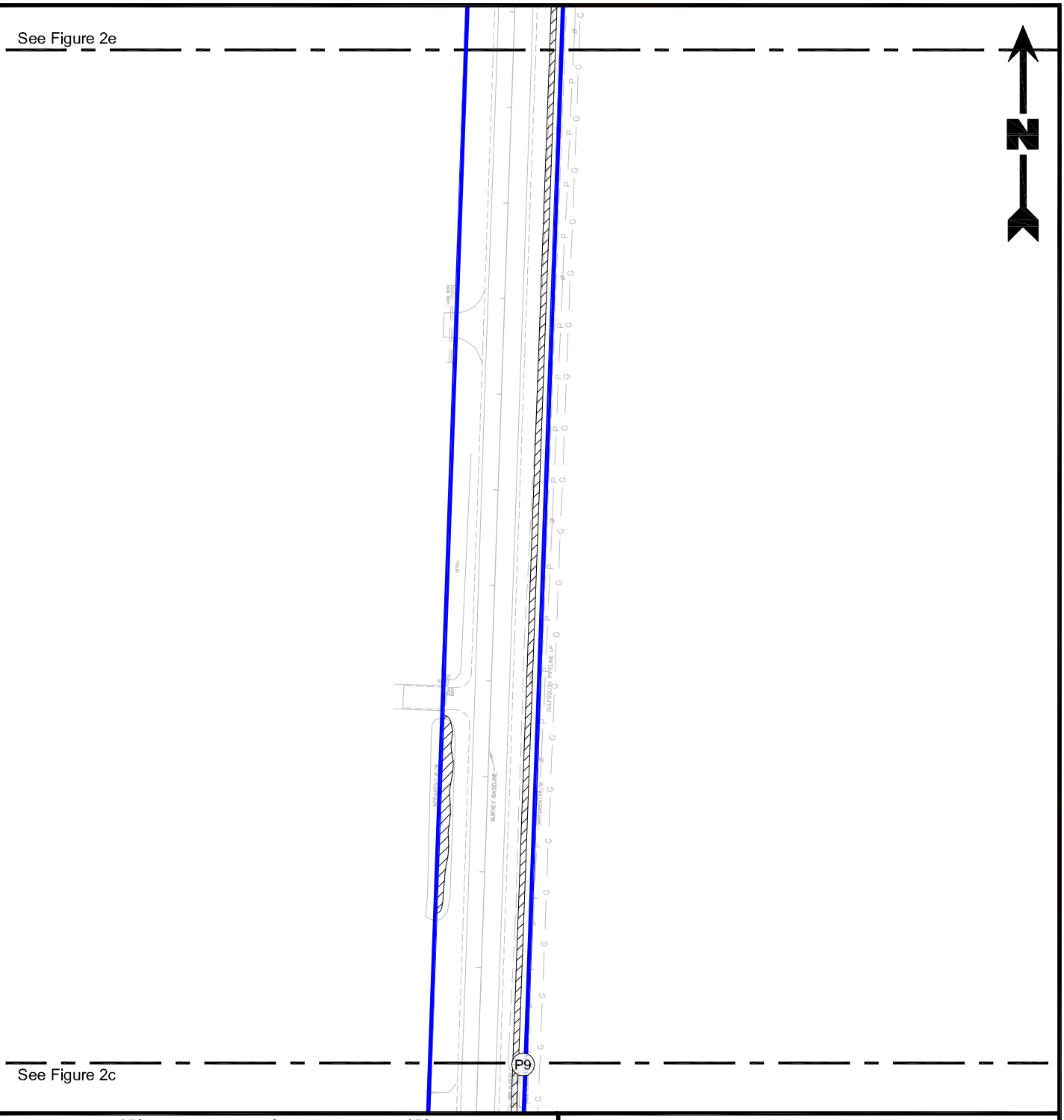
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A017

2c Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

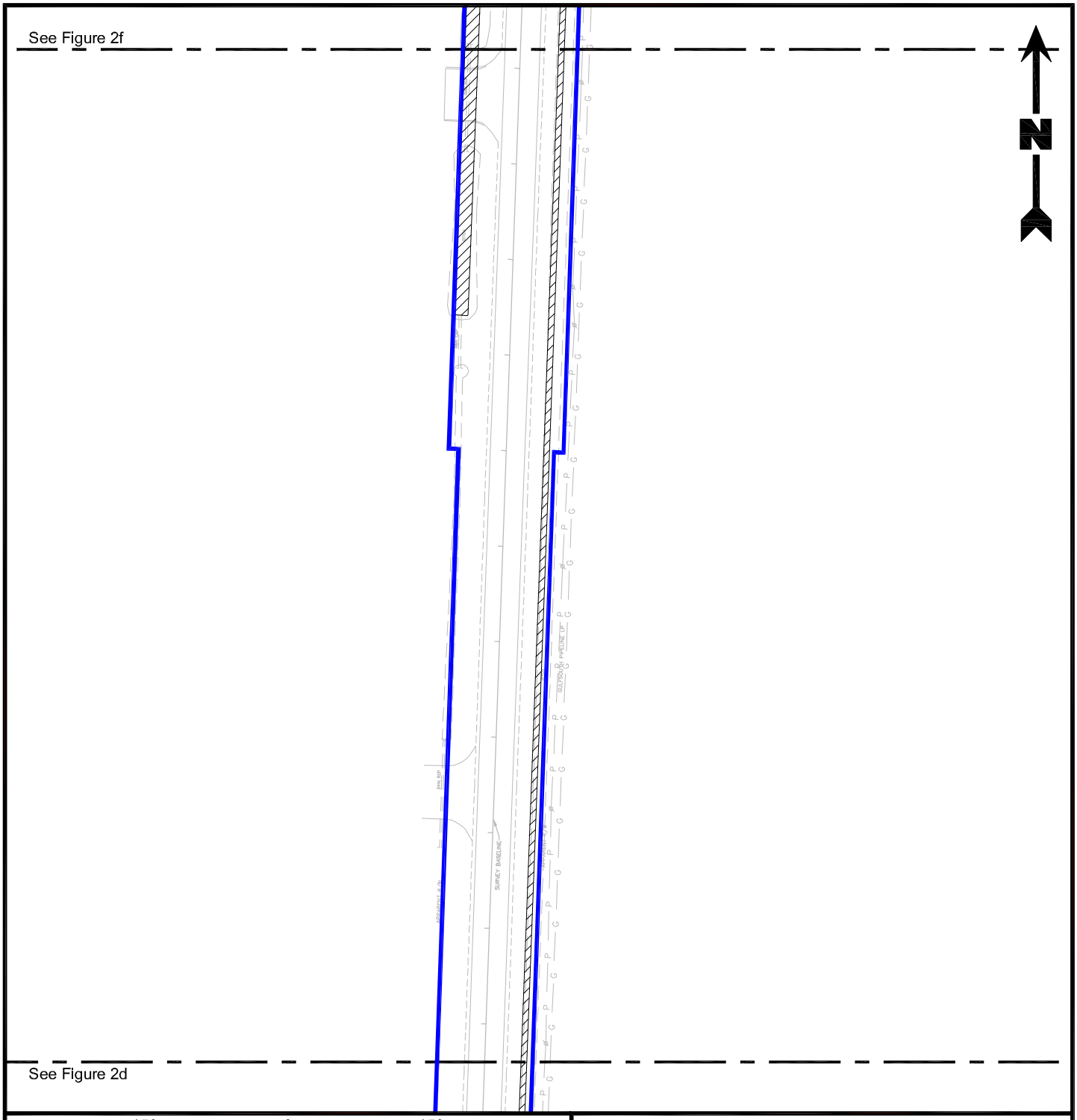
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A018

2d Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

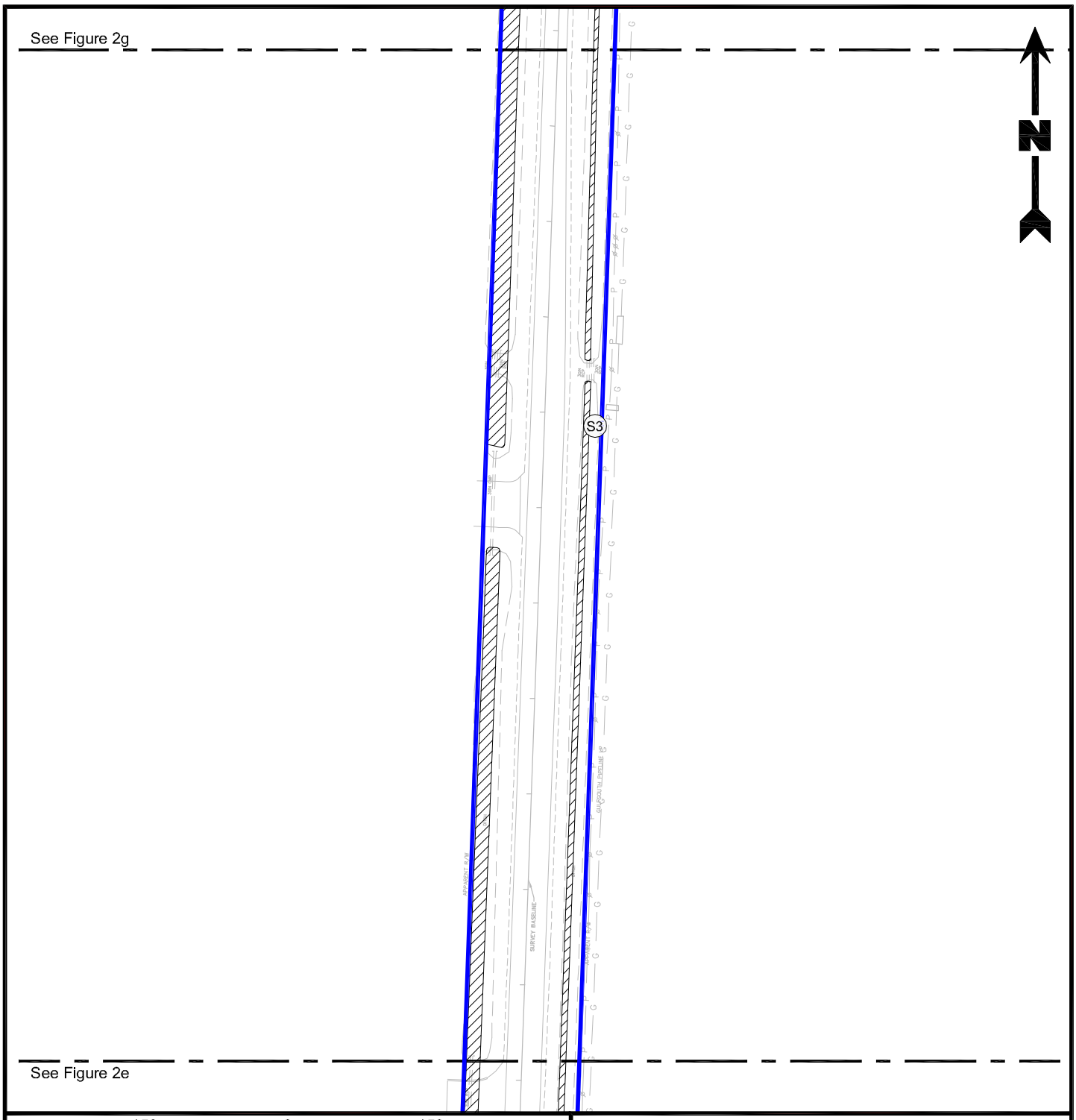
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A019

2e Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

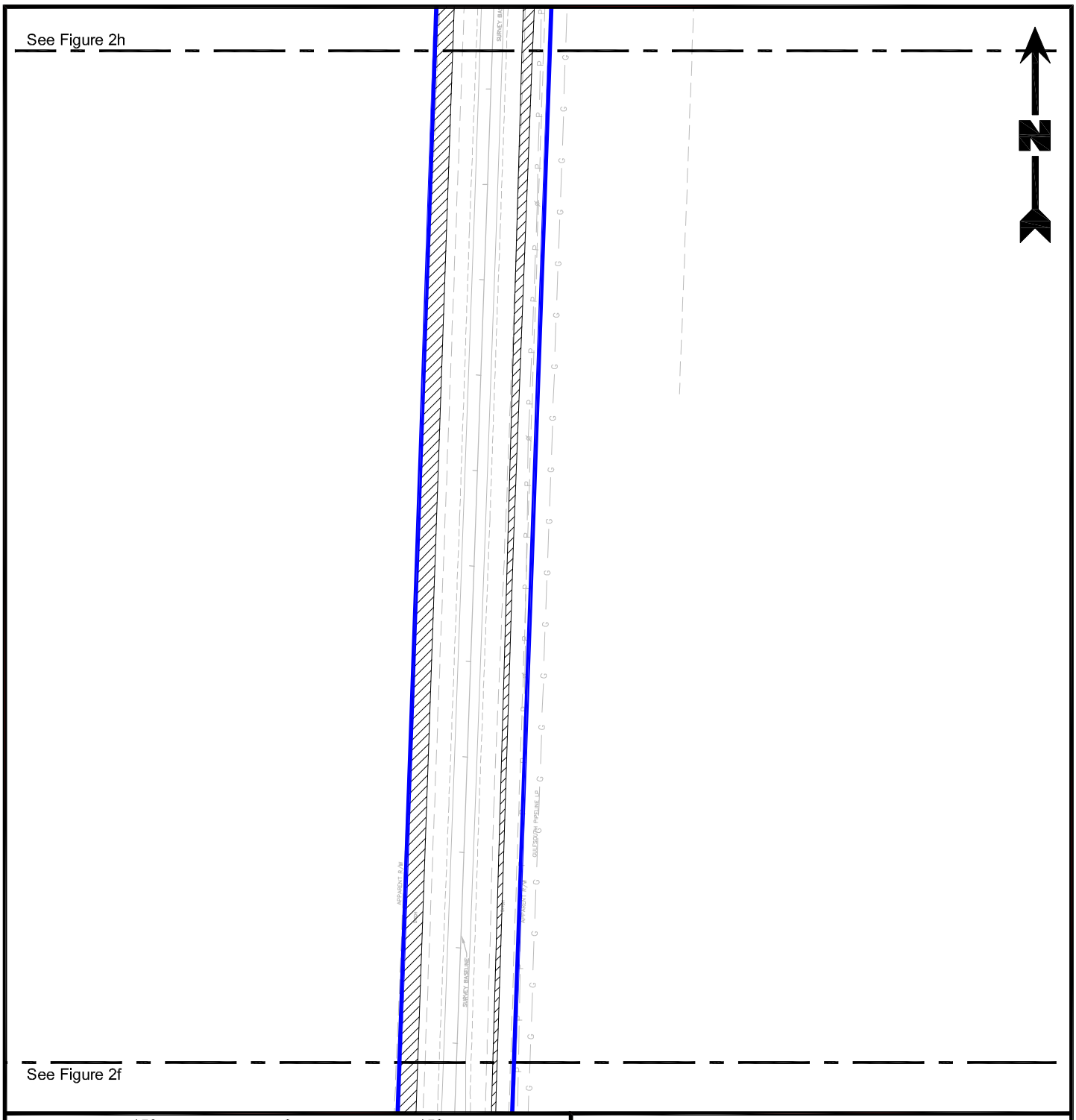
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A020

2f Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

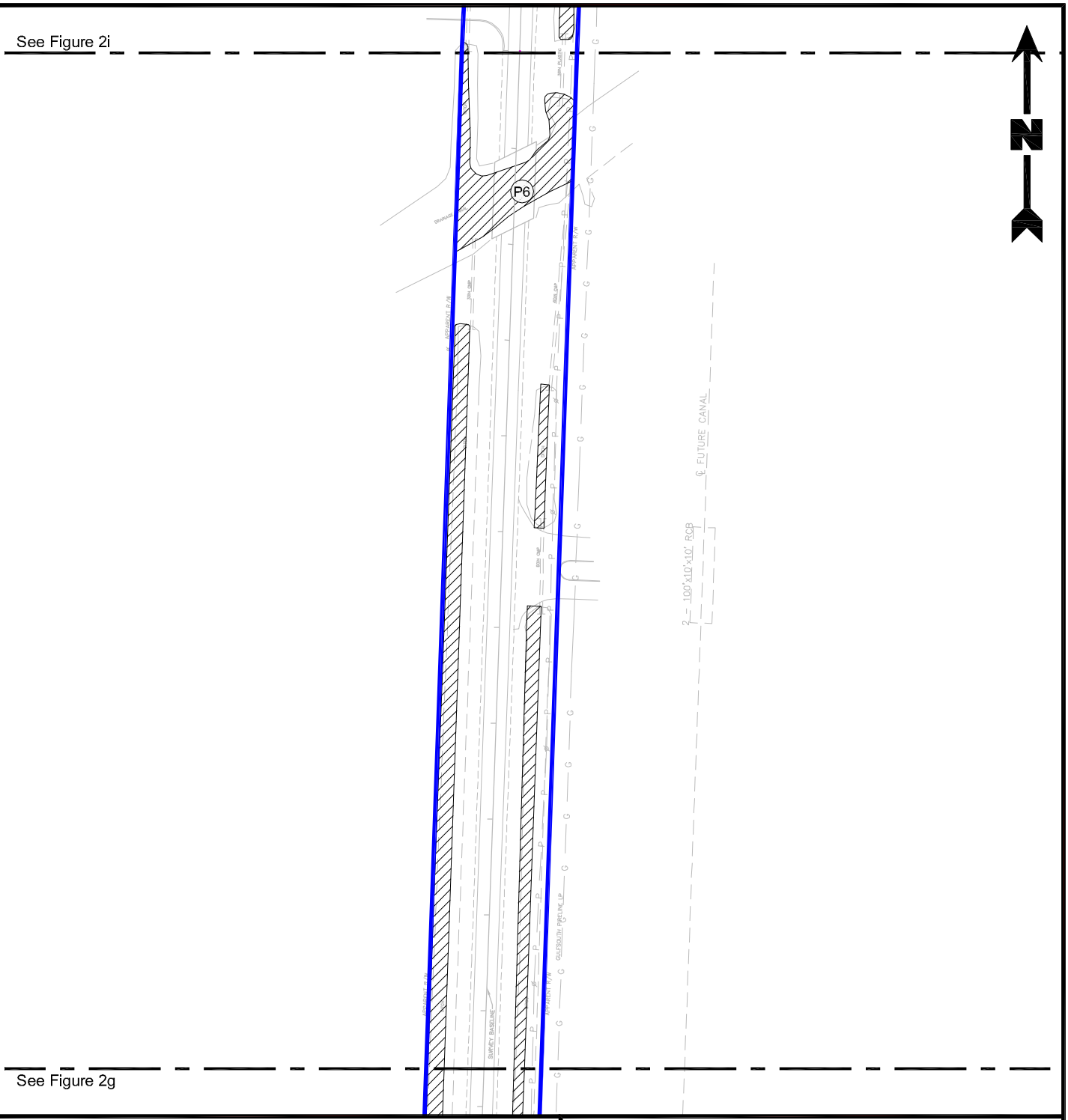
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A021

2g Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

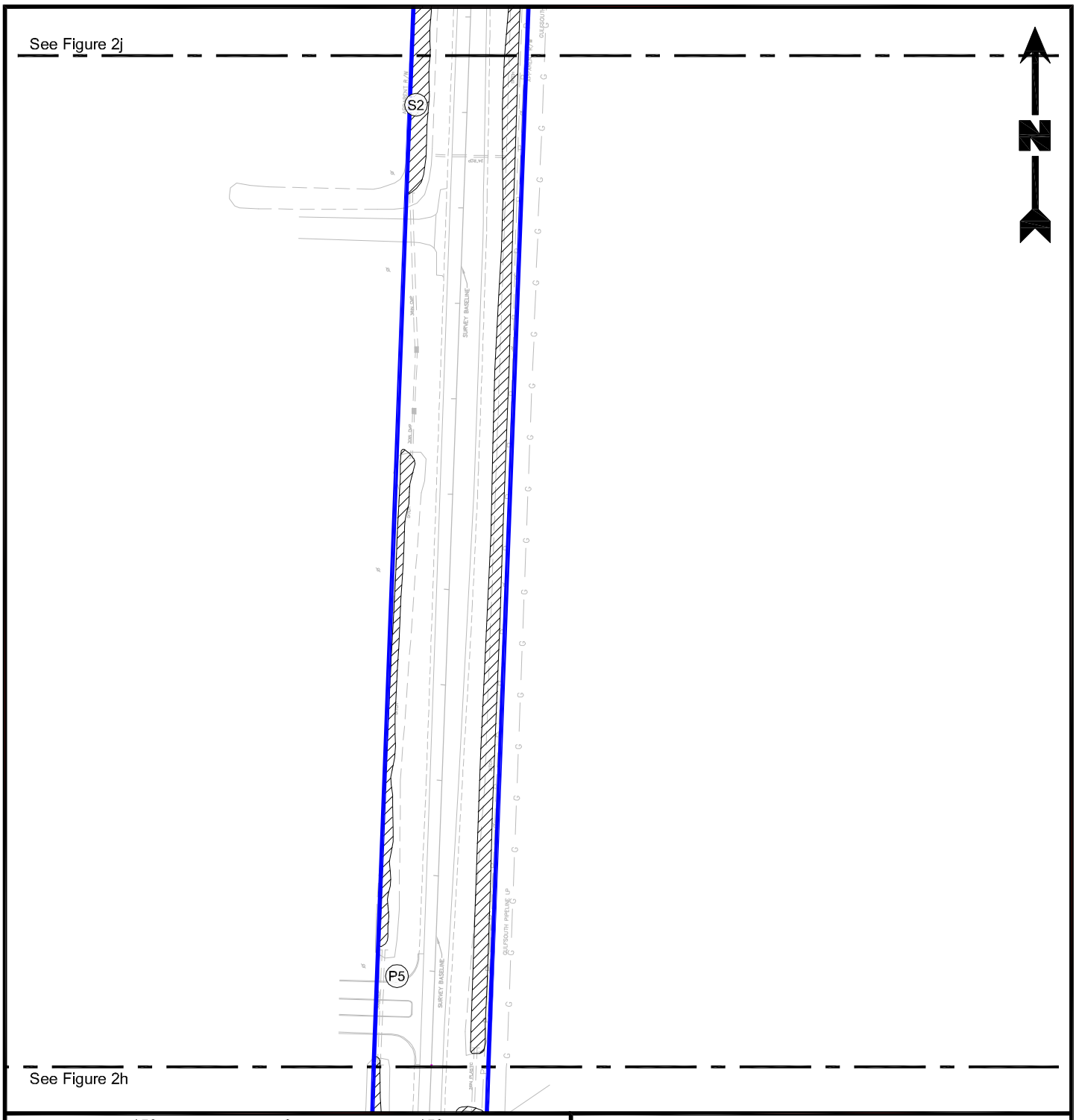
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A022

2h
Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

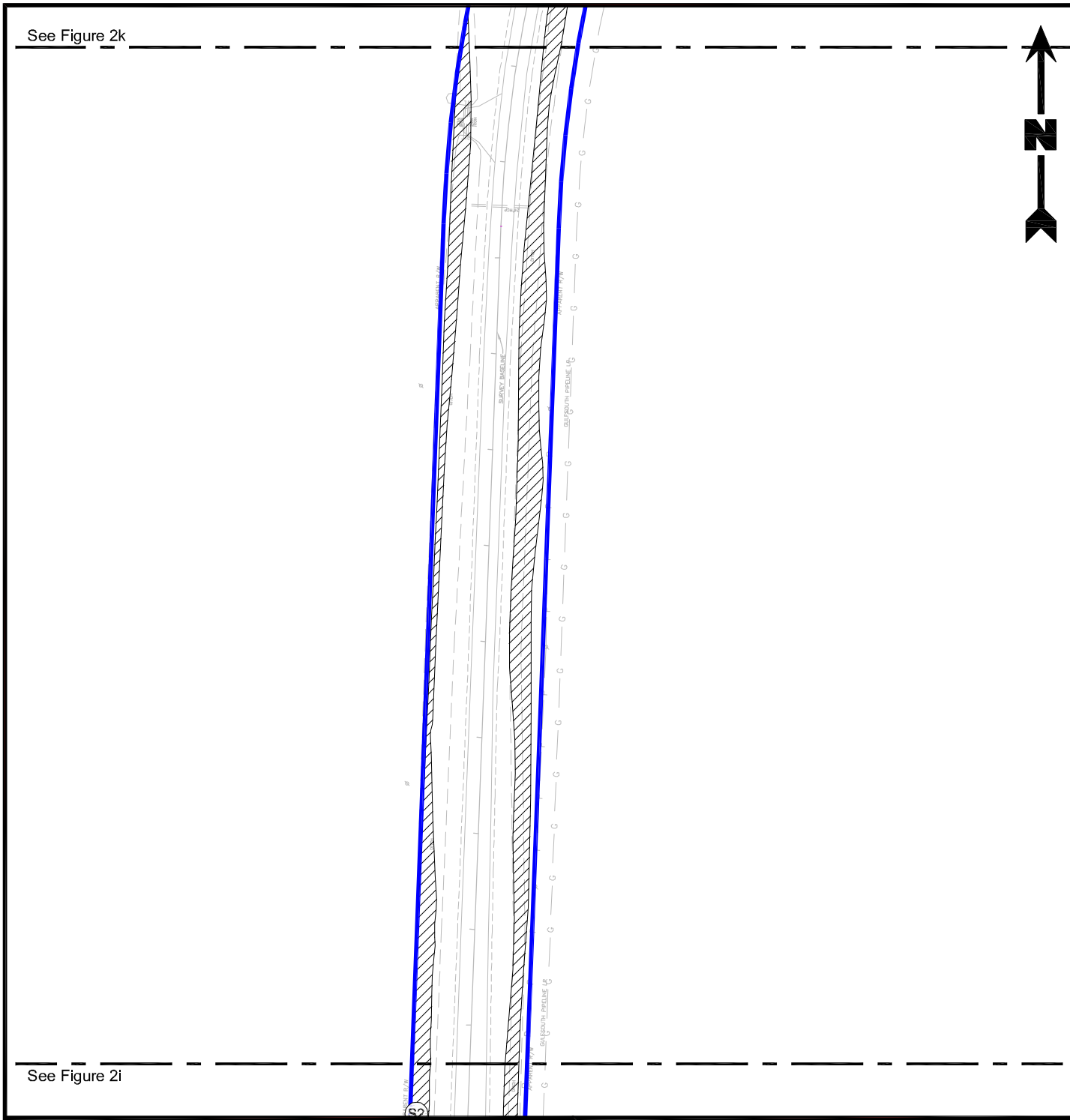
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A023

2i Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

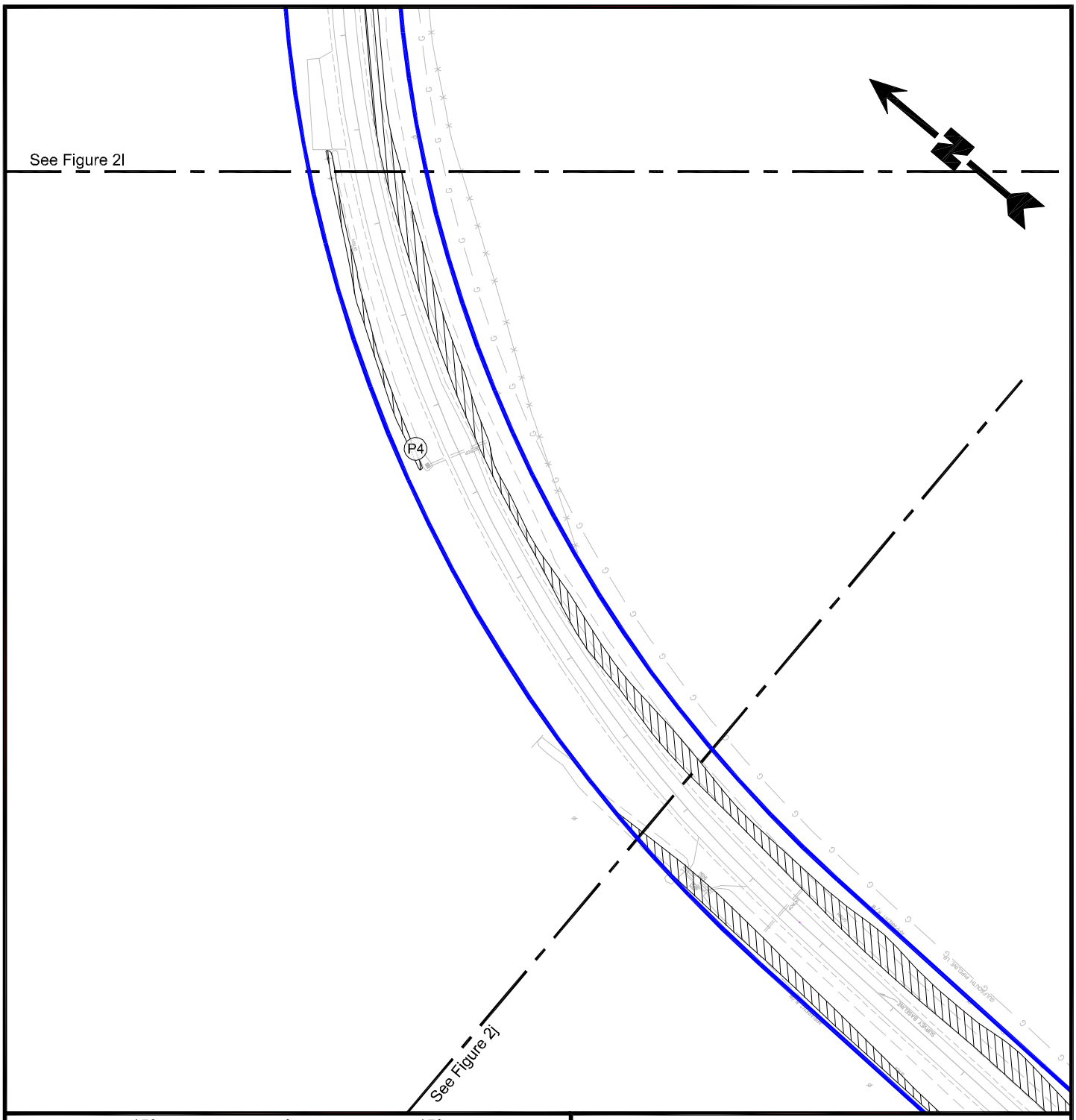
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A024

2j Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

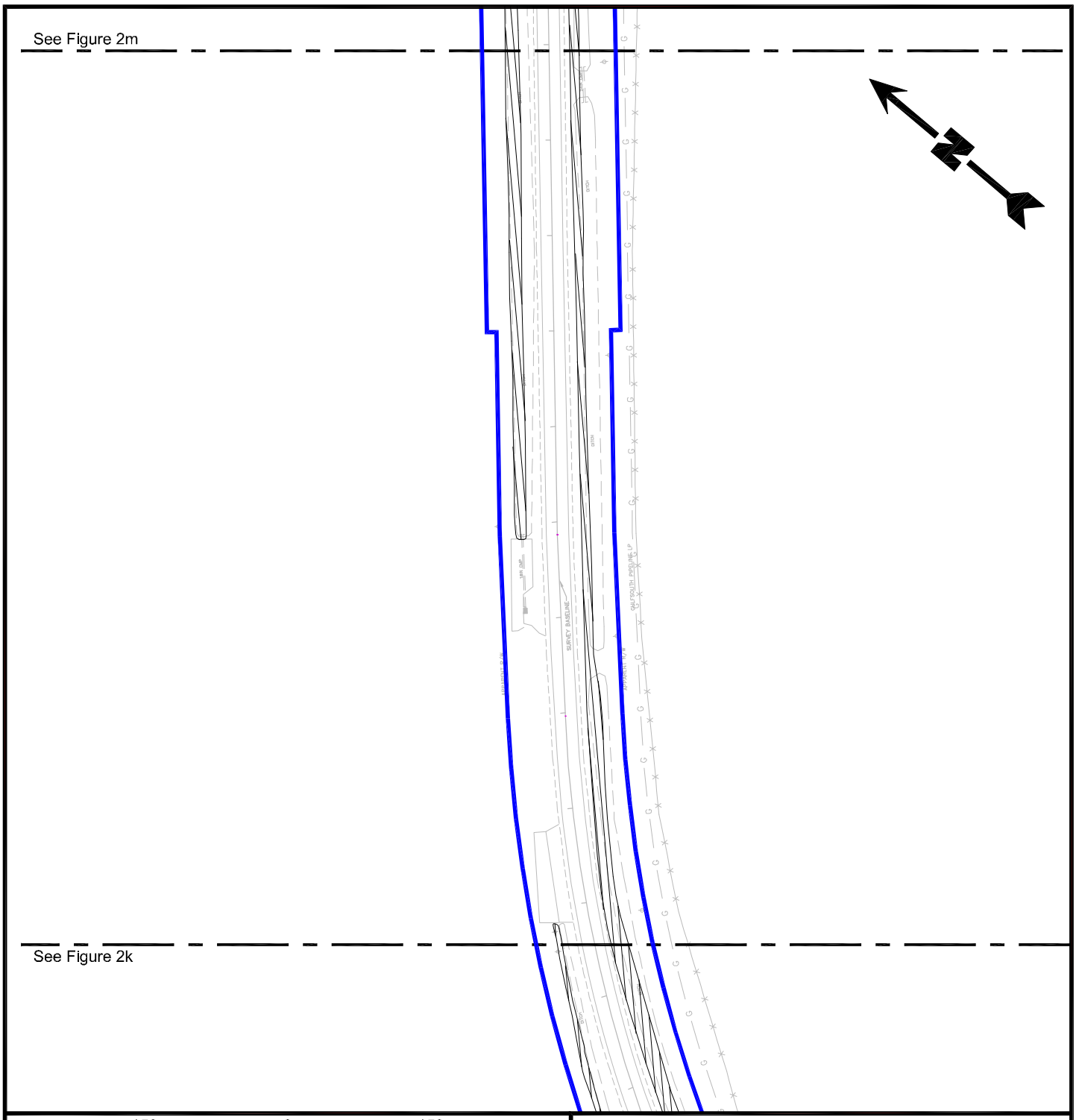
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A025

2k Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

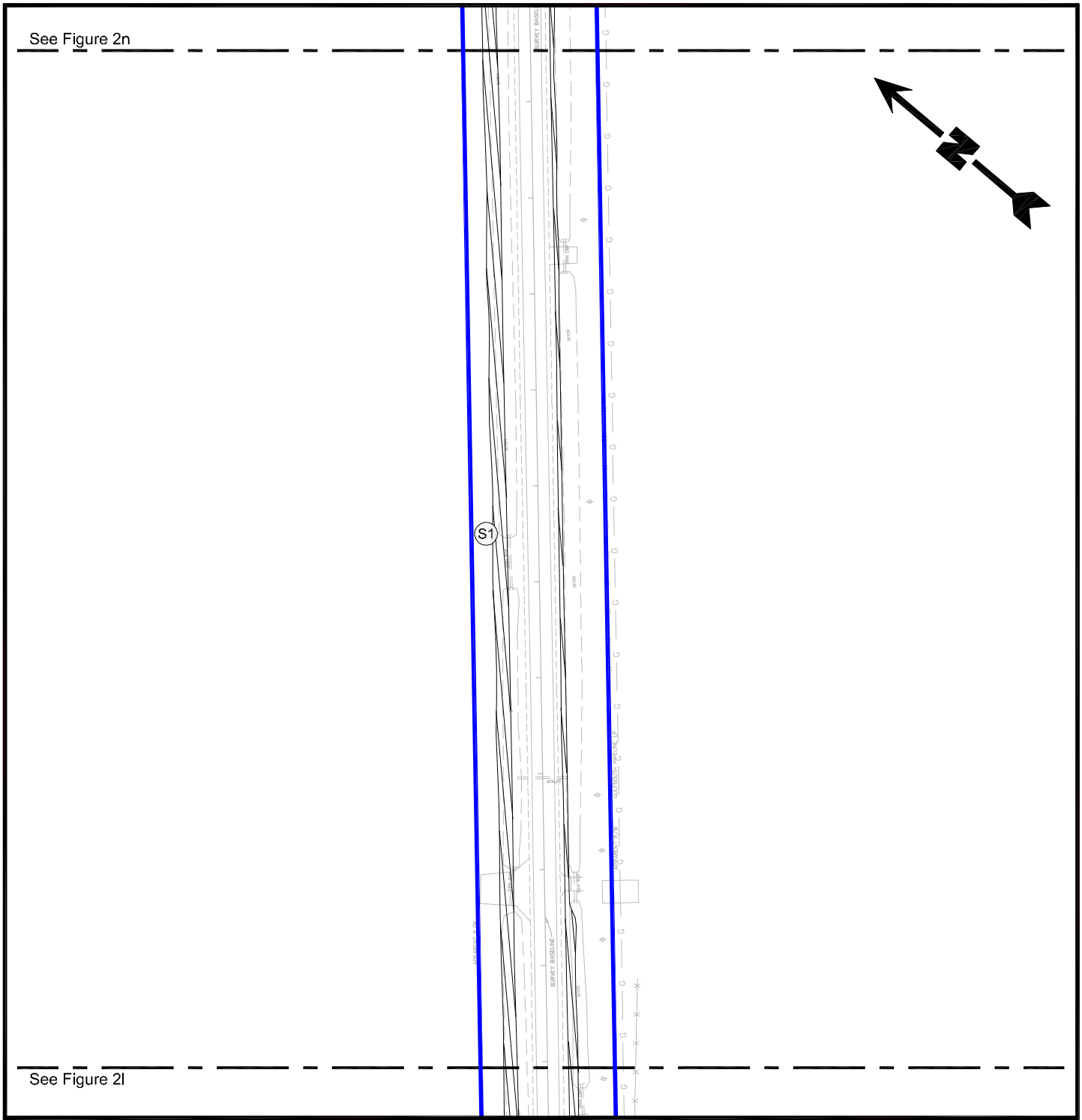
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A026

2I
Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

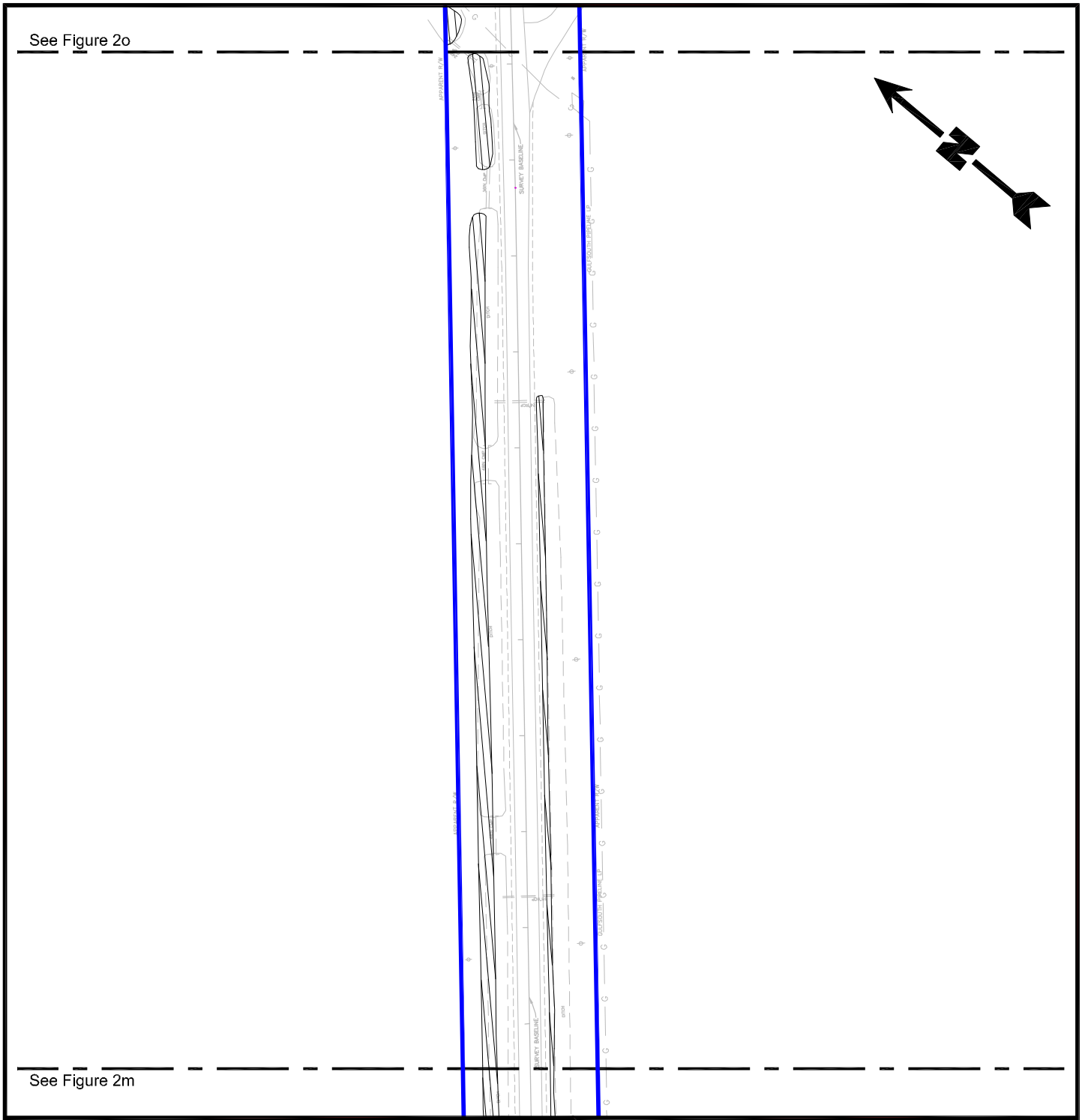
Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12
Project Number 788-001		
Drawing Number 788-001-A027		

2m
Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

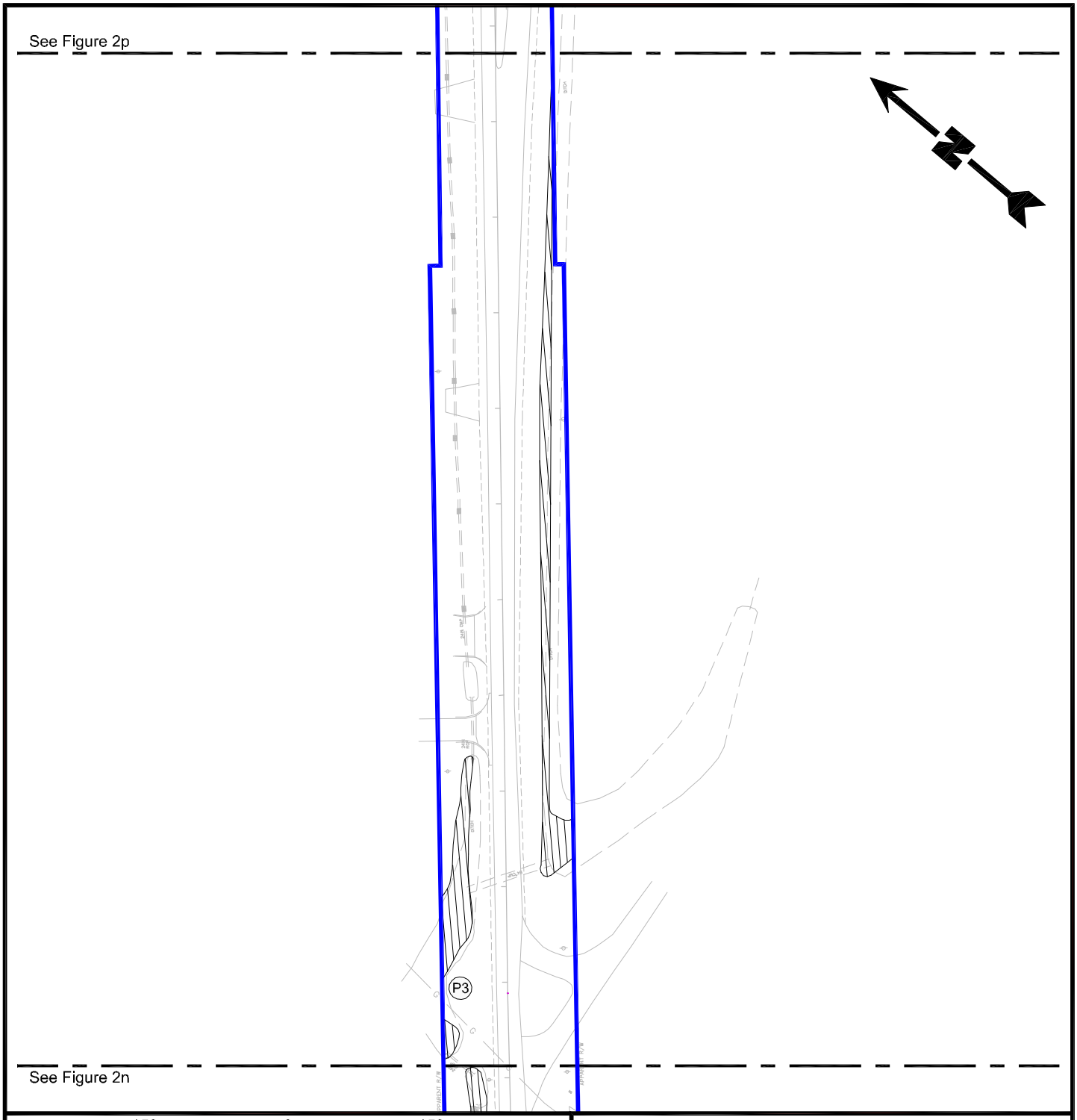
Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12
Project Number 788-001		
Drawing Number 788-001-A028		

2n
Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

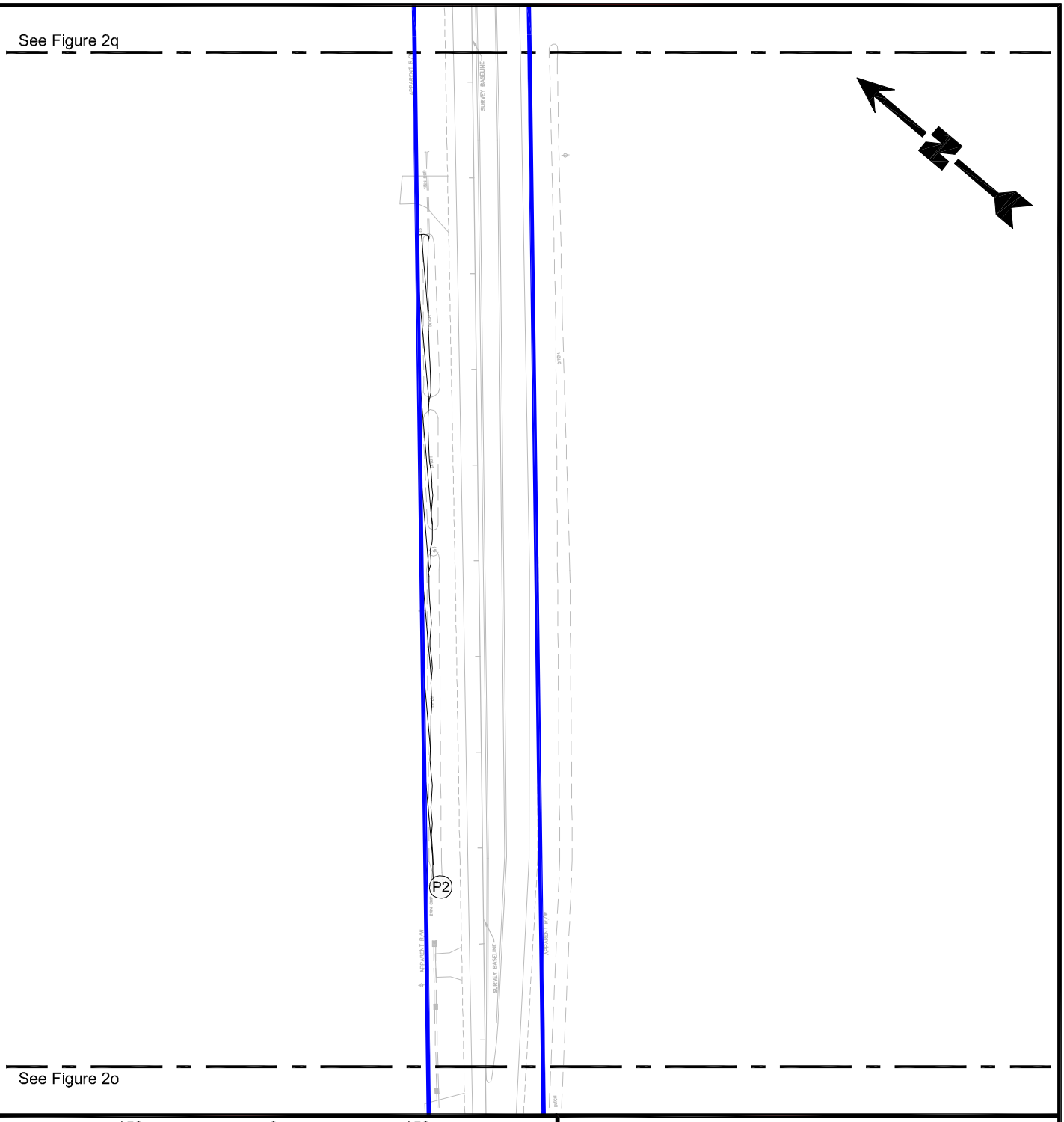
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A029

2o Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

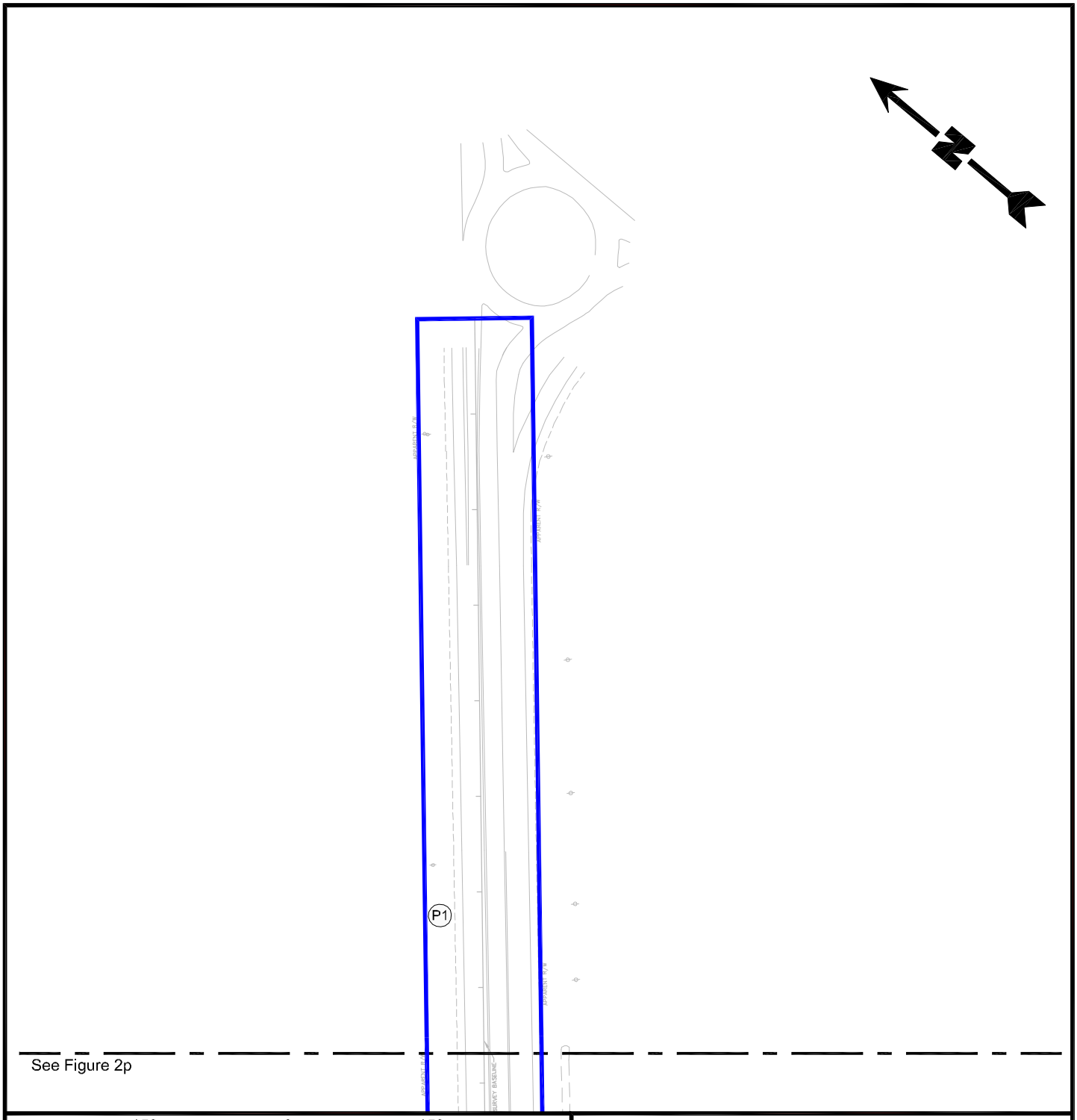
Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

Drawing Number 788-001-A030

2p Figure

Providence Engineering and Environmental Group LLC



150 0 150

Scale: 1" = 150'

Legend

- Project Area (46.79 Acres)
- Other Waters of the U.S. (5.95 Acres)
- (S1) Sample Location
- (P8) Photograph Location

Reference

Base map comprised of client provided figures titled: x-survey.dwg.

Site Plan

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

Project Number 788-001

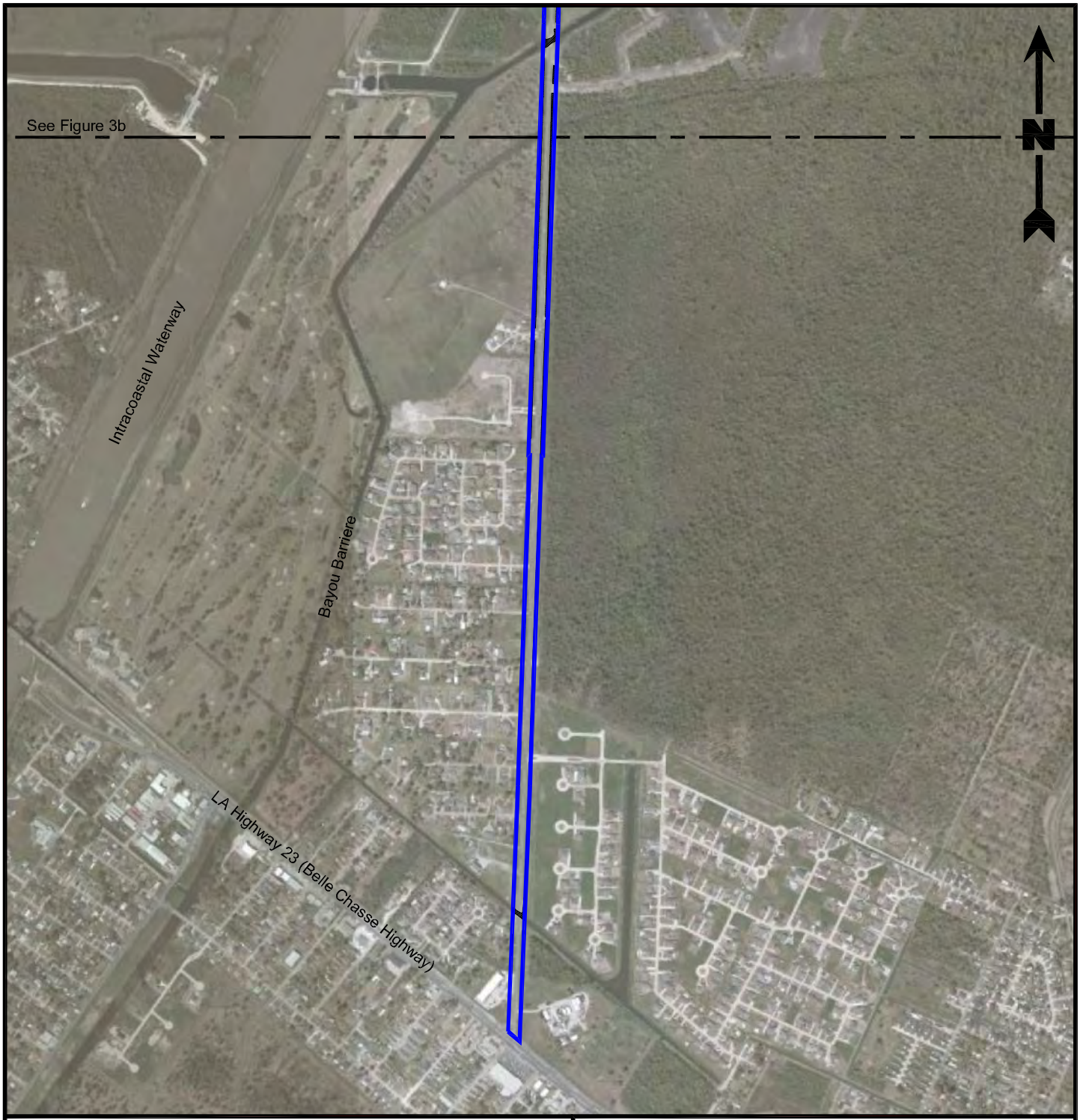
Drawing Number 788-001-A031

2q Figure

Providence Engineering and Environmental Group LLC

FIGURE 3a-3b

AERIAL PHOTOGRAPH



1,200 0 1,200

Scale: 1" = 1,200'

Legend

Project Area (46.79 Acres)

Other Waters of the U.S. (5.95 Acres)

Reference

Base map comprised of Bing Maps aerial imagery from (c) 2010 Microsoft Corporation and its data suppliers . Base map comprised of client provided figures titled: x-survey.dwg.

Aerial Photograph

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

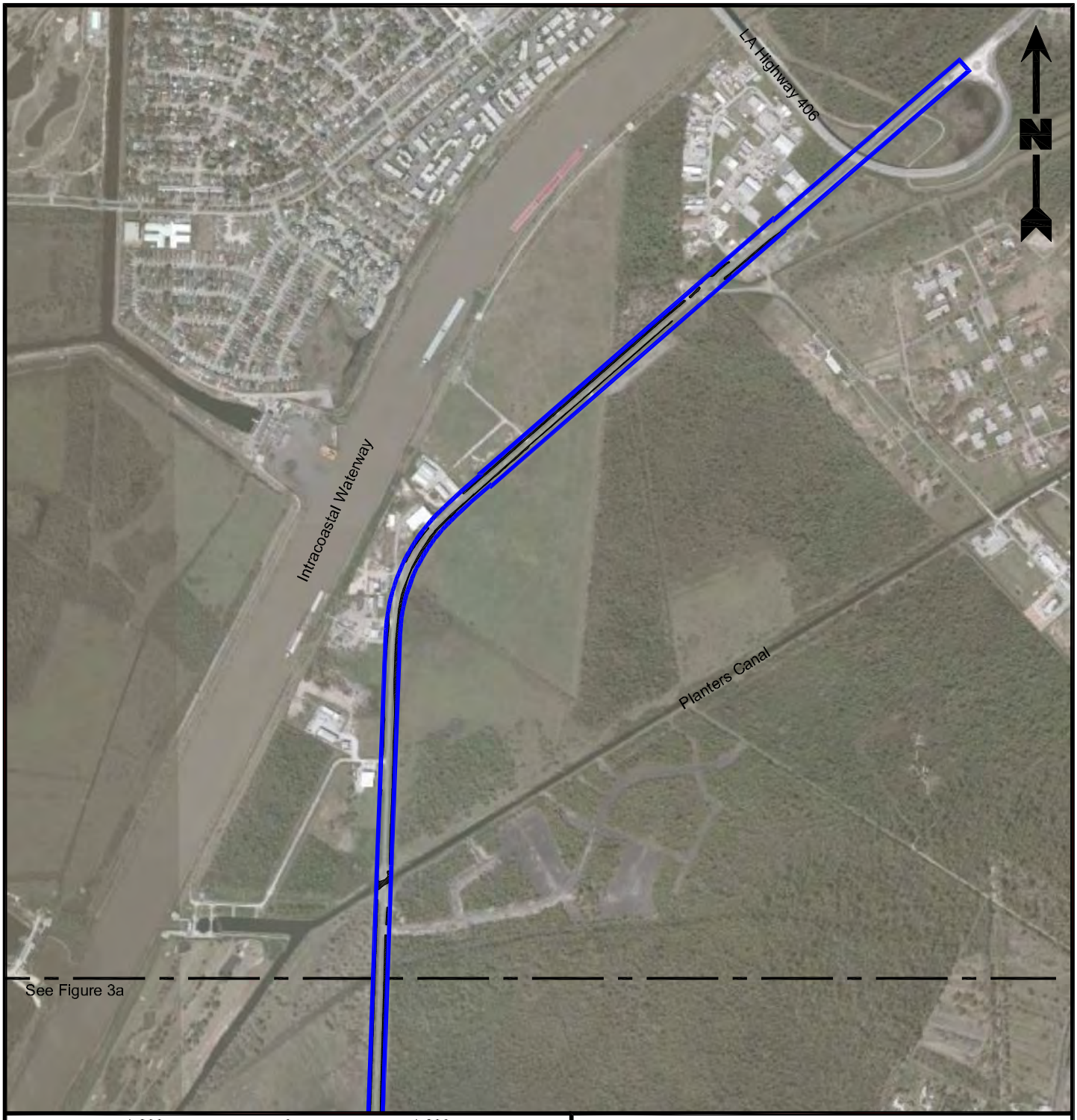
Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

PROVIDENCE

Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12
Project Number 788-001		
Drawing Number 788-001-A032		

3a
Figure

Providence Engineering and Environmental Group LLC



1,200 0 1,200

Scale: 1" = 1,200'

Legend

Project Area (46.79 Acres)

Other Waters of the U.S. (5.95 Acres)

Reference

Base map comprised of Bing Maps aerial imagery from (c) 2010 Microsoft Corporation and its data suppliers . Base map comprised of client provided figures titled: x-survey.dwg.

Aerial Photograph

Wetlands Finding Report
Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.
Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

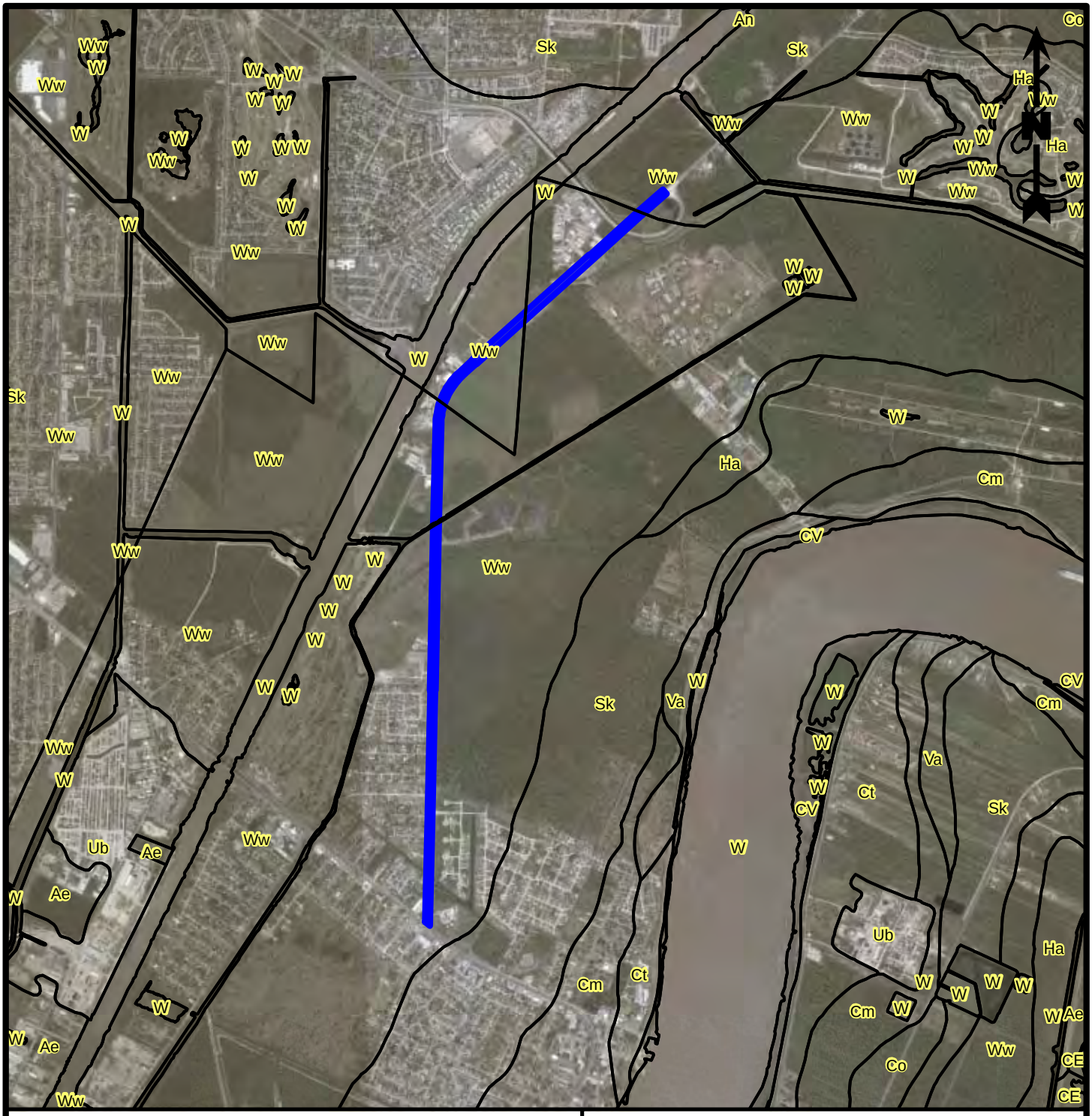
PROVIDENCE

Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12
Project Number 788-001		3b Figure
Drawing Number 788-001-A033		

Providence Engineering and Environmental Group LLC

FIGURE 4

SOILS MAP



3,000 1,500 0 3,000 Feet

Legend

Project Area (46.79 Acres)

Soils Data:

Ww - Westwego Clay

Reference

Base map comprised of Bing Maps aerial imagery from (c) 2010 Microsoft Corporation and its data suppliers. Soils data obtained from Natural Resources Conservation Service (NRCS) data-server.

Soils Map

Wetlands Finding Report

Plaquemines and Orleans Parishes, Louisiana

Volkert, Inc.

Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)

Drawn By	LMM	05/15/12
Checked By	LMH	05/15/12
Approved By	LAW	05/15/12

PROVIDENCE

Project Number 788-001

Drawing Number 788-001-A034

4 Figure

Providence Engineering and Environmental Group LLC

EXHIBIT 1

COPIES OF SITE PHOTOGRAPHS

	VOLKERT, INC.
Site Name:	Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)
Site Location:	Orleans and Plaquemines Parishes
Date:	May 10, 2012

Photograph #1A

Direction:

N/A

Comments:

Typical soil profile at Sample Location 1.

Photograph #1B

Direction:

Northeasterly

Comments:

View of habitat and typical landscape features at Sample Location 1.

	VOLKERT, INC.
Site Name:	Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)
Site Location:	Orleans and Plaquemines Parishes
Date:	May 10, 2012

Photograph #2A

Direction:

N/A

Comments:

Typical soil profile at Sample Location 2.

Photograph #2B

Direction:

Northerly

Comments:

View of habitat and typical landscape features at Sample Location 2.

	VOLKERT, INC.
Site Name:	Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)
Site Location:	Orleans and Plaquemines Parishes
Date:	May 10, 2012

Photograph #3A

Direction:

N/A

Comments:

Typical soil profile at Sample Location 3.

Photograph #3B

Direction:

Northerly

Comments:

View of habitat and typical landscape features at Sample Location 3.

	VOLKERT, INC.
Site Name:	Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)
Site Location:	Orleans and Plaquemines Parishes
Date:	May 10, 2012

Photograph #P1

Direction:

Southwesterly

Comments:

View of habitat and typical landscape features at P1.

Photograph #P2

Direction:

Southwesterly

Comments:

View of habitat and typical landscape features at P2.

VOLKERT, INC.

Site Name:	Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)
Site Location:	Orleans and Plaquemines Parishes
Date:	May 10, 2012

Photograph #P3

Direction:

Southwesterly

Comments:

View of habitat and typical landscape features at P3.

Photograph #P4

Direction:

Northeasterly

Comments:

View of habitat and typical landscape features at P4.

VOLKERT, INC.

Site Name:	Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)
Site Location:	Orleans and Plaquemines Parishes
Date:	May 10, 2012

Photograph #P5

Direction:

Northerly

Comments:

View of habitat and typical landscape features at P5.

Photograph #P6

Direction:

Easterly

Comments:

View of habitat and typical landscape features at P6.

	VOLKERT, INC.
Site Name:	Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)
Site Location:	Orleans and Plaquemines Parishes
Date:	May 10, 2012

Photograph #P7	
Direction: Southeasterly	
Comments: View of habitat and typical landscape features at P7.	

Photograph #P8	
Direction: Southerly	
Comments: View of habitat and typical landscape features at P8.	

	VOLKERT, INC.
Site Name:	Woodland Highway/LA 406 Widening (LA Hwy 23 to LA Hwy 407)
Site Location:	Orleans and Plaquemines Parishes
Date:	May 10, 2012

Photograph #P9

Direction:

Northerly

Comments:

View of habitat and typical landscape features at P9.

EXHIBIT 2

WETLAND DETERMINATION DATA FORMS – ATLANTIC AND GULF COASTAL PLAIN REGION

WETLAND DETERMINATION DATA FORM - ATLANTIC AND GULF COASTAL PLAIN REGION

Project/Site:	Woodland Highway/LA 406 Widening		Parish: Orleans	Sampling Date:	5/10/2012
Applicant/Owner:	Volkert, Inc.		State: Louisiana	Sampling Point:	1
Investigator(s):	Lee Womack & Monica Herrera		Section, Township, Range:	Section 28, Township 14 South, Range 24 East	
Landform (hillslope, terrace, etc.):	Flat		Local Relief (concave, convex, none): None		Slope: 0-1%
Subregion (LRR or MLRA):	LRR T	Lat: 29°53'46.16"N	Long: 89°59'23.47"W		Datum: Lat/Long NAD 83
Soil Map Unit Name:	Westwego clay		NWI Classification:		None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (If no explain in Remarks)
Are Vegetation_____, Soil_____, or Hydrology_____ significantly disturbed? No Are "Normal Circumstances" present? Yes
Are Vegetation_____, Soil_____, or Hydrology_____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	Yes	
Hydric Soil Present?	Yes	**Is the Sampled Area within a Wetland?** **No**
Wetland Hydrology Present?	No	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (Need 1):

No	Surface Water	No	Water Stained Leaves	No	Surface Soil Cracked
No	High Water Table	No	Aquatic Fauna	No	Sparsely Vegetated Concave Surf
No	Saturation	No	Marl Deposits	No	Drainage Patterns
No	Water Marks	No	Hydrogen Sulfide Odor	No	Moss Trim Lines
No	Sediment deposits	No	Oxidized Root Channels	No	Dry Season Water Table
No	Drift Deposits	No	Presence of Reduced Iron	No	Crayfish Burrows
No	Algal Mat or Crust	No	Recent Reduction in Tilled Soils	No	Saturation on Aerial Imagery
No	Iron Deposits	No	Thin Muck Surface	No	Geomorphic Position
No	Inundation on Aerial Imagery		Other (Explain in Remarks	No	Shallow Aquitard
				No	FAC-Neutral Test
				No	Sphagnum moss

Field Observations:

Surface Water Present?	None	Depth (inches):	N/A
Water table Present?	None	Depth (inches):	N/A
Saturation Present?	None	Depth (inches):	N/A

Wetland Hydrology Present? **No**

Remarks:

SOIL

Depth	Matrix		Redox Features				Texture
Inches	Color	%	Color	%	Type	Location	
0-16	10YR 3/2	90	10YR 3/6	10	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains Location: Pl=Pore Lining, M=Matrix

Hydric Soil Indicators:

No	Histol	No	Polyvalue Below Surface (S,T,U)	No	1cm Muck (O)
No	Histic Epipedon	No	Thin Dark Surface (S,T,U)	No	2cm Muck (S)
No	Black Histic	No	Loamy Mucky Mineral (O)	No	Reduced Vertic
No	Hydrogen Sulfide	No	Loamy Gleyed Matrix	No	Piedmont Floodplain Soils (P,S,T)
No	Stratified Layers	Yes	Depleted Matrix	No	Anomalous Bright Loamy Soils
No	Organic Bodies (P,T,U)	No	Redox Dark Surface	No	Red Parent Material
No	5cm Mucky Mineral (P,T,U)	No	Depleted Dark Surface	No	Very Shallow Dark Surface (T,U)
No	Muck Presence (U)	No	Redox Depressions		Other (Explain)
No	1cm Muck (P,T)	No	Marl (U)		
No	Depleted Below Dark Surface	No	Depleted Ochric (MLRA 151)		
No	Thick Dark Surface	No	Iron-Manganese Masses (O,P,T)		
No	Coast Prairie Redox (MLRA 150A)	No	Umbric Surface (P,T,U)		
No	Sandy Mucky Mineral (O,S)	No	Delta Ochric (MLRA 151)		
No	Sandy Gleyed Matrix	No	Reduced Vertic (MLRA 150A, 150B)		
No	Sandy Redox	No	Piedmont Floodplain Soils (MLRA 149A)		
No	Stripped Matrix	No	Anomalous Bright Loamy Soils (MLRA 149A, 153C, 153D)		
No	Dark Surface (P,S,T,U)				

Restrictive Layer (if observed):

Type: None
Depth inches: None

Hydric Soil Present? **Yes**

Remarks:

VEGETATION **SAMPLING POINT** 1

Tree Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
None				

0 = Total Cover

50/20 Threshold
50% of Total Cover = 0
20% of Total Cover = 0

Sapling Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
None				

0 = Total Cover

50/20 Threshold
50% of Total Cover = 0
20% of Total Cover = 0

Shrub Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
Rubus trivialis		10	Yes	FAC

10 = Total Cover

50/20 Threshold
50% of Total Cover = 5
20% of Total Cover = 2

Herb Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
Panicum virgatum		70	Yes	FAC
Solidago altissima		3	No	FACU
Juncus effusus		2	No	FACW
Ambrosia trifida		2	No	FAC
Elymus villosus		1	No	FAC

78 = Total Cover

50/20 Threshold
50% of Total Cover = 39
20% of Total Cover = 15.6

Woody Vine Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
None				

0 = Total Cover

50/20 Threshold
50% of Total Cover = 0
20% of Total Cover = 0

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC (A): 2

Total Number of Dominant Species Across All Strata (B): 2

Percent of Dominant Species That Are OBL, FACW, or FAC (A/B): 100.00%

Prevalence Index Worksheet:

Total % Cover of:		Multiply
	OBL	x1=
	FACW	x2=
	FAC	x3=
	FACU	x4=
	UPL	x5=
	A Totals	**B**

Prevalence Index (B/A)=

Hydrophytic Vegetation Indicators:

Dominance Test > 50%: Yes
Prevalence Index is ≤3.0: N/A
Problematic Hydrophytic Veg: No

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20' or more in height and 3" or larger in DBH.

Sapling - Woody plants, excluding woody vines, approximately 20' or more in height and less than 3" in DBH.

Shrub - Woody plants, excluding woody vines, approximately 3-20' in height.

Herb - All herbaceous plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3' in height.

Woody vine - All woody vines, regardless of height.

Remarks:

Hydrophytic Vegetation Present?

Yes

WETLAND DETERMINATION DATA FORM - ATLANTIC AND GULF COASTAL PLAIN REGION

Project/Site:	Woodland Highway/LA 406 Widening		Parish: Plaquemines	Sampling Date:	5/10/2012
Applicant/Owner:	Volkert, Inc.		State: Louisiana	Sampling Point:	2
Investigator(s):	Lee Womack & Monica Herrera		Section, Township, Range:	Section 26, Township 14 South, Range 24 East	
Landform (hillslope, terrace, etc.):	Flat		Local Relief (concave, convex, none): None		Slope: 0-1%
Subregion (LRR or MLRA):	LRR T	Lat: 29°53'18.41"N	Long: 89°59'40.55"W	Datum: Lat/Long NAD 83	
Soil Map Unit Name:	Westwego clay		NWI Classification:	None	

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (If no explain in Remarks)
Are Vegetation_____, Soil_____, or Hydrology_____ significantly disturbed? No Are "Normal Circumstances" present? Yes
Are Vegetation_____, Soil_____, or Hydrology_____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	No	**Is the Sampled Area within a Wetland?** **No**
Hydric Soil Present?	Yes	
Wetland Hydrology Present?	No	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (Need 1):

No	Surface Water	No	Water Stained Leaves	No	Surface Soil Cracked
No	High Water Table	No	Aquatic Fauna	No	Sparsely Vegetated Concave Surf
No	Saturation	No	Marl Deposits	No	Drainage Patterns
No	Water Marks	No	Hydrogen Sulfide Odor	No	Moss Trim Lines
No	Sediment deposits	No	Oxidized Root Channels	No	Dry Season Water Table
No	Drift Deposits	No	Presence of Reduced Iron	No	Crayfish Burrows
No	Algal Mat or Crust	No	Recent Reduction in Tilled Soils	No	Saturation on Aerial Imagery
No	Iron Deposits	No	Thin Muck Surface	No	Geomorphic Position
No	Inundation on Aerial Imagery		Other (Explain in Remarks	No	Shallow Aquitard
				No	FAC-Neutral Test
				No	Sphagnum moss

Field Observations:

Surface Water Present?	None	Depth (inches):	N/A
Water table Present?	None	Depth (inches):	N/A
Saturation Present?	None	Depth (inches):	N/A

Wetland Hydrology Present? **No**

Remarks:

SOIL

Depth	Matrix		Redox Features				Texture
Inches	Color	%	Color	%	Type	Location	
0-16	10YR 2/1	70	10YR 3/3	30	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains Location: Pl=Pore Lining, M=Matrix

Hydric Soil Indicators:

No	Histol	No	Polyvalue Below Surface (S,T,U)	No	1cm Muck (O)
No	Histic Epipedon	No	Thin Dark Surface (S,T,U)	No	2cm Muck (S)
No	Black Histic	No	Loamy Mucky Mineral (O)	No	Reduced Vertic
No	Hydrogen Sulfide	No	Loamy Gleyed Matrix	No	Piedmont Floodplain Soils (P,S,T)
No	Stratified Layers	Yes	Depleted Matrix	No	Anomalous Bright Loamy Soils
No	Organic Bodies (P,T,U)	No	Redox Dark Surface	No	Red Parent Material
No	5cm Mucky Minera (P,T,U)	No	Depleted Dark Surface	No	Very Shallow Dark Surface (T,U)
No	Muck Presence (U)	No	Redox Depressions		Other (Explain)
No	1cm Muck (P,T)	No	Marl (U)		
No	Depleted Below Dark Surface	No	Depleted Ochric (MLRA 151)		
No	Thick Dark Surface	No	Iron-Manganese Masses (O,P,T)		
No	Coast Prairie Redox (MLRA 150A)	No	Umbric Surface (P,T,U)		
No	Sandy Mucky Mineral (O,S)	No	Delta Ochric (MLRA 151)		
No	Sandy Gleyed Matrix	No	Reduced Vertic (MLRA 150A, 150B)		
No	Sandy Redox	No	Piedmont Floodplain Soils (MLRA 149A)		
No	Stripped Matrix	No	Anomalous Bright Loamy Soils (MLRA 149A, 153C, 153D)		
No	Dark Surface (P,S,T,U)				

Indicators for Problematic Soils:

Restrictive Layer (if observed):

Type: None
Depth inches: None

Hydric Soil Present? **Yes**

Remarks:

VEGETATION **SAMPLING POINT** 2

Tree Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
None				

0 = Total Cover

50/20 Threshold
50% of Total Cover = 0
20% of Total Cover = 0

Sapling Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
None				

0 = Total Cover

50/20 Threshold
50% of Total Cover = 0
20% of Total Cover = 0

Shrub Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
None				

0 = Total Cover

50/20 Threshold
50% of Total Cover = 0
20% of Total Cover = 0

Herb Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
Cynodon dactylon		40	Yes	FACU
Paspalum notatum		30	Yes	FACU
Medicago arabica		2	No	NL

72 = Total Cover

50/20 Threshold
50% of Total Cover = 36
20% of Total Cover = 14.4

Woody Vine Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
None				

0 = Total Cover

50/20 Threshold
50% of Total Cover = 0
20% of Total Cover = 0

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC (A): 0

Total Number of Dominant Species Across All Strata (B): 2

Percent of Dominant Species That Are OBL, FACW, or FAC (A/B): 0.00%

Prevalence Index Worksheet:

Total % Cover of:		Multiply
	OBL	x1=
	FACW	x2=
	FAC	x3=
	FACU	x4=
	UPL	x5=
	A Totals	**B**

Prevalence Index (B/A)=

Hydrophytic Vegetation Indicators:

Dominance Test > 50%: No
Prevalence Index is ≤3.0: N/A
Problematic Hydrophytic Veg: No

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20' or more in height and 3" or larger in DBH.

Sapling - Woody plants, excluding woody vines, approximately 20' or more in height and less than 3" in DBH.

Shrub - Woody plants, excluding woody vines, approximately 3-20' in height.

Herb - All herbaceous plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3' in height.

Woody vine - All woody vines, regardless of height.

Remarks:

Hydrophytic Vegetation Present?

No

WETLAND DETERMINATION DATA FORM - ATLANTIC AND GULF COASTAL PLAIN REGION

Project/Site:	Woodland Highway/LA 406 Widening		Parish: Plaquemines	Sampling Date:	5/10/2012
Applicant/Owner:	Volkert, Inc.		State: Louisiana	Sampling Point:	3
Investigator(s):	Lee Womack & Monica Herrera		Section, Township, Range:	Section 2, Township 14 South, Range 24 East	
Landform (hillslope, terrace, etc.):	Flat		Local Relief (concave, convex, none): None		Slope: 0-1%
Subregion (LRR or MLRA):	LRR T	Lat: 29°52'43.57"N	Long: 89°59'41.24"W	Datum: Lat/Long NAD 83	
Soil Map Unit Name:	Westwego clay		NWI Classification:	None	

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (If no explain in Remarks)
Are Vegetation_____, Soil_____, or Hydrology_____ significantly disturbed? No Are "Normal Circumstances" present? Yes
Are Vegetation_____, Soil_____, or Hydrology_____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	No	**Is the Sampled Area within a Wetland?** **No**
Hydric Soil Present?	Yes	
Wetland Hydrology Present?	No	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (Need 1):

No	Surface Water	No	Water Stained Leaves	No	Surface Soil Cracked
No	High Water Table	No	Aquatic Fauna	No	Sparsely Vegetated Concave Surf
No	Saturation	No	Marl Deposits	No	Drainage Patterns
No	Water Marks	No	Hydrogen Sulfide Odor	No	Moss Trim Lines
No	Sediment deposits	No	Oxidized Root Channels	No	Dry Season Water Table
No	Drift Deposits	No	Presence of Reduced Iron	No	Crayfish Burrows
No	Algal Mat or Crust	No	Recent Reduction in Tilled Soils	No	Saturation on Aerial Imagery
No	Iron Deposits	No	Thin Muck Surface	No	Geomorphic Position
No	Inundation on Aerial Imagery		Other (Explain in Remarks	No	Shallow Aquitard
				No	FAC-Neutral Test
				No	Sphagnum moss

Field Observations:

Surface Water Present?	None	Depth (inches):	N/A
Water table Present?	None	Depth (inches):	N/A
Saturation Present?	None	Depth (inches):	N/A

Wetland Hydrology Present? **No**

Remarks:

SOIL

Depth	Matrix		Redox Features				Texture
Inches	Color	%	Color	%	Type	Location	
0-16	10YR 4/1	60	10YR 3/1	30	C	M	clay
			10YR 5/6	10	C	M	clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains Location: Pl=Pore Lining, M=Matrix

Hydric Soil Indicators:

No	Histol	No	Polyvalue Below Surface (S,T,U)	No	1cm Muck (O)
No	Histic Epipedon	No	Thin Dark Surface (S,T,U)	No	2cm Muck (S)
No	Black Histic	No	Loamy Mucky Mineral (O)	No	Reduced Vertic
No	Hydrogen Sulfide	No	Loamy Gleyed Matrix	No	Piedmont Floodplain Soils (P,S,T)
No	Stratified Layers	Yes	Depleted Matrix	No	Anomalous Bright Loamy Soils
No	Organic Bodies (P,T,U)	No	Redox Dark Surface	No	Red Parent Material
No	5cm Mucky Mineral (P,T,U)	No	Depleted Dark Surface	No	Very Shallow Dark Surface (T,U)
No	Muck Presence (U)	No	Redox Depressions		Other (Explain)
No	1cm Muck (P,T)	No	Marl (U)		
No	Depleted Below Dark Surface	No	Depleted Ochric (MLRA 151)		
No	Thick Dark Surface	No	Iron-Manganese Masses (O,P,T)		
No	Coast Prairie Redox (MLRA 150A)	No	Umbric Surface (P,T,U)		
No	Sandy Mucky Mineral (O,S)	No	Delta Ochric (MLRA 151)		
No	Sandy Gleyed Matrix	No	Reduced Vertic (MLRA 150A, 150B)		
No	Sandy Redox	No	Piedmont Floodplain Soils (MLRA 149A)		
No	Stripped Matrix	No	Anomalous Bright Loamy Soils (MLRA 149A, 153C, 153D)		
No	Dark Surface (P,S,T,U)				

Indicators for Problematic Soils:

Restrictive Layer (if observed):

Type: None
Depth inches: None

Hydric Soil Present? **Yes**

Remarks:

Tree Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
None				

0 = Total Cover

50/20 Threshold
50% of Total Cover = 0
20% of Total Cover = 0

Sapling Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
None				

0 = Total Cover

50/20 Threshold
50% of Total Cover = 0
20% of Total Cover = 0

Shrub Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
None				

0 = Total Cover

50/20 Threshold
50% of Total Cover = 0
20% of Total Cover = 0

Herb Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
Sorghum halepense		65	Yes	FACU
Solidago altissima		2	No	FACU

67 = Total Cover

50/20 Threshold
50% of Total Cover = 33.5
20% of Total Cover = 13.4

Woody Vine Stratum	Plot Size: 30'	Absolute % Cover	Dominant Species	Indicator Status
None				

0 = Total Cover

50/20 Threshold
50% of Total Cover = 0
20% of Total Cover = 0

Dominance Test Worksheet:

Number of Dominant Species That are OBL, FACW, or FAC (A): 0

Total Number of Dominant Species Across All Strata (B): 1

Percent of Dominant Species That Are OBL, FACW, or FAC (A/B): 0.00%

Prevalence Index Worksheet:

Total % Cover of:		Multiply
	OBL	x1=
	FACW	x2=
	FAC	x3=
	FACU	x4=
	UPL	x5=
	A Totals	**B**

Prevalence Index (B/A)=

Hydrophytic Vegetation Indicators:

Dominance Test > 50%: No
Prevalence Index is ≤3.0: N/A
Problematic Hydrophytic Veg: No

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20' or more in height and 3" or larger in DBH.

Sapling - Woody plants, excluding woody vines, approximately 20' or more in height and less than 3" in DBH.

Shrub - Woody plants, excluding woody vines, approximately 3-20' in height.

Herb - All herbaceous plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3' in height.

Woody vine - All woody vines, regardless of height.

Remarks:

Hydrophytic Vegetation Present?

No

APPENDIX F

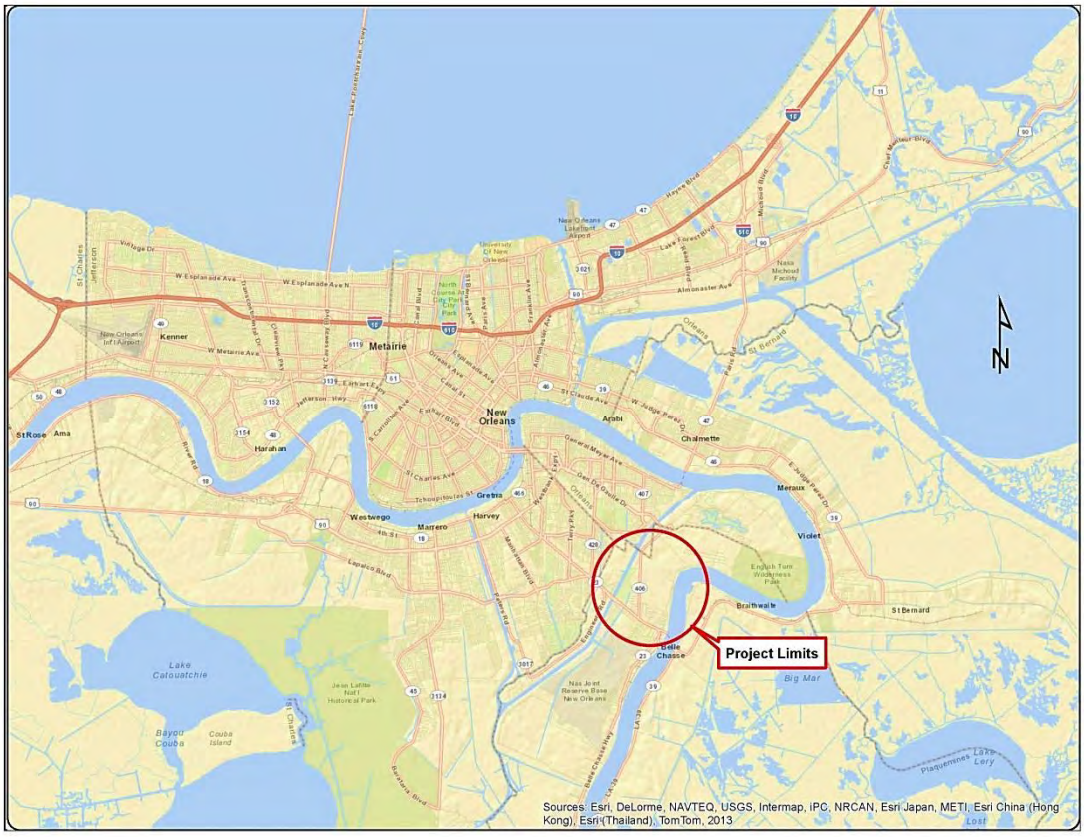
Traffic Report

Traffic Analysis

Stage 1 Environmental Assessment of

LA 406 (Woodland HWY) from General De Gaulle Dr to LA 23

PLAQUEMINES AND ORLEANS PARISHES, LA



Prepared by

VOLKERT

STATE OF LOUISIANA
STEVE R. COMMANDER
License No. 23213
PROFESSIONAL ENGINEER

April 2013

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Appendix A---Volume Analysis Worksheets

Appendix B---Projected Volumes

Appendix C---AM Counts

Appendix D---PM counts

Introduction

This report was developed in conjunction with the Stage 1 Environmental Assessment, for the LA 406 (Woodland Highway) widening from LA Hwy 23(Belle Chasse Highway) to LA Hwy 407 (General De Gaulle Drive) in Plaquemines and Orleans Parish. It was developed to assess the existing and future traffic volumes for a Build and No Build scenario.

The purpose of this widening project is to reduce existing traffic congestion and improve safety. It is needed to accommodate current and future traffic demands along the corridor created by continued residential and commercial development along Woodland Highway as well as area developments, including the Federal City project in Algiers and the expansion of services at the Naval Air Station Joint Reserve Base in Belle Chase.

The objectives of this traffic study was to evaluate the future traffic volumes as it relates to the proposed improvements to widening LA 406 (Woodland Highway) to a four lane facility. The analysis includes developing future traffic volumes for the year 2038, and comparing those volumes to the capacity for a "Build" and "No Build Scenario. Recommendations were to be developed for any improvements needed for the mainline and the two end intersections.

Study Area

The limits of the project are from LA 23 (Belle Chasse Highway) to the south, to General De Gaulle Drive (LA 407) to the north, a distance of approximately 3.27 miles (see figures 1 & 2). Both LA 23 and General De Gaulle Drive are classified as Principal Arterials as is Woodland Highway. The intersection at LA 23 has been improved to accommodate left and right turn lanes and is a signalized intersection. Woodland Highway then narrows down to a three lane facility for approximately one mile. There is an added left turn lane at Chancellor Drive, after which the highway narrows to a two lane facility and ultimately to a four lane divided highway at the General De Gaulle intersection. Hebert Drive is an intersection along the route that currently ties in to the highway at a very bad angle and is proposed to be improved as part of the widening project.

The existing surrounding land is mostly undeveloped but does include residential, industrial, shopping and trade activities, which were identified in the 2004 Feasibility Study for Woodland Highway (LA 406) Widening –Belle Chasse Highway to English Turn prepared for the Regional

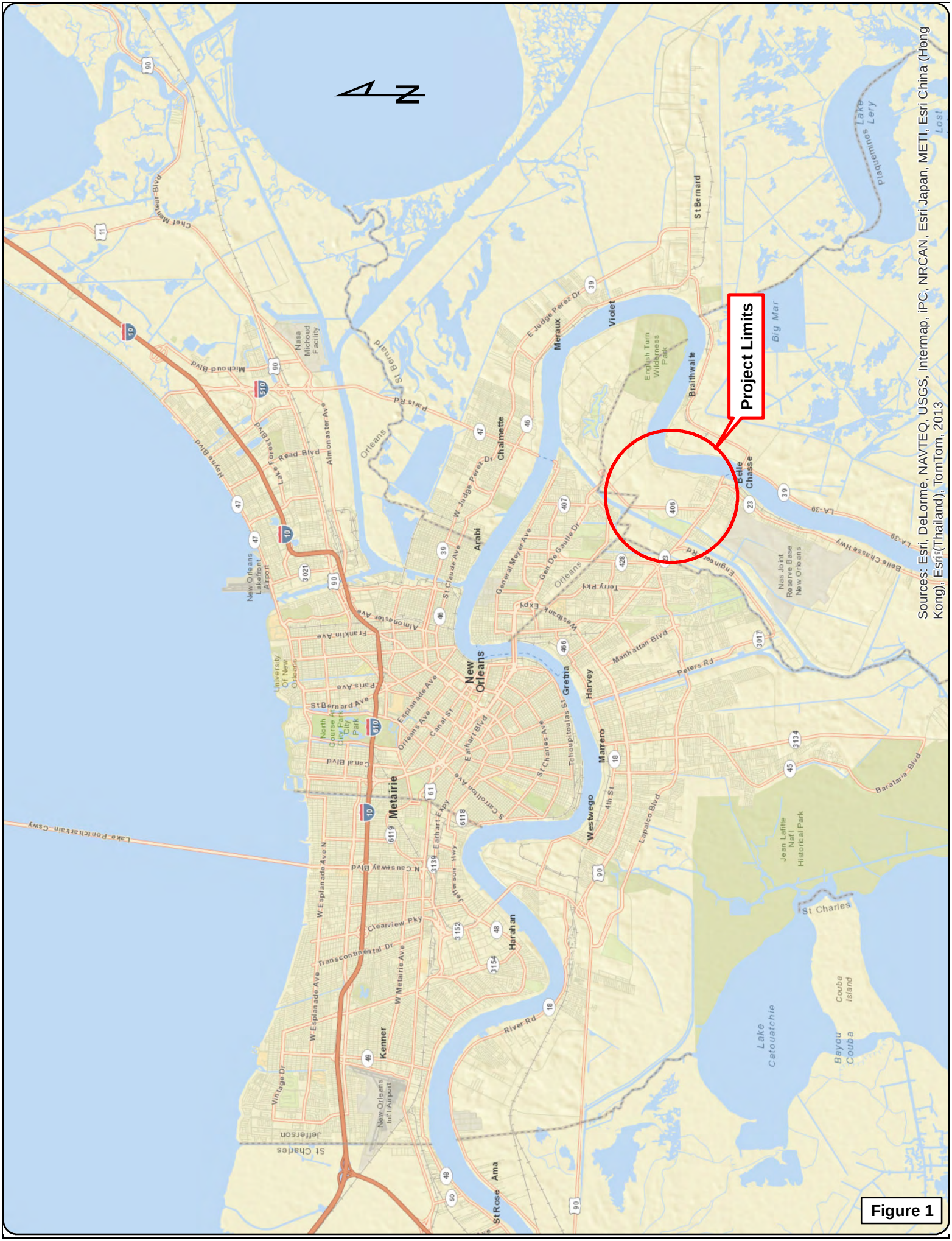
Project Limits
Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

Figure 1

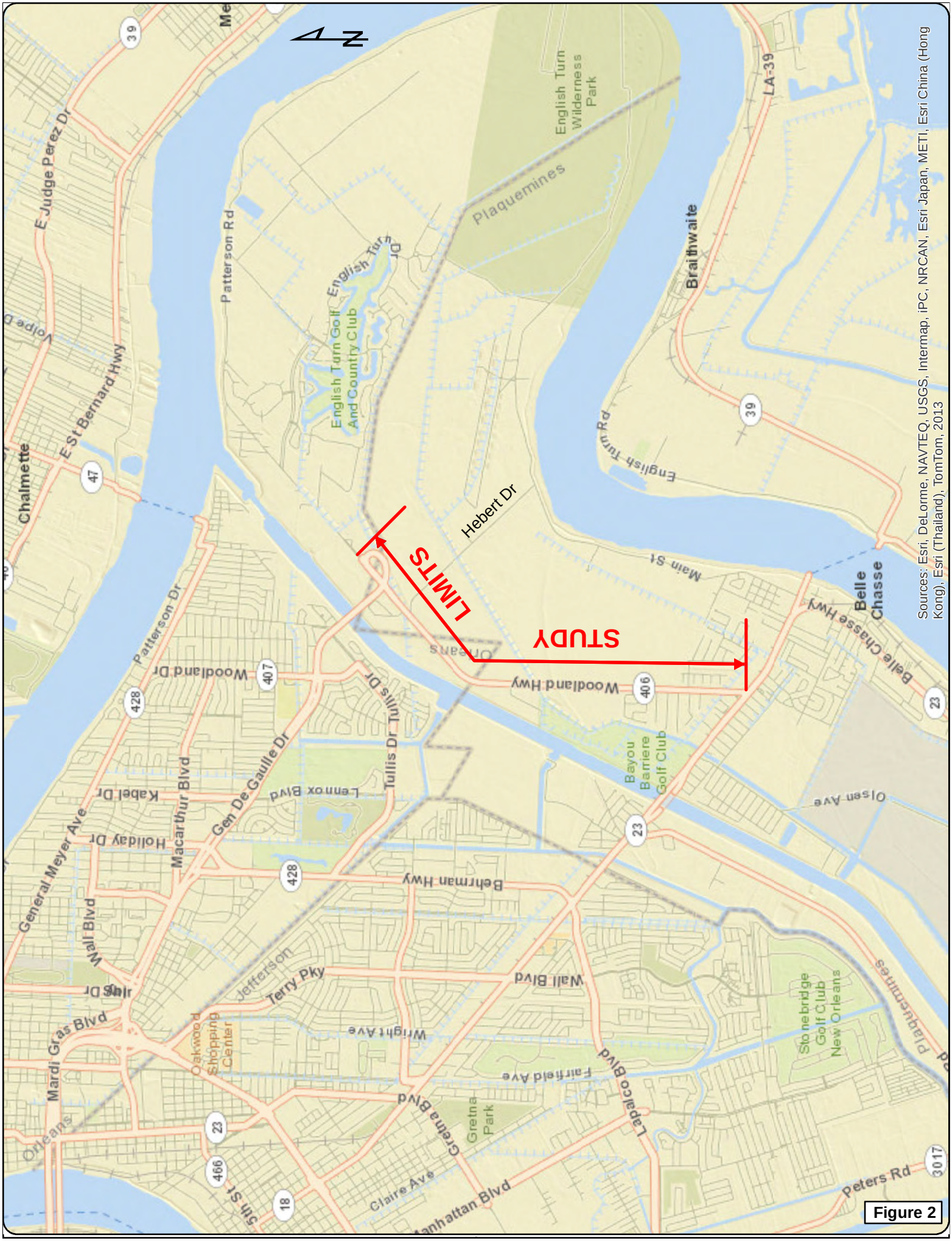
N
STUDY
LIMITS
Hebert Dr
Plaquemines
English Turn Wilderness Park
English Turn Golf And Country Club
Patterson Rd
E Judge Perez Dr
E St Bernard Hwy
Chalmette
LA-39
Braithwaite
Belle Chasse
Belle Chasse Hwy
Woodland Hwy
Patterson Dr
Tullis Dr
Gen De Gaulle Dr
Macarthur Blvd
Lennox Blvd
Behrman Hwy
Wall Blvd
Terry Pky
Jefferson
Mardi Gras Blvd
Oakwood Shopping Center
Wright Ave
Fairfield Ave
Gretna Blvd
Gretna Park
Lapalco Blvd
Claire Ave
Manhattan Blvd
Peters Rd
Stonebridge Golf Club New Orleans
Bayou Barriere Golf Club
Olsen Ave
Main St
Orleans
Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

Figure 2

Planning Commission. It identifies future land growth for the area and predicts that residential is the largest percentage of the area growth. Other areas of growth include shopping, industrial manufacturing, social institutional, natural resource related activities, and leisure activities. The only land use projected to decline is the no human activity land use. This growth projection has been used to project traffic growth utilizing trip generation models.

The proposed widening begins at LA 23 and ends approximately 0.30 miles west of the General De Gaulle Dr. intersection. The widening will include adding two lanes so that the ultimate finished product will be a four lane divided highway with a raised grassed median that will open for designated left turn lanes and intersections.

The following scenarios were analyzed:

- 2011 Existing Conditions
- 2038 No Build Conditions
- 2011 Build Conditions
- 2038 Build Conditions

Previous Studies

As mentioned above the Regional Planning Commission retained Burk Kleinpeter, Inc to develop a Feasibility Study for Woodland Highway (LA 406) Widening, Belle Chasse Highway to English Turn. The report dated March 2004 was reviewed and data was used as appropriate for this report. That report found that it was feasible and desirable to expand the corridor by adding lanes and improving safety to accommodate current and future demands brought on by commercial and residential growth. That report recommended the following interim highway improvements:

1. A five lane section near the intersection of LA 23 to the Industry Canal and reduce this to a three lane section for one mile beyond that point
2. Roadway widening at Chancellor Drive to accommodate a left turn lane
3. Intersection improvements at Hebert Drive to eliminate the bad skew angle intersection

Improvements 1 and 2 above have been constructed while 3 has become a part of this widening project.

Safety Review

The safety study included obtaining and reviewing crash data summary reports for the years 2009 thru 2011, provided by the Regional Planning Commission. For this three year period an average of 47 crashes occur per year for this study area, with no fatalities and no pedestrians involved. Note that the total number of crashes has decreased over that three year period. Most crashes were rear end collisions as shown on the table below, with an average of 49% over the three year period. This indicates people stopped for turns and someone behind them not noticing the stop. By adding additional lanes with a non-traversable median, it improves corridor safety by reducing conflict points by 50% at unsignalized intersections and driveways. By adding left turn bays, there is a reduction of rear-end crashes related to left-turn maneuvers while the additional through lane affords the through traffic the ability to by-pass slow or stopped right turn maneuvering vehicles. A summary of some of the data is shown below by year.

The following improvements can be made to this highway to improve safety:

- Widen the highway to accommodate two lanes per direction with a non-traversable median to move left turn vehicles out the through lanes and allowing through vehicles to avoid slowed or stopped right turn vehicles.
- Implement Louisiana Access Connection Policy (LAC Title 70, Part I, Chapter 15) and thereby incorporating access management strategies to control access along the corridor by limiting the number and configuration of intersections locations. Along most non-interstate roadway segments, intersections have the highest percentage of crashes (therefore are the most common place for crashes to occur) and driveways as unsignalized intersections.
- Utilize reflectorized raised pavement markers to clearly delineate the lanes for night driving.
- Include street lighting to improve night visibility and reduce night crashes.

General Historical Crash Data			
	Year		
Description	**2009**	**2010**	**2011**
Total No. of Crashes	51	46	43
Fatalities	0	0	0
Pedestrian Involved	0	0	0

Ambulance called	5	12	4
Rear end collision (no./% of total)	(32/63%)	(17/32%)	(22/52%)

Data Collection

Actual traffic counts were taken in October 2011 at the LA 407 intersection and the LA 23 intersection. The counts included truck counts, turning movements and thru volumes. They were counted from 6:00 to 8:30 AM and 4:00 to 6:30 PM at the LA 407 interchange in 30 minute increments. The counts at the LA 23 intersection were taken from 6:00 to 9:00 AM and 4:00 to 7:00 PM in 15 minute increments. Traffic growth from the surrounding potential development was factored in to these counts and projected volumes for the year 2038 were estimated. The peak AM and PM hours were selected based on this data and these numbers were converted to average daily traffic (ADT). The actual tabulation sheets are provided in Appendix C and D, and the projected traffic volumes are shown in Appendix B. Traffic volumes for Woodland Highway proper were calculated based on volumes that were entering and leaving these two end intersections.

Methodology

Existing and projected traffic data was provided by the Regional Planning Commission for the main roadway, and for turn movements at both intersections. Traffic data includes actual traffic volumes (counts), percentage of truck volumes, and peak hour volumes for both AM and PM traffic. Analysis looks at both morning and evening peaks. These volumes were then projected with growth factors to the year 2038—which is common design practice to project 20 years from the end construction date. Analysis of the traffic compares projected volumes to capacities and assigns a level of Service (LOS). The LOS can range from LOS A (free flowing) to LOS F (total failure/gridlock). LOS E & F are considered unacceptable. Generally design practices strive to achieve a LOS C or D for the design year. This analysis is the industry standard and is the widely accepted practice for evaluating traffic operations. Improving a poor LOS can be achieved by changing traffic flows such as adding additional lanes (adding capacity) including adding turn lanes.

Highway Capacity Software (HCS) version 5.4 was used to analyze the mainline and the round-about intersection at General De Gaulle Drive, while Synchro 7 software was used to develop the LOS for the signalized LA 23 intersection. The 2010 Highway Capacity Manual states "There is no formal methodology for evaluating the traffic operational effectiveness of a TWLTL on a two-lane highway." (HCM 15-63) Because of this, the existing conditions were treated as having 100% no passing zones to best match the current operation of Woodland Highway.

Analysis:

After the traffic volumes have been re-calculated for math closure and growth the analysis can begin. The locations were analyzed for both AM and PM traffic peaks and for the Build and No Build scenarios and yields a LOS for each location. Four types of analysis for the various conditions were conducted for this report for 2038 traffic volumes:

- Multilane ---used for Woodland Highway proper both directions
- Two-lane ---No build scenario---used for the existing two lane conditions
- Roundabout---used at General De Gaulle Dr.
- Signalized Intersection. Used at LA 23 intersection

Critical design elements used for this capacity analysis include:

Multilane

- 55 mph free flow speed
- Peak Hour Factor (PHF) = 0.9
- 12 ft Total Lateral Clearance (TLC)
- 12 ft lane width

Two-lane

- 55 mph Free Flow Speed
- PHF= 0.9
- 6 ft shoulder
- 12 ft Lane Width
- Class I Highway
- 100% No passing

Roundabout

- PHF= 0.9

- Eastbound and Northbound have Free Flow Right-Turn Bypass Lanes.

The Level of Service is based on traffic flows and safety and assigned a score of A-F described as follows:

- LOS A—Free flowing traffic, no delays, safest conditions
- LOS B—Reasonably free flow traffic
- LOS C—Provides flows near the free flow, queues may be expected
- LOS D—Free flow speeds decrease, congestion and delays occur more quickly
- LOS E—Flows are at or near capacity, no gaps in the traffic stream queues form easily
- LOS F—Total gridlock, traffic flow failure

LOS E & F are unacceptable levels of service.

Existing Conditions Analysis

The existing LOS was analyzed for both AM and PM peaks for the two existing intersections and the highway proper for 2011 traffic volumes and 2038 traffic volumes. As described earlier the LA 23 intersection has been upgraded. A three lane section has been added for one mile north of Industry Canal and a left turn lane has been added at Chancellor Drive. These improvements were made as recommended in the 2004 Feasibility Report. The LA 23 and General De Gaulle Drive intersection utilized Synchro-7 software, which is based on the Highway Capacity Manual criteria and the Woodland Highway proper utilized Highway Capacity software HCS version 5.4. Although the mainline has a three lane section and a left turn intersection the capacity was based on two lanes as sited in the Methodology. The center lane is considered to add no capacity to the section. As shown in Table 1 and 2 the LA 23 intersection is experiencing a LOS F during the peak hour, the highway is experiencing a LOS C and D, and the General De Gaulle intersection is experiencing a LOS A.

No Build Analysis

If no improvements are made to the Woodland Highway the 2038 LOS will continue to drop to total failure represented by a LOS E and F at the LA 23 intersection and LOS E, at the General De Gaulle Drive intersection.

Build Analysis

The Woodland Highway and two end intersections were analyzed based on widening the facility from a two lane road to a four lane highway. It was analyzed for both AM and PM peak hour traffic flows and 2011 and 2038 volumes. The highway will be widened to four 12 foot lanes, with a 22 foot raised median and two-four foot shoulders. Median openings for street and driveway access will be located where justified and approved by the LADOTD in accordance with the Access Connections Policy during the design phase. As stated in the Policy, "…access connections are a major contributor to traffic congestion, increase the degradation of transportation facility operations, can result in decreased highway capacity, may cause driver and pedestrian confusion, and can increase safety hazards." "By State Law, the DOTD is responsible for regulating the location, design, construction, and maintenance of street and driveway connections on the State Highway System."

Table 1 and 2 shows, if widened, the highway near LA 23 will operate at LOS A thru C throughout the AM and PM peaks for the design year of 2038 and LOS A and B near the General De Gaulle Dr. intersection. The two end intersections will operate at a LOS D and F. The intersections will need upgrading to accommodate the additional traffic, which may include signal timing changes, or additional thru or turn lanes for both highway approaches.

Conclusions

This report is developed in support of and in conjunction with the Environmental Assessment Report for widening the Woodland Highway from a two lane road to a four lane highway. The prior 2004 Feasibility Report determined that it was feasible and desirable to widen this corridor to accommodate growth and improve traffic flows and safety. It also recommended interim improvements that have been implemented as part of a first phased approach. This report further justifies and supports the need to widen this road now to accommodate increasing traffic flows and improve safety in order to eliminate total congestion. The proposed four lane widening will improve the 2038 LOS from a LOS F to a LOS C. The LA 23 intersection and General De Gaulle Dr. intersection will need more detailed traffic analysis to develop the design options to improve the LOS. This will involve potential improvements on LA 23 and General De Gaulle Drive as

well as Woodland Highway, including signal timing changes, and additional left, right and thru lanes.

Recommendations

The recommendation of this study is to proceed with the plans to widen the two lane highway to at least two 12 foot thru lanes per direction, with either, a raised median and intermittent left turn bays, or a five lane road with a two way left turn lane. The choice is based on the number of potential driveways that may be expected over time.

Results

The LOS for Woodland Highway and the intersections at LA 23 and General De Gaulle Dr are shown in the tables below.

Table 1: LOS for Woodland Highway and LA 23

	Woodland Highway (LA 406) @ LA 23								
	2011					2038			
	EB		WB			EB		WB	
	AM	PM	AM	PM		AM	PM	AM	PM
No Build	D	D	D	D		F	E	F	E
4-Lane	A	A	A	A		A	A	C	B
Signal	F	F				F	F		

Table 2: LOS for Woodland Highway and General De Gaulle Dr

	Woodland Highway (LA 406) @ General De Gaulle Dr								
	2011					2038			
	EB		WB			EB		WB	
	AM	PM	AM	PM		AM	PM	AM	PM
No Build	C	D	D	C		E	E	E	E
4-Lane	A	A	A	A		A	B	B	A
	Intersection					Intersection			
	AM	PM				AM	PM		
Roundabout	A	A				F	D		

Appendix A

Volume Analysis Worksheets

ROUNDABOUT REPORT

General Information		Site Information
Analyst	C. Kennedy	Intersection
Agency or Co.		E/W Street Name
Date Performed	9/26/2012	N/S Street Name
Time Period		Analysis Year
		Project ID

Project Description:

Volume Adjustment and Site Characteristics

	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes(N)	0	1	0		1	0	0		1	0	0		0	0	0	
Volume (V), veh/h	0	15	0	0	260	0	0	0	454	0	0	0	0	0	0	0
Heavy Veh. Adj. (f_{HV}), %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour Factor (PHF)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
No. of Pedestrians Crossing Entry	0				0				0				0			

Critical and Follow-Up Headway Adjustment

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929
Follow-Up Headway (sec)	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858

Flow Computations

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Circulating Flow (V_c), pc/h	298			520			17			818		
Exiting Flow (V_{ex}), pc/h	17			520			0			298		
Entry Flow (V_e), pc/h		17	0		298			520	0			
Entry Volume veh/h		17	0		289			505	0			

Capacity and v/c Ratios

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Capacity (c_{PCE}), pc/h		839			672			1111			499	
Capacity (c), veh/h		815			652			1079			484	
v/c Ratio (X)		0.02			0.44			0.47				

Delay and Level of Service

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.6	0.0		12.1			8.6	0.0			
Lane LOS		A			B			A				
Lane 95% Queue		0.1			2.3			2.5				
Approach Delay, s/veh	4.61			12.07			8.57					
Approach LOS, s/veh	A			B			A					
Intersection Delay, s/veh	9.29											
Intersection LOS	A											

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ROUNDABOUT REPORT

General Information		Site Information	
Analyst	C. Kennedy	Intersection	General De Gaulle and Woodland
Agency or Co.		E/W Street Name	
Date Performed	9/26/2012	N/S Street Name	
Time Period		Analysis Year	
		Project ID	

Project Description:

Volume Adjustment and Site Characteristics

	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes(N)	0	1	0		1	0	0		1	0	0		0	0	0	
Volume (V), veh/h	0	54	0	0	106	0	0	0	365	0	0	0	0	0	0	0
Heavy Veh. Adj. (f_{HV}), %	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Peak Hour Factor (PHF)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
No. of Pedestrians Crossing Entry	0				0				0				0			

Critical and Follow-Up Headway Adjustment

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929
Follow-Up Headway (sec)	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858

Flow Computations

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Circulating Flow (V_c), pc/h	125			430			64			555		
Exiting Flow (V_{ex}), pc/h	64			430			0			125		
Entry Flow (V_e), pc/h		64	0		125			430	0			
Entry Volume veh/h		60	0		118			406	0			

Capacity and v/c Ratios

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Capacity (c_{PCE}), pc/h		997			735			1060			649	
Capacity (c), veh/h		941			693			1000			612	
v/c Ratio (X)		0.06			0.17			0.41				

Delay and Level of Service

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.4	0.0		7.1			8.1	0.0			
Lane LOS		A			A			A				
Lane 95% Queue		0.2			0.6			2.0				
Approach Delay, s/veh	4.41			7.11			8.06					
Approach LOS, s/veh	A			A			A					
Intersection Delay, s/veh	7.73											
Intersection LOS	A											

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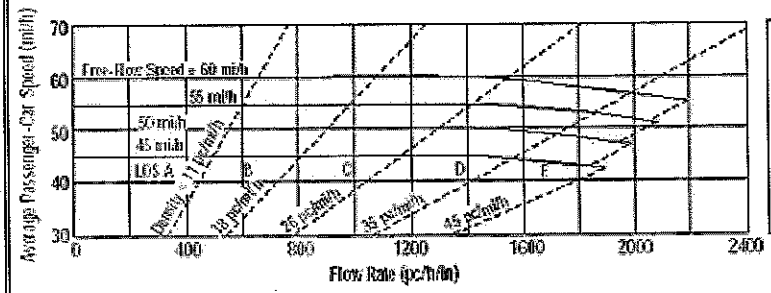
Proposed

MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) AM

o Oper.(LOS) o Des. (N) o Plan. (vp)

Flow Inputs

Volume, V (veh/h)	331	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	2
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.990

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	6.0
Access Points, A (A/mi)	3
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	1.3
f_A (mi/h)	0.8
f_M (mi/h)	0.0
FFS (mi/h)	53.0

Operations

Operational (LOS)	
Flow Rate, v_p (pc/h/ln)	185
Speed, S (mi/h)	55.0
D (pc/mi/ln)	3.4
LOS	A

Design

Design (N)	
Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*183.9*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.00*
Bicycle level of service (Exhibit 15-4)	*B*

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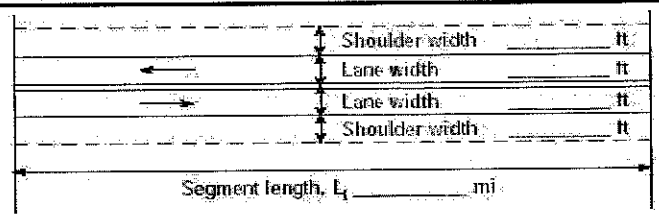
EXIST

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *WB PM TWLTL*

Input Data



○ Class I highway ○ Class II highway ○ Class III highway

Terrain ● Level ○ Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	589veh/h
Opposing direction vol., V_o	580veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	3.0
Peak-hour factor, PHF	0.90
No-passing zone	100%
% Trucks and Buses , P_T	4 %
% Recreational vehicles, P_R	0%
Access points *mi*	9/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	0.996
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	657	647

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	2.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.8 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	57.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	45.8 mi/h

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	654	644
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	61.8	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	31.6	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	77.7	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, *v/c*	0.41

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1700*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*79.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*654.4*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.17*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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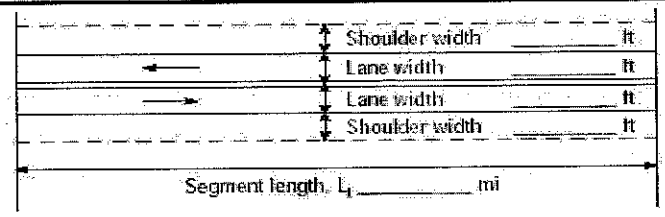
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *WB AM TWLTL*

Input Data



9 Class I highway 0 Class II highway 0 Class III highway

Terrain 9 Level 0 Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *100%*

% Trucks and Buses , P_T *2 %*

% Recreational vehicles, P_R *0%*

Access points *mi* *9/mi*

Analysis direction vol., V_d *586veh/h*

Opposing direction vol., V_o *487veh/h*

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *3.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.1*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*	*0.996*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*652*	*543*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.4 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*57.8 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*46.1 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*651*	*541*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*60.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*33.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*79.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.38*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	79.8
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	651.1
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	2.64
Bicycle level of service (Exhibit 15-4)	C

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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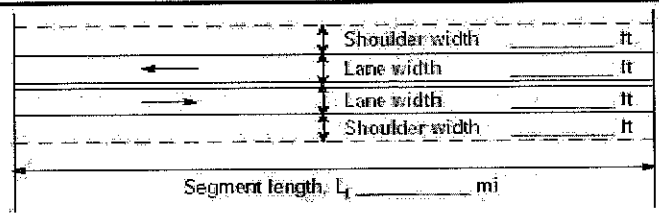
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *EB PM TWLTL*

Input Data



Analysis direction vol., V_d	580veh/h	◉ Class I highway	○ Class II highway ○ Class III highway
Opposing direction vol., V_o	589veh/h	Terrain	◉ Level ○ Rolling
Shoulder width ft	6.0	Grade Length mi	Up/down
Lane Width ft	12.0	Peak-hour factor, PHF	0.90
Segment Length mi	3.0	No-passing zone	100%
		% Trucks and Buses , P_T	4 %
		% Recreational vehicles, P_R	0%
		Access points *mi*	9/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	0.996
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	647	657

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	2.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.8 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	57.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	45.8 mi/h

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	644	654
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	60.8	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	31.6	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	76.5	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, *v/c*	0.41

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	79.4
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	644.4
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.16
Bicycle level of service (Exhibit 15-4)	C

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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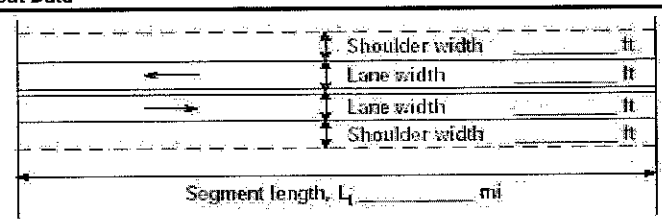
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *EB AM TWLTL*

Input Data



9 Class I highway 0 Class II highway 0 Class III highway

Terrain 9 Level 0 Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	487veh/h
Opposing direction vol., V_o	586veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	3.0
Peak-hour factor, PHF	0.90
No-passing zone	100%
% Trucks and Buses , P_T	2 %
% Recreational vehicles, P_R	0%
Access points *mi*	9/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	0.998
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	543	652

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	2.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.8 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	57.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	46.7 mi/h

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	541	651
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	55.6	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	33.6	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	70.8	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, *v/c*	0.38

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	80.8
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	541.1
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	2.55
Bicycle level of service (Exhibit 15-4)	C

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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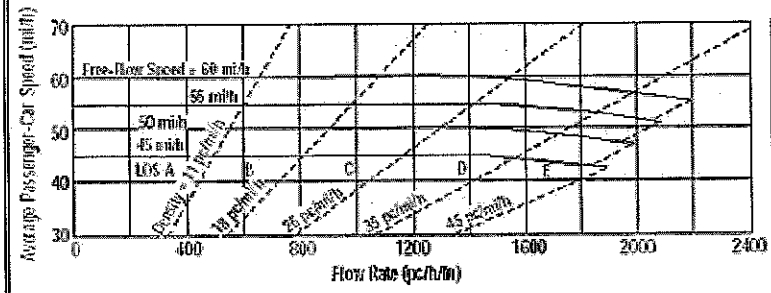
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) AM

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	586	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	2
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.990

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	6.0
Access Points, A (A/mi)	6
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	1.3
f_A (mi/h)	1.5
f_M (mi/h)	0.0
FFS (mi/h)	52.2

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	328
Speed, S (mi/h)	50.0
D (pc/mi/ln)	6.6
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*325.6*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.29*
Bicycle level of service (Exhibit 15-4)	*B*

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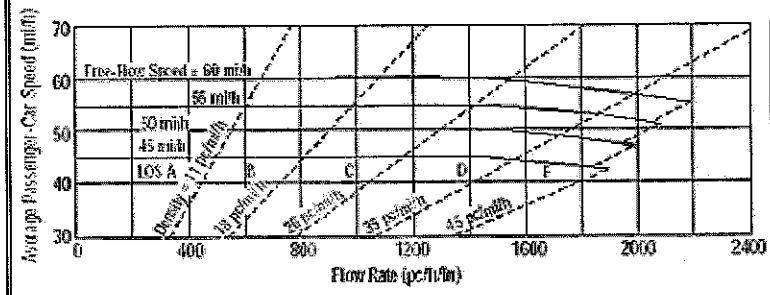
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) pm

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	589	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	4
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.980

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	6.0
Access Points, A (A/mi)	6
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	1.3
f_A (mi/h)	1.5
f_M (mi/h)	0.0
FFS (mi/h)	52.2

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	333
Speed, S (mi/h)	50.0
D (pc/mi/ln)	6.7
LOS	A

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*327.2*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.82*
Bicycle level of service (Exhibit 15-4)	*C*

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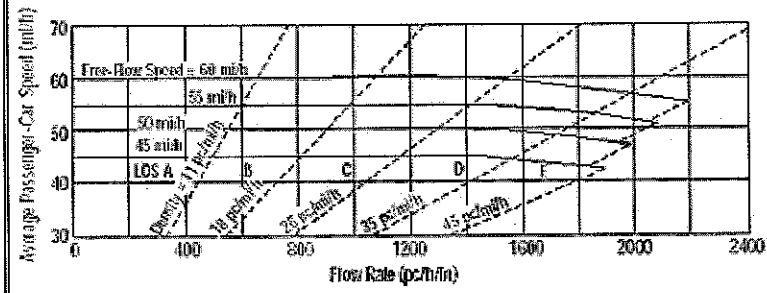
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	C.Kennedy	Highway/Direction to Travel	La 406
Agency or Company	Volkert	From/To	General De Gaulie Dr to 23
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) AM

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	487	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	2
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.990

Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f_{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	6.0	f_{LC} (mi/h)	1.3
Access Points, A (A/mi)	3	f_A (mi/h)	0.8
Median Type, M	Divided	f_M (mi/h)	0.0
FFS (measured)		FFS (mi/h)	53.0
Base Free-Flow Speed, BFFS	55.0		

Operations		Design	
Operational (LOS)		Design (N)	
Flow Rate, v_p (pc/h/ln)	273	Required Number of Lanes, N	
Speed, S (mi/h)	55.0	Flow Rate, v_p (pc/h)	
D (pc/mi/ln)	5.0	Max Service Flow Rate (pc/h/ln)	
LOS	A	Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*270.6*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.20*
Bicycle level of service (Exhibit 15-4)	*B*

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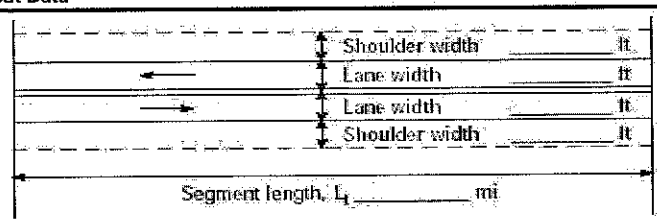
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *WB PM TWLTL*

Input Data



Analysis direction vol., V_d	399veh/h	Class I highway	Class II highway Class III highway
Opposing direction vol., V_o	543veh/h	Terrain	Level Rolling
Shoulder width ft	6.0	Grade Length mi	Up/down
Lane Width ft	12.0	Peak-hour factor, PHF	0.90
Segment Length mi	3.0	No-passing zone	100%
		% Trucks and Buses , P_T	6 %
		% Recreational vehicles, P_R	0%
		Access points *mi*	9/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.3	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.982	0.994
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	451	607

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	2.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.9 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	57.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.6 mi/h

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	443	603
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	48.2	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	36.4	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	63.6	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.36

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1700*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*443.3*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.57*
Bicycle level of service (Exhibit 15-4)	*D*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis–the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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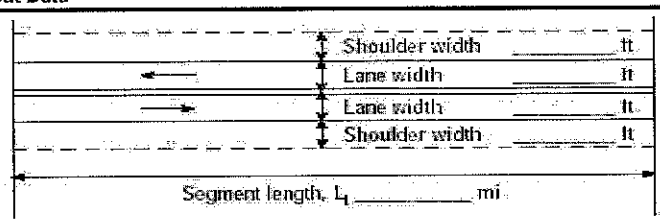
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *WB AM TWLTL*

Input Data



9 Class I highway 0 Class II highway 0 Class III highway

Terrain 9 Level 0 Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*494*veh/h
Opposing direction vol., V_o	*331*veh/h
Shoulder width ft	*6.0*
Lane Width ft	*12.0*
Segment Length mi	*3.0*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100%*
% Trucks and Buses , P_T	*3 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*9*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.994*	*0.991*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*552*	*371*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.5 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*57.8 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*47.1 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*0.997*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*549*	*369*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*52.6*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*38.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*75.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.32*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	81.5
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	548.9
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	2.81
Bicycle level of service (Exhibit 15-4)	C

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis—the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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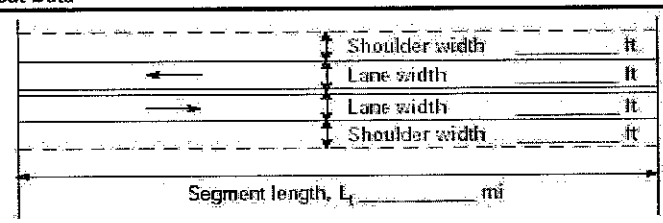
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *EB PM TWLTL*

Input Data



θ Class I highway 0 Class II highway 0 Class III highway

Terrain θ Level 0 Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *100%*

% Trucks and Buses , P_T *6 %*

% Recreational vehicles, P_R *0%*

Access points *mi* *9/mi*

Analysis direction vol., V_d	*543veh/h*
Opposing direction vol., V_o	*399veh/h*
Shoulder width ft	*6.0*
Lane Width ft	*12.0*
Segment Length mi	*3.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.1*	*1.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.994*	*0.982*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*607*	*451*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.0 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*57.8 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*46.5 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*603*	*443*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*56.1*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*36.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*77.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*
Volume to capacity ratio, *v/c*	*0.36*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	80.5
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	603.3
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.73
Bicycle level of service (Exhibit 15-4)	D

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis–the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	83.6
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	367.8
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	2.60
Bicycle level of service (Exhibit 15-4)	C

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis—the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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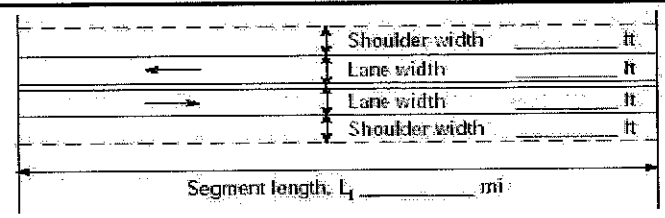
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *EB AM TWLTL*

Input Data



Class I highway Class II highway Class III highway

Terrain Level Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *100%*

% Trucks and Buses , P_T *3 %*

% Recreational vehicles, P_R *0%*

Access points *mi* *9/mi*

Analysis direction vol., V_d *331*veh/h

Opposing direction vol., V_o *494*veh/h

Shoulder width ft *6.0*

Lane Width ft *12.0*

Segment Length mi *3.0*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.3*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.991*	*0.994*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*371*	*552*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*57.8 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*48.3 mi/h*

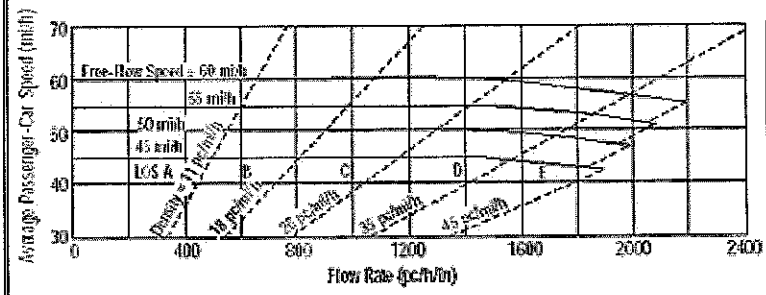
Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.997*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*369*	*549*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*42.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*38.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*58.2*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.32*

MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) pm

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	399	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	4
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.980

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	6.0
Access Points, A (A/mi)	6
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	1.3
f_A (mi/h)	1.5
f_M (mi/h)	0.0
FFS (mi/h)	52.2

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	226
Speed, S (mi/h)	50.0
D (pc/mi/ln)	4.5
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*221.7*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.62*
Bicycle level of service (Exhibit 15-4)	*C*

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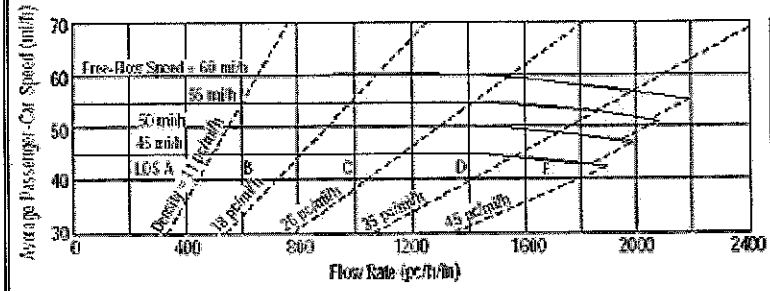
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) AM

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	494	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	2
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.990

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	6.0
Access Points, A (A/mi)	6
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	1.3
f_A (mi/h)	1.5
f_M (mi/h)	0.0
FFS (mi/h)	52.2

Operations

Operational (LOS)	
Flow Rate, v_p (pc/h/ln)	277
Speed, S (mi/h)	50.0
D (pc/mi/ln)	5.5
LOS	A

Design

Design (N)	
Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*274.4*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.20*
Bicycle level of service (Exhibit 15-4)	*B*

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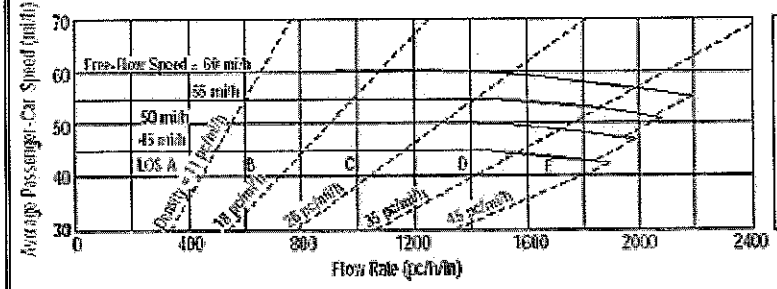
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulle Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) pm

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	543	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	4
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.980

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	6.0
Access Points, A (A/mi)	3
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	1.3
f_A (mi/h)	0.8
f_M (mi/h)	0.0
FFS (mi/h)	53.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	307
Speed, S (mi/h)	55.0
D (pc/mi/ln)	5.6
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*301.7*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.78*
Bicycle level of service (Exhibit 15-4)	*C*

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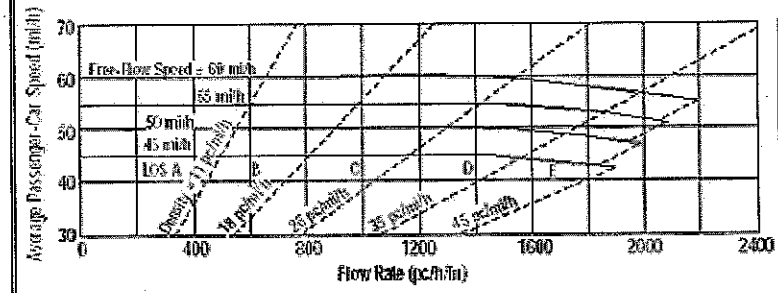
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) AM

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	331	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	2
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.990

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	6.0
Access Points, A (A/mi)	3
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	1.3
f_A (mi/h)	0.8
f_M (mi/h)	0.0
FFS (mi/h)	53.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	185
Speed, S (mi/h)	55.0
D (pc/mi/ln)	3.4
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*183.9*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.00*
Bicycle level of service (Exhibit 15-4)	*B*

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ROUNDABOUT REPORT

General Information		Site Information	
Analyst	C. Kennedy	Intersection	General De Gaulle and Woodland
Agency or Co.		E/W Street Name	
Date Performed	9/26/2012	N/S Street Name	
Time Period		Analysis Year	
		Project ID	

Project Description:

Volume Adjustment and Site Characteristics

	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes(N)	0	1	0		1	0	0		1	0	0		0	0	0	
Volume (V), veh/h	0	70	0	0	243	0	0	0	767	0	0	0	0	0	0	0
Heavy Veh. Adj. (f_{HV}), %	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Peak Hour Factor (PHF)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
No. of Pedestrians Crossing Entry	0				0				0				0			

Critical and Follow-Up Headway Adjustment

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929
Follow-Up Headway (sec)	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858

Flow Computations

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Circulating Flow (V_c), pc/h	286			903			82			1189		
Exiting Flow (V_{ex}), pc/h	82			903			0			286		
Entry Flow (V_e), pc/h		82	0		286			903	0			
Entry Volume veh/h		77	0		270			852	0			

Capacity and v/c Ratios

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Capacity (c_{PCE}), pc/h		849			458			1041			344	
Capacity (c), veh/h		801			432			982			325	
v/c Ratio (X)		0.10			0.62			0.87				

Delay and Level of Service

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.5	0.0		24.3			26.4	0.0			
Lane LOS		A			C			D				
Lane 95% Queue		0.3			4.1			11.5				
Approach Delay, s/veh	5.46			24.34			26.36					
Approach LOS, s/veh	A			C			D					
Intersection Delay, s/veh	25.31											
Intersection LOS	D											

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ROUNDABOUT REPORT

General Information		Site Information	
Analyst	C. Kennedy	Intersection	General De Gaulle and Woodland
Agency or Co.		E/W Street Name	
Date Performed	9/26/2012	N/S Street Name	
Time Period		Analysis Year	
		Project ID	

Project Description:

Volume Adjustment and Site Characteristics

	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes(N)	0	1	0		1	0	0		1	0	0		0	0	0	
Volume (V), veh/h	0	23	0	0	430	0	0	0	1003	0	0	0	0	0	0	0
Heavy Veh. Adj. (f_{HV}), %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour Factor (PHF)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
No. of Pedestrians Crossing Entry	0				0				0				0			

Critical and Follow-Up Headway Adjustment

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929	5.1929
Follow-Up Headway (sec)	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858	3.1858

Flow Computations

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Circulating Flow (V_c), pc/h	492			1148			26			1640		
Exiting Flow (V_{ex}), pc/h	26			1148			0			492		
Entry Flow (V_e), pc/h		26	0		492			1148	0			
Entry Volume veh/h		25	0		478			1115	0			

Capacity and v/c Ratios

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Capacity (c_{PCE}), pc/h		691			359			1101			219	
Capacity (c), veh/h		671			349			1069			213	
v/c Ratio (X)		0.04			1.37			1.04				

Delay and Level of Service

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.8	0.0		213.3			58.8	0.0			
Lane LOS		A			F			F				
Lane 95% Queue		0.1			23.7			23.5				
Approach Delay, s/veh	5.76			213.31			58.85					
Approach LOS, s/veh	A			F			F					
Intersection Delay, s/veh	85.38											
Intersection LOS	F											

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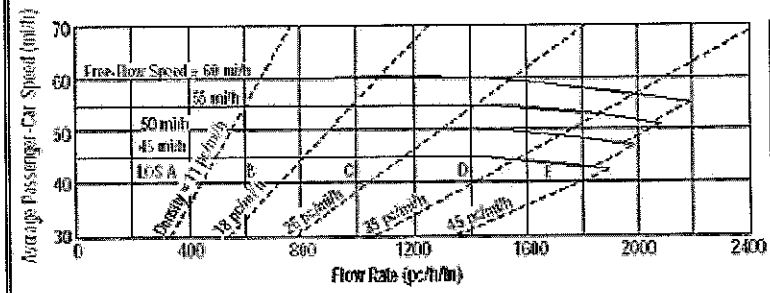
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) pm

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1427	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	4
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.980

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	6
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	0.0
f_A (mi/h)	1.5
f_M (mi/h)	0.0
FFS (mi/h)	53.5

Operations

Operational (LOS)	
Flow Rate, v_p (pc/h/ln)	808
Speed, S (mi/h)	55.0
D (pc/mi/ln)	14.7
LOS	B

Design

Design (N)	
Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*792.8*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_f (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.27*
Bicycle level of service (Exhibit 15-4)	*C*

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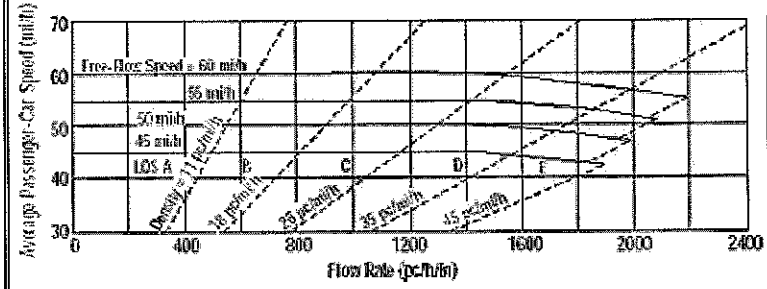
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) AM

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1064	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	3
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.985

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	6.0
Access Points, A (A/mi)	6
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	1.3
f_A (mi/h)	1.5
f_M (mi/h)	0.0
FFS (mi/h)	52.2

Operations

Operational (LOS)	
Flow Rate, v_p (pc/h/ln)	599
Speed, S (mi/h)	50.0
D (pc/mi/ln)	12.0
LOS	B

Design

Design (N)	
Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*591.1*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.85*
Bicycle level of service (Exhibit 15-4)	*C*

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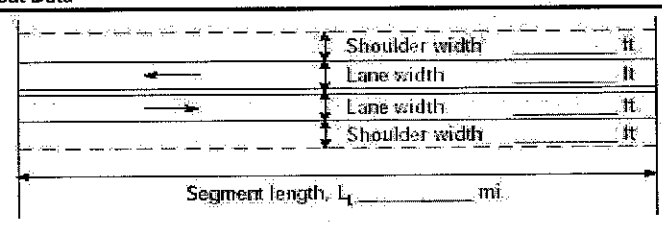
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *NO BUILD WB PM TWLTL*

Input Data



Analysis direction vol., V_d	*1427*veh/h	Class I highway	Class II highway	Class III highway
Opposing direction vol., V_o	*1006*veh/h	Terrain	Level	Rolling
Shoulder width ft	*6.0*	Grade Length	mi	Up/down
Lane Width ft	*12.0*	Peak-hour factor, PHF	*0.90*	
Segment Length mi	*3.0*	No-passing zone	*100%*	
		% Trucks and Buses , P_T	*4 %*	
		% Recreational vehicles, P_R	*0%*	
		Access points *mi*	*9*/mi	

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*1586*	*1118*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*57.8 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*35.7 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*1586*	*1118*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*90.0*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*10.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*95.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*E*
Volume to capacity ratio, *v/c*	*0.93*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	61.8
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	1585.6
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.62
Bicycle level of service (Exhibit 15-4)	D

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis—the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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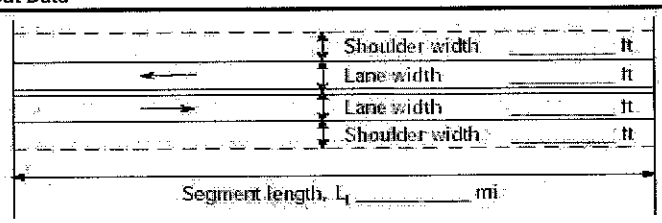
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *NO BUILD WB AM TWLTL*

Input Data



Analysis direction vol., V_d	1745veh/h	○ Class I highway	○ Class II highway ○ Class III highway
Opposing direction vol., V_o	801veh/h	Terrain	○ Level ○ Rolling
Shoulder width ft	6.0	Grade Length mi	Up/down
Lane Width ft	12.0	Peak-hour factor, PHF	0.90
Segment Length mi	3.0	No-passing zone	100%
		% Trucks and Buses , P_T	2 %
		% Recreational vehicles, P_R	0%
		Access points *mi*	9/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	1939	890

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	2.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.3 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	57.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	34.5 mi/h

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	1939	890
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	92.1	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	13.9	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	100.0	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	F
Volume to capacity ratio, *v/c*	1.14

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	59.8
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	1938.9
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_f (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.20
Bicycle level of service (Exhibit 15-4)	C

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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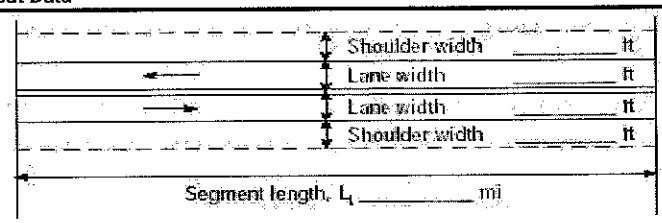
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *NO BUILD EB PM TWLTL*

Input Data



Analysis direction vol., V_d	*1006*veh/h	○ Class I highway	○ Class II highway ○ Class III highway
Opposing direction vol., V_o	*1427*veh/h	Terrain	● Level ○ Rolling
Shoulder width ft	*6.0*	Grade Length mi	Up/down
Lane Width ft	*12.0*	Peak-hour factor, PHF	*0.90*
Segment Length mi	*3.0*	No-passing zone	*100%*
		% Trucks and Buses , P_T	*2 %*
		% Recreational vehicles, P_R	*0%*
		Access points *mi*	*9/mi*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*1118*	*1586*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.7 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*57.8 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*36.1 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*1118*	*1586*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*85.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*10.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*89.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*E*
Volume to capacity ratio, *v/c*	*0.93*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1700*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*62.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*1117.8*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_f (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.92*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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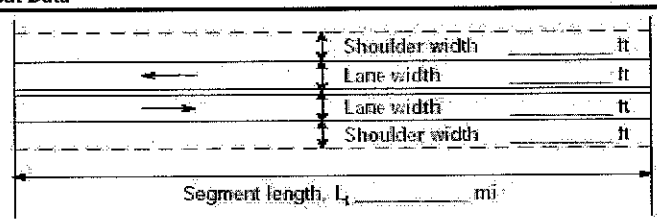
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *EB AM TWLTL*

Input Data



θ Class I highway θ Class II highway θ Class III highway

Terrain θ Level θ Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*801* veh/h
Opposing direction vol., V_o	*1745* veh/h
Shoulder width ft	*6.0*
Lane Width ft	*12.0*
Segment Length mi	*3.0*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100%*
% Trucks and Buses , P_T	*2 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*9*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*890*	*1939*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.7 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*57.8 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*35.1 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*890*	*1939*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*79.7*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*13.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*84.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*F*
Volume to capacity ratio, *v/c*	*1.14*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	60.8
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	890.0
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_f (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	2.80
Bicycle level of service (Exhibit 15-4)	C

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis–the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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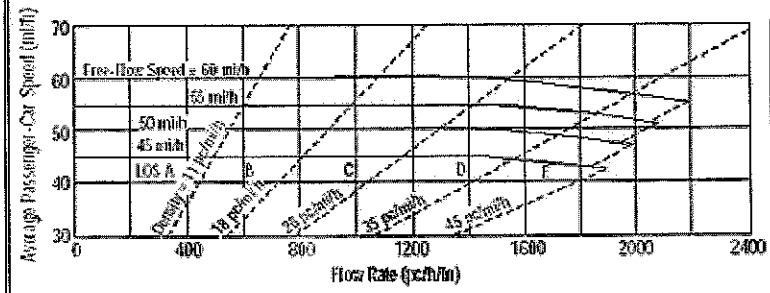
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) pm

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1006	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	4
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.980

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	3
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	0.0
f_A (mi/h)	0.8
f_M (mi/h)	0.0
FFS (mi/h)	54.3

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	570
Speed, S (mi/h)	55.0
D (pc/mi/ln)	10.4
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*558.9*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.09*
Bicycle level of service (Exhibit 15-4)	*C*

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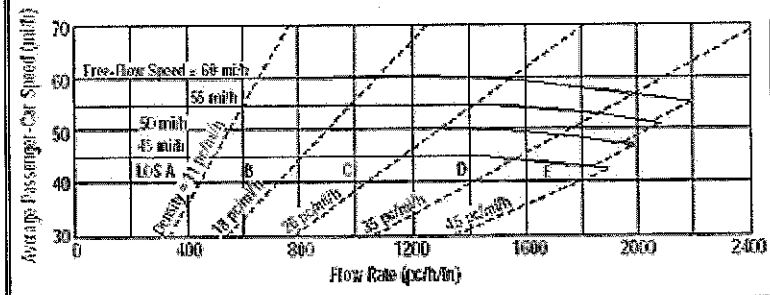
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) AM

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	801	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	2
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.990

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	3
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	0.0
f_A (mi/h)	0.8
f_M (mi/h)	0.0
FFS (mi/h)	54.3

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	449
Speed, S (mi/h)	55.0
D (pc/mi/ln)	8.2
LOS	A

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*445.0*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.45*
Bicycle level of service (Exhibit 15-4)	*B*

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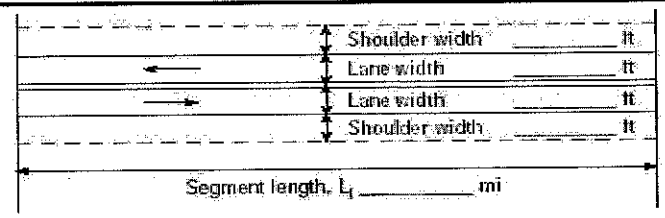
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *WB PM TWLTL*

Input Data



9 Class I highway 0 Class II highway 0 Class III highway

Terrain 9 Level 0 Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*808*veh/h
Opposing direction vol., V_o	*1158*veh/h
Shoulder width ft	*6.0*
Lane Width ft	*12.0*
Segment Length mi	*3.0*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100%*
% Trucks and Buses , P_T	*6 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*9*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*898*	*1287*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.0 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*57.8 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*39.8 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*898*	*1287*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*77.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*15.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*84.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*E*
Volume to capacity ratio, *v/c*	*0.76*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	68.9
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	897.8
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.93
Bicycle level of service (Exhibit 15-4)	D

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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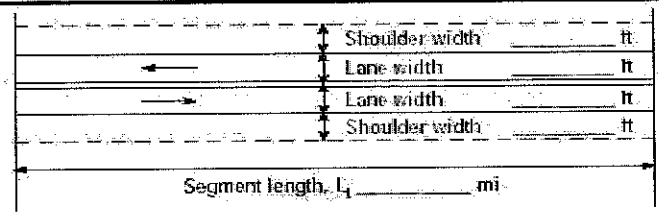
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *WB AM TWLTL*

Input Data



0 Class I highway 0 Class II highway 0 Class III highway

Terrain 0 Level 0 Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	1064veh/h
Opposing direction vol., V_o	772veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	3.0
Peak-hour factor, PHF	0.90
No-passing zone	100%
% Trucks and Buses , P_T	3 %
% Recreational vehicles, P_R	0%
Access points *mi*	9/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	1182	858

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	2.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.3 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	57.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	40.6 mi/h

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	1182	858
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	80.9	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	17.1	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	90.8	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	E
Volume to capacity ratio, *v/c*	0.70

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	70.3
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	1182.2
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.20
Bicycle level of service (Exhibit 15-4)	C

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis—the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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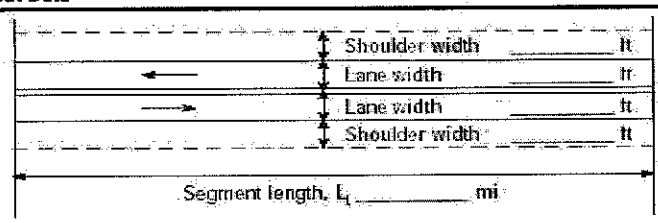
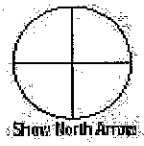
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *EB PM TWLTL*

Input Data





9 Class I highway 0 Class II highway 0 Class III highway

Terrain 9 Level 0 Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*1158*veh/h
Opposing direction vol., V_o	*808*veh/h
Shoulder width ft	*6.0*
Lane Width ft	*12.0*
Segment Length mi	*3.0*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100%*
% Trucks and Buses , P_T	*6 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*9*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*1287*	*898*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*60.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*1.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*57.8 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*39.5 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*1287*	*898*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*83.5*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*15.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*92.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*E*
Volume to capacity ratio, *v/c*	*0.76*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	68.4
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	1286.7
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	4.11
Bicycle level of service (Exhibit 15-4)	D

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis–the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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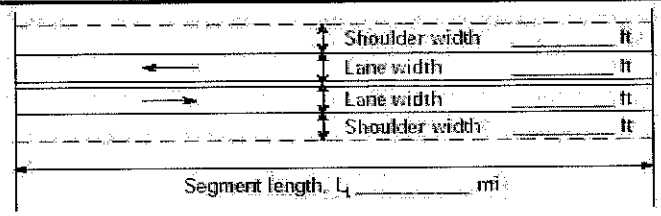
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	C. Kennedy	Highway / Direction of Travel	
Agency or Company		From/To	
Date Performed	9/26/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description: *EB AM TWLTL*

Input Data



9 Class I highway 0 Class II highway 0 Class III highway

Terrain 9 Level 0 Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	772veh/h
Opposing direction vol., V_o	1064veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	3.0
Peak-hour factor, PHF	0.90
No-passing zone	100%
% Trucks and Buses , P_T	3 %
% Recreational vehicles, P_R	0%
Access points *mi*	9/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	858	1182

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	2.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.1 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	57.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	40.9 mi/h

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	858	1182
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	75.8	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	17.1	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	83.0	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	E
Volume to capacity ratio, *v/c*	0.70

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1700*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*70.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*857.8*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.03*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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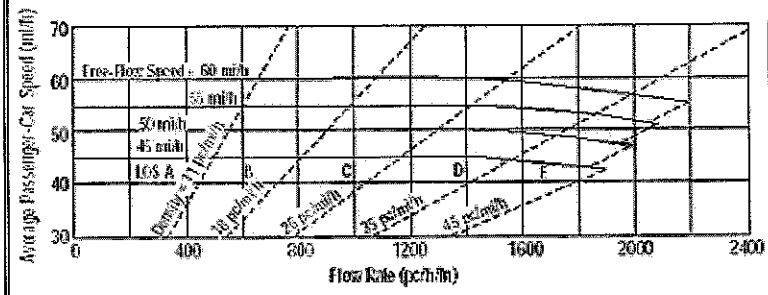
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) pm

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	808	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	6
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.971

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	6.0
Access Points, A (A/mi)	6
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	1.3
f_A (mi/h)	1.5
f_M (mi/h)	0.0
FFS (mi/h)	52.2

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	462
Speed, S (mi/h)	50.0
D (pc/mi/ln)	9.2
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*448.9*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_f (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.58*
Bicycle level of service (Exhibit 15-4)	*D*

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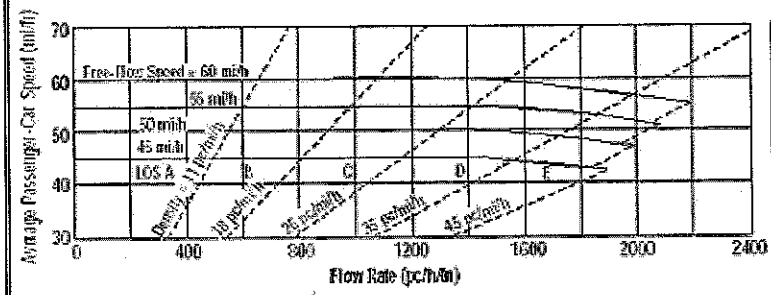
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulle Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) AM

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1064	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	3
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.985

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	6.0
Access Points, A (A/mi)	6
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	1.3
f_A (mi/h)	1.5
f_M (mi/h)	0.0
FFS (mi/h)	52.2

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	599
Speed, S (mi/h)	50.0
D (pc/mi/ln)	12.0
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*591.1*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.85*
Bicycle level of service (Exhibit 15-4)	*C*

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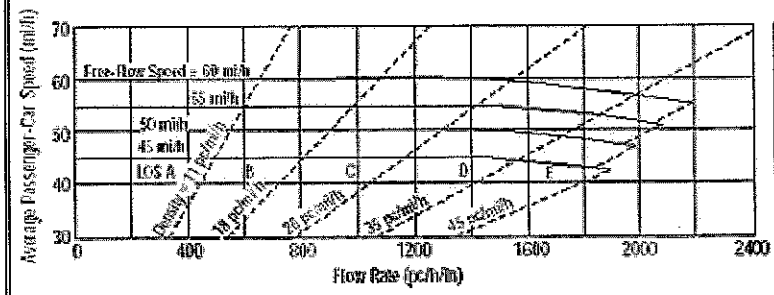
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) pm

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	1158	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	6
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.971

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	6.0
Access Points, A (A/mi)	3
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	1.3
f_A (mi/h)	0.8
f_M (mi/h)	0.0
FFS (mi/h)	53.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	662
Speed, S (mi/h)	55.0
D (pc/mi/ln)	12.0
LOS	B

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*643.3*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.76*
Bicycle level of service (Exhibit 15-4)	*D*

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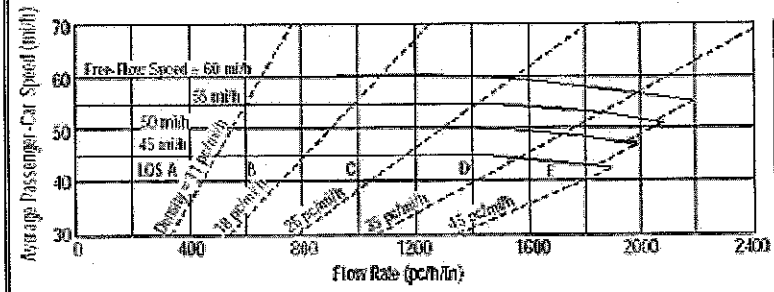
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	C.Kennedy
Agency or Company	Volkert
Date Performed	9/26/2012
Analysis Time Period	

Site Information

Highway/Direction to Travel	La 406
From/To	General De Gaulie Dr to 23
Jurisdiction	
Analysis Year	

Project Description Woodland Highway Widening 2038 (Direction 1 EB) AM

○ Oper.(LOS) ○ Des. (N) ○ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	772	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	3
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.985

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	6.0
Access Points, A (A/mi)	3
Median Type, M	Divided
FFS (measured)	
Base Free-Flow Speed, BFFS	55.0

Calc Speed Adj and FFS

f_{LW} (mi/h)	0.0
f_{LC} (mi/h)	1.3
f_A (mi/h)	0.8
f_M (mi/h)	0.0
FFS (mi/h)	53.0

Operations

Operational (LOS)	
Flow Rate, v_p (pc/h/ln)	435
Speed, S (mi/h)	55.0
D (pc/mi/ln)	7.9
LOS	A

Design

Design (N)	
Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*428.9*

Effective width, W_v (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.68*
Bicycle level of service (Exhibit 15-4)	*C*

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Appendix B

Projected Volumes

(Provided by others)

VOLKERT

NOT TO SCALE

Note: This map is for presentation use only and not to be used for construction purposes.

Traffic Counts at LA 23 and LA 406 (Woodland Highway)

Path: T:\Civil\Projects\138000 - LA 406_Woodland Hwy. Widening\Project_Design\Environmental\GIS\Map_Documents\Traffic Counts.mxd

VOLKERT

NOT TO SCALE

Note: This map is for presentation use only and not to be used for construction purposes.

Traffic Counts at Chancellor Dr and LA 406 (Woodland Highway)

Path: T:\Civil\Projects\138000 - LA 406_Woodland Hwy. Widening\Project_Design\Environmental\GIS\Map_Documents\Traffic Counts Chancellar Dr and Woodland.mxd

VOLKERT

NOT TO SCALE

Note: This map is for presentation use only and not to be used for construction purposes.

Traffic Counts at LA 406 and LA 407 (General De Gaulle Dr)

Path: T:\Civil\Projects\138000 - LA 406_Woodland Hwy. Widening\Project_Design\Environmental\GIS\Map_Documents\Traffic Counts LA406 and LA407.mxd

VOLKERT

NOT TO SCALE

Note: This map is for presentation use only and not to be used for construction purposes.

2038 Traffic Volumes at LA 23 and LA 406 (Woodland Highway)

Path: T:\Civil\Projects\138000 - LA 406_Woodland Hwy. Widening\Project_Design\Environmental\GIS\Map_Documents\2038 Traffic Volumes LA23 and LA406.mxd

VOLKERT

NOT TO SCALE

Note: This map is for presentation use only and not to be used for construction purposes.

2038 Traffic Volumes at Chancellor Dr and LA 406 (Woodland Highway)

Path: T:\Civil\Projects\138000 - LA 406_Woodland Hwy. Widening\Project_Design\Environmental\GIS\Map_Documents\2038 Traffic Volumes Chancellar Dr and Woodland.mxd

VOLKERT

NOT TO SCALE

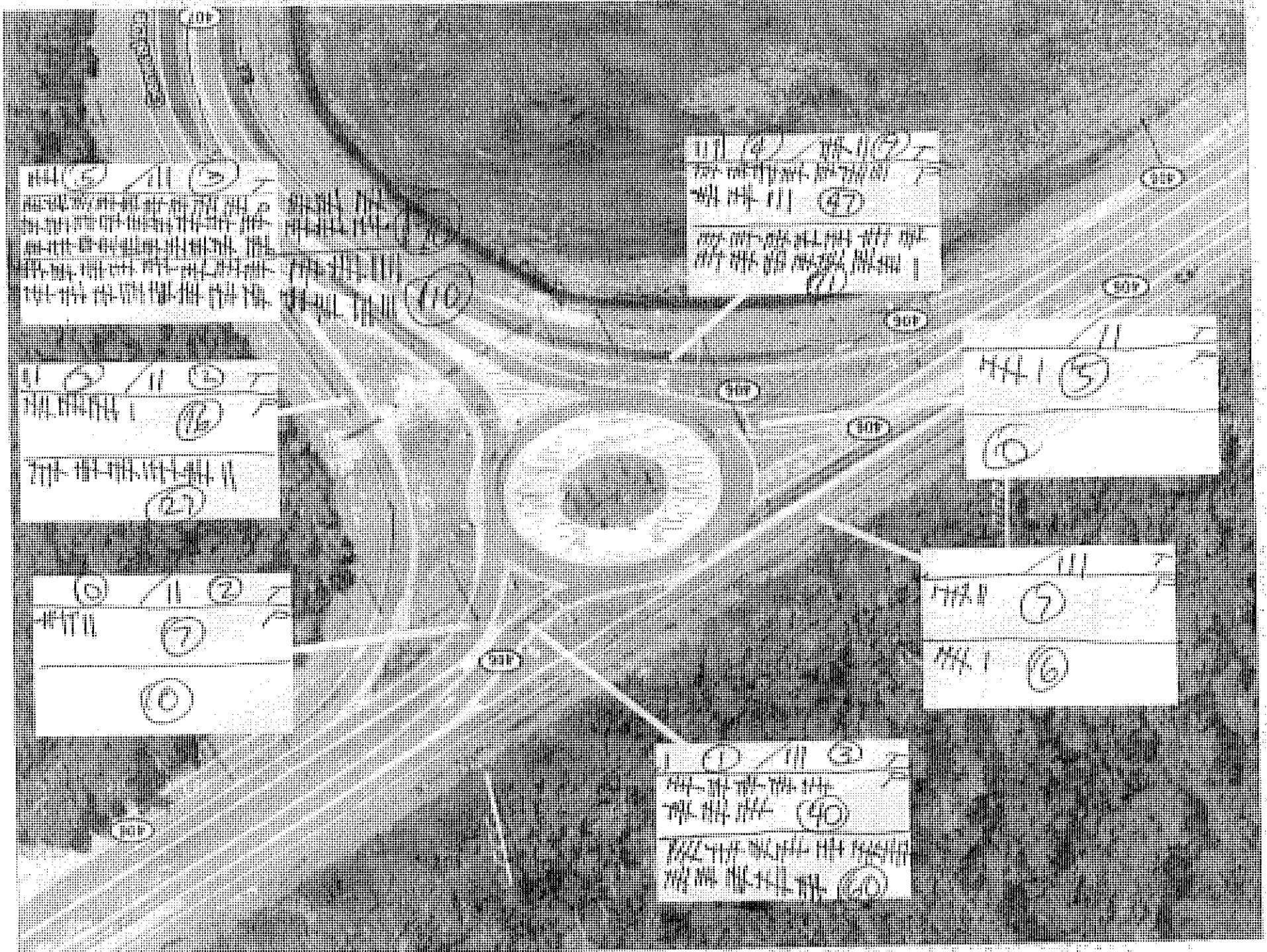
Note: This map is for presentation use only and not to be used for construction purposes.

2038 Traffic Volumes at LA 406 and LA 407 (General De Gaulle Dr)

Path: T:\Civil\Projects\138000 - LA 406_Woodland Hwy. Widening\Project_Design\Environmental\GIS\Map_Documents\2038 Traffic Volumes LA406 and LA407.mxd

Appendix C

A.M. Traffic Counts



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VEHICLE TURNING MOVEMENT COUNT SHEET

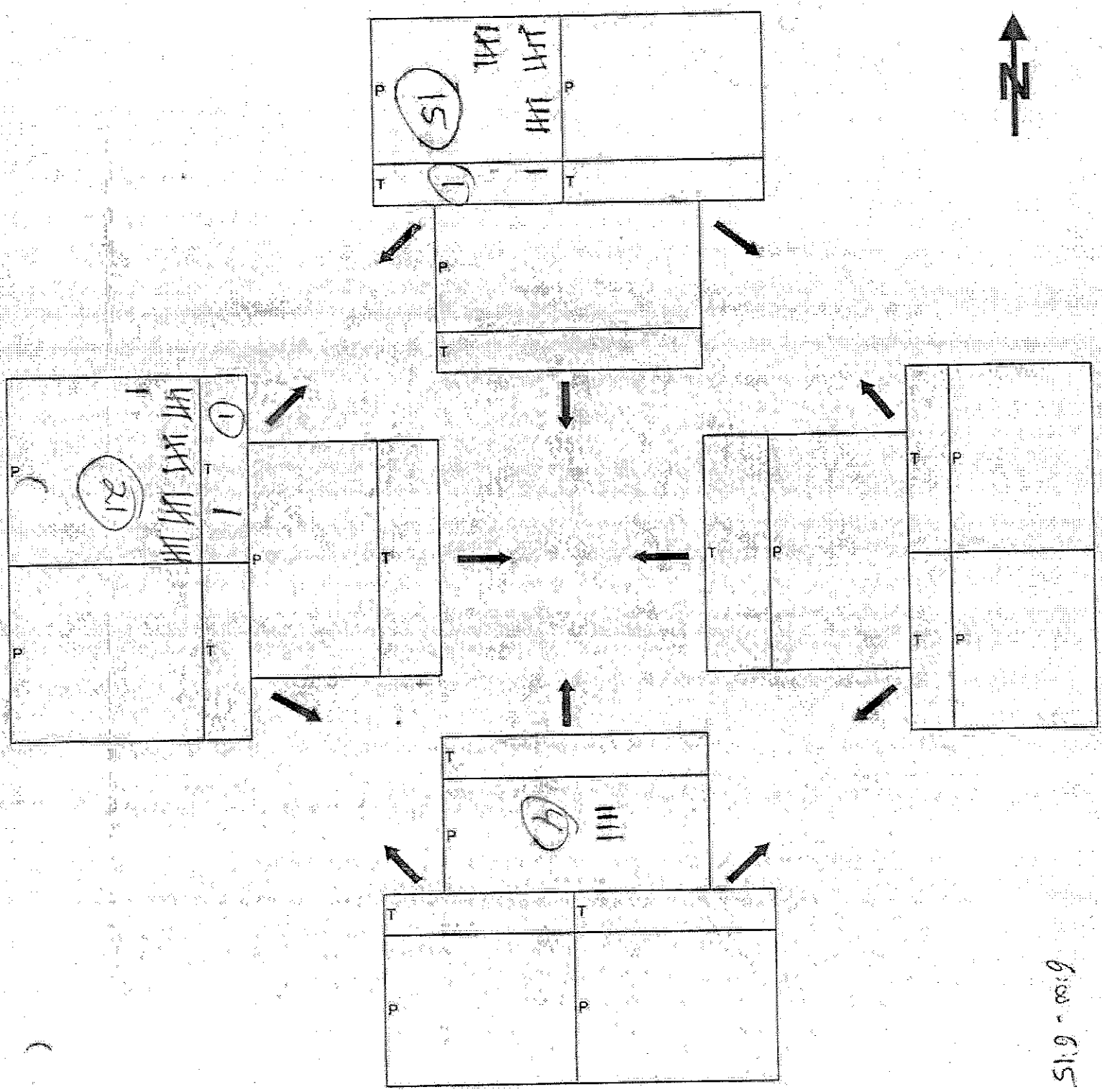
NORTH/SOUTH STREET LA406

EAST/WEST STREET LA27

DATE 10/27/11

WEATHER Clear

OBSERVER D. Hymel



6:30 - 6:15

VEHICLE TURNING MOVEMENT COUNT SHEET

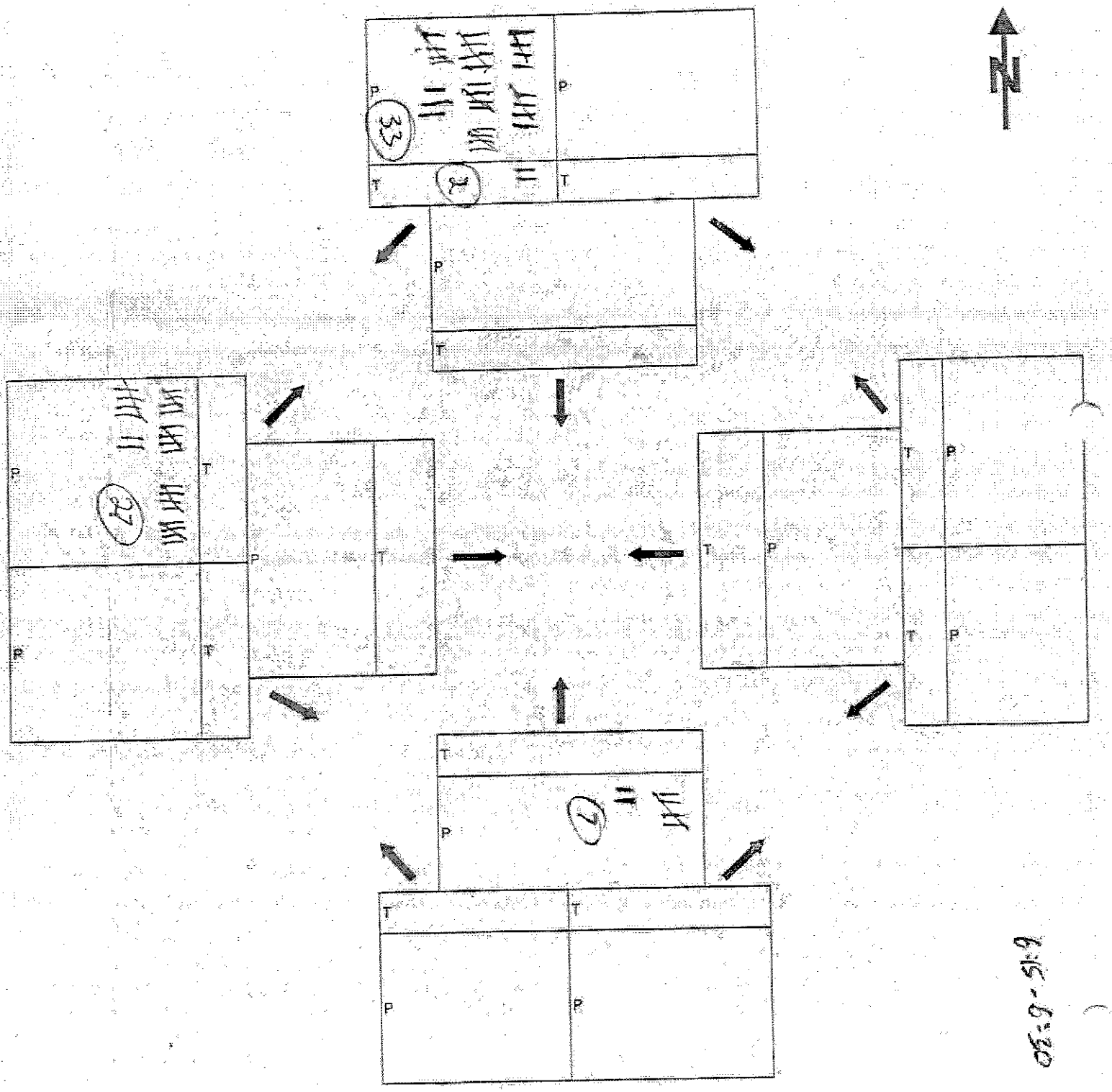
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 22

DATE 10/27/11

WEATHER Clear

OBSERVER D. Hymel



05-9-51.9

VEHICLE TURNING MOVEMENT COUNT SHEET

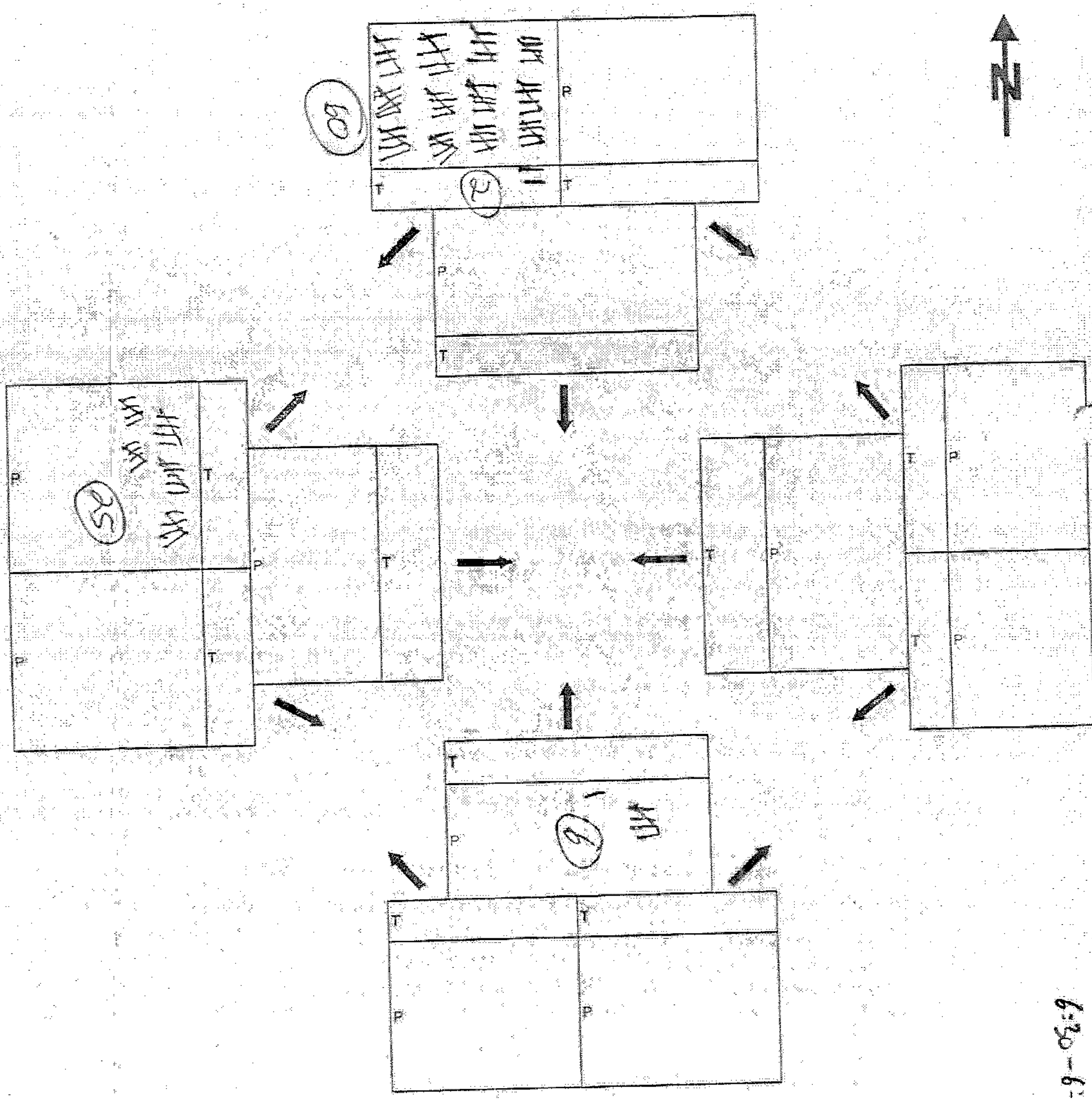
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/27/11

WEATHER clear

OBSERVER D. Hynel



6:20–6:45

VEHICLE TURNING MOVEMENT COUNT SHEET

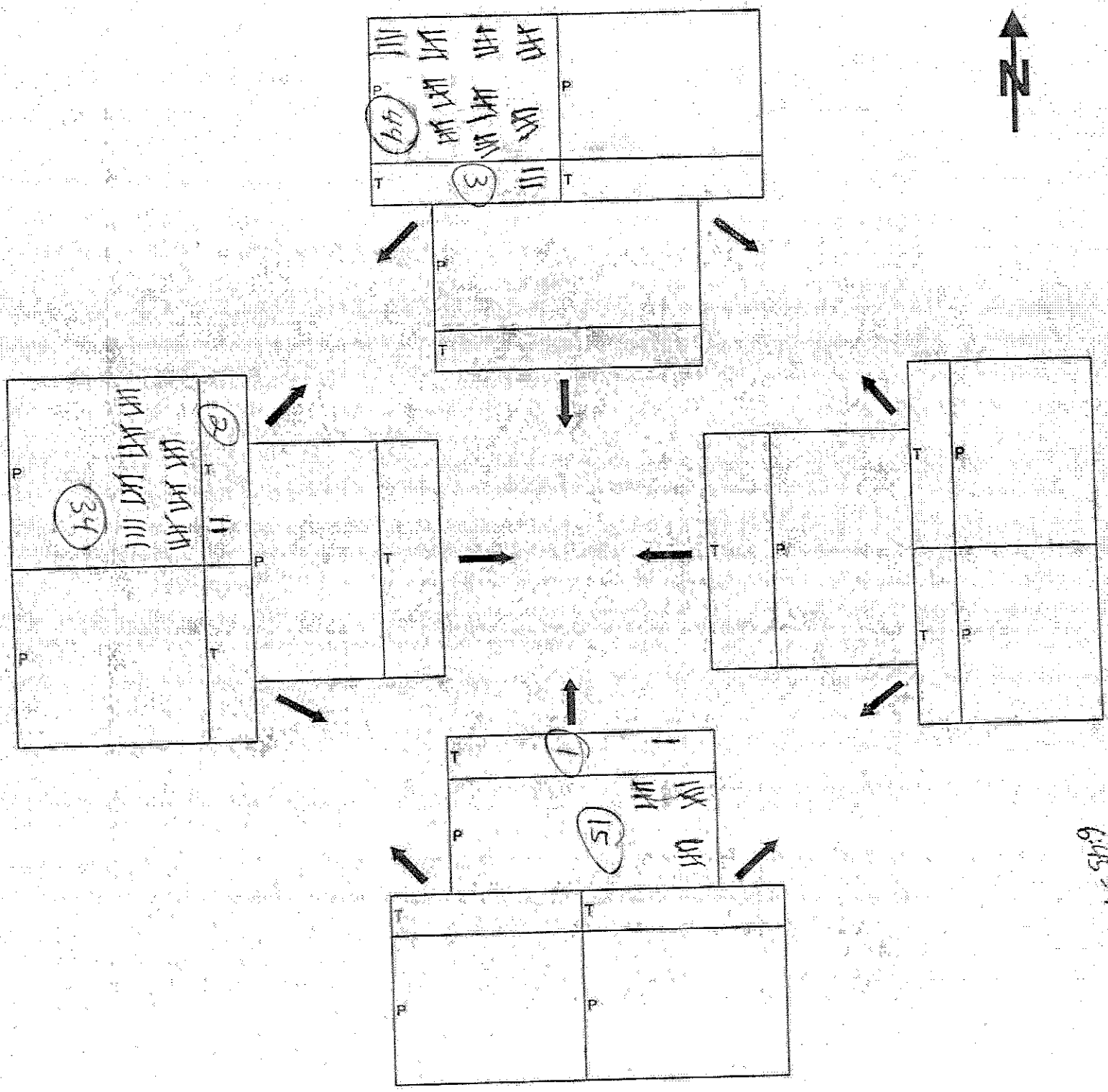
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/27/11

WEATHER Clear

OBSERVER D. Hymel



6:45

VEHICLE TURNING MOVEMENT COUNT SHEET

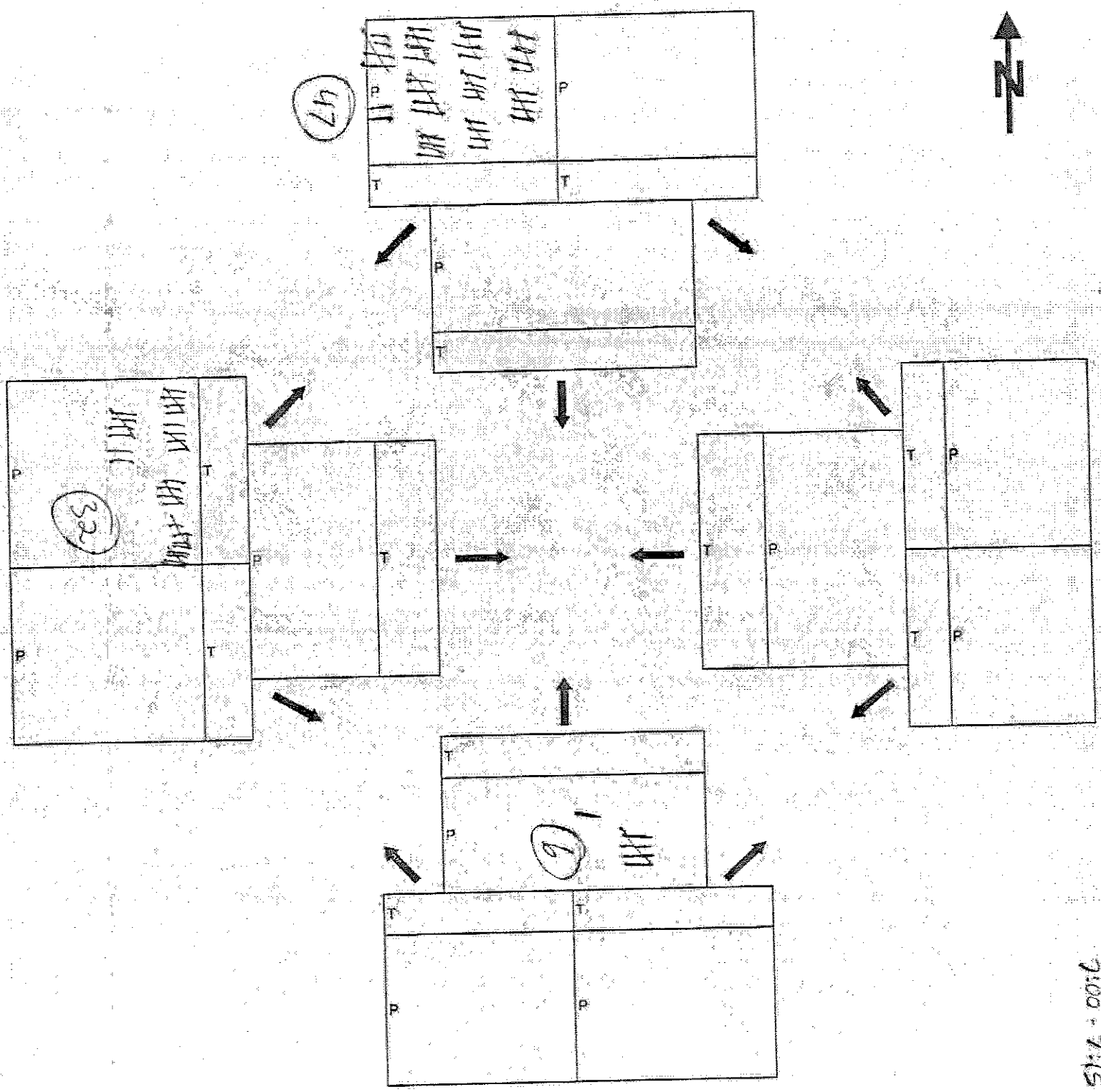
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/27/11

WEATHER Clear

OBSERVER D. Hymel



7:00 - 7:15

VEHICLE TURNING MOVEMENT COUNT SHEET

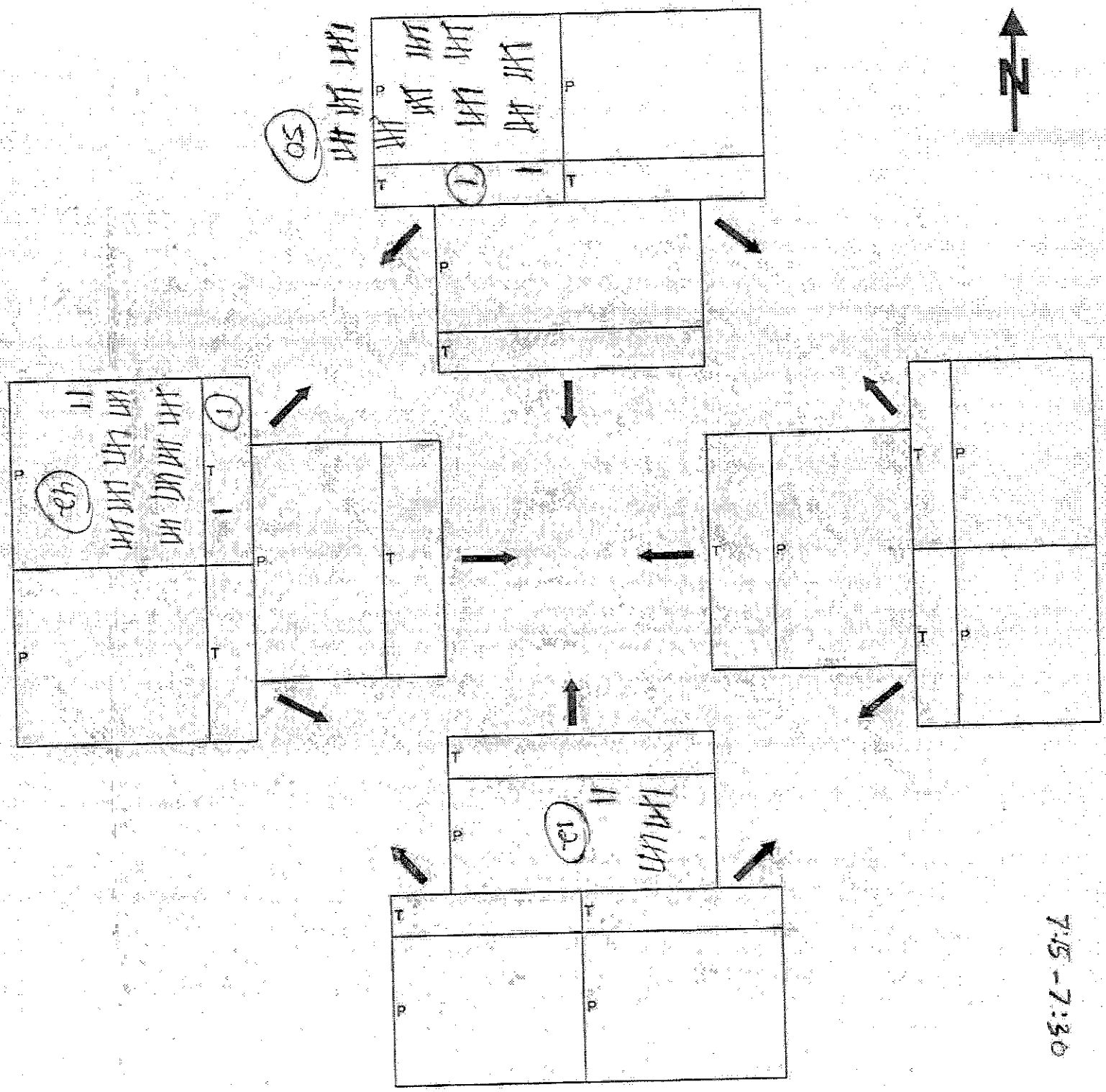
NORTH/SOUTH STREET LA406

EAST/WEST STREET LA23

DATE 10/27/11

WEATHER Clear

OBSERVER D. Hymel



VEHICLE TURNING MOVEMENT COUNT SHEET

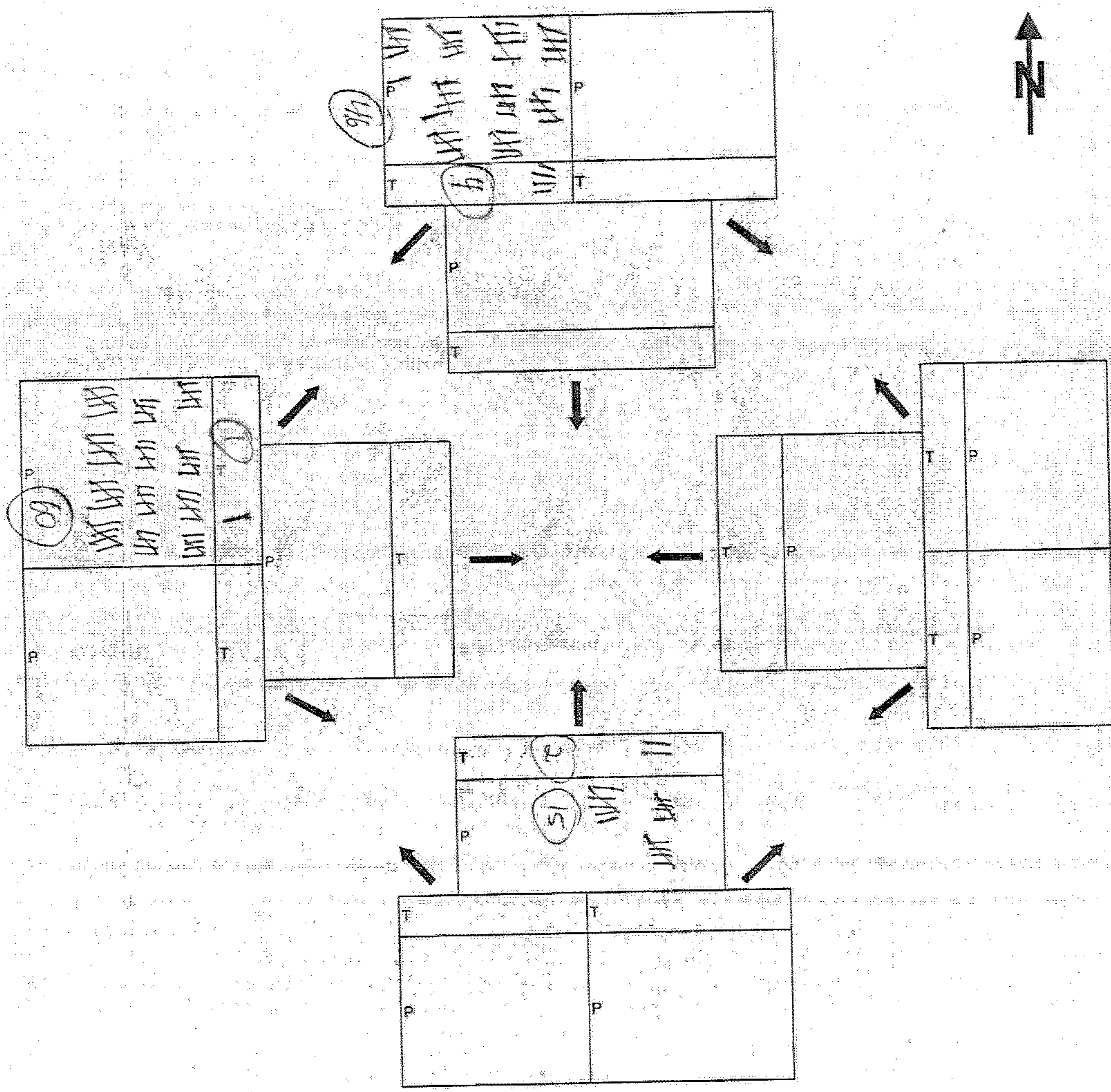
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/27/11

WEATHER clear

OBSERVER D. Hymel



VEHICLE TURNING MOVEMENT COUNT SHEET

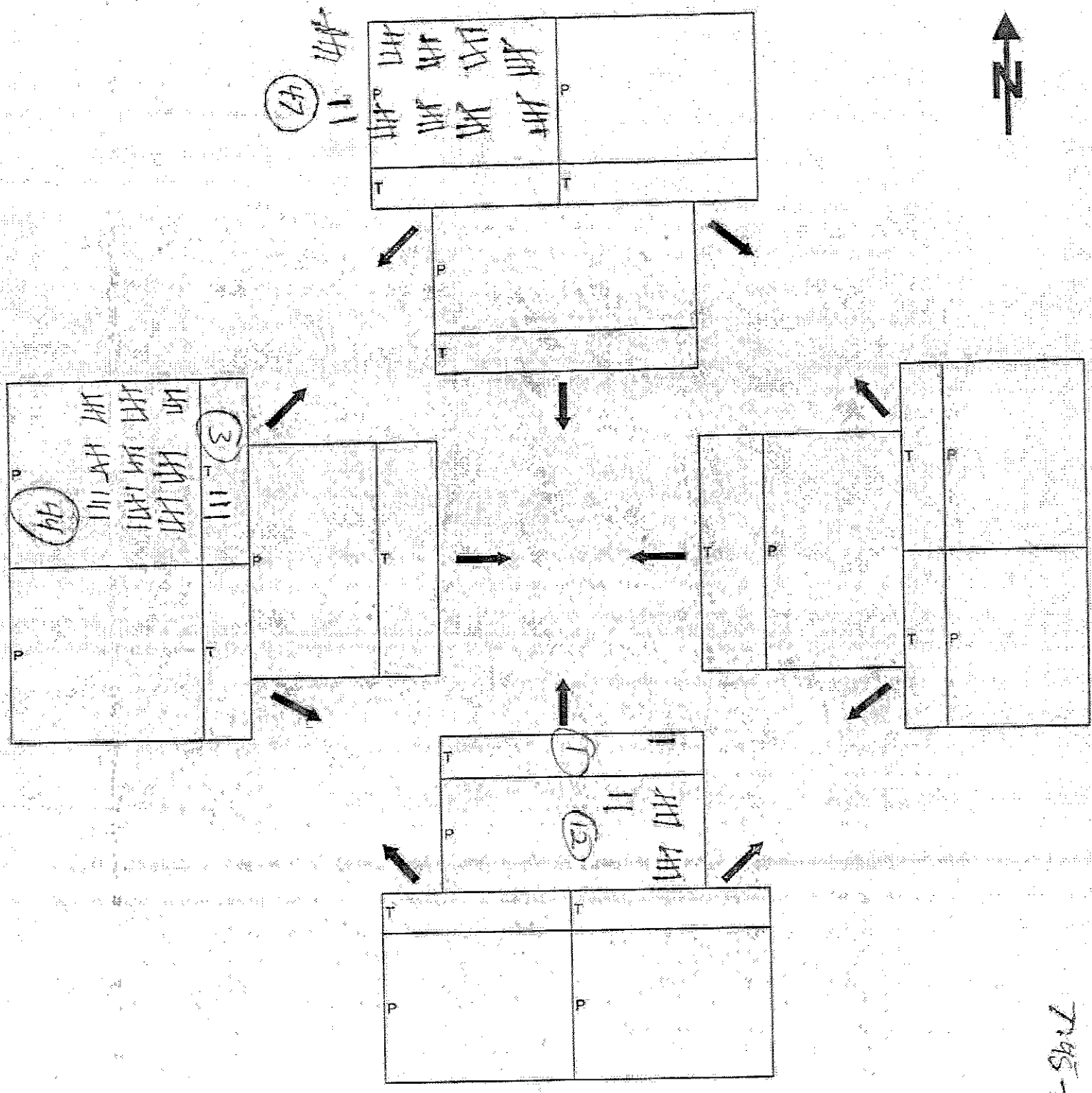
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/27/11

WEATHER clear

OBSERVER D. Hymel

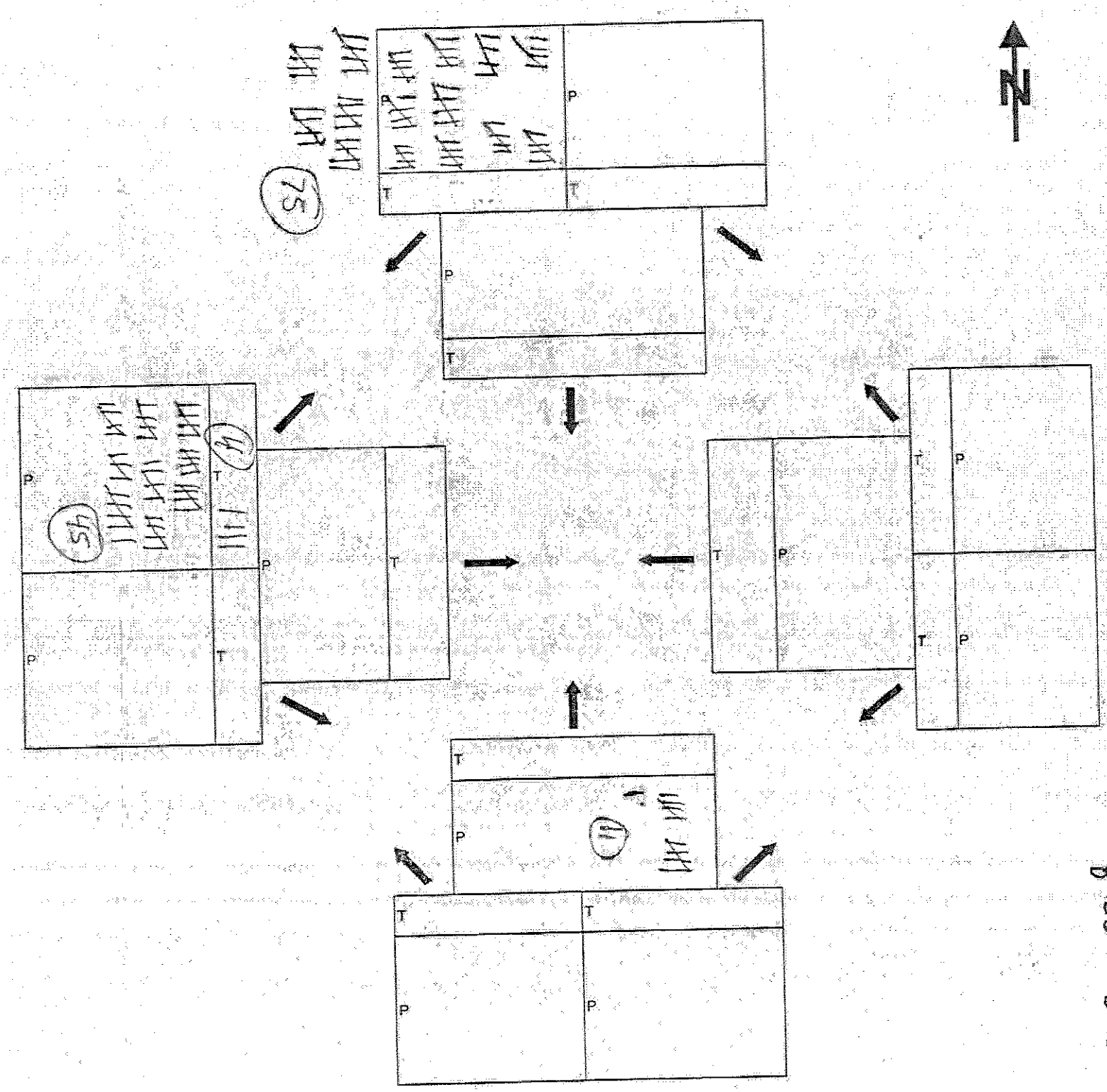


T45-600

VEHICLE TURNING MOVEMENT COUNT SHEET

NORTH/SOUTH STREET: LA 406
EAST/WEST STREET: LA 23

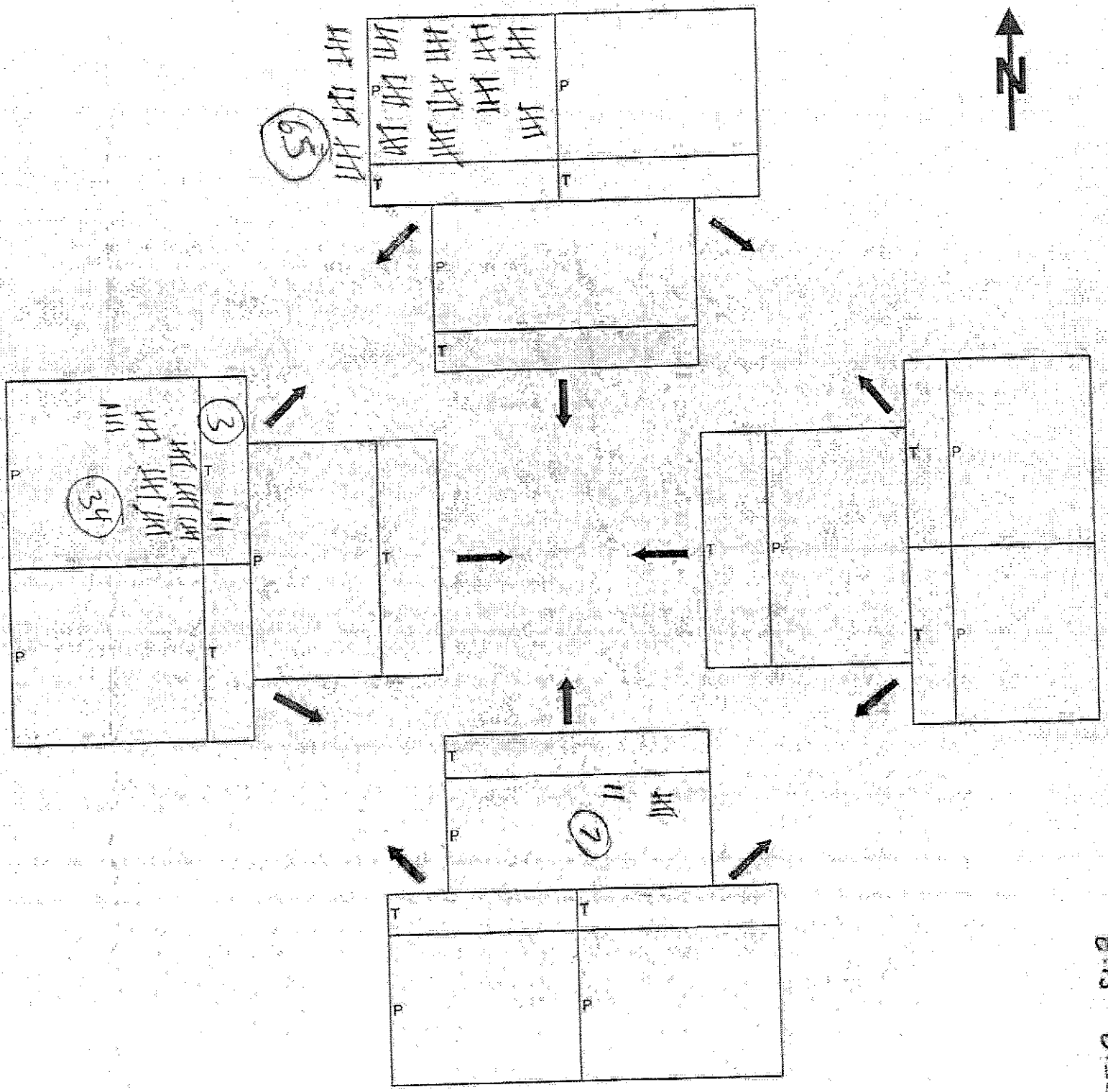
DATE: 10/27/11
WEATHER: Clear
OBSERVER: D. Hymel



VEHICLE TURNING MOVEMENT COUNT SHEET

NORTH/SOUTH STREET LA 406
EAST/WEST STREET LA 23

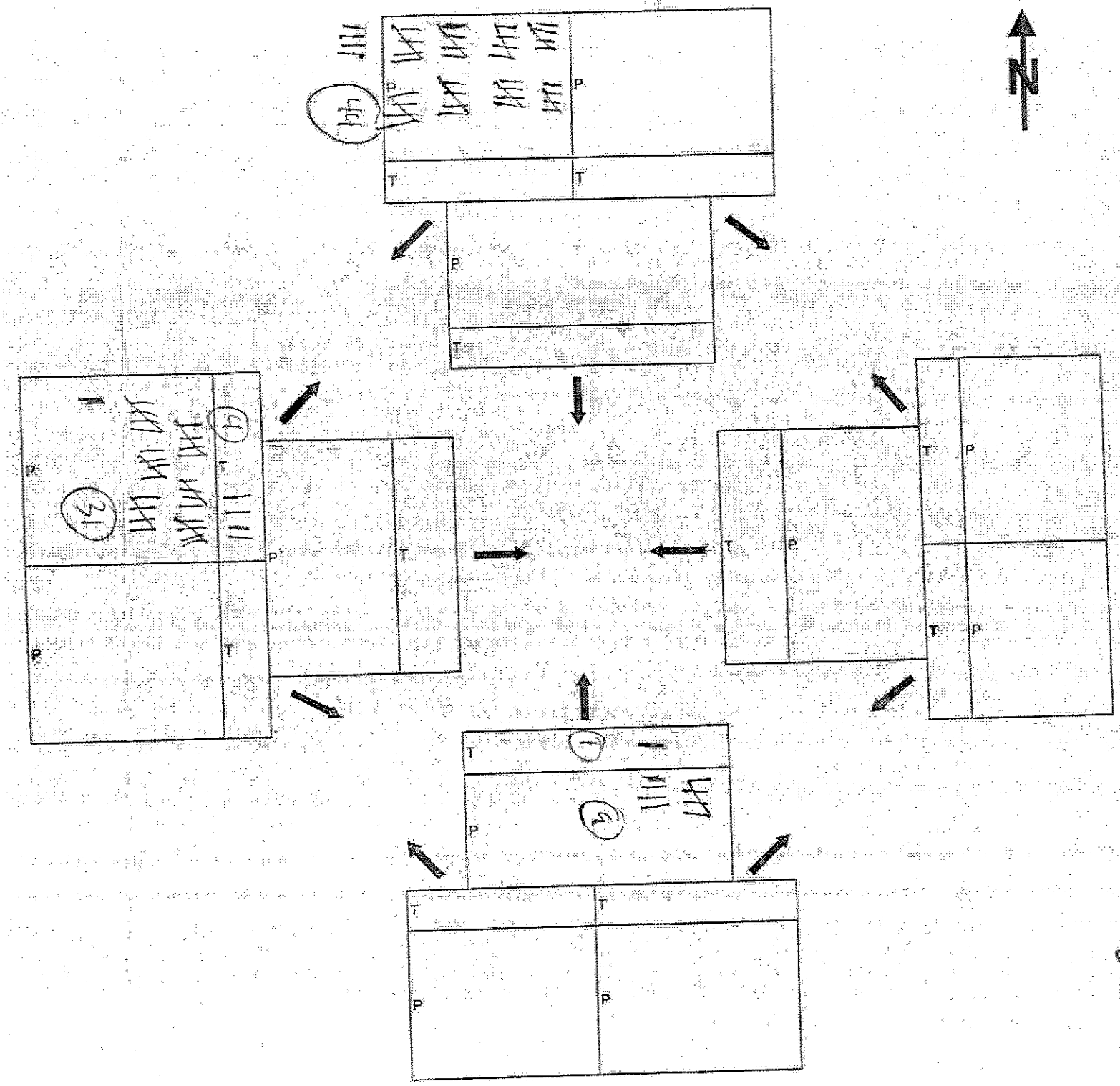
DATE 10/27/11
WEATHER Clear
OBSERVER D Hymel



VEHICLE TURNING MOVEMENT COUNT SHEET

NORTH/SOUTH STREET LA 406
EAST/WEST STREET LA 22

DATE 10/27/11
WEATHER Clear
OBSERVER D. Hymel



VEHICLE TURNING MOVEMENT COUNT SHEET

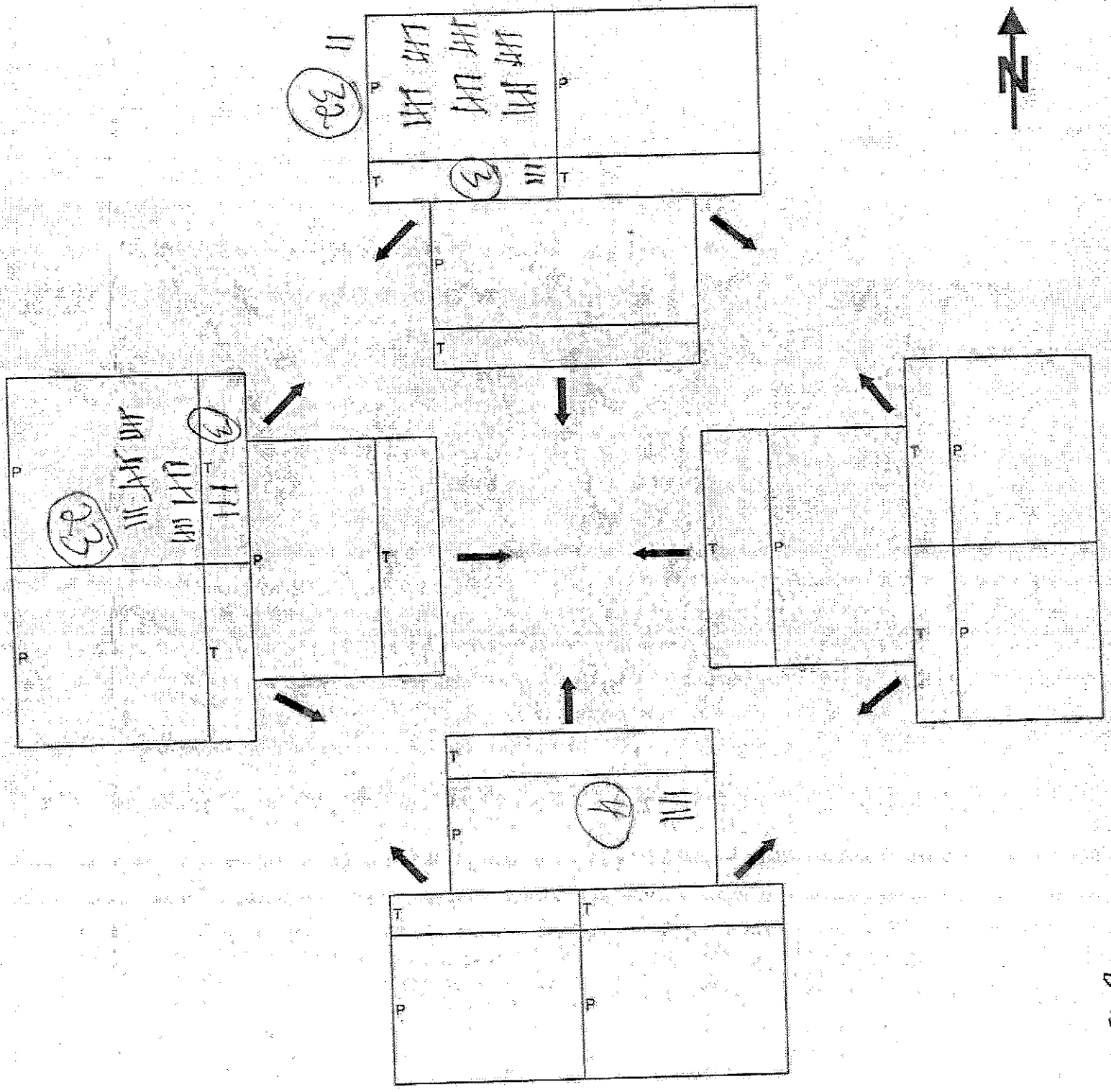
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10-27-11

WEATHER Clear

OBSERVER D. Hymel



6:30 — 6:45

VEHICLE TURNING MOVEMENT COUNT SHEET

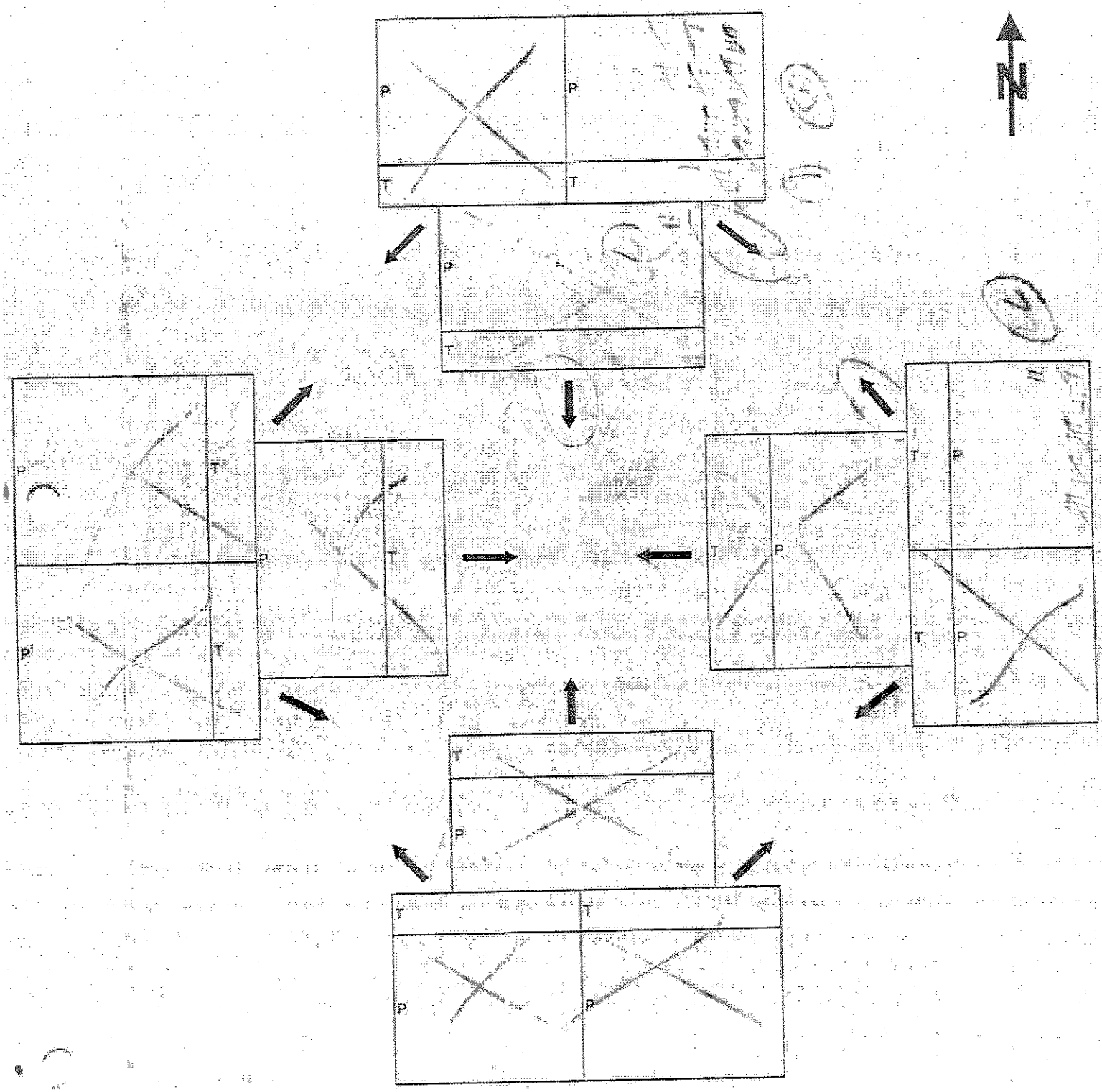
NORTH/SOUTH STREET _____

EAST/WEST STREET _____

DATE _____

WEATHER _____

OBSERVER _____



VEHICLE TURNING MOVEMENT COUNT SHEET

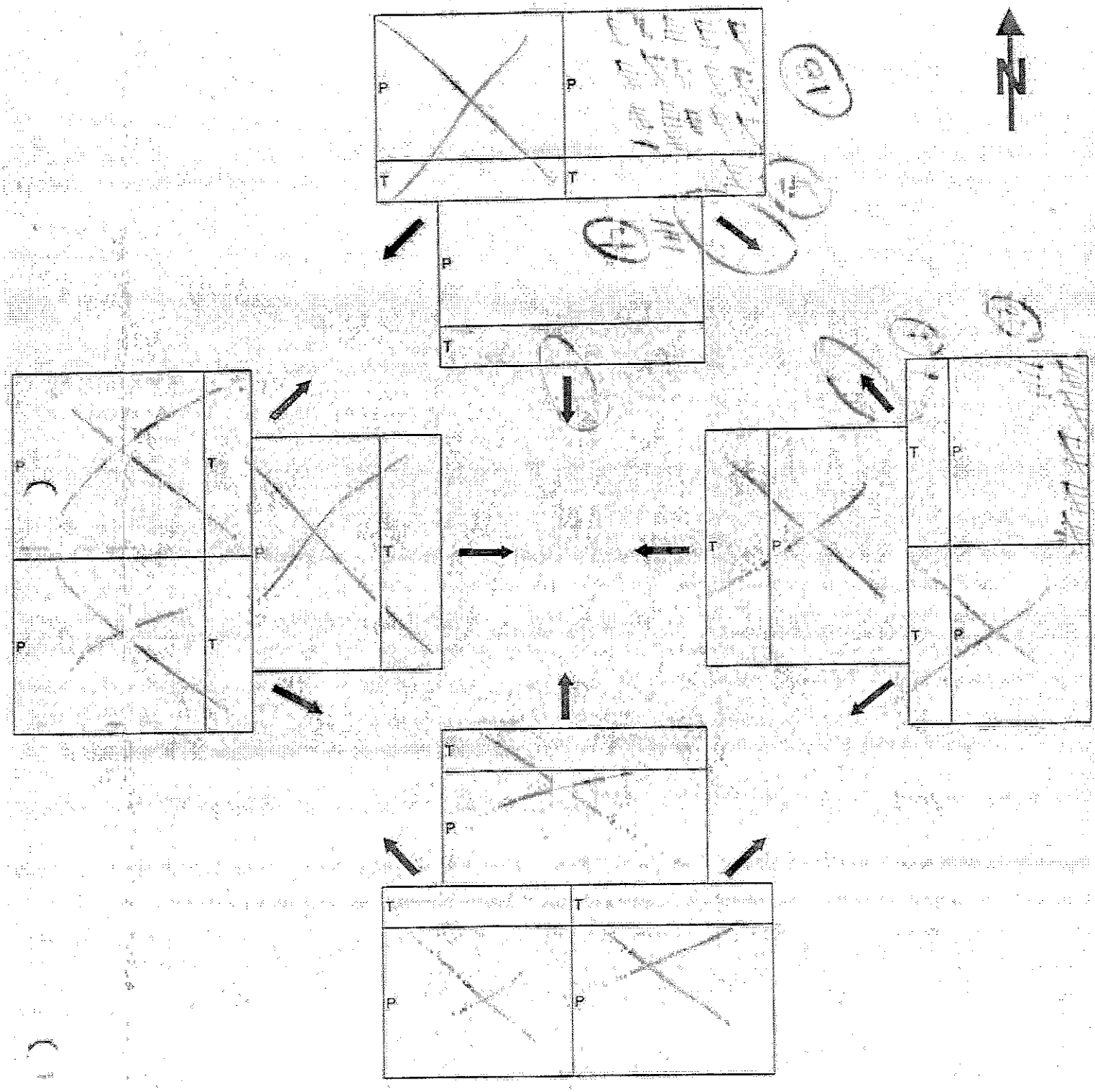
RTH/SOUTH STREET

EAST/WEST STREET

DATE

WEATHER

OBSERVER



6:30 - 6:45

VEHICLE TURNING MOVEMENT COUNT SHEET

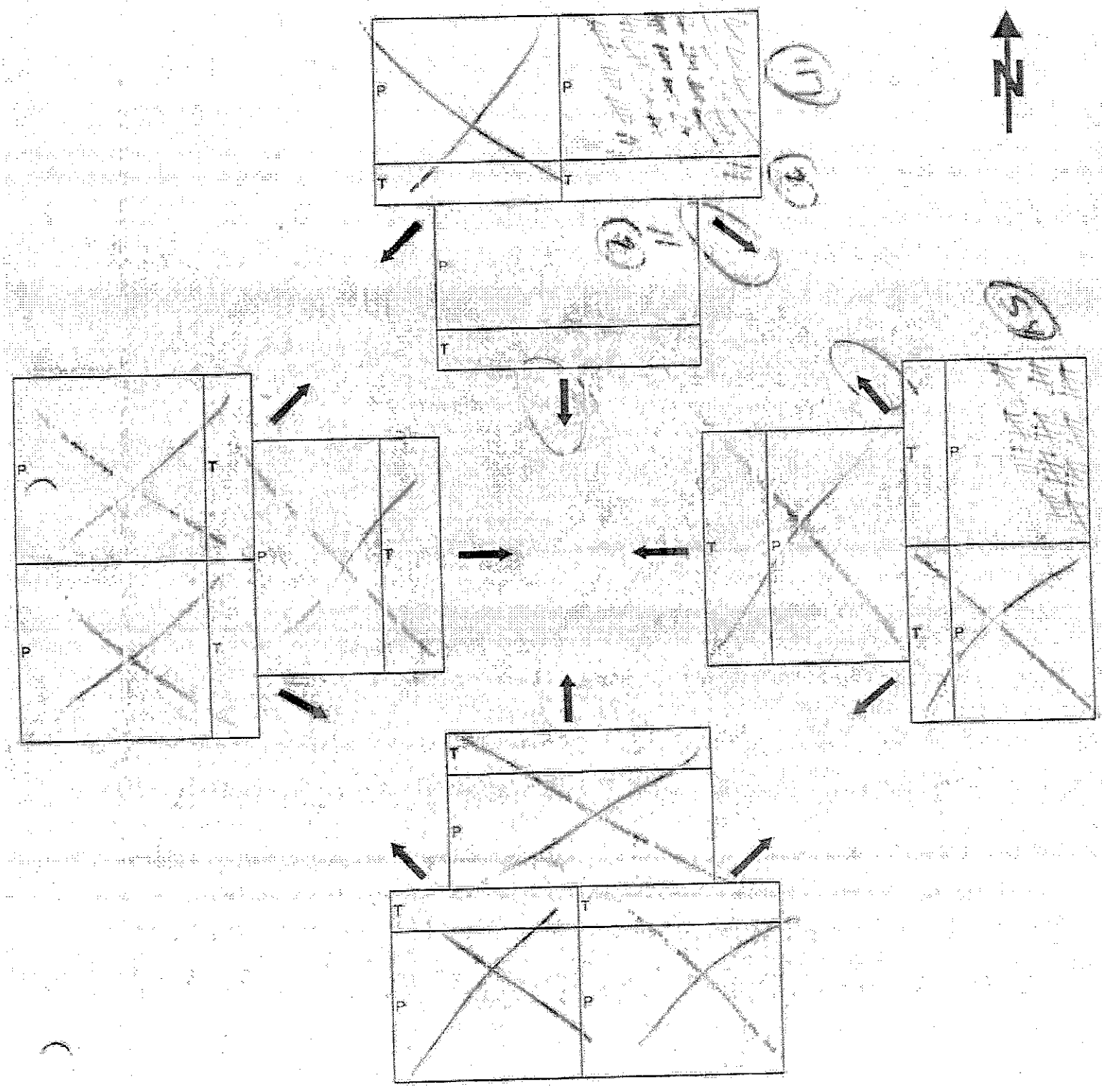
NORTH/SOUTH STREET: [illegible]

EAST/WEST STREET: [illegible]

DATE: [illegible]

WEATHER: [illegible]

OBSERVER: [illegible]



VEHICLE TURNING MOVEMENT COUNT SHEET

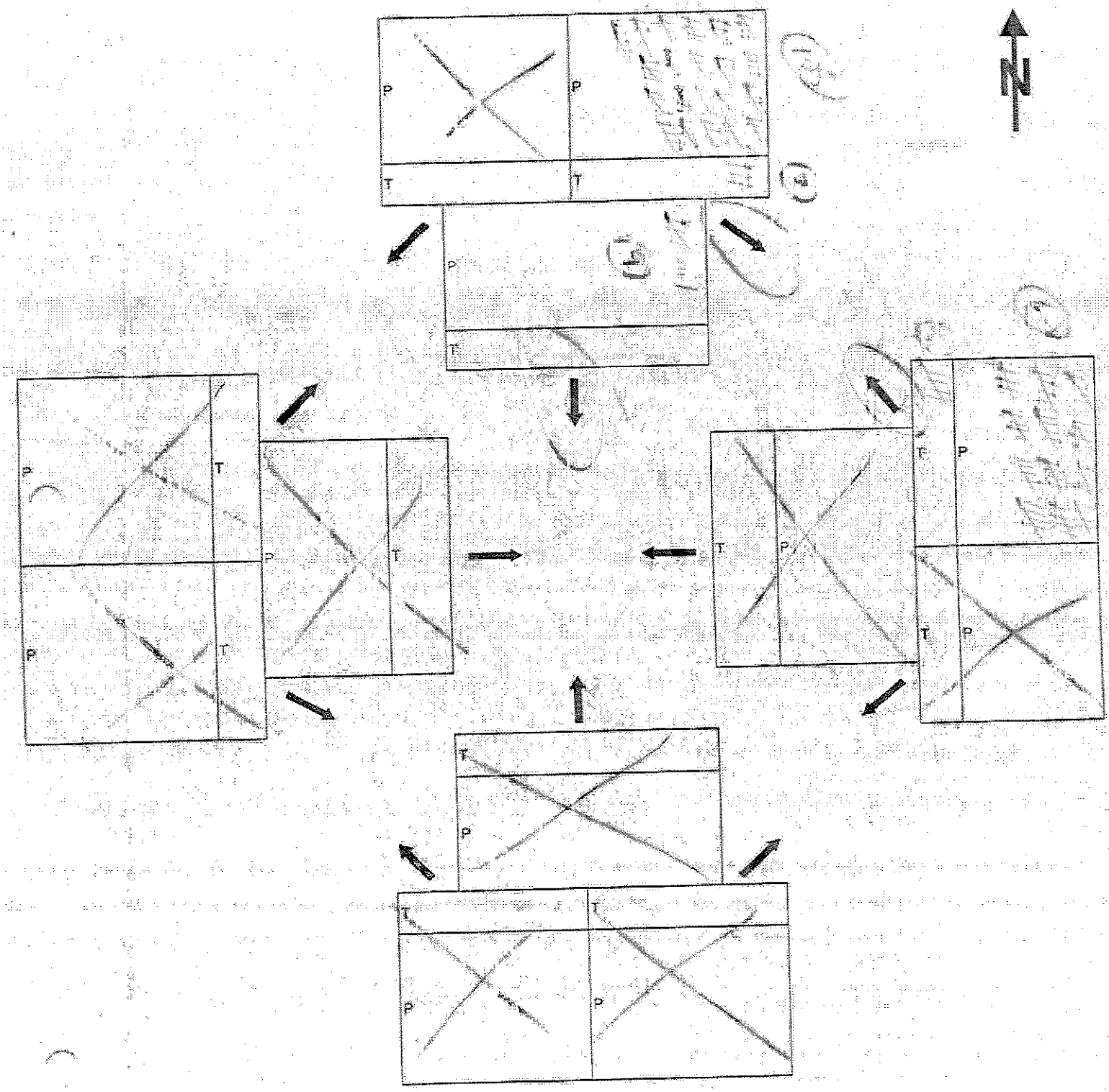
NORTH/SOUTH STREET LAKE

EAST/WEST STREET LAKE

DATE 10/27/21

WEATHER CLEAR

OBSERVER



VEHICLE TURNING MOVEMENT COUNT SHEET

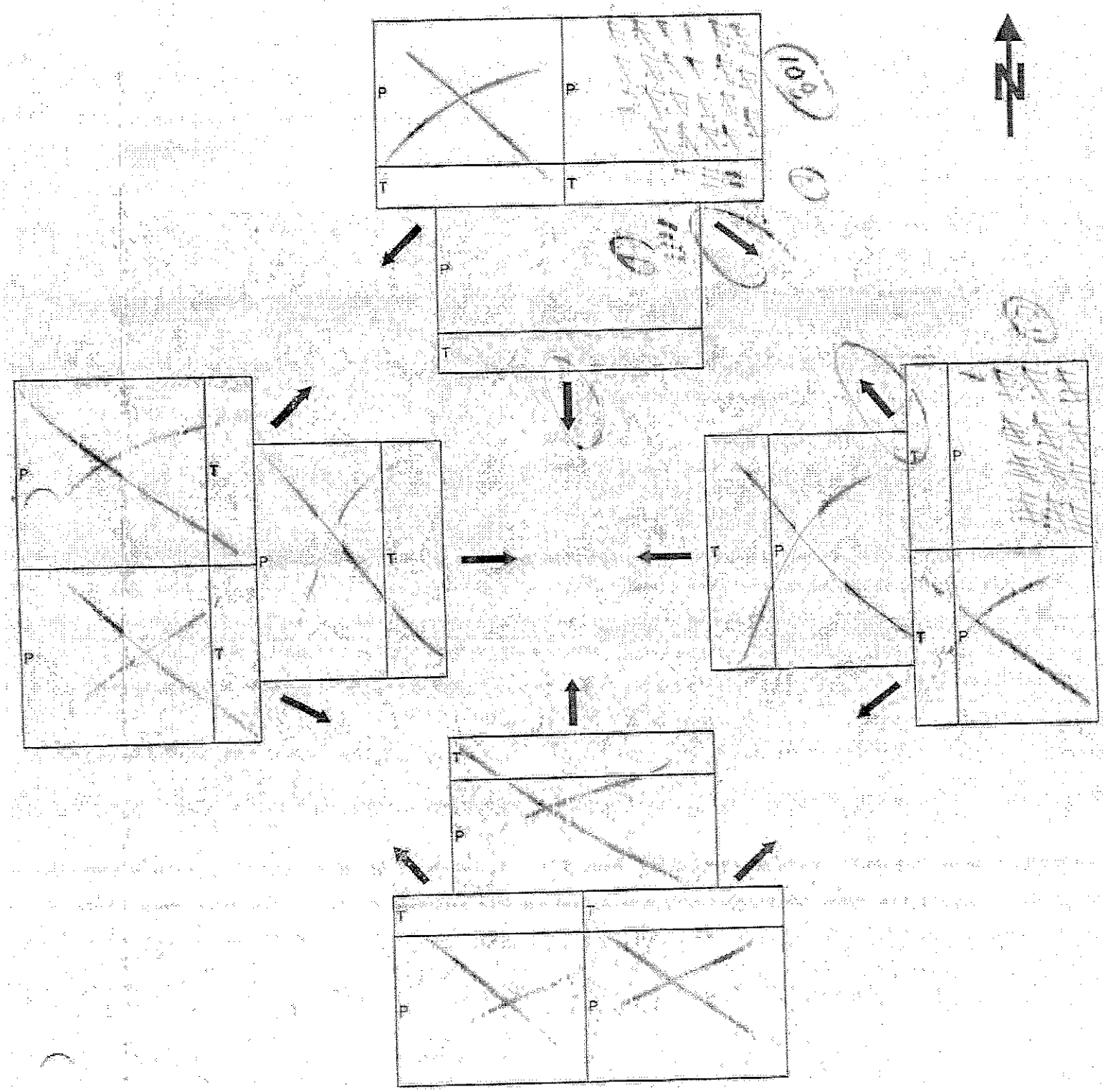
NORTH/SOUTH STREET

EAST/WEST STREET

DATE

WEATHER

OBSERVER



VEHICLE TURNING MOVEMENT COUNT SHEET

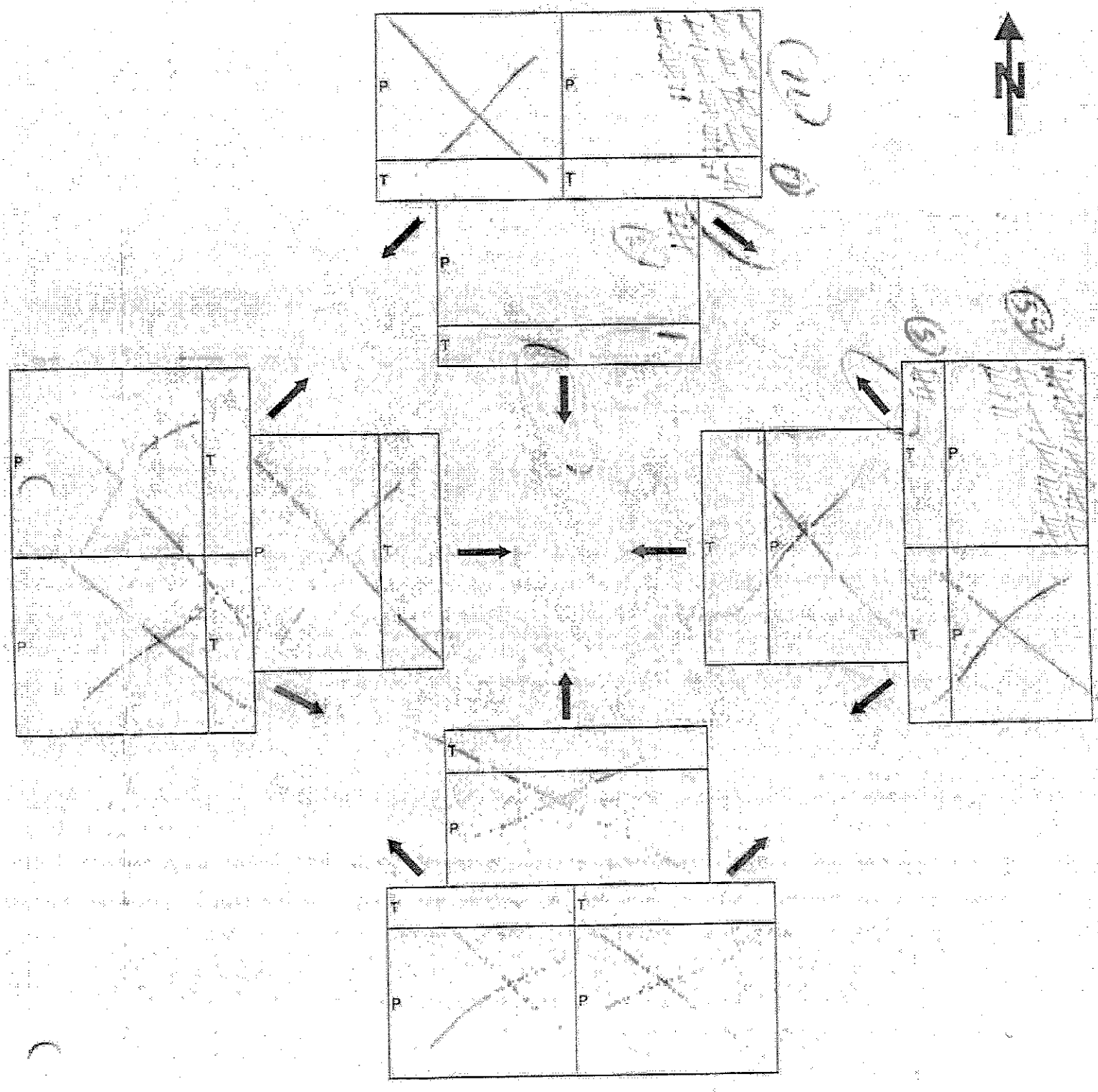
NORTH/SOUTH STREET _____

EAST/WEST STREET _____

DATE _____

WEATHER _____

OBSERVER _____



VEHICLE TURNING MOVEMENT COUNT SHEET

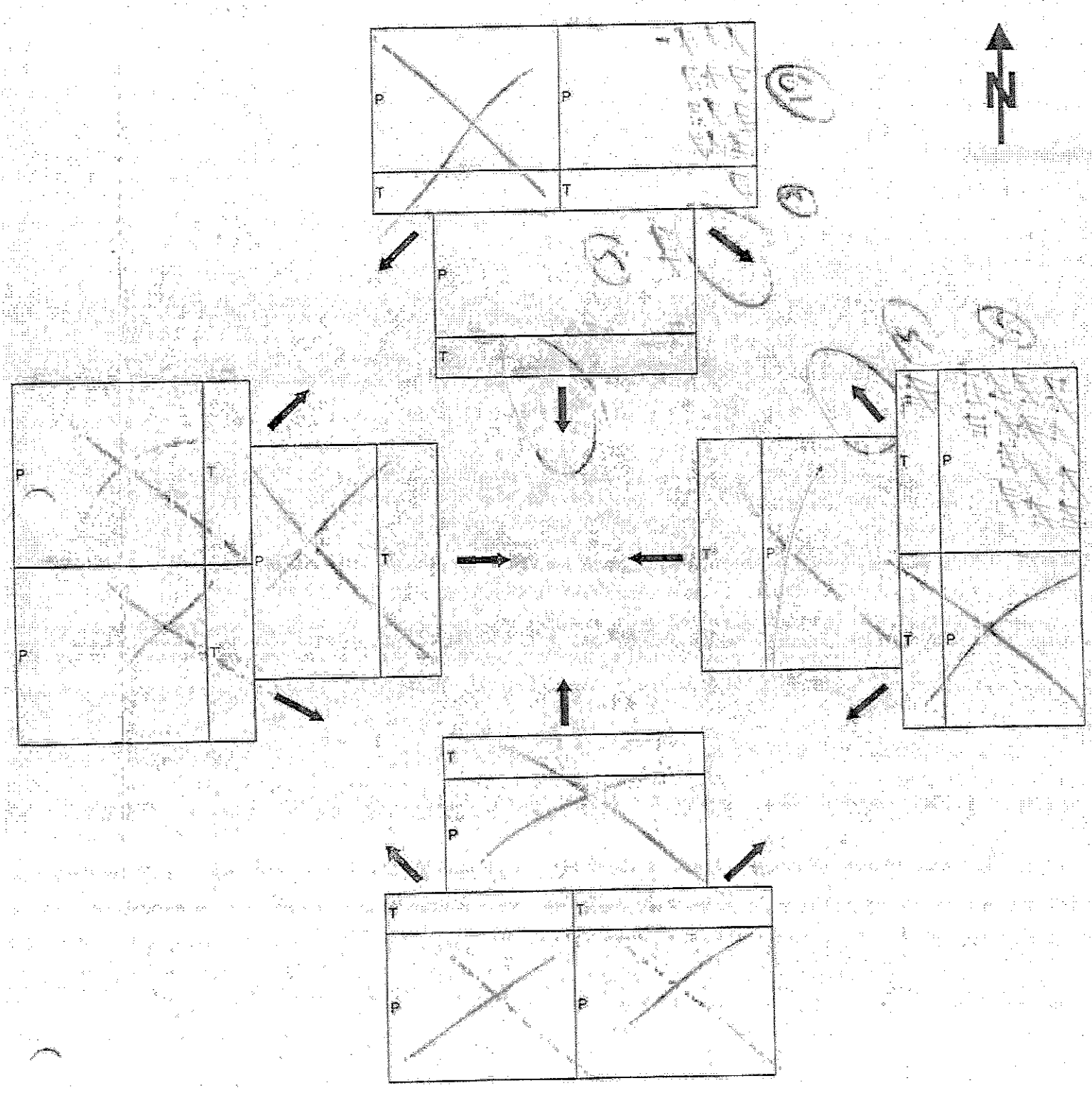
NORTH/SOUTH STREET _____

EAST/WEST STREET _____

DATE _____

WEATHER _____

OBSERVER _____



VEHICLE TURNING MOVEMENT COUNT SHEET

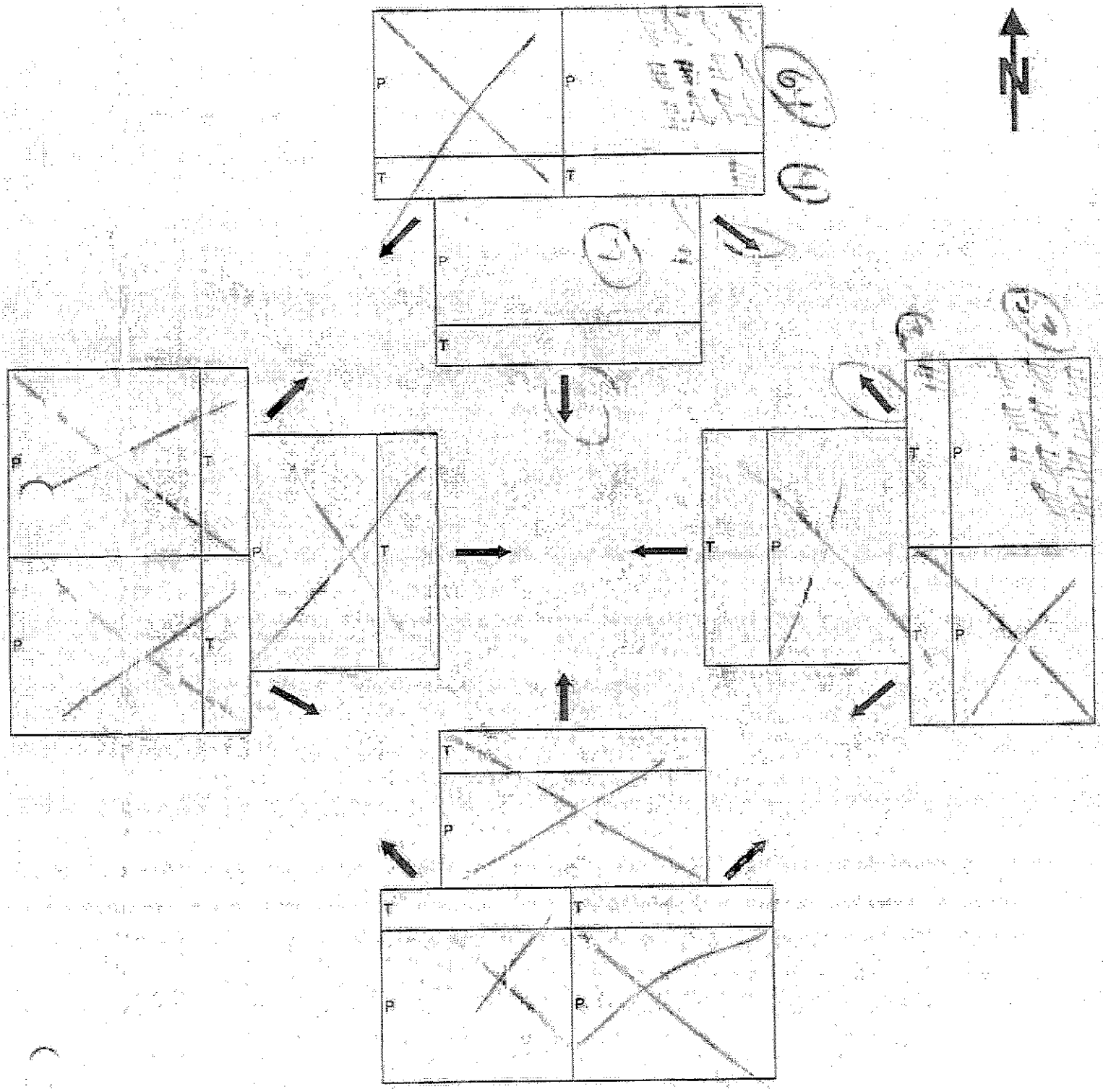
NORTH/SOUTH STREET _____

EAST/WEST STREET _____

DATE _____

WEATHER _____

OBSERVER _____



VEHICLE TURNING MOVEMENT COUNT SHEET

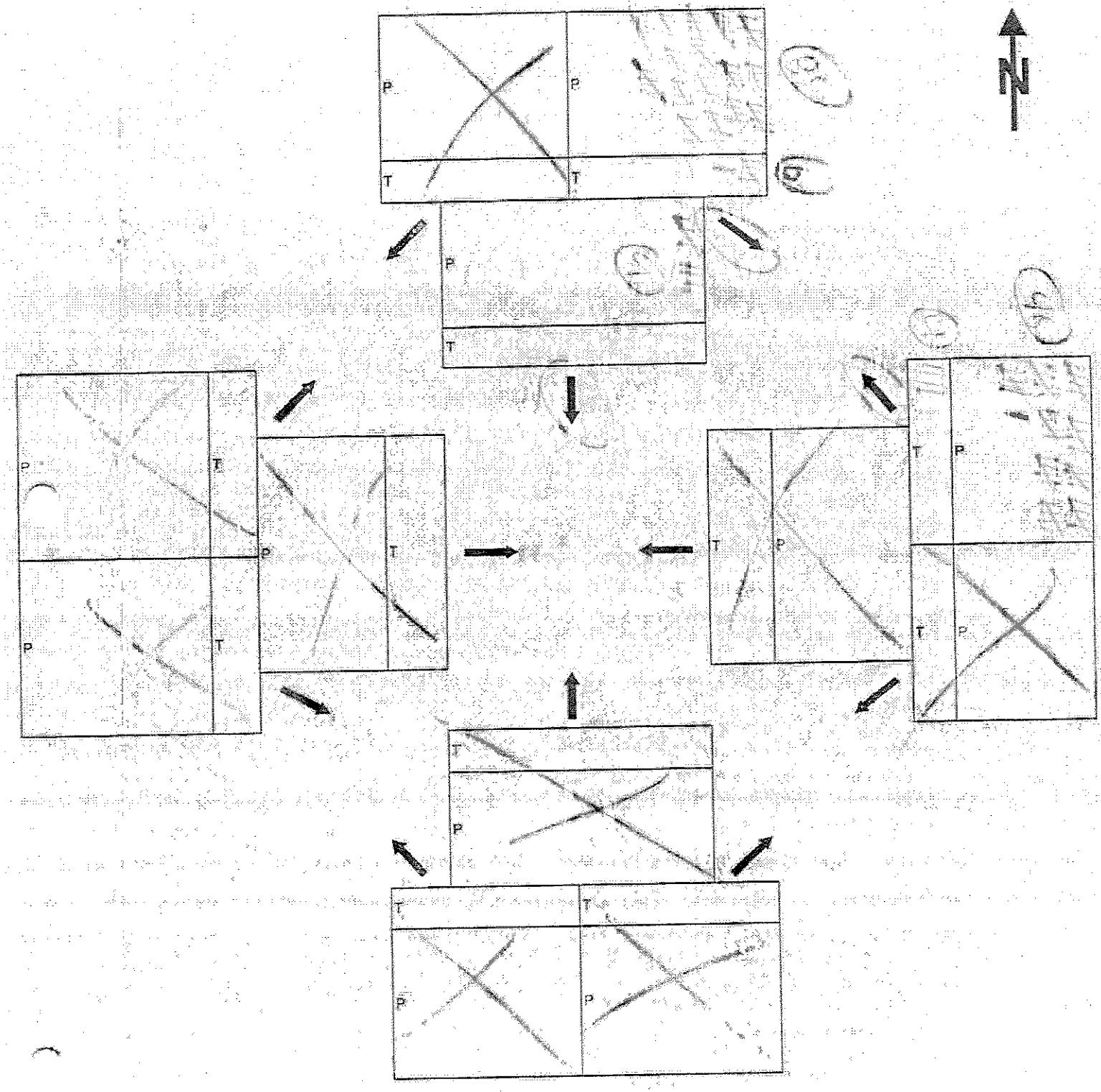
NORTH/SOUTH STREET Lake

EAST/WEST STREET Lake

DATE

WEATHER

OBSERVER



VEHICLE TURNING MOVEMENT COUNT SHEET

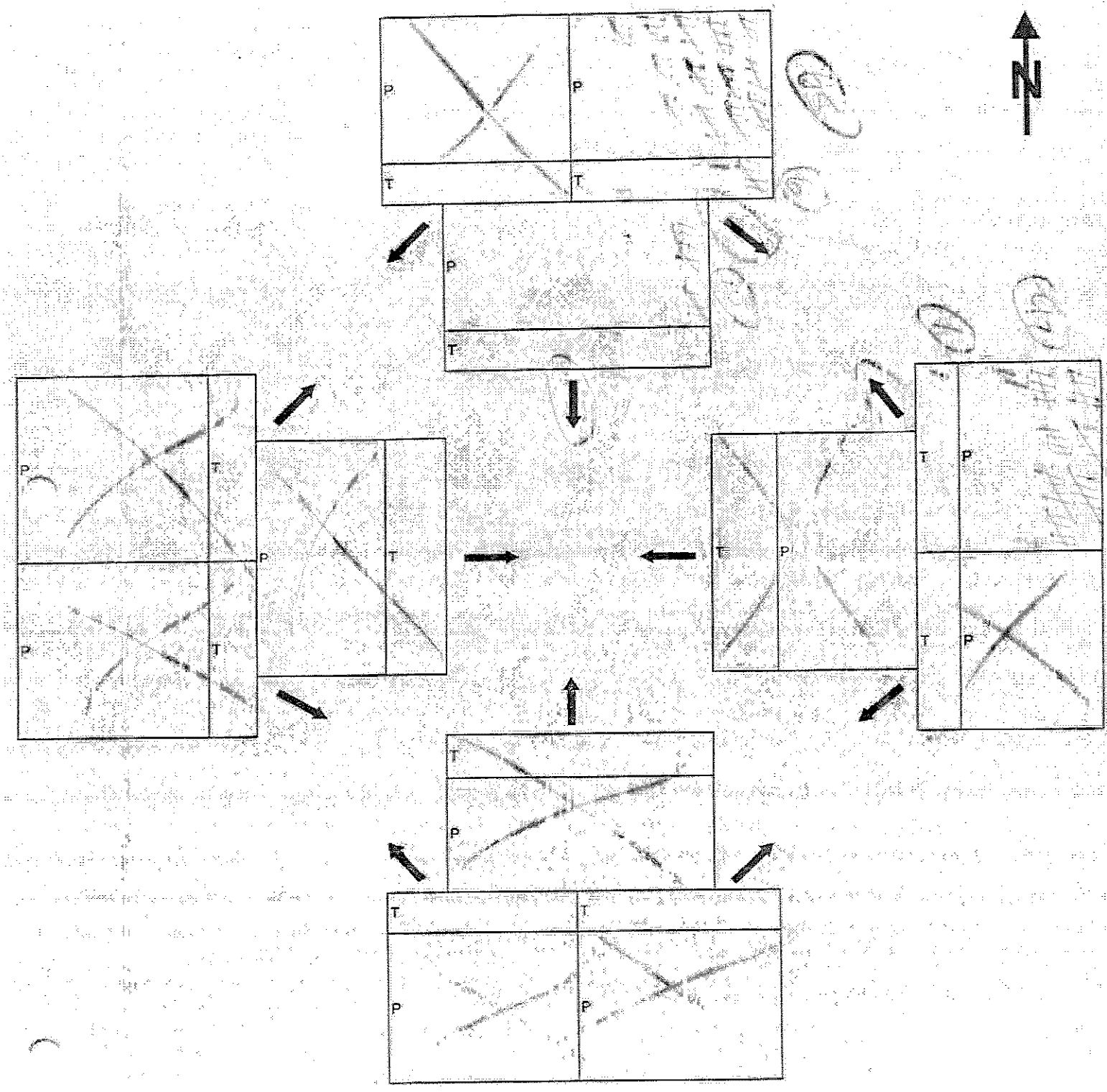
NORTH/SOUTH STREET _____

EAST/WEST STREET _____

DATE _____

WEATHER _____

OBSERVER _____



VEHICLE TURNING MOVEMENT COUNT SHEET

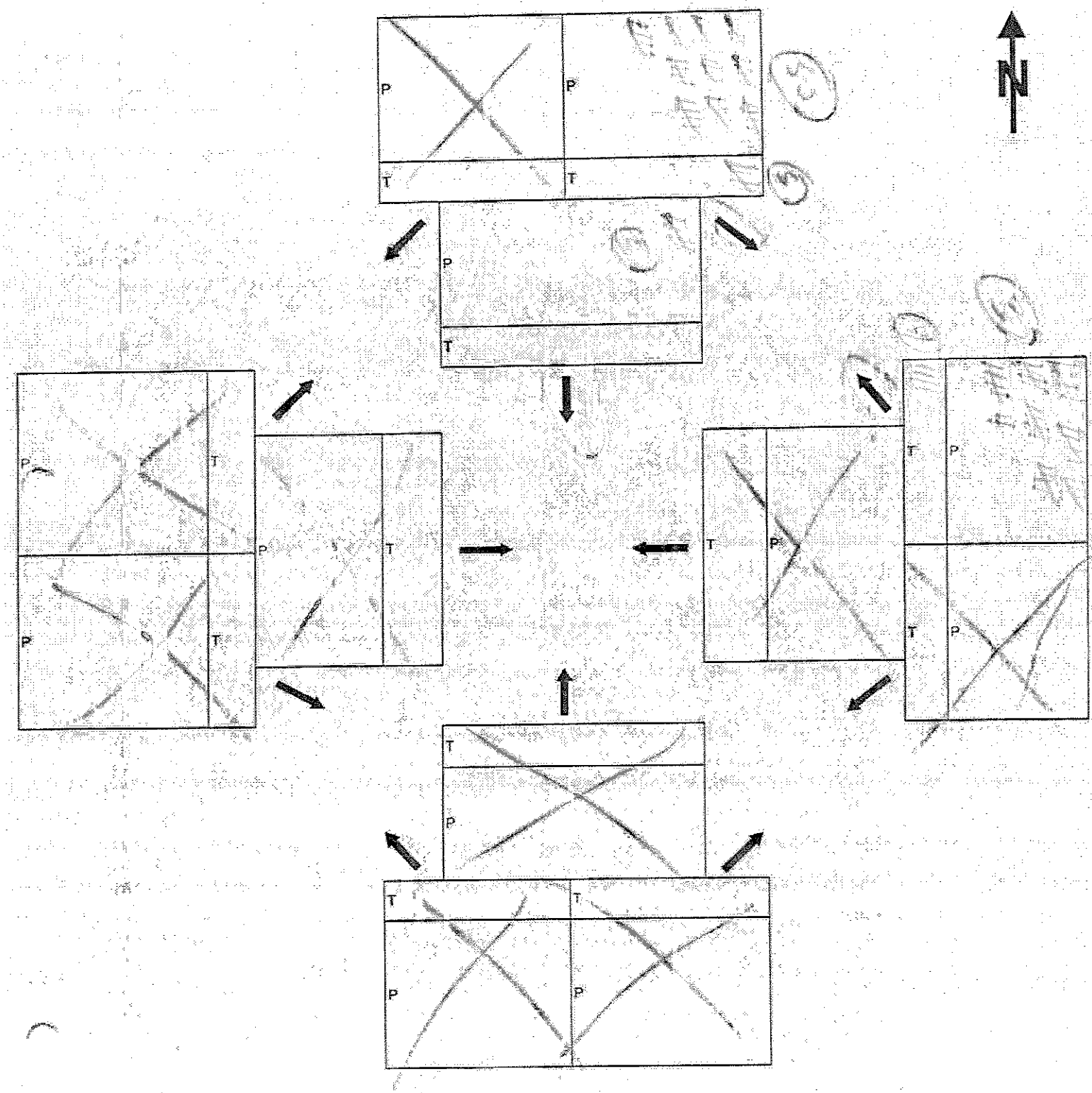
NORTH/SOUTH STREET _____

EAST/WEST STREET _____

DATE _____

WEATHER _____

OBSERVER _____



VEHICLE TURNING MOVEMENT COUNT SHEET

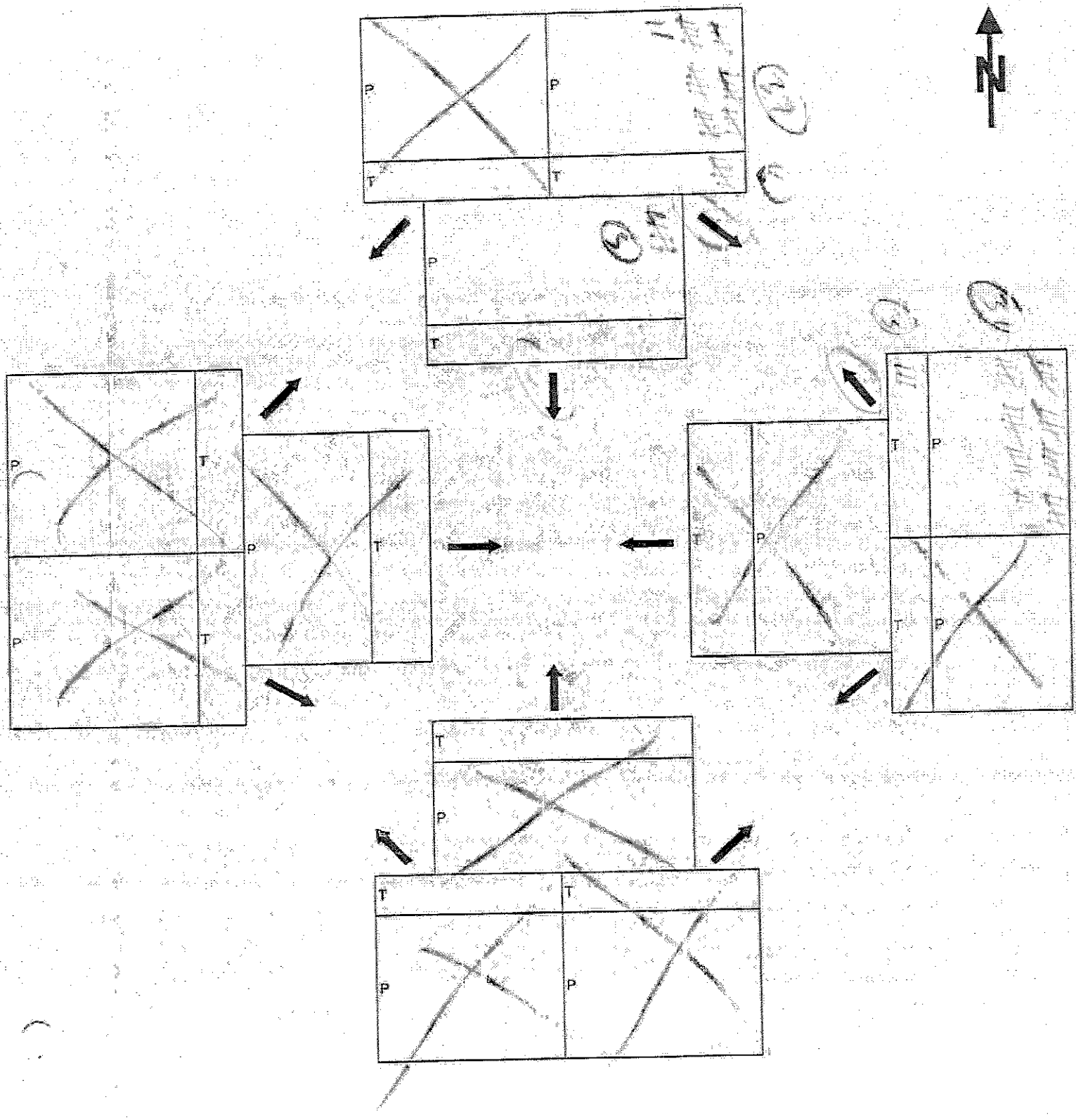
NORTH/SOUTH STREET

EAST/WEST STREET

DATE

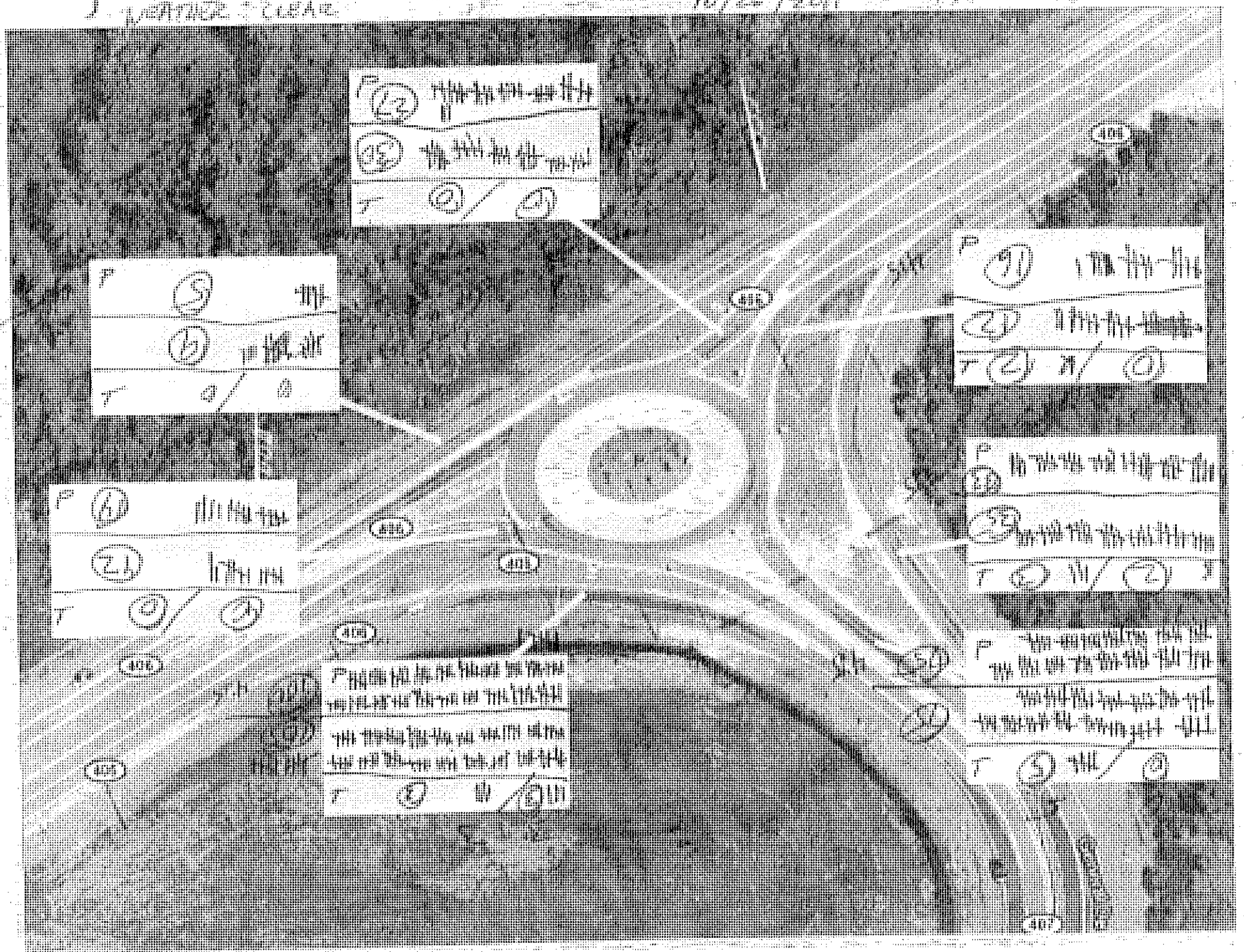
WEATHER

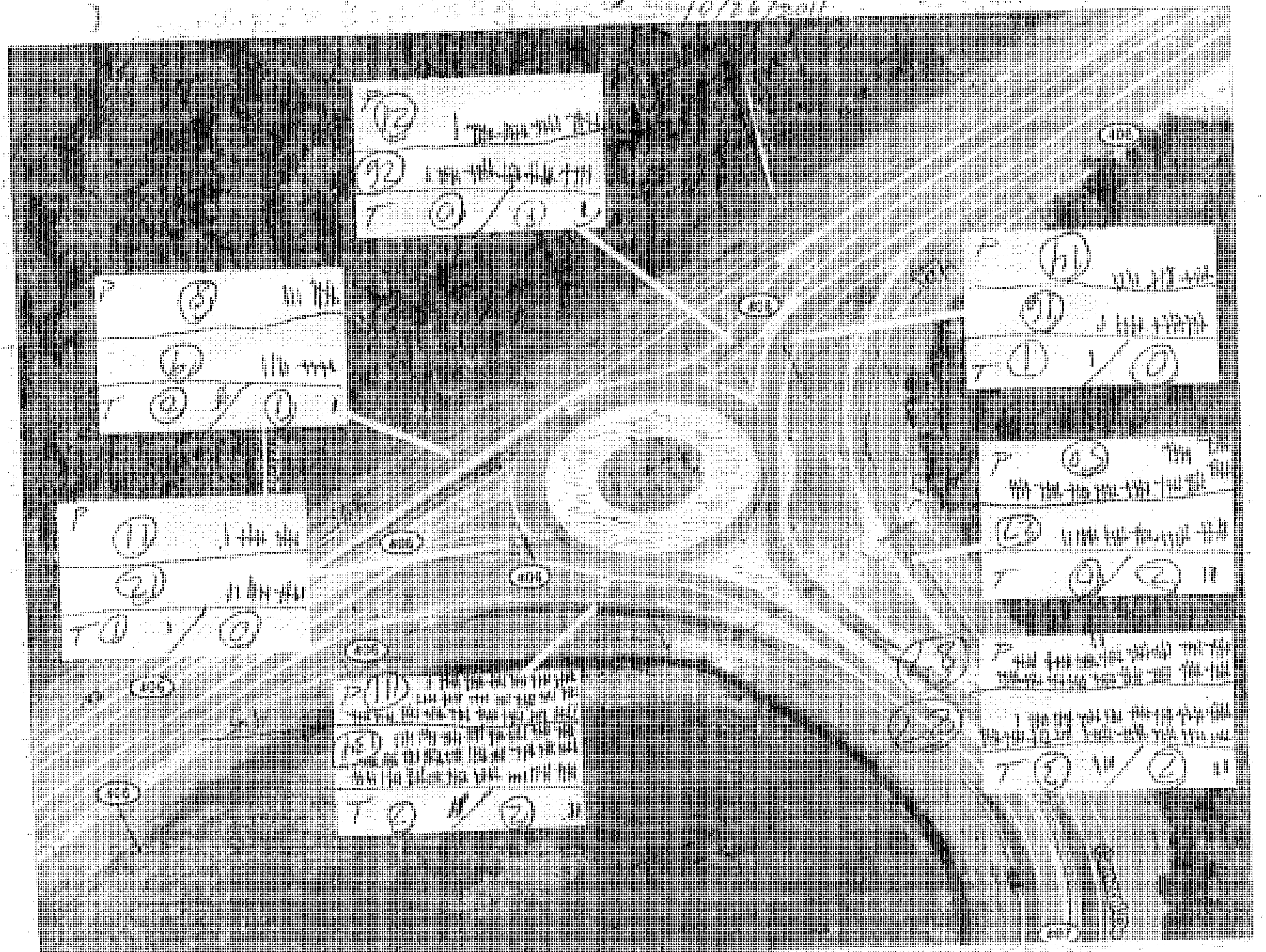
OBSERVER

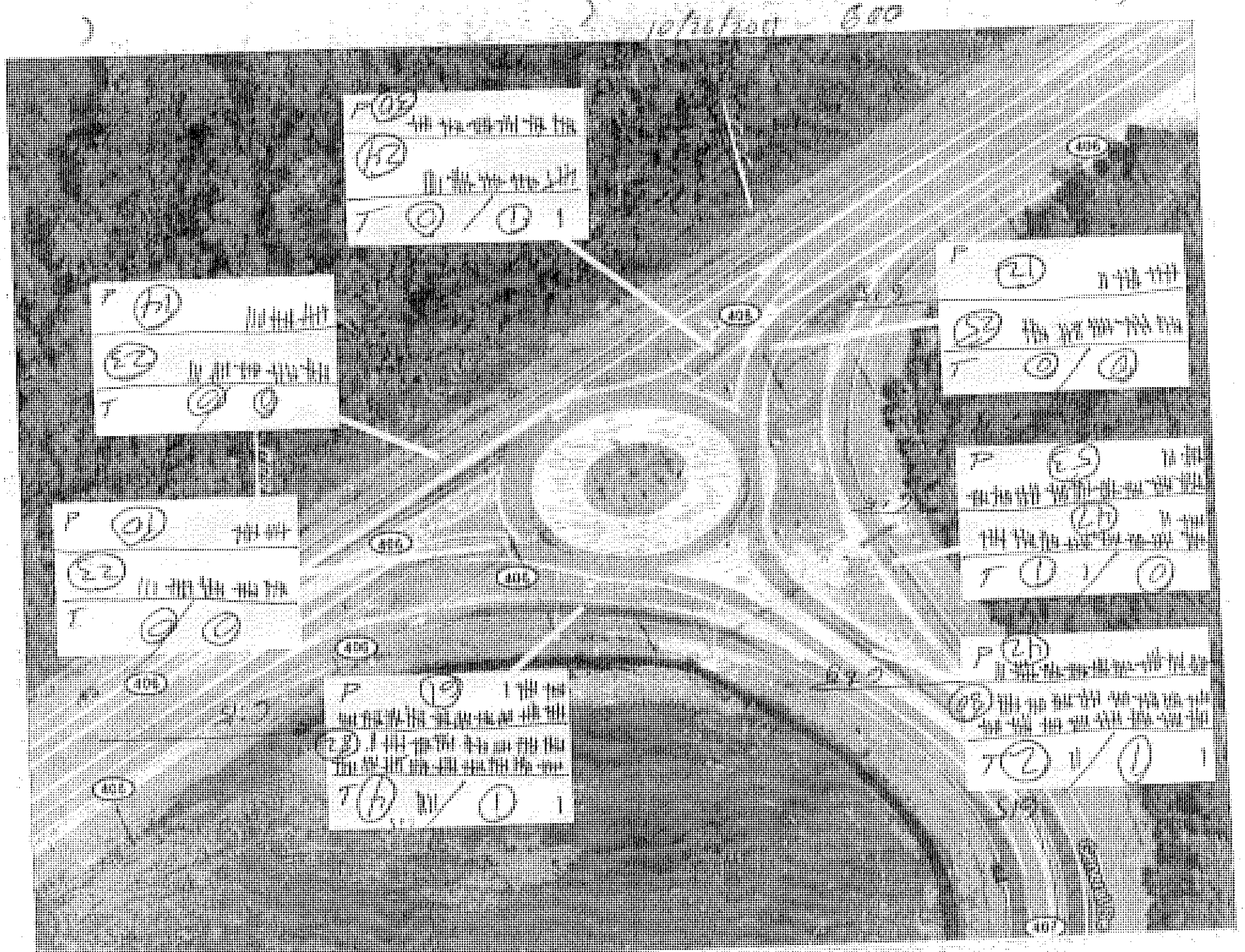


Appendix D

P.M. Traffic Counts





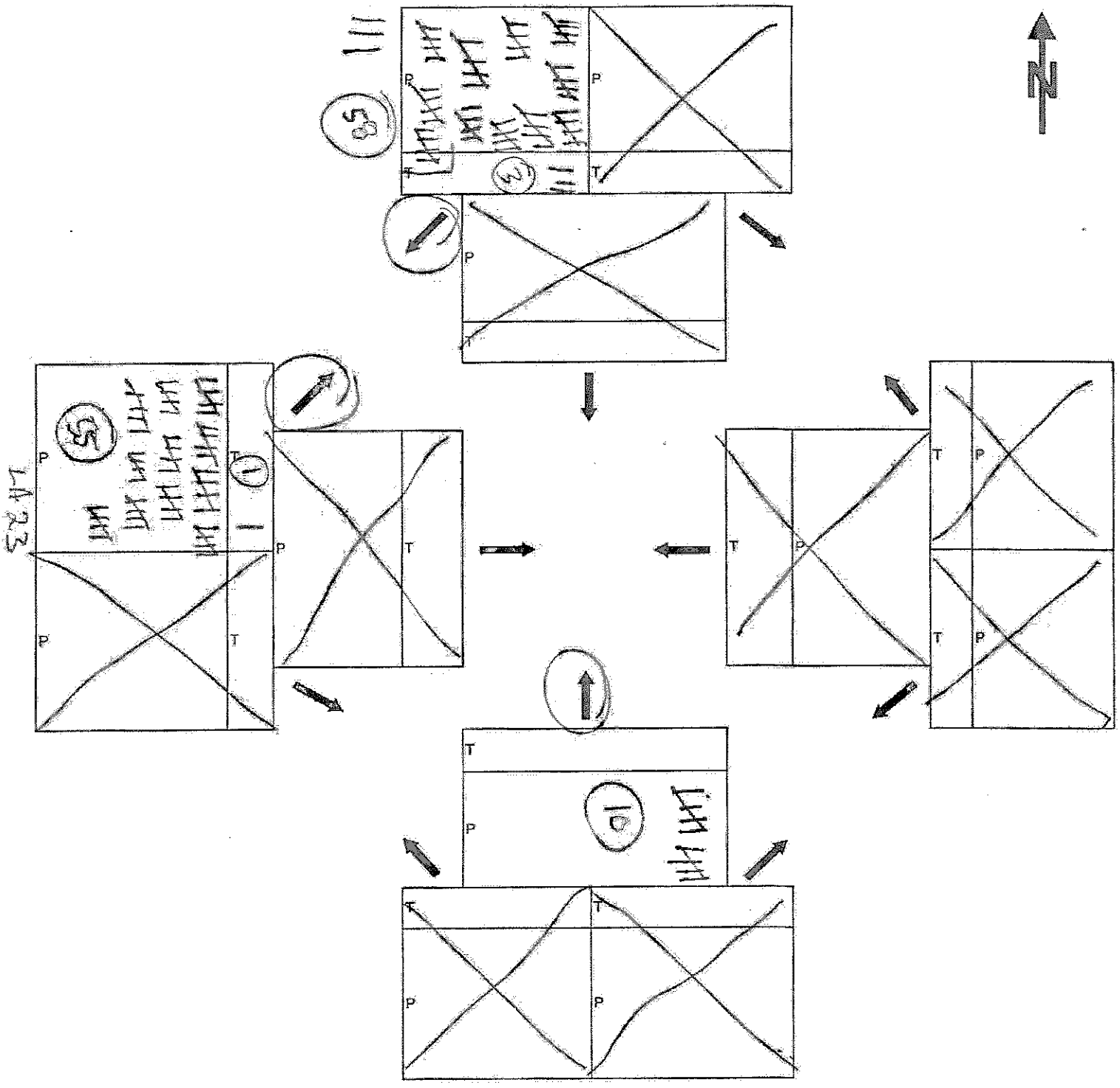


@ 16:00 - 16:15

VEHICLE TURNING MOVEMENT COUNT SHEET

NORTH/SOUTH STREET LA 406
EAST/WEST STREET LA 23

DATE 10/26/2011
WEATHER CLEAR
OBSERVER D. Hymel



16:15 - 16:30

VEHICLE TURNING MOVEMENT COUNT SHEET

NORTH/SOUTH STREET LA 406

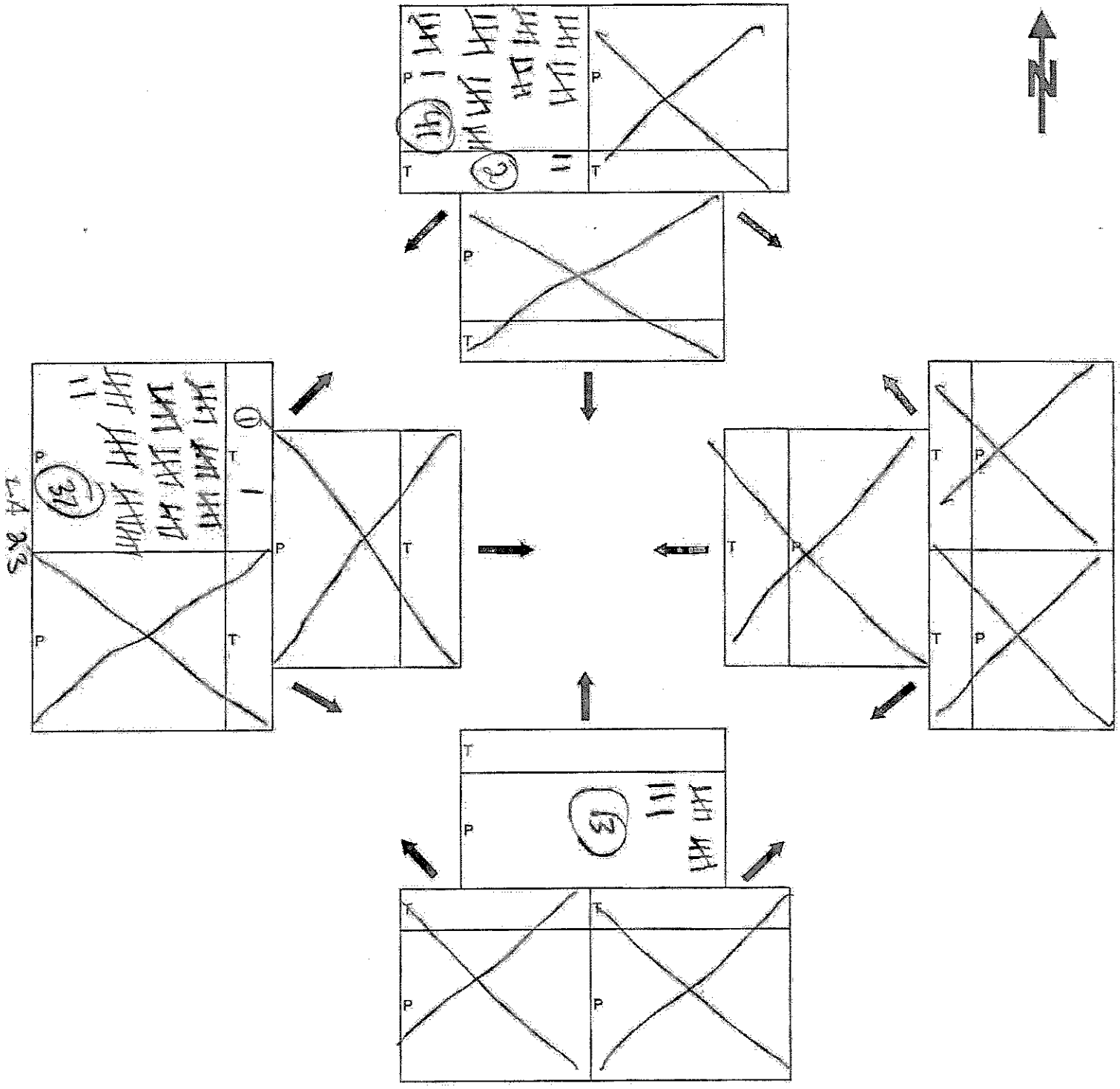
EAST/WEST STREET LA 23

LA 406

DATE 10/26/2011

WEATHER CLEAR

OBSERVER D. Hymel

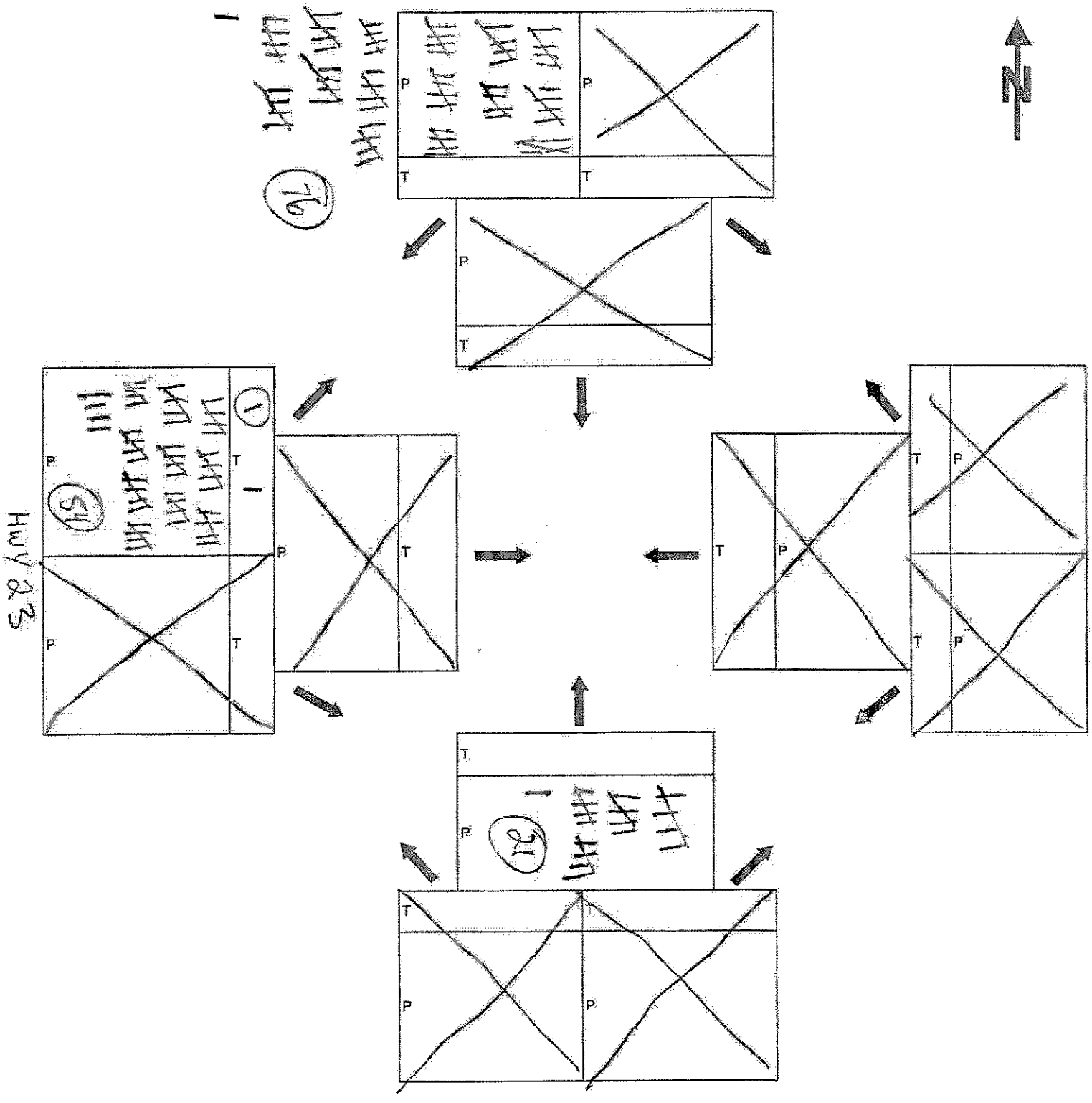


16:30 - 16:45

VEHICLE TURNING MOVEMENT COUNT SHEET

NORTH/SOUTH STREET LA 406
EAST/WEST STREET LA 23

DATE 10/26/11
WEATHER Sunny 60/83
OBSERVER D. Hymel



16:45 - 17:00

VEHICLE TURNING MOVEMENT COUNT SHEET

NORTH/SOUTH STREET LA 406

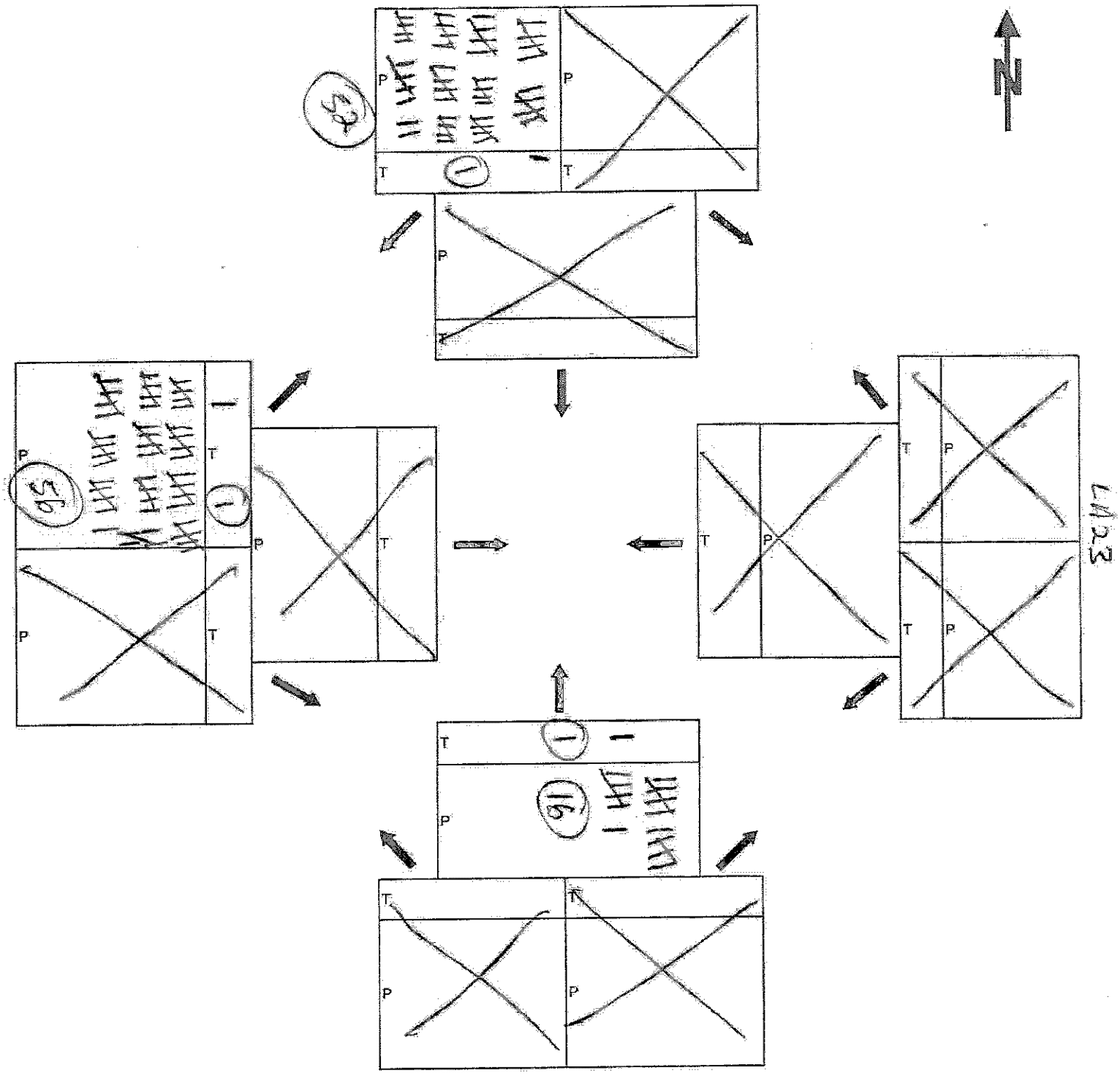
EAST/WEST STREET LA 23

DATE 10/26/11

WEATHER Sunny - 60/93

OBSERVER D. Hymel

LA 406

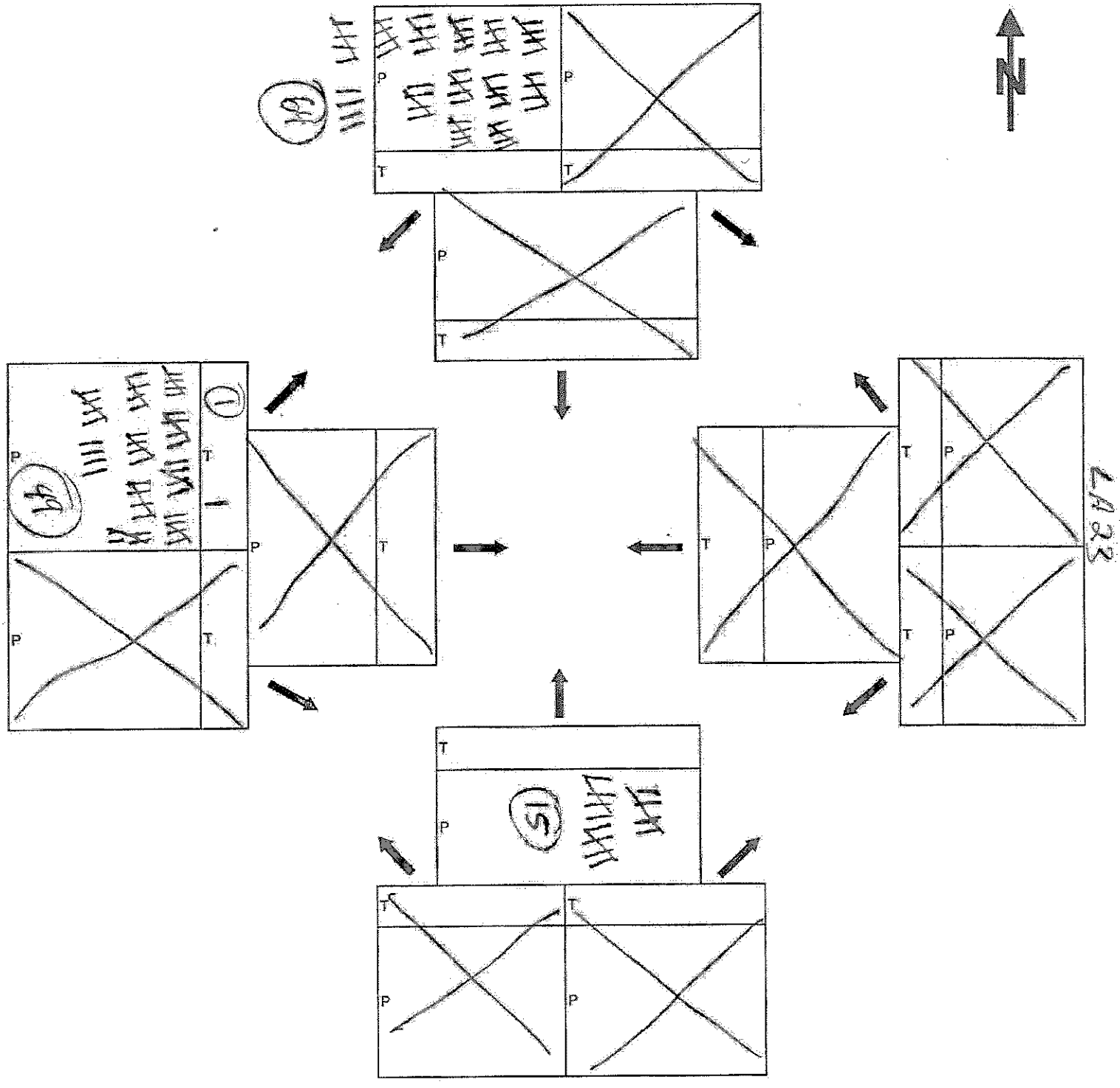


17:00 - 17:15

VEHICLE TURNING MOVEMENT COUNT SHEET

NORTH/SOUTH STREET LA406
EAST/WEST STREET LA 23

DATE 10/26/11
WEATHER Sunny
OBSERVER D. Hymel



17:15 - 17:30

VEHICLE TURNING MOVEMENT COUNT SHEET

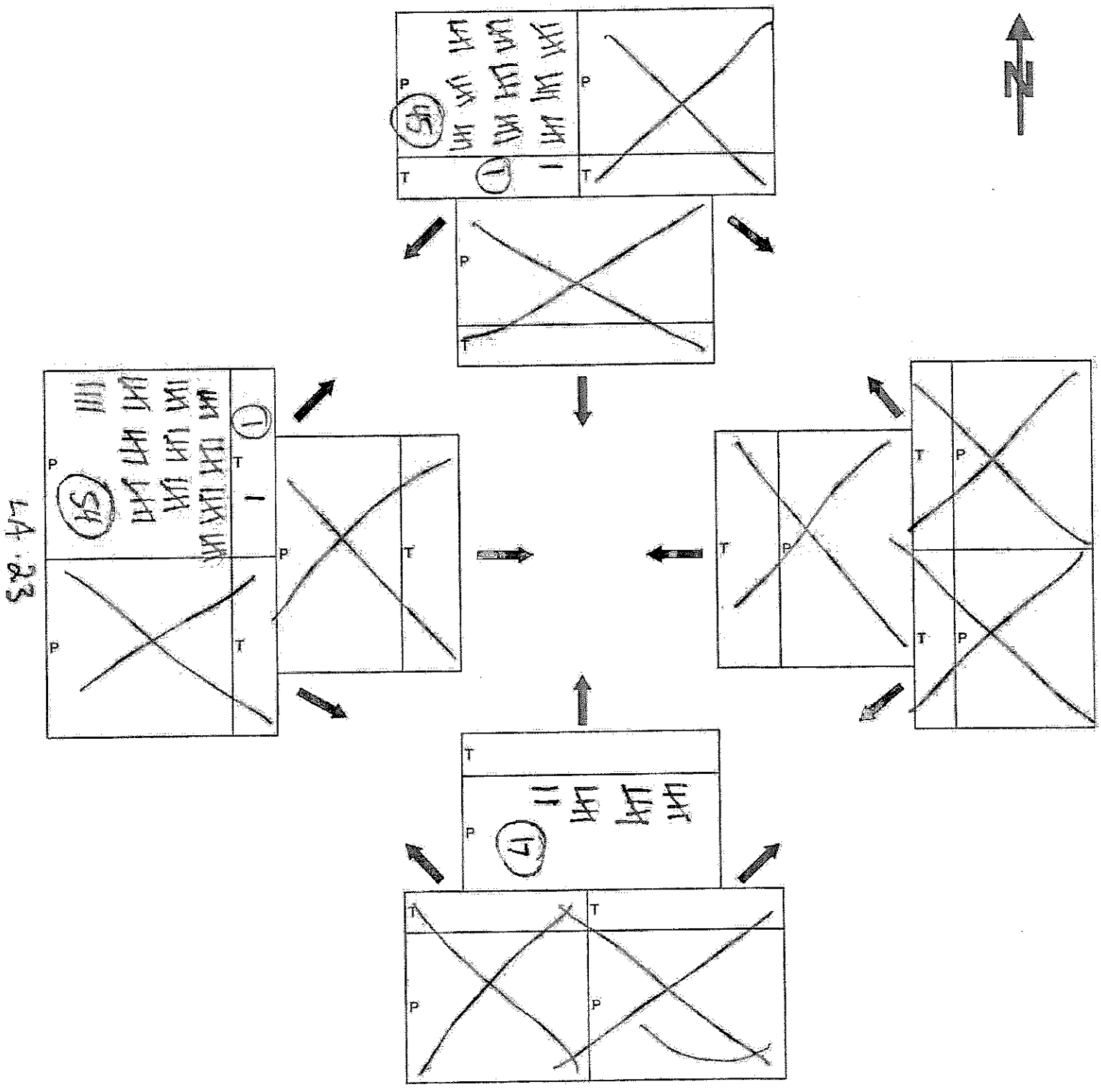
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/26/11

WEATHER Sunny

OBSERVER D. Hymel



17:30 - 17:45

VEHICLE TURNING MOVEMENT COUNT SHEET

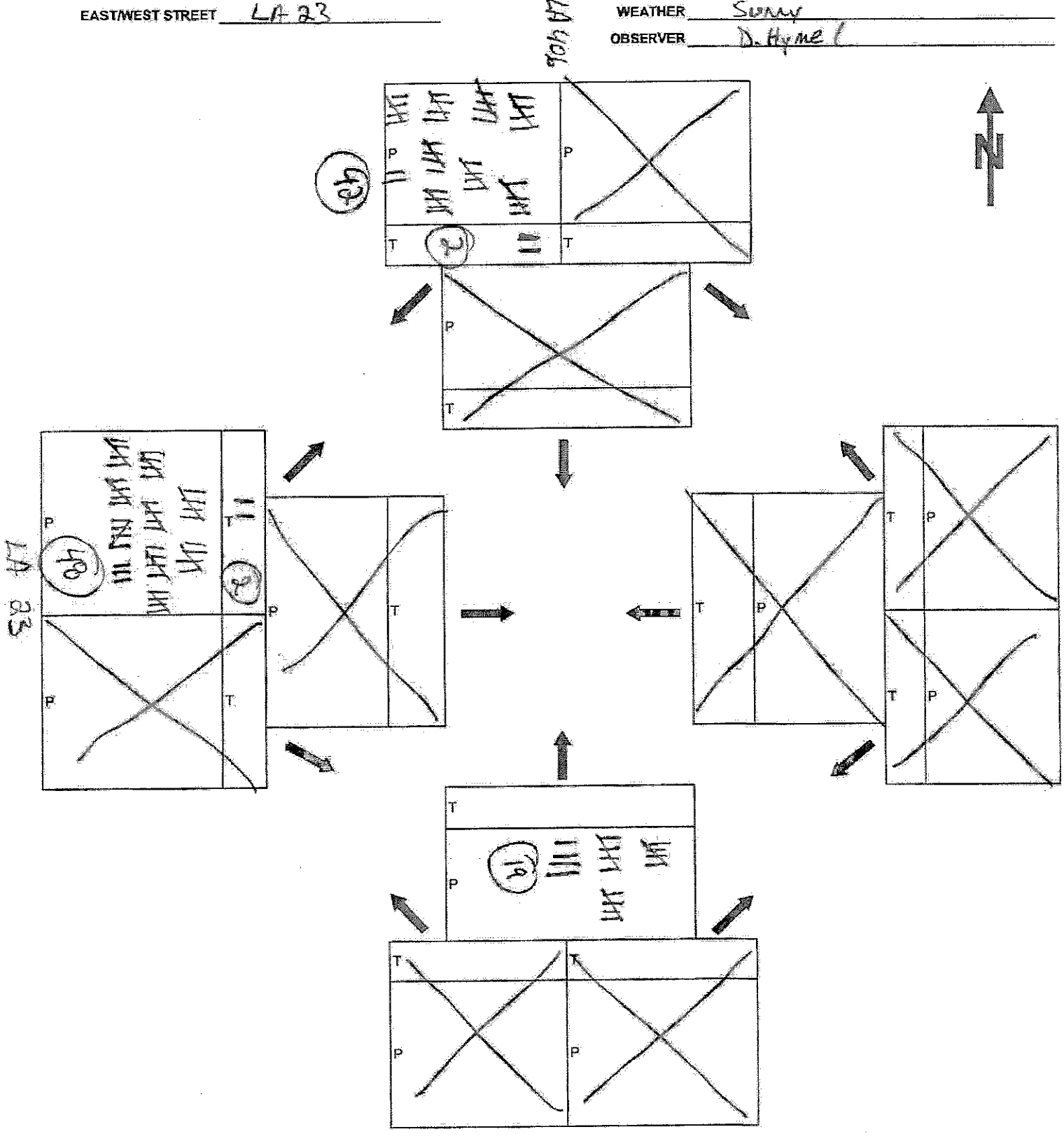
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/26/11

WEATHER Sunny

OBSERVER D. Hymel



17:45 - 19:00

VEHICLE TURNING MOVEMENT COUNT SHEET

NORTH/SOUTH STREET LA 406

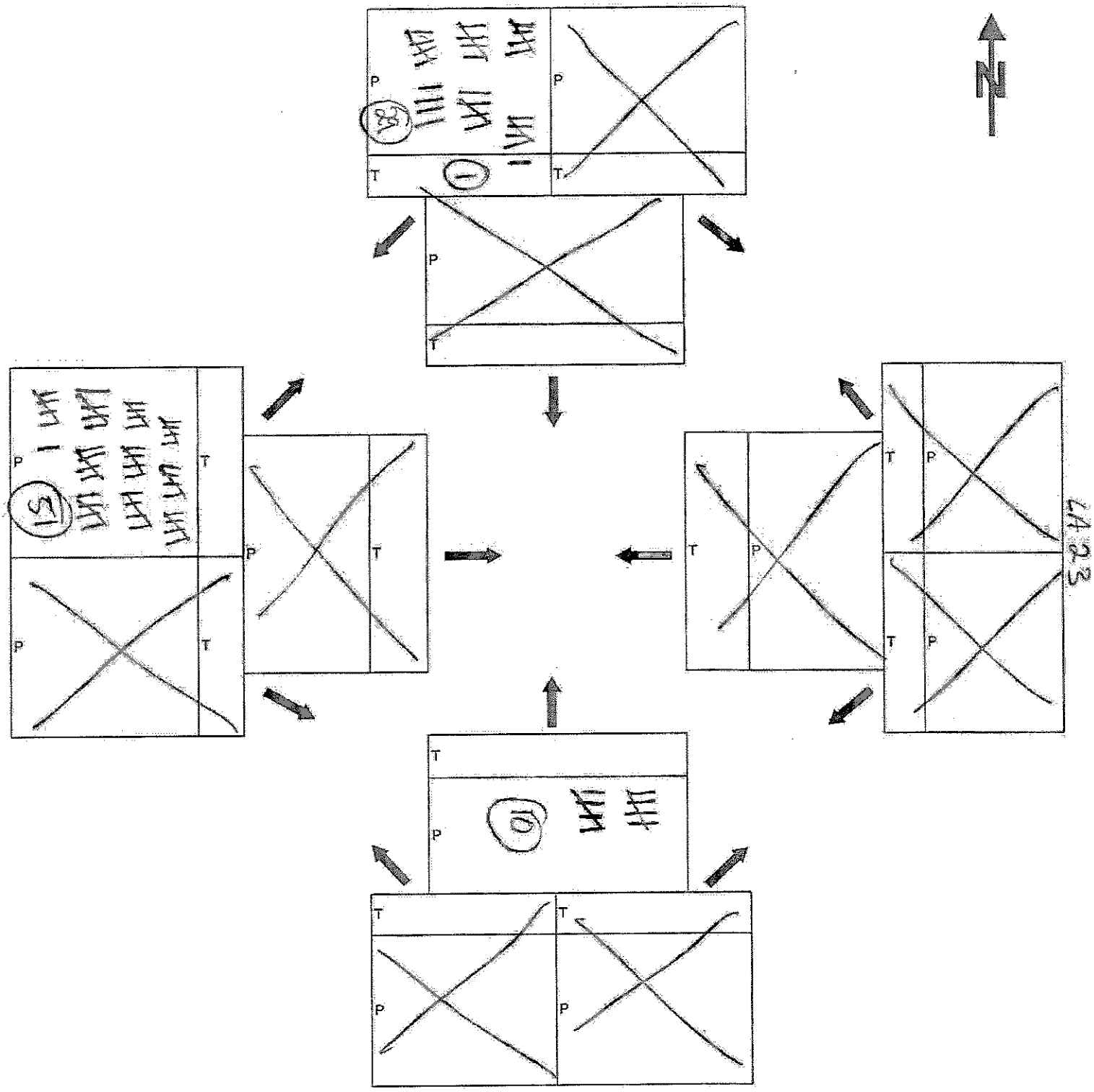
EAST/WEST STREET LA 23

90th St

DATE 10/26/11

WEATHER Sunny

OBSERVER D. Hymel



18:00 - 18:15

VEHICLE TURNING MOVEMENT COUNT SHEET

NORTH/SOUTH STREET LA 406

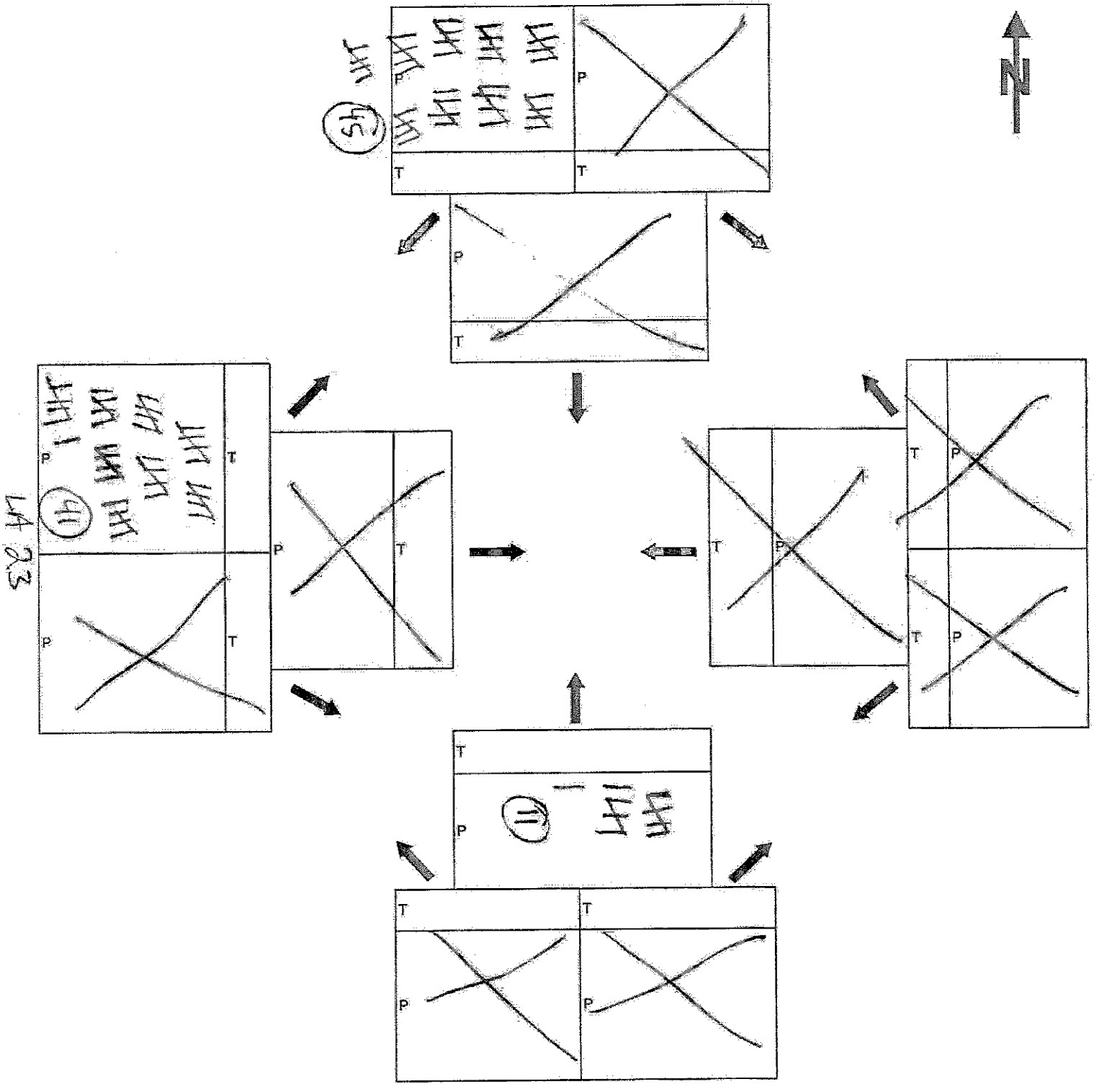
EAST/WEST STREET LA 23

LA 406

DATE 10/26/11

WEATHER Sunny

OBSERVER D. Hymel



18:15 - 18:30

VEHICLE TURNING MOVEMENT COUNT SHEET

NORTH/SOUTH STREET LA 406

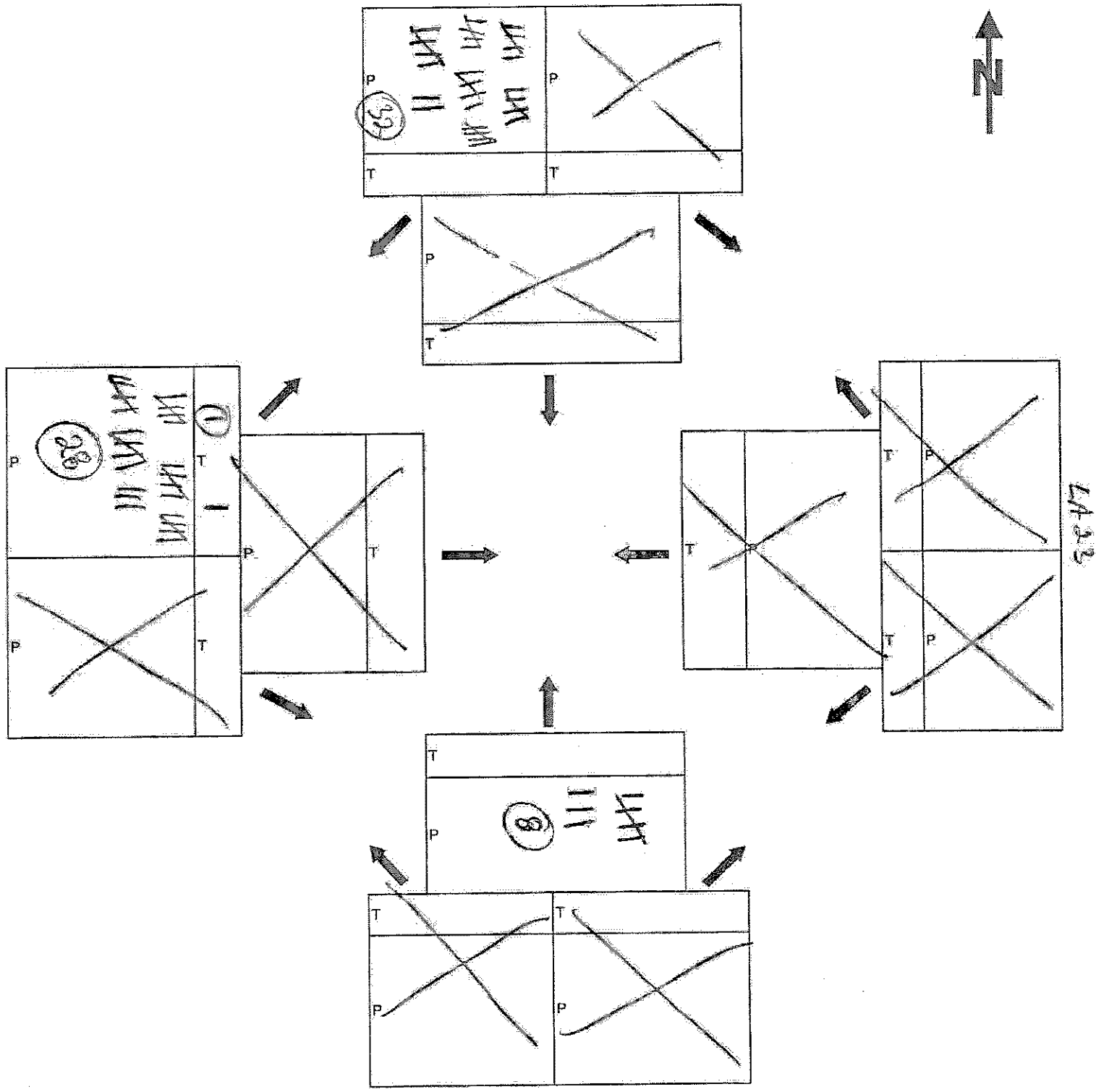
EAST/WEST STREET LA 23

90 h 47

DATE 10/26/11

WEATHER Sunny

OBSERVER D. Hymel



18:30 - 18:45

VEHICLE TURNING MOVEMENT COUNT SHEET

NORTH/SOUTH STREET LA 406

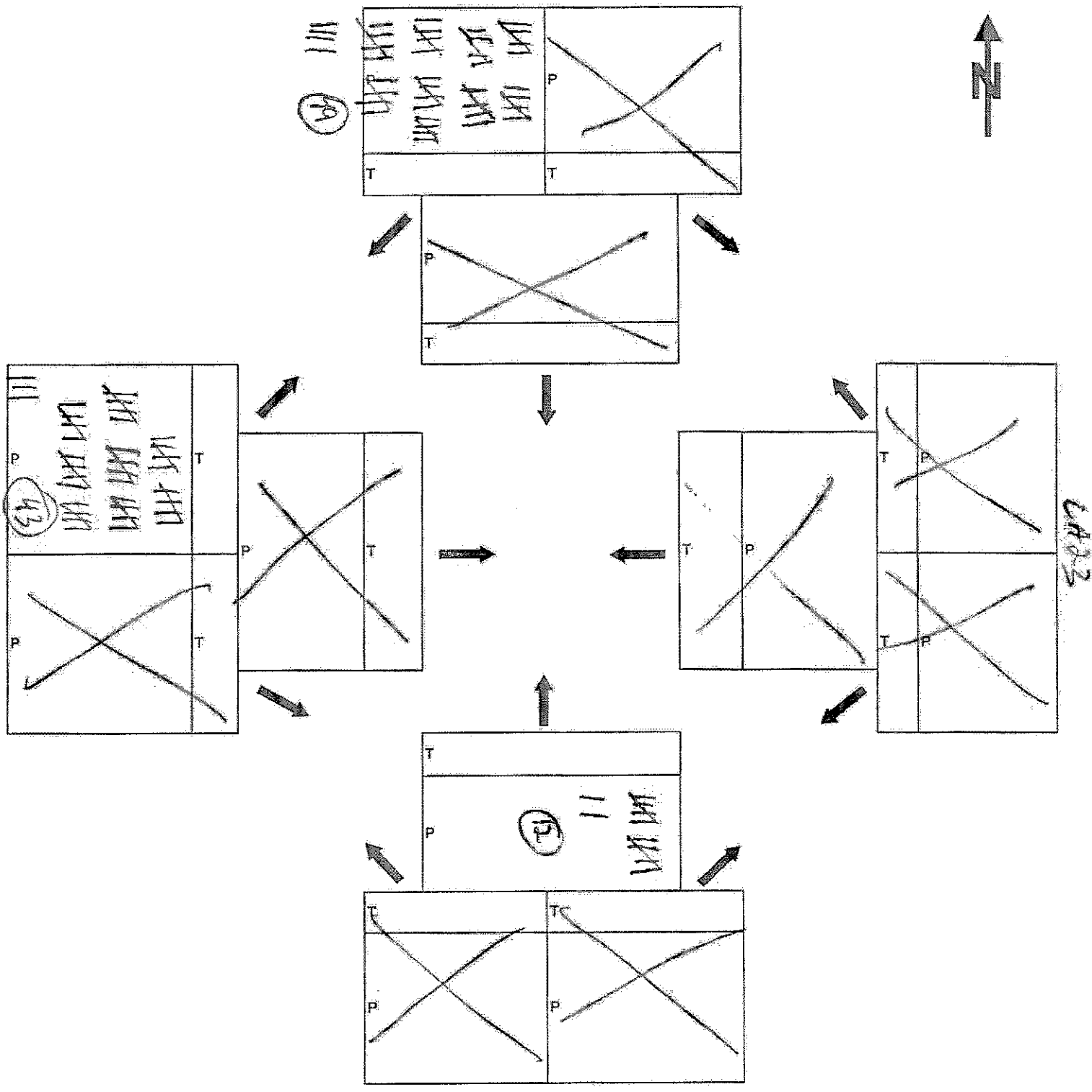
EAST/WEST STREET LA 23

LA 406

DATE 10/26/14

WEATHER Sunny

OBSERVER D-Hymel



18:45 - 19:00

VEHICLE TURNING MOVEMENT COUNT SHEET

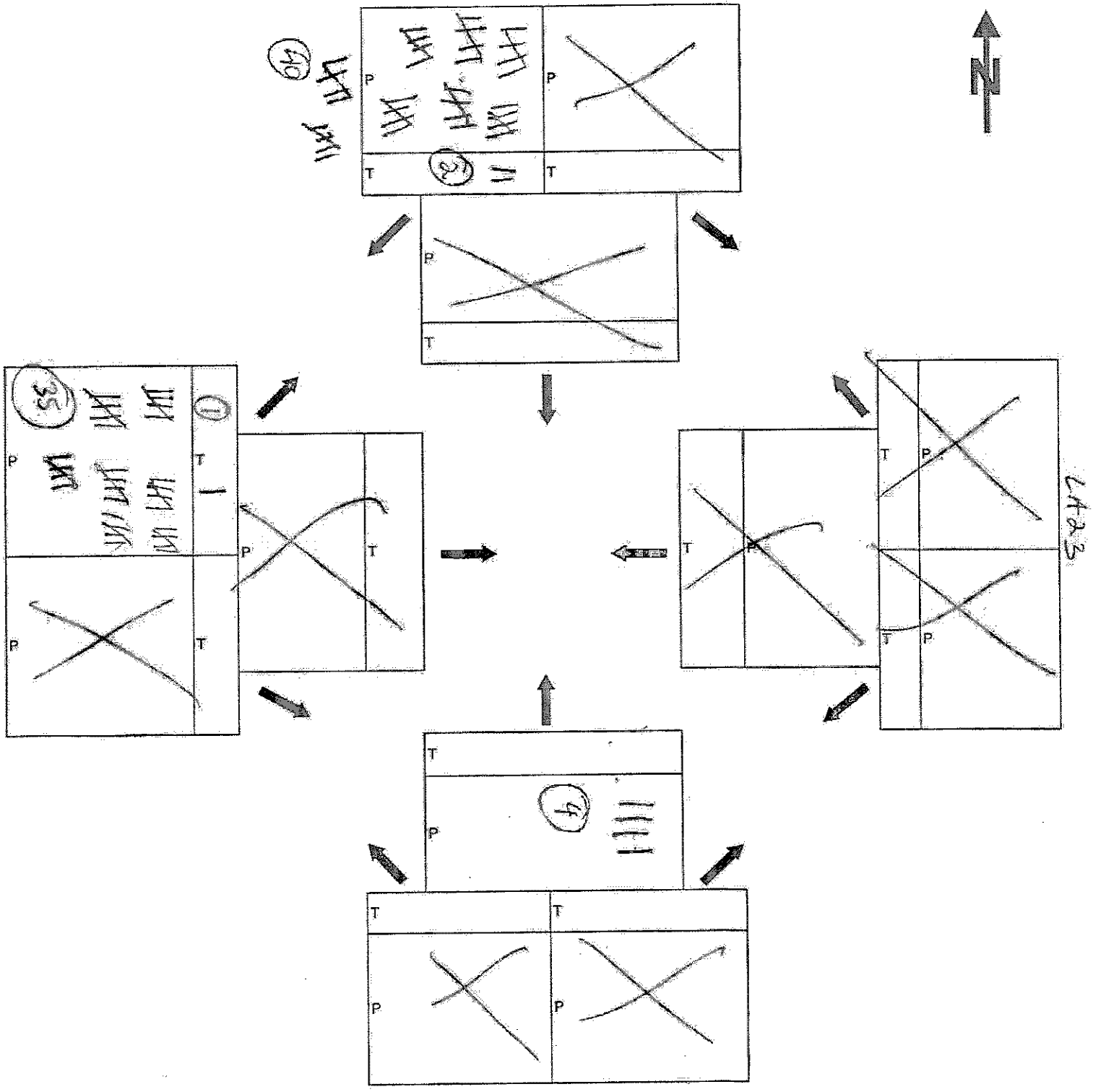
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/26/11

WEATHER Clear

OBSERVER D. Hymel



16:00 – 16:15

VEHICLE TURNING MOVEMENT COUNT SHEET

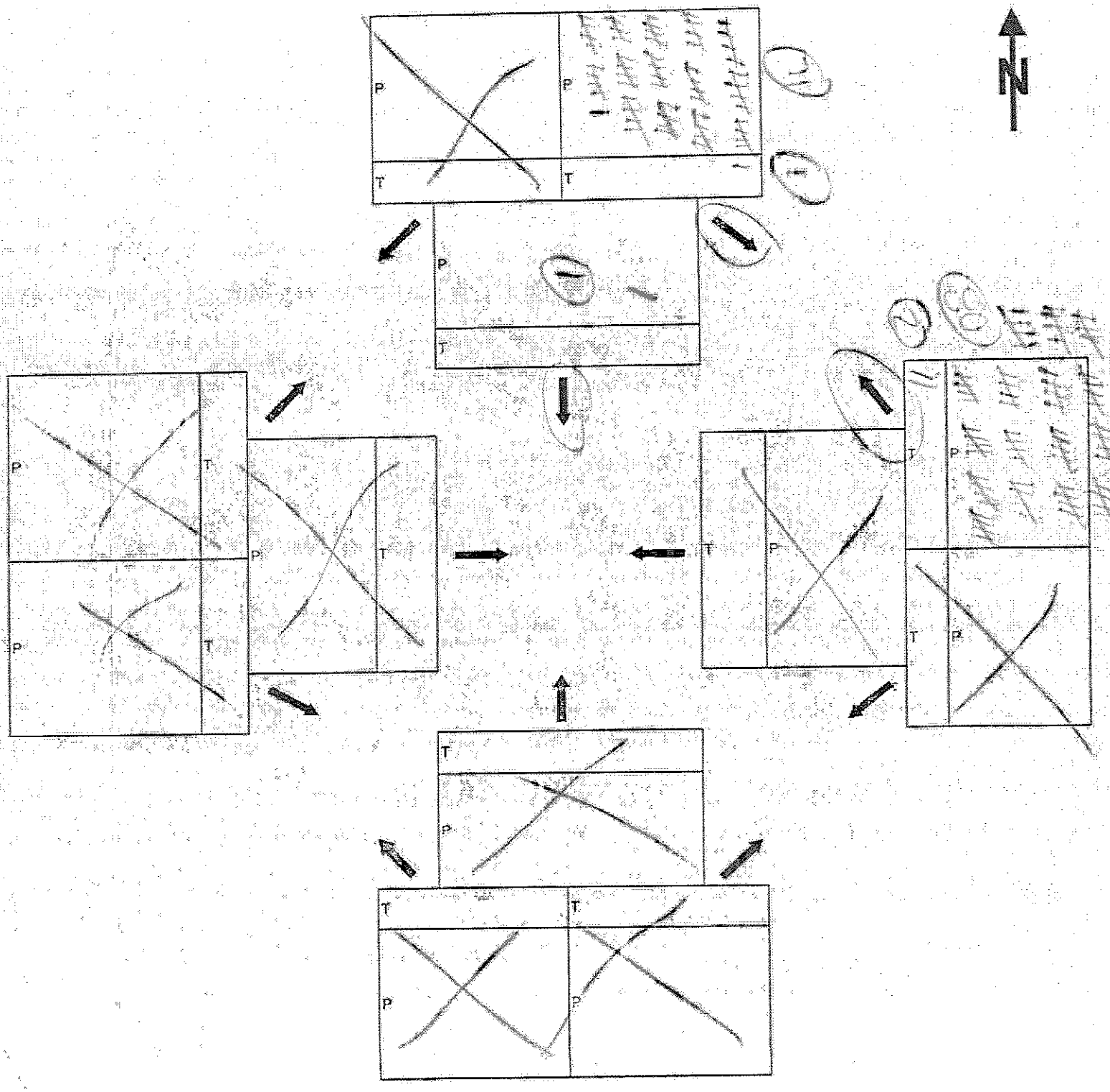
NORTH/SOUTH STREET LA406

EAST/WEST STREET LA23

DATE 10/26/2011

WEATHER CLEAR

OBSERVER [illegible]



16:15 – 16:30

VEHICLE TURNING MOVEMENT COUNT SHEET

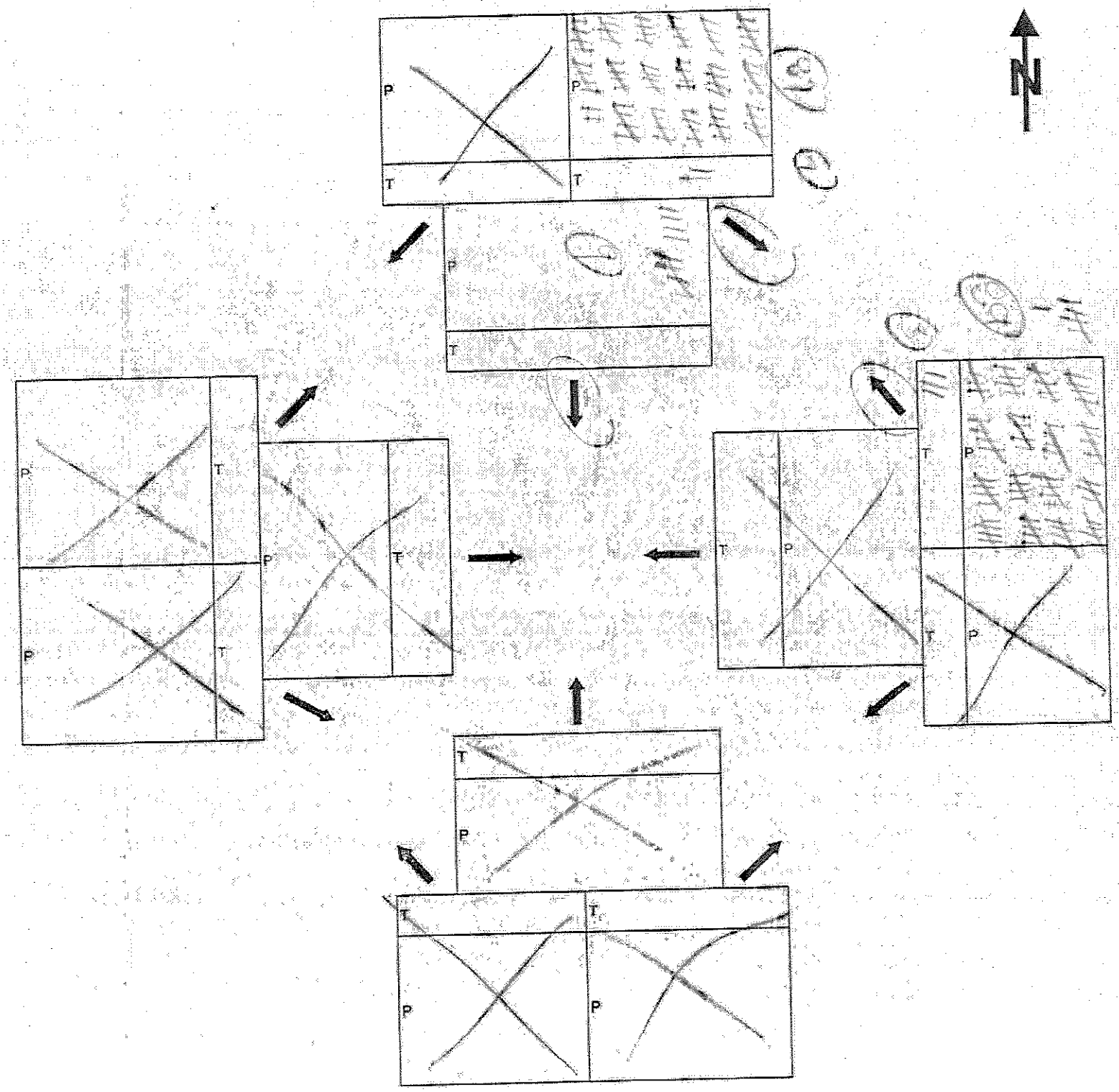
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/26/2011

WEATHER CLEAR

OBSERVER AJ FELTMAN



LA 33 - 16.7

VEHICLE TURNING MOVEMENT COUNT SHEET

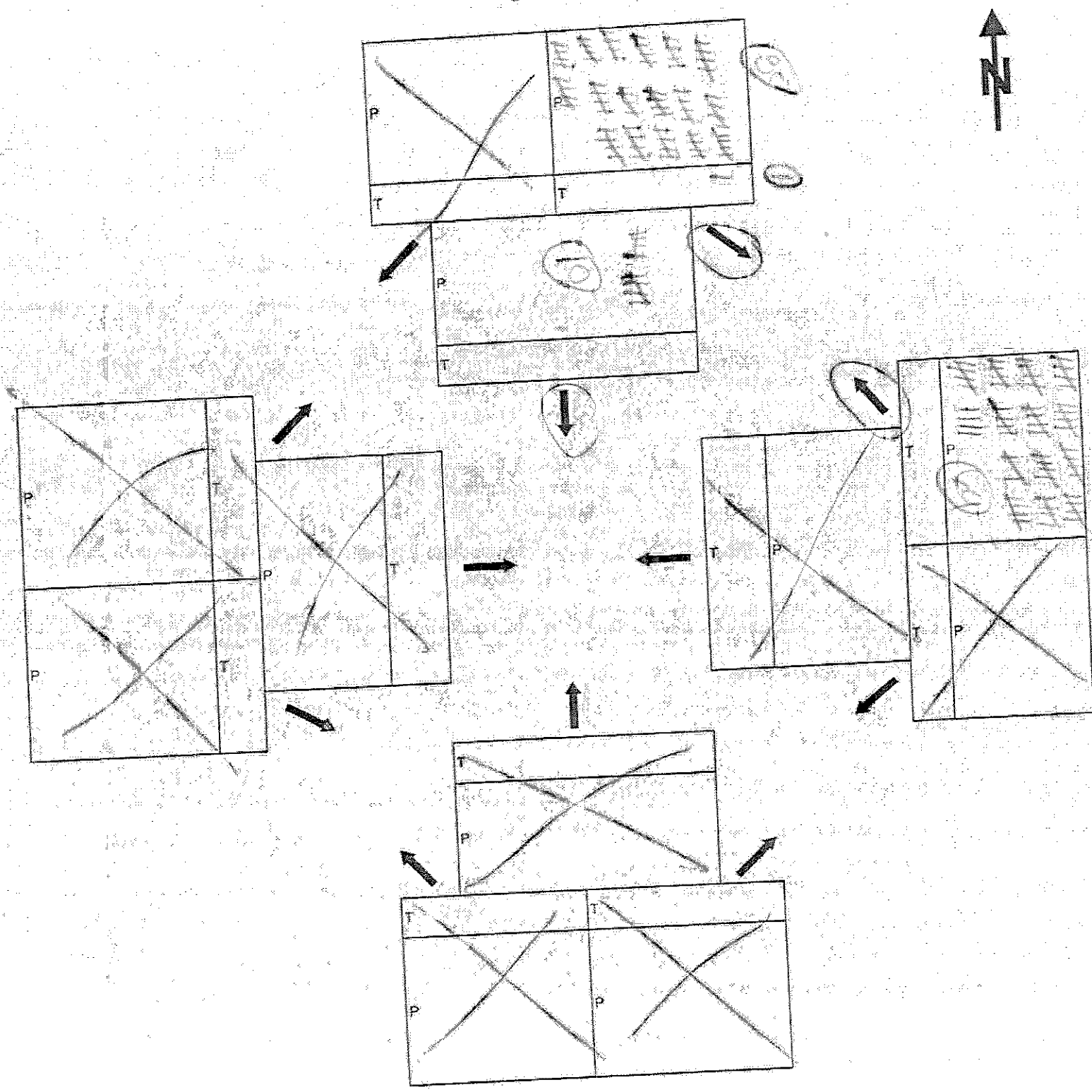
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/26/2011

WEATHER CLEAR

OBSERVER M. RYAN



16:45 – 17:00

VEHICLE TURNING MOVEMENT COUNT SHEET

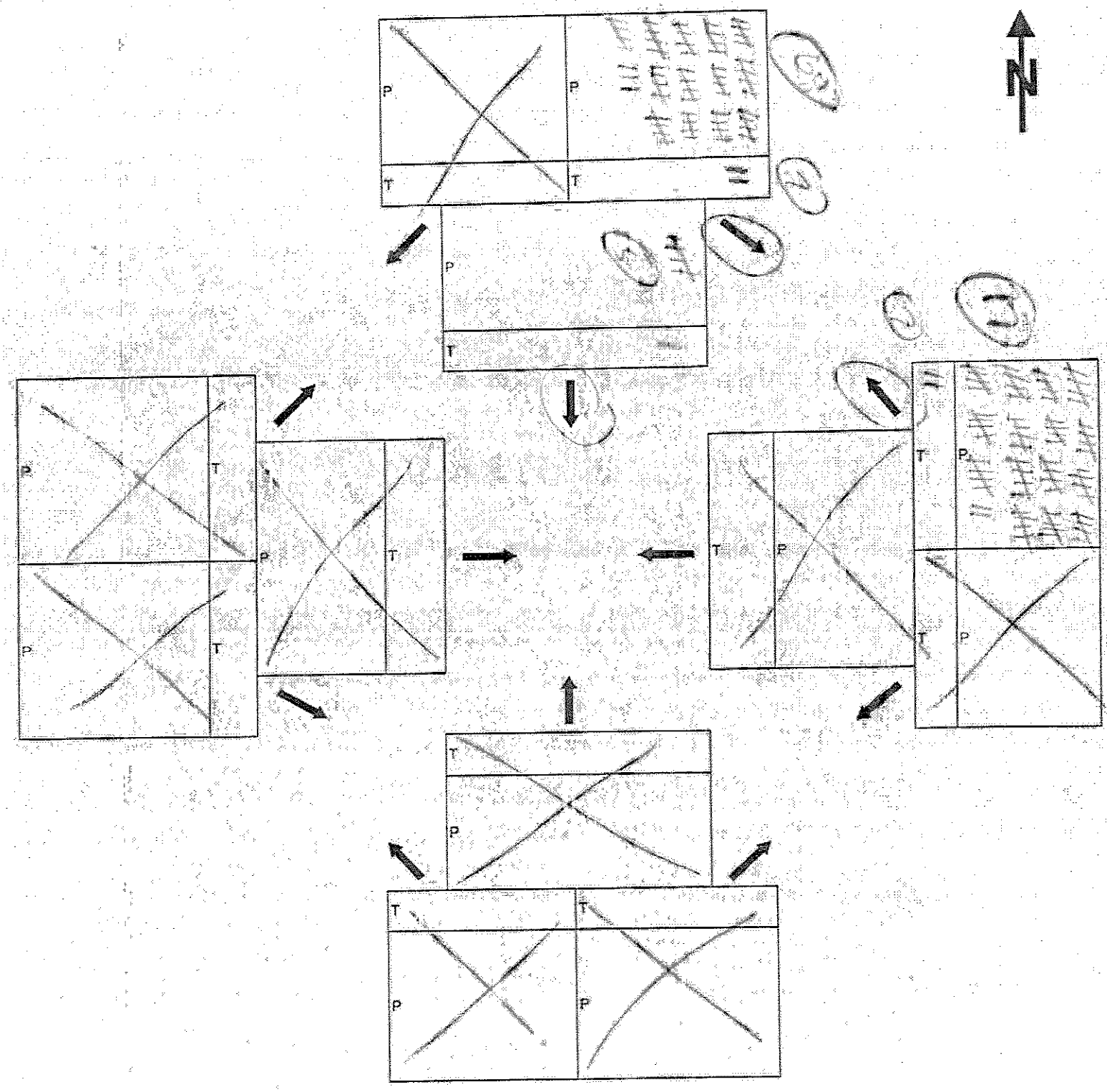
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/26/2011

WEATHER CLEAR

OBSERVER



17:30 – 17:45

VEHICLE TURNING MOVEMENT COUNT SHEET

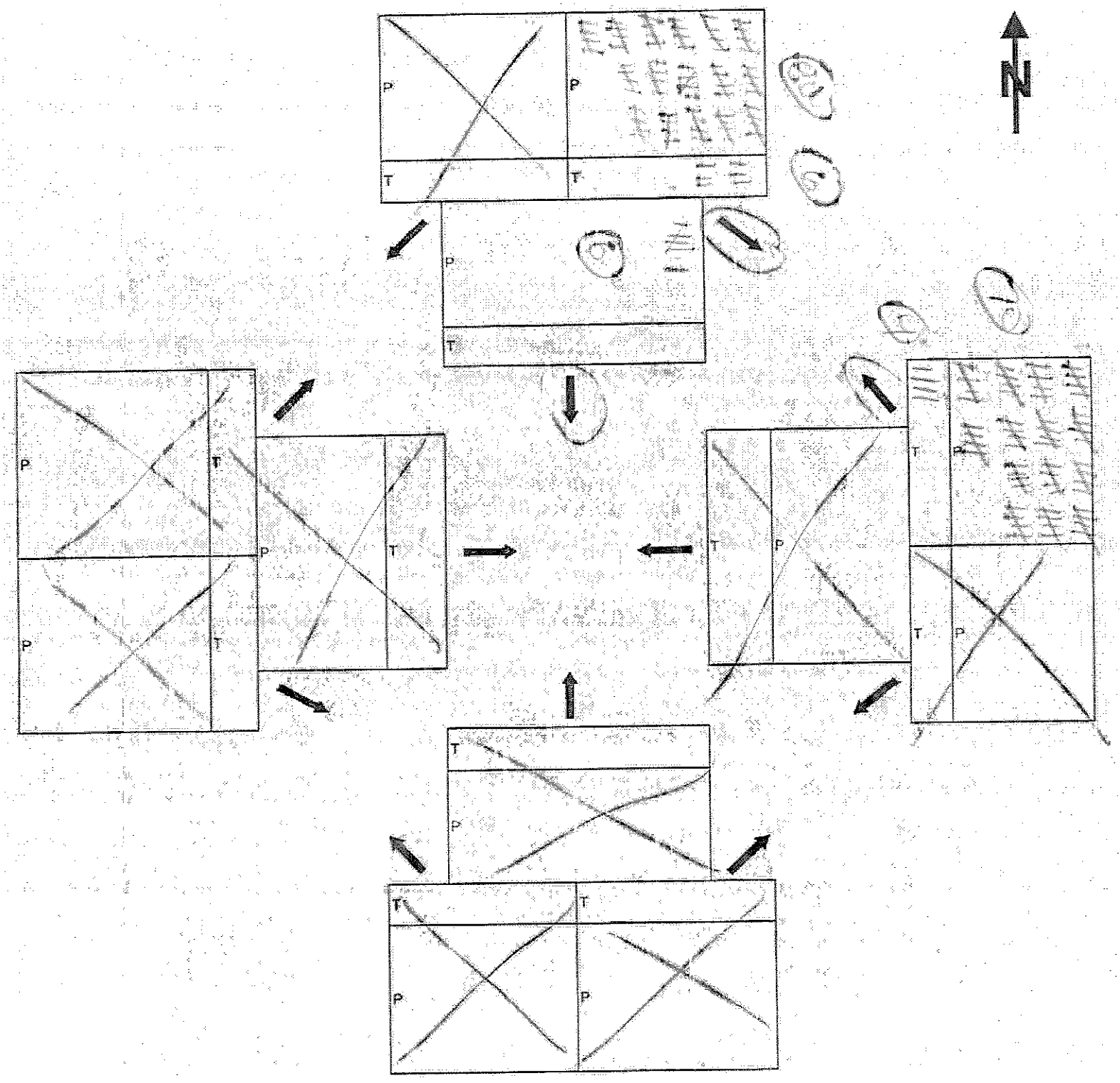
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/26/2011

WEATHER CLEAR

OBSERVER [illegible]



17:15 - 17:30

VEHICLE TURNING MOVEMENT COUNT SHEET

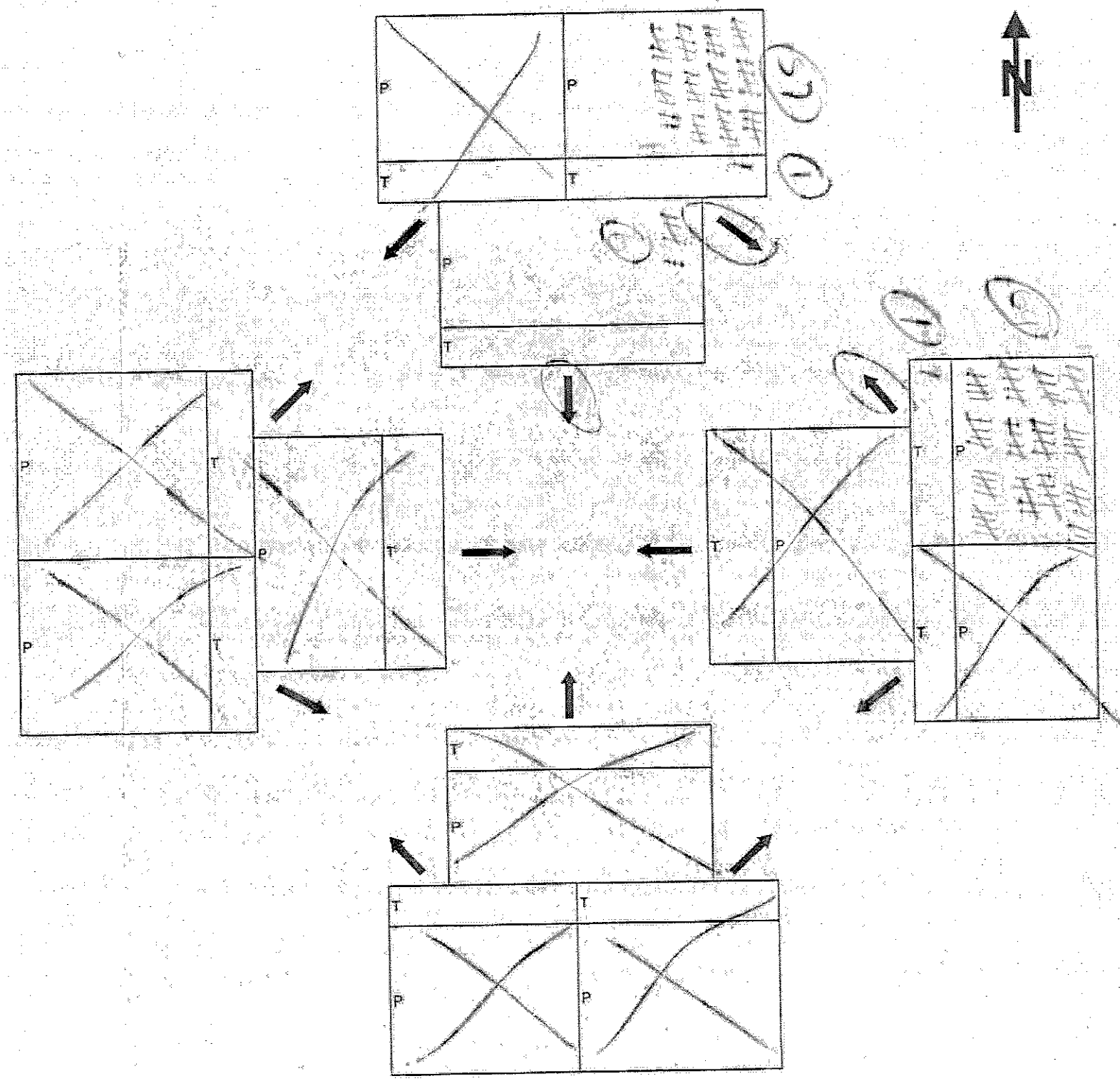
NORTH/SOUTH STREET LA 466

EAST/WEST STREET LA 23

DATE 10/26/2011

WEATHER CLEAR

OBSERVER [illegible]



17:30 - 17:45

VEHICLE TURNING MOVEMENT COUNT SHEET

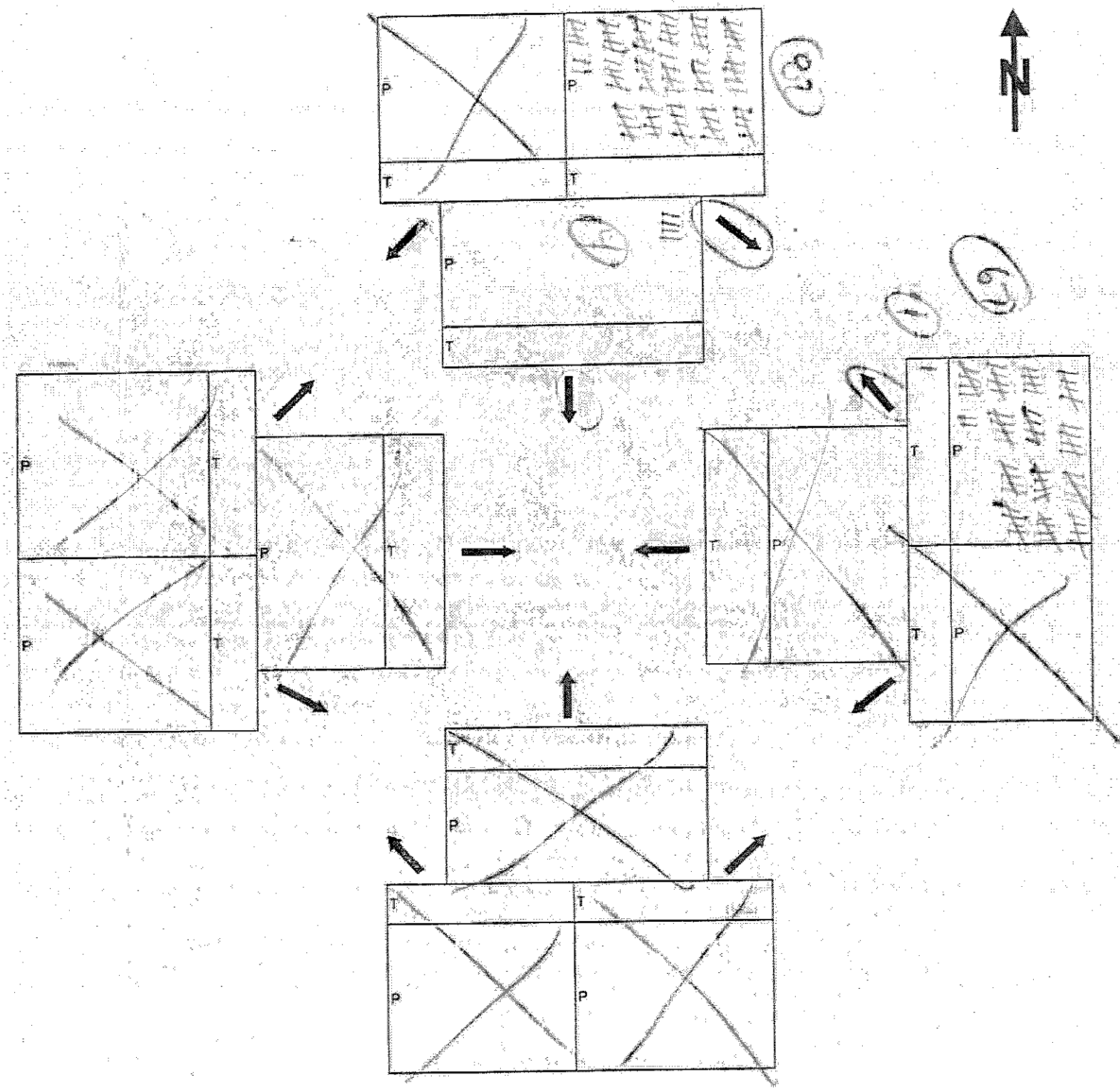
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/26/2011

WEATHER CLEAR

OBSERVER M. BROUSSARD



17:45 - 18:05

VEHICLE TURNING MOVEMENT COUNT SHEET

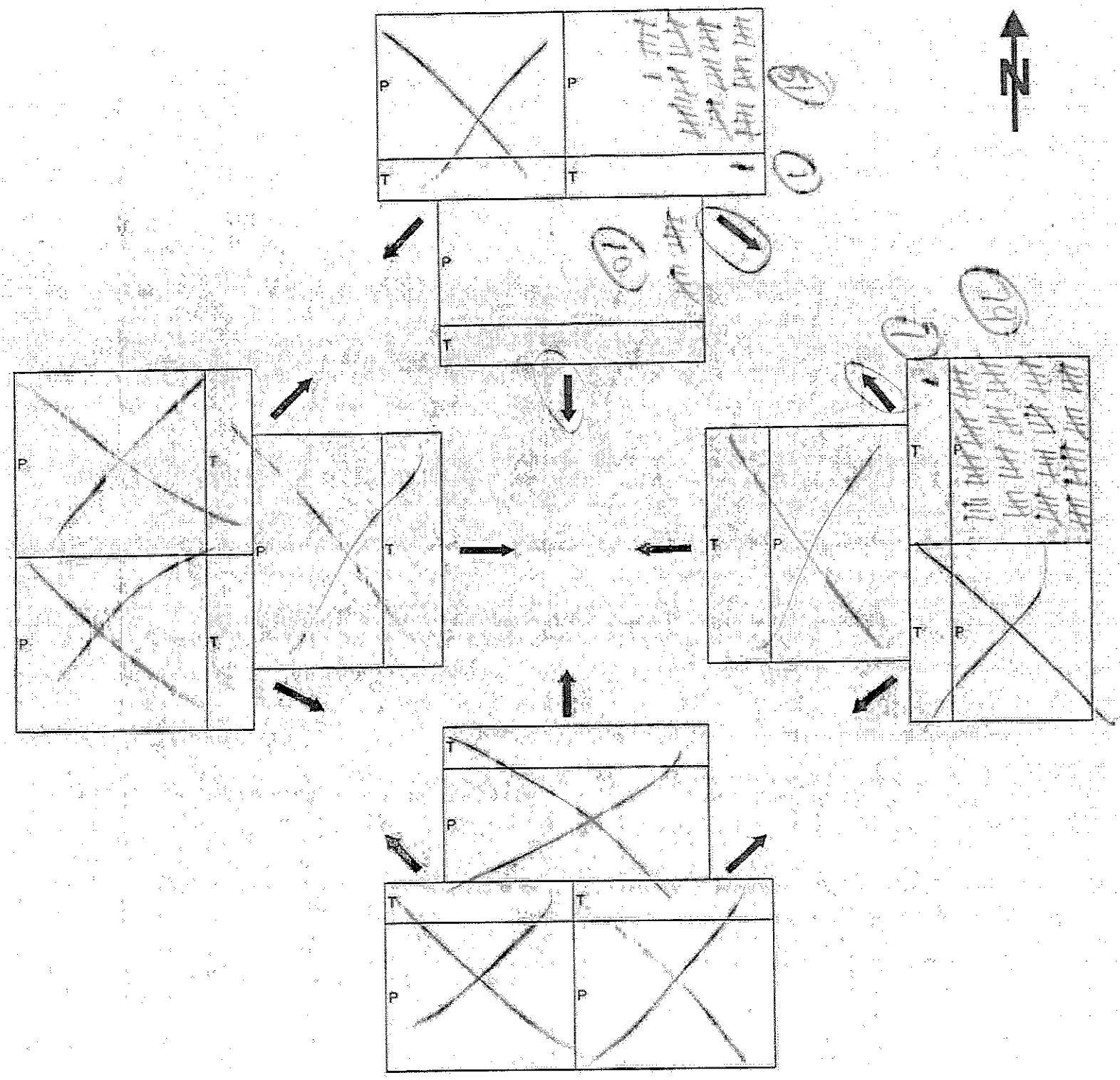
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/26/2011

WEATHER CLEAR

OBSERVER [illegible]



18:00 – 19:15

VEHICLE TURNING MOVEMENT COUNT SHEET

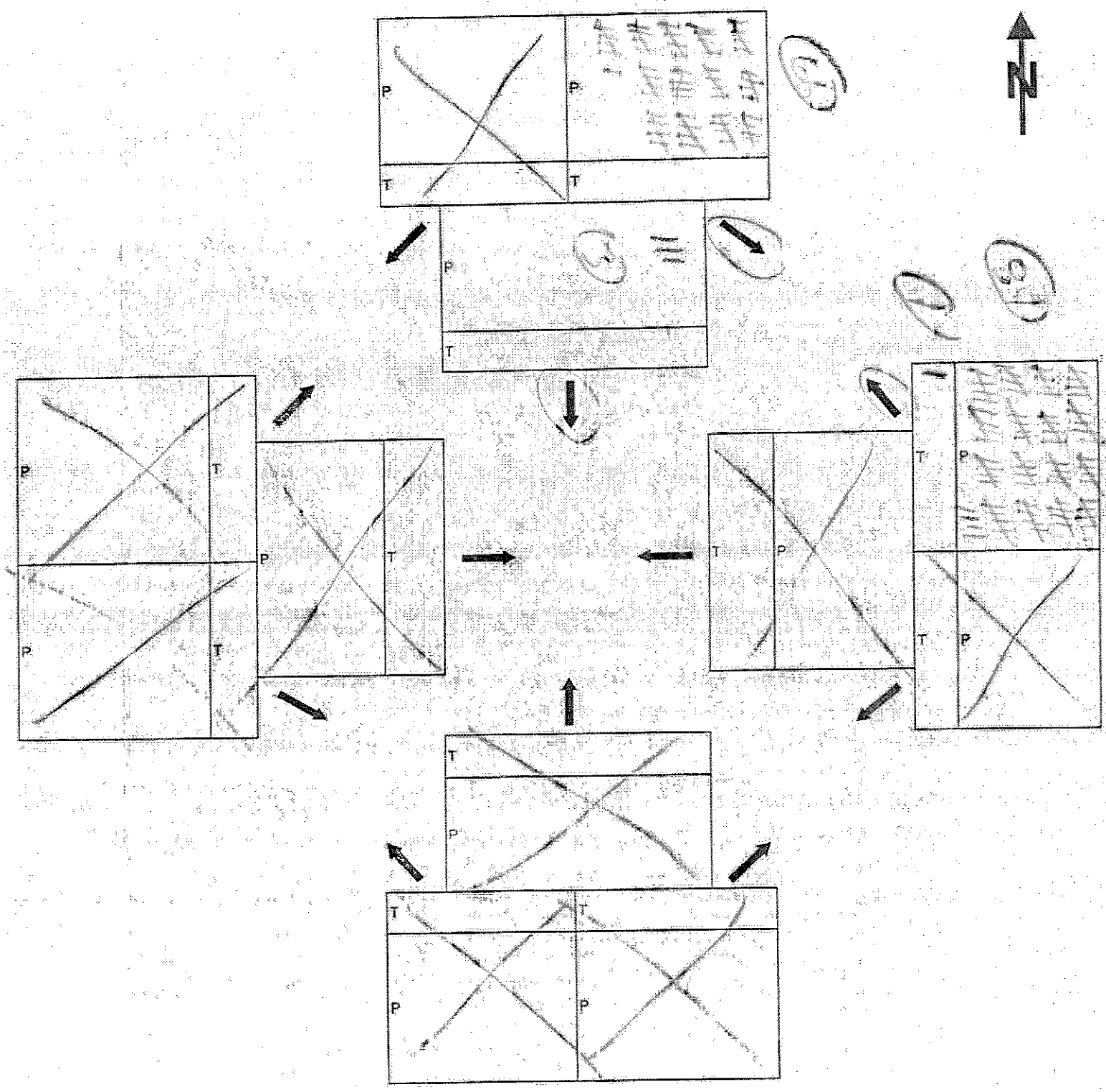
NORTH/SOUTH STREET LA 466

EAST/WEST STREET LA 23

DATE 10/26/2011

WEATHER CLEAR

OBSERVER M. BRAN



18:15 - 19:30

VEHICLE TURNING MOVEMENT COUNT SHEET

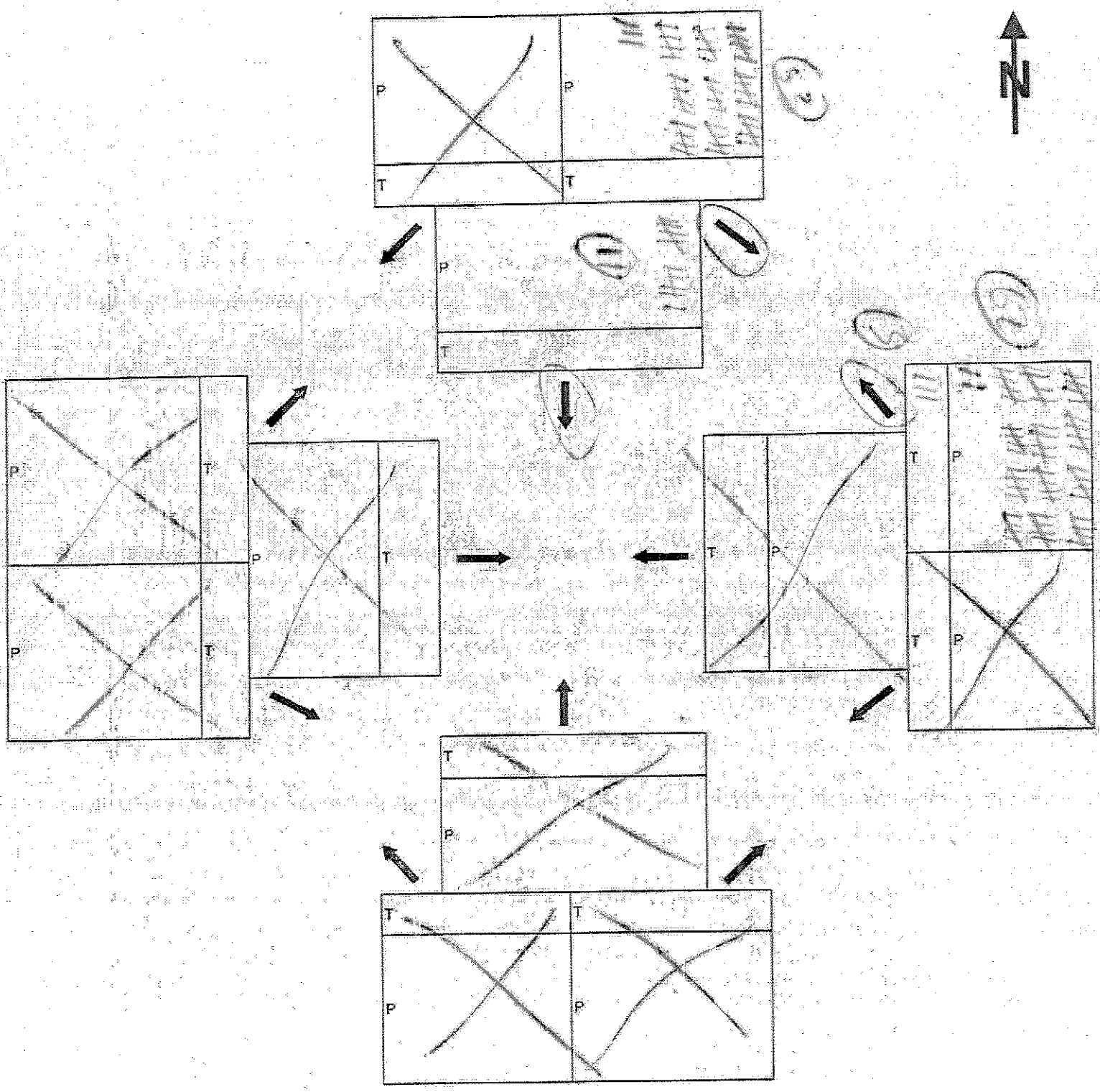
NORTH/SOUTH STREET LA 406

EAST/WEST STREET LA 23

DATE 10/26/2011

WEATHER CLEAR

OBSERVER M. SHAH



18:30 – 18:45

VEHICLE TURNING MOVEMENT COUNT SHEET

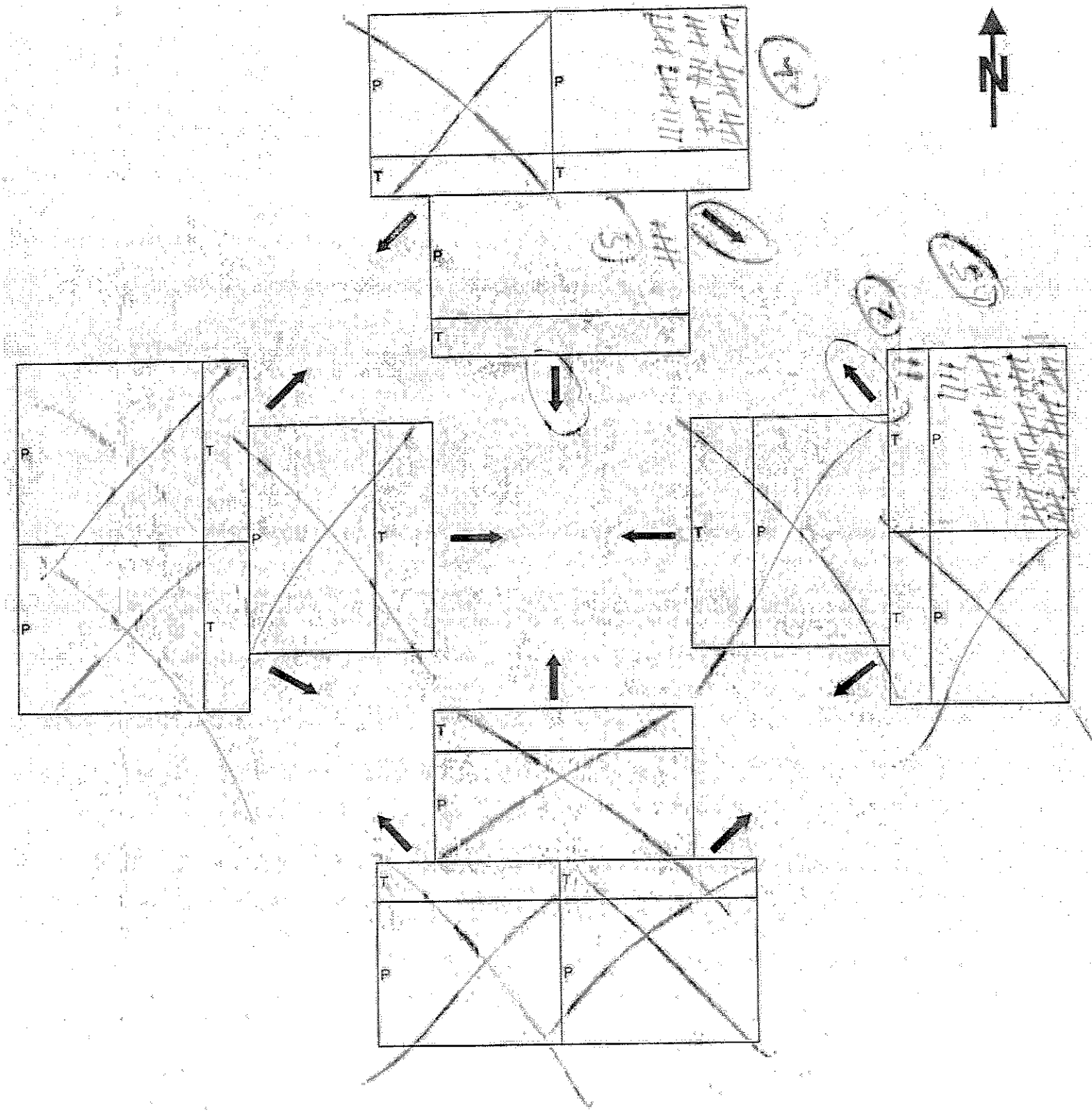
NORTH/SOUTH STREET LA 466

EAST/WEST STREET LA 28

DATE 10/7/2011

WEATHER CLEAR

OBSERVER M RIGHT



8:15 - 9:00

VEHICLE TURNING MOVEMENT COUNT SHEET

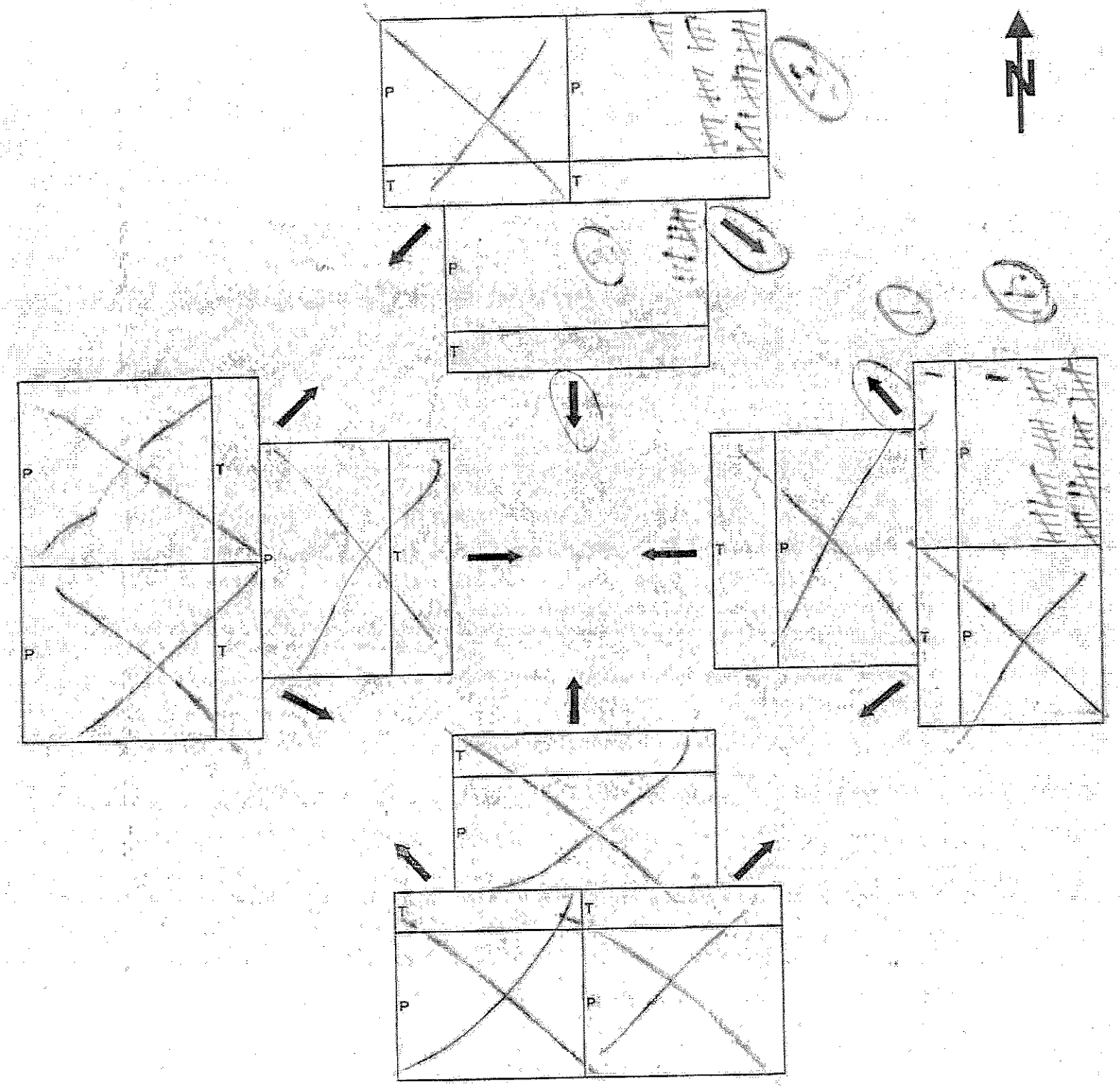
NORTH/SOUTH STREET LA 1088

EAST/WEST STREET LA 75

DATE 12/20/2011

WEATHER Clear

OBSERVER M. Rivard



APPENDIX G

Public Involvement Comments

LA 406 / Woodland Highway Widening

LA 23 to LA 407

Open House Public Meeting

STATE PROJECT NO. H.008220
RPC PROJECT NO. 406EA
LA 406 / WOODLAND HIGHWAY WIDENING
LA 23 TO LA 407
ORLEANS AND PLAQUEMINES PARISHES

APRIL 25, 2012
6:00 pm – 8:00 pm

Please provide your comments below regarding the purpose and need for the project, the initial alternatives that have been considered and screened, the proposed alternatives and the issues that the project team should evaluate in detail for this study. After completing this form, please submit it at Station 6 – Next Steps and Comments. Comments received tonight post-marked by May 7, 2012 will become part of the record for this meeting. To mail, fold the form in half with the address showing on the outside and seal with a piece of tape.

REGARDING PURPOSE AND NEED, U.S. MARINES THAT RESIDE AT THE NAVAL AIR STATION/JOINT RESERVE BASE IN BELLE CHASSE TRAVEL TO THEIR JOBS ON A DAILY BASIS ON WOODLAND HIGHWAY / GEN. DEGAULLE BRIDGE TO "MAFORRES" FACILITY IN ALGIERS. EFFICIENT ACCESS BETWEEN ALGIERS AND BELLE CHASSE SUPPORTS THE DEPT OF DEFENSE MISSIONS, AND THIS PROJECT IS SUPPORTIVE IN THIS REGARD

MAFORRES = MARINES FORCES RESERVE COMMAND

Name: BRUCE KELLER, COMMUNITY PLANS & LIAISON OFFICER

Address: NAS/JRB NEW ORLEANS
400 RUSSEL RD, BELLECHASSE
(504) 678-9941 BRUCE.KELLER1@NAVY.MIL

LA 406 / Woodland Highway Widening

LA 23 to LA 407

Open House Public Meeting

STATE PROJECT NO. H.008220
RPC PROJECT NO. 406EA
LA 406 / WOODLAND HIGHWAY WIDENING
LA 23 TO LA 407
ORLEANS AND PLAQUEMINES PARISHES

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RIGHT TURN OFF OF HWY 23 TO WOODLAND IS A RIGHT TURN ONLY AND DOES NOT PROVIDE ANY WAITING AREA FOR VEHICLES to STACK UP IN WAIT OF RIGHT TURN.

A "STACK" LANE would Really HELP ALLEVIATE THE TRAFFIC PROBLEM IN THIS AREA, FOR AT LEAST 10-CARS.

AJMARINOVICH @ATT.NET

Name: ANTHONY J. ~~MARINOVICH~~ MARINOVICH

Address: 116 EVANGELINE TRACE
Belle Chasse, LA. 70037

LA 406 / Woodland Highway Widening

LA 23 to LA 407

Open House Public Meeting

STATE PROJECT NO. H.008220
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(1) Sheet #6 - Consider moving MEDIAN Cut thru away from Hwy 23 @ 300' - to center of Highway on East side.

(2) Sheet #11 - Review drainage issues at Slow on west side of Hwy

(3) Sheet #12 - Note that Plantas CANAL will need to be widened in near future, therefore Bridge will need to be widened

(4) Sheet #13 Consider moving MEDIAN Cut thru south, away from the Curb & to Allow for future development on EAST SIDE of Hwy.

(5) Sheet #10 Consider moving further around South @ 500' to Subdivision Entrance - 158+00

Name: MARK PIVACH

Address: PO Box 7125
BELLE CHASSE, La

James M. Peeples
208 Demandre St.
Belle Chasse, LA 70037
(504) 394-4829

April 25, 2012

Regional Planning Commission
DOTD
Federal Highway Administration

Plaquemines Parish is critical to the local, Louisiana, and national economies in providing jobs and critical products and services in such industries as oil & gas, seafood, shipping, and recreation, as well as many other industries. Plaquemines Parish is also very supportive of our military personnel at the Naval Air Station in Belle Chasse.

Unfortunately, inadequate roads and bridges to support these activities have made the traffic in Belle Chasse almost unbearable.

At times traffic backs up for miles, not only seriously inconveniencing the people who travel in and through Belle Chasse, but also seriously hindering response to emergencies.

The people of Belle Chasse have been paying Mississippi River Bridge tolls for years, as well as state and Federal taxes. Now it is time for some of this toll money, as well as other state and Federal resources, to be spent to help alleviate the major traffic problems in Belle Chasse.

I am fully supportive of widening Woodland High to four lanes (plus turning lanes where needed) from the Belle Chasse Highway to the Algiers Bridge, in order to help alleviate the serious traffic problems in Belle Chasse.

James M. Peeples

Charles Ballay

From: Charles Ballay [charlesballay@25thda.org]
Sent: Tuesday, April 17, 2012 3:16 PM
To: 'pat.owens@volkert.com'
Subject: Woodland Hwy - LA 406 Project

Mr. Owens – this email is sent to comment on the Woodland Hwy (LA 406) project that I saw notice of in the Plaquemines Gazette today. If time permits I may make the meeting set for April 25th on this project.
My comments involve the intersection of Woodland Hwy and Hebert Drive. I am quite familiar with this area since I reside on Park Riverwoods Drive off Main Street (river road) in Belle Chasse and use these roadways on a daily basis. I am also familiar with this intersection since I am aware of a number of vehicular accidents that have occurred at it.

I would requests that your project include how to make this a safer intersection since it presently is unsafe and the traffic using it will continue to increase. One of the problems with the intersection is the angle motorists are at when driving from Hebert Drive to Woodland Hwy, turning left. Basically a blind spot exists causing one to take too great a risk, especially if weather conditions are foggy or rainy (this particular area often has ground fog) when entering Woodland Hwy.

As a result of the BC Primary School and certain government offices being located on Hebert Drive, the number of vehicles using this area has increased substantially over the years, and all indications are that it will continue to increase. The former Metropolitan State School is now proposed to be government complex for various governmental offices.

I would suggest that Hebert Drive be connected to Woodland Hwy opposite Keating Drive and that a 'round-a-bout' intersection (sorry for use of this term but I don't know the correct highway term for it) be used. This would do three things: Greatly reduce the likelihood of serious accidents (esp. mid-section crashes), eliminate the need of electronic traffic signals/lights, and allow traffic to flow better especially during off-hours or light traffic times. An additional benefit given to round-a-bout intersections is that it saves on fuel since you usually don't have to come to a complete stop.

I would ask that my comments be given to the appropriate people handling this project and due consideration be given to it. If anyone has any questions for me they can contact me at my office address below. Charles Ballay

Charles J. Ballay

District Attorney - Plaquemines Parish
301-A Main Street
Belle Chasse, LA 70037
Office (504)-297-5146
Fax (504)-297-5157
Direct Fax (504)-324-0953
charlesballay@25thda.org

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APPENDIX H

Preliminary Cost Estimate

WOODLAND HIGHWAY / LA 406 WIDENING
CONCEPTUAL CONSTRUCTION COST ESTIMATE
BELLE CHASSE, LOUISIANA

28-Aug-14

Item No.	Item Description	Unit	Estimated Quantity	Estimated Unit Price	Estimated Cost
201-01-00100	Clearing and Grubbing	AC	28	$4,000.00	$112,000.00
202-01-00100	Removal of Structures and Obstructions	LS	1	$502,806.62	$502,806.62
202-02-02020	Removal of Asphalt Pavement	SY	68,386	$5.00	$341,930.00
202-02-04000	Removal of Bridges (Industry Canal)	EA	1	$150,000.00	$150,000.00
202-02-04000	Removal of Bridges (Planters Canal)	EA	1	$204,000.00	$204,000.00
203-01-00100	General Excavation	CY	22,205	$8.00	$177,640.00
204-02-00100	Temporary Hay or Straw Bales	EA	300	$17.00	$5,100.00
204-04-00100	Temporary Sediment Basins	EA	5	$1,000.00	$5,000.00
204-05-00100	Temporary Sediment Check Dams (Hay)	EA	10	$115.00	$1,150.00
204-05-00200	Temporary Sediment Check Dams (Stone)	EA	10	$450.00	$4,500.00
204-06-00100	Temporary Silt Fencing	LF	35,600	$2.00	$71,200.00
302-02-03000	Class II Base Course (8" Thick)	SY	90,020	$30.00	$2,700,600.00
305-01-04000	Subgrade Layer (12" Thick)	SY	101,273	$16.00	$1,620,368.00
502-03-00300	Superpave Asphaltic Concrete (6" Thick)	TN	29,706.6	$95.00	$2,822,127.00
501-02-00001	Asphalt Tack Coat	GAL	2,701	$3.50	$9,453.50
701-03-01000	Storm Drain Pipe (15" RCP/PP)	LF	7,680	$51.00	$391,680.00
701-03-01020	Storm Drain Pipe (18" RCP/PP)	LF	4,520	$62.00	$280,240.00
701-03-01040	Storm Drain Pipe (24" RCP/PP)	LF	11,940	$78.00	$931,320.00
701-03-01060	Storm Drain Pipe (30" RCP/PP)	LF	9,200	$85.00	$782,000.00
702-02-00200	Manholes (R-CB-11)	EA	41	$4,058.00	$166,378.00
702-03-00500	Catch Basins (CB-06)	EA	184	$5,000.00	$920,000.00
704-03-00100	Blocked Out Guard Rail	LF	480	$20.00	$9,600.00
704-01-02000	Guard Rail (Double Thrie Beam)	LF	100	$50.00	$5,000.00
704-08-00200	Guard Rail Transitions (Double Thrie Beam)	LF	50	$70.00	$3,500.00
704-11-00100	Guard Rail End Treatment (Flared)	EA	7	$2,250.00	$15,750.00
704-11-00200	Guard Rail End Treatment (Tangent)	EA	1	$2,250.00	$2,250.00
706-01-00100	Concrete Walk (4" Thick)	SY	7,925	$55.00	$435,875.00
706-02-00300	Concrete Drive (8" Thick)	SY	95	$87.00	$8,265.00
707-01-00200	Concrete Curb (Barrier)	LF	58,394	$10.00	$583,940.00
711-04-00100	Geotextile Fabric	SY	90,020	$3.10	$279,062.00
712-01-00100	Concrete Cast-in-Place Revetment (4" Thick)	SY	1,400	$70.00	$98,000.00
713-01-00100	Temporary Signs and Baricades	LS	1	$838,011.03	$838,011.03
727-01-00100	Mobilization	LS	1	$1,340,817.65	$1,340,817.65
732-01-01060	Plastic Pavement Striping (12" Width) (Thermoplastic 90 mil)	LF	483	$6.00	$2,898.00
732-01-01080	Plastic Pavement Striping (24" Width) (Thermoplastic 90 mil)	LF	132	$8.00	$1,056.00
732-02-02000	Plastic Pavement Striping (Solid Line)(4" Width)(Thermo 90 mil)	MILE	11.2	$3,000.00	$33,600.00
732-03-02000	Plastic Pavement Striping (Broken Line) (4" Width) (Thermoplastic	MILE	6.1	$1,001.00	$6,106.10
732-04-01080	Plastic Pavement Legends and Symbols (Arrow - Left Turn)	EA	10	$240.00	$2,400.00
739-01-00100	Hydro-Seeding	AC	20	$1,600.00	$32,000.00
740-01-00200	Construction Layout	LS	1	$335,204.41	$335,204.41
802-01-00100	Structural Excavation	CY	300	$25.00	$7,500.00
804-01-00300	Precast Concrete Piles (16")	LF	4,940	$68.00	$335,920.00
804-01-00600	Precast Concrete Piles (24")	LF	7,670	$100.00	$767,000.00
804-05-00300	Precast Concrete Test Piles (16")	EA	4	$18,000.00	$72,000.00
804-05-00300	Precast Concrete Test Piles (24")	EA	4	$37,178.00	$148,712.00
804-09-00100	Loading Test Piles	EA	8	$16,000.00	$128,000.00
805-01-00200	Class A Concrete (Pipe Headwalls)	CY	60	$1,350.00	$81,000.00
805-01-00700	Class A Concrete (Bents)	CY	330	$980.00	$323,400.00
805-03-00100	Class AA Concrete (Deck)	CY	910	$620.00	$564,200.00
805-08-00200	Precast-Prestressed Concrete Girders (Type II)	LF	3,685	$110.00	$405,350.00
805-09-00100	Expansion Joint Seal	LF	900	$35.00	$31,500.00
806-01-00100	Deformed Reinforcing Steel	LB	195,000	$1.00	$195,000.00
810-01-00200	Concrete Railing (Slotted Barrier)	LF	630	$73.00	$45,990.00
813-01-00100	Concrete Approach Slabs	SY	924	$215.00	$198,660.00
NS-P40-00002	Block Retaining Wall	LF	1,200	$200.00	$240,000.00
				Subtotal	$19,777,060.31
				Miscellaneous & Contingency (15%)	$2,966,559.00
				TOTAL ESTIMATED CONSTRUCTION COST	**$22,743,619.31**

APPENDIX I

Preliminary Plan Set

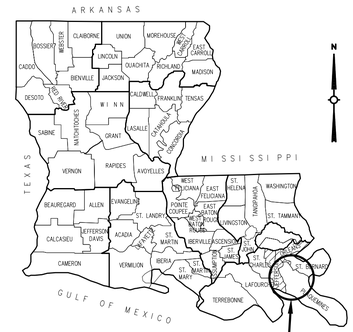
STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
PLANS OF PROPOSED STATE HIGHWAY

INDEX TO SHEETS

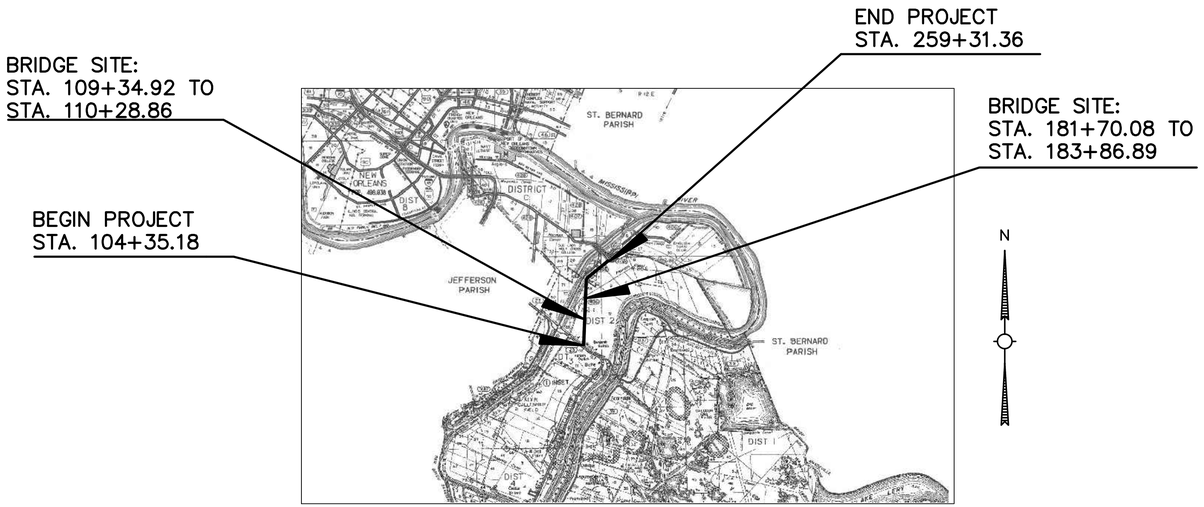
SHEET NO.	DESCRIPTION
1	TITLE SHEET AND LAYOUT MAP
2–4D	TYPICAL SECTIONS
5–18	PLAN AND PROFILE SHEETS
100–119	CROSS SECTIONS

RPC PROJECT NUMBER 406-EA

WOODLAND HIGHWAY / LA 406 WIDENING
(LA HWY 23 TO LA HWY 407)
ORLEANS PARISH
JEFFERSON PARISH



VICINITY MAP
PROJECT LOCATION



TRAFFIC DATA
2010 A.D.T. = 10,239
2030 A.D.T. = 26,448
D =
K =
T = 5%

DESIGN SPEED = 45 M.P.H.
FUNCTIONAL CLASS: UC–2

DATE	REVISION	DATE	RECOMMENDED	DATE	APPROVED

SCHEDULE OF REVISIONS

TYPE OF CONSTRUCTION:

DATUM USED : NAD83, NAVD88
MAGNETIC VAR :
BEARINGS ARE :

SCALES:
PLAN – 1"=50'
PROFILE HOR. – 1"=50'
VERT. – 1"=5'

LAYOUT MAP

SCALE: 1 INCH = 5,280 FEET

1 Mi. 0 1 Mi. 2 Mi. 3 Mi.

NOTE:
THE 2006 EDITION OF THE LOUISIANA DOTD STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, AS AMENDED BY THE PROJECT SPECIFICATIONS, SHALL GOVERN ON THIS PROJECT.

LENGTH OF PROJECT

DESCRIPTION	ALGEBRAIC SUM OF ALL EQUATIONS	GROSS LENGTH	EXCEPTION	BRIDGE LENGTH		ROADWAY LENGTH	
STATION TO STATION	FEET	FEET	FEET	FEET	MILES	FEET	MILES
104+35.18 TO 259+31.36		15,496.18		310.75	0.06	15,185.43	2.88
TOTAL LENGTH OF BRIDGES				310.75	0.06		
TOTAL LENGTH OF ROADWAY						15,185.43	2.88
TOTAL MILES				2.94			

SHEET NUMBER	1

PARISH	FEDERAL PROJECT	STATE PROJECT
PLAQUEMINES/ORLEANS		

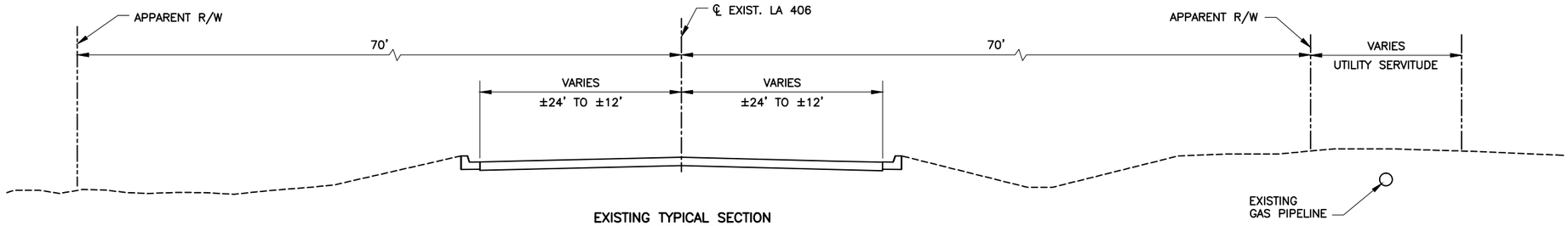
DESIGNED	RR	DETAILED	SG	DATE	07/01/2014
CHECKED	JE	CHECKED	RR	SHEET	

PRELIMINARY
Louisiana Department of Transportation And Development
NOT FOR CONSTRUCTION OR BIDDING
REVIEW UNDER THE AUTHORITY OF ENGINEER: RAUL H. RIOS
LICENSE #: 34066
DATE: 7/1/14
PURPOSES, AND SHALL NOT BE USED FOR THE ISSUANCE OF A PERMIT.

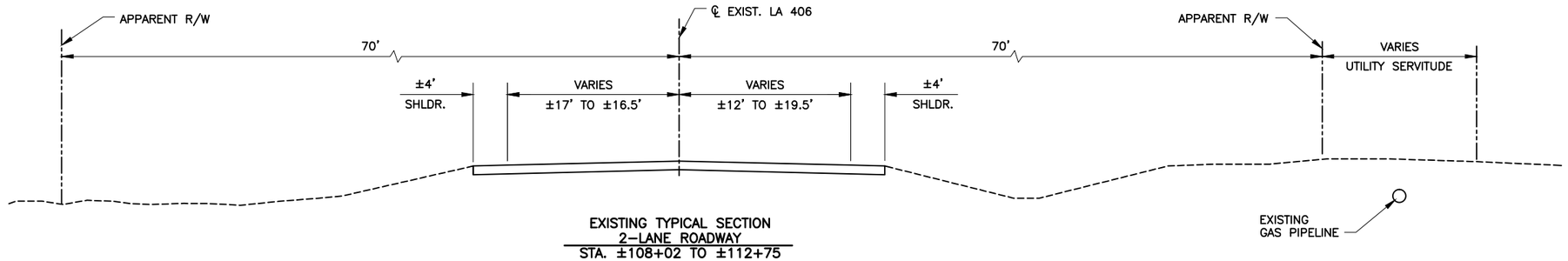
TITLE SHEET

WOODLAND HIGHWAY/LA 406 WIDENING

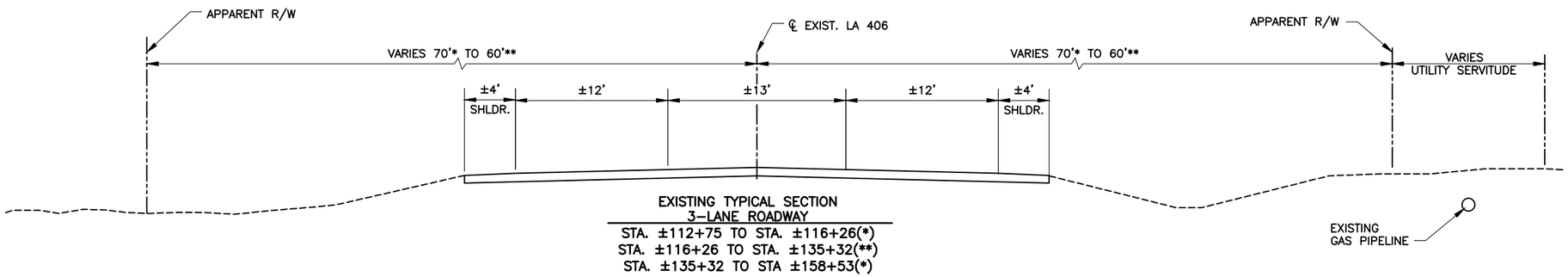
VOLKERT



EXISTING TYPICAL SECTION
2–LANE ROADWAY
STA. ±104+35 TO ±108+02



EXISTING TYPICAL SECTION
2–LANE ROADWAY
STA. ±108+02 TO ±112+75



EXISTING TYPICAL SECTION
3–LANE ROADWAY
STA. ±112+75 TO STA. ±116+26(*)
STA. ±116+26 TO STA. ±135+32(**)
STA. ±135+32 TO STA ±158+53(*)

SHEET NUMBER 2

PARISH	PLAQUEMINES/ORLEANS
FEDERAL PROJECT	
STATE PROJECT	

DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, RECORDATION, CONVEYANCES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

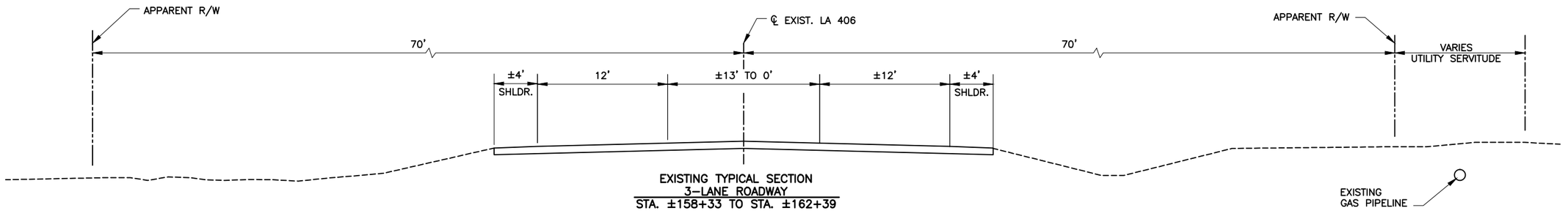
PRELIMINARY
Louisiana Department
Of
Transportation
And
Development
ENGINEER
LICENSE #
DATE

EXISTING TYPICAL SECTIONS

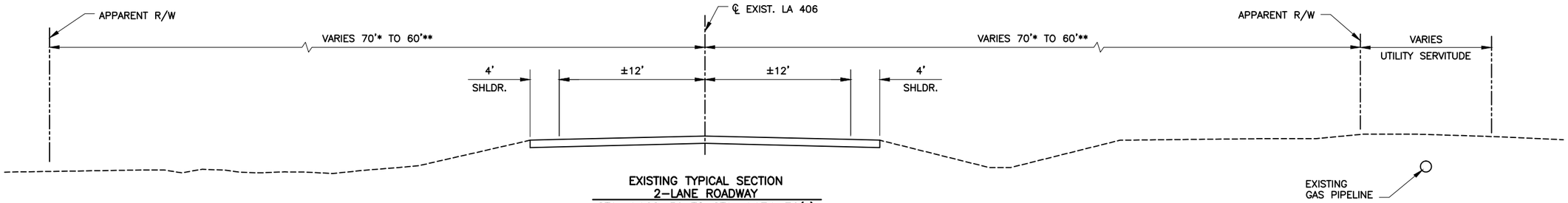
WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

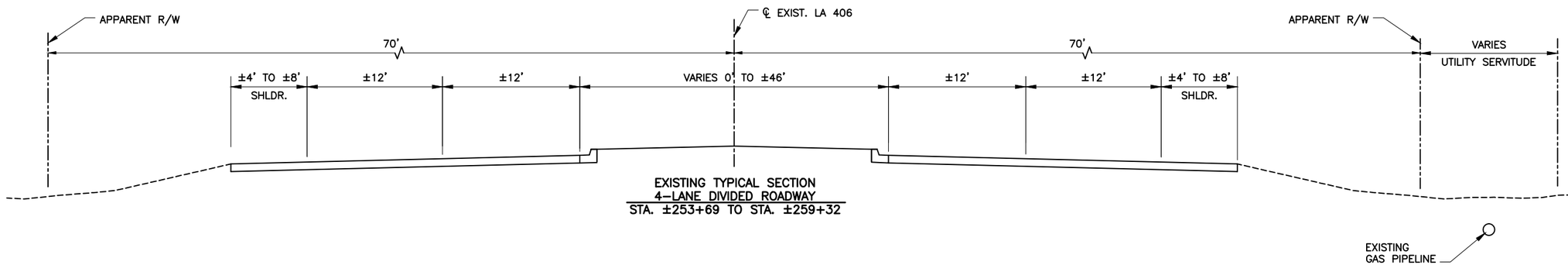
VOLKERT



EXISTING TYPICAL SECTION
3–LANE ROADWAY
STA. ±158+33 TO STA. ±162+39



EXISTING TYPICAL SECTION
2–LANE ROADWAY
STA. ±162+39 TO STA. ±174+76(*)
STA. ±174+76 TO STA. ±219+16(**)
STA. ±219+16 TO STA. ±253+69(*)



EXISTING TYPICAL SECTION
4–LANE DIVIDED ROADWAY
STA. ±253+69 TO STA. ±259+32

SHEET NUMBER 3

PARISH | PLAQUEMINES/ORLEANS
FEDERAL PROJECT |
STATE PROJECT |

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER
LICENSE #
DATE
PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, RIGHT-OF-WAY ACQUISITION, RECORDATION, CONVEYANCE OR AS THE BASIS FOR BIDDING OR FOR A PERMIT

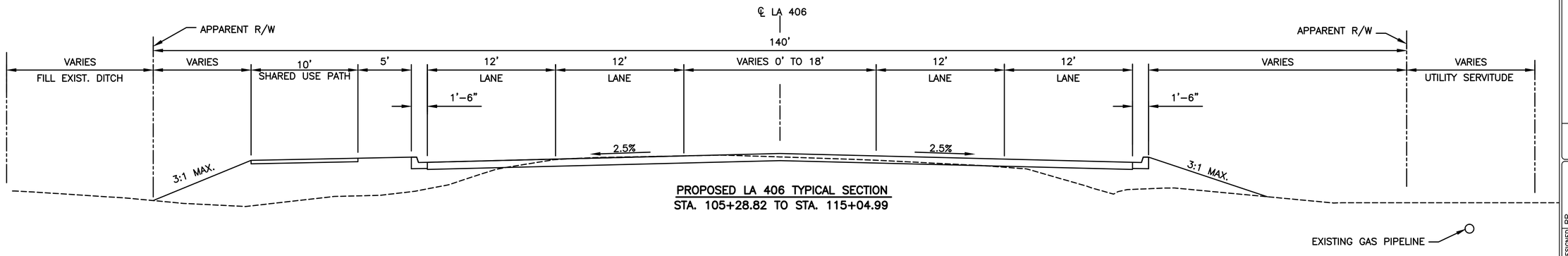
LOUISIANA

EXISTING TYPICAL SECTIONS

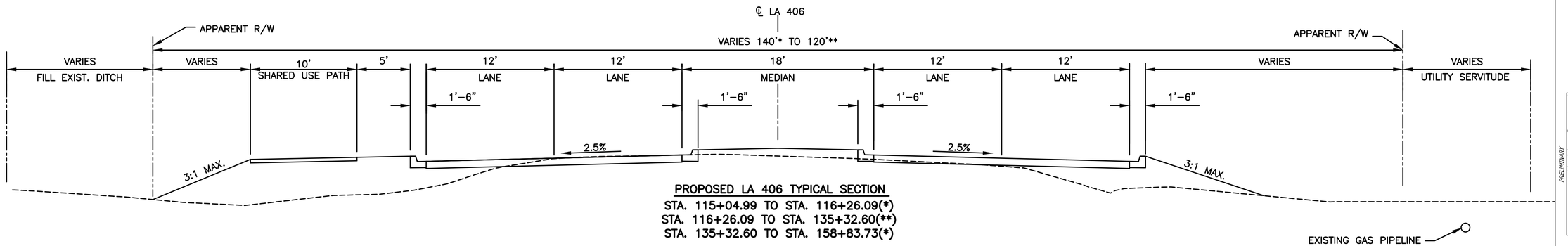
WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

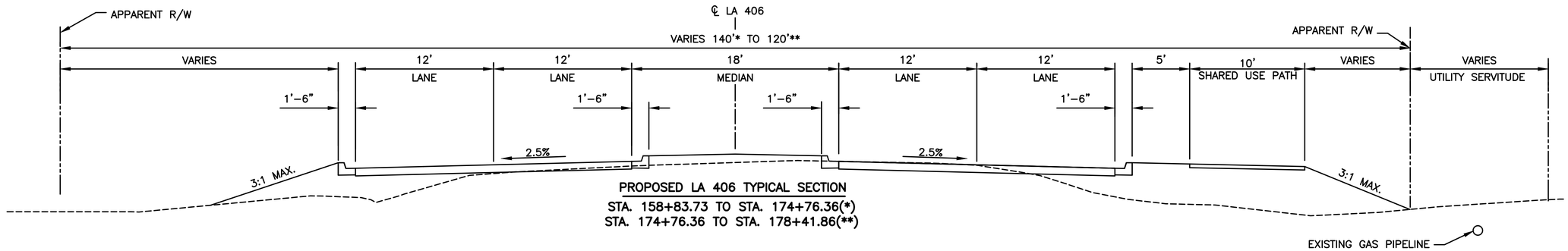
VOLKERT



PROPOSED LA 406 TYPICAL SECTION
STA. 105+28.82 TO STA. 115+04.99



PROPOSED LA 406 TYPICAL SECTION
STA. 115+04.99 TO STA. 116+26.09(*)
STA. 116+26.09 TO STA. 135+32.60(**)
STA. 135+32.60 TO STA. 158+83.73(*)



PROPOSED LA 406 TYPICAL SECTION
STA. 158+83.73 TO STA. 174+76.36(*)
STA. 174+76.36 TO STA. 178+41.86(**)

SHEET NUMBER 4

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT:
STATE PROJECT:

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

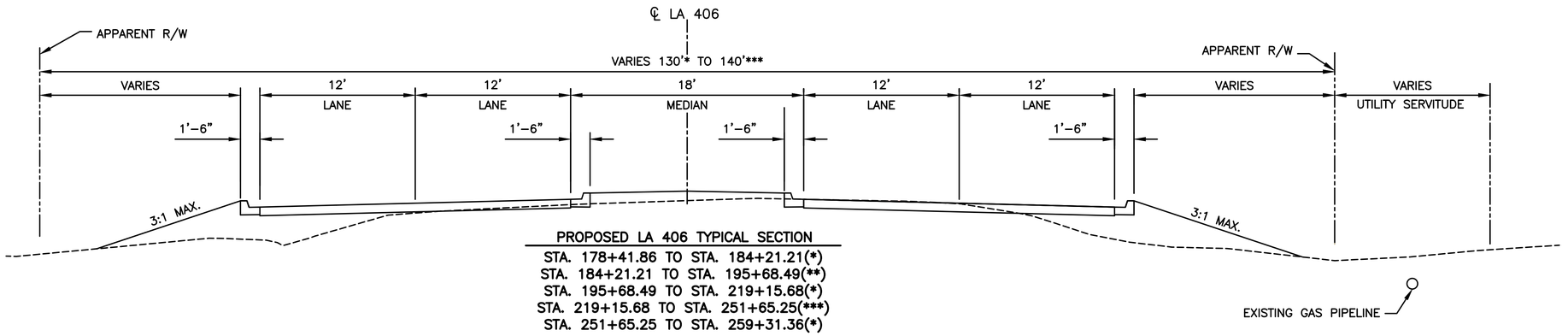
PRELIMINARY
Louisiana Department of Transportation And Development
NOT FOR CONSTRUCTION OR BIDDING
REVISIONS, ADDITIONS, OR DELETIONS TO THIS PLAN SHEET MAY BE MADE BY ADDENDA ONLY
ENGINEER RAUL R. RIOS
LICENSE # 34056
DATE 7/1/14

TYPICAL SECTIONS

WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT



PROPOSED LA 406 TYPICAL SECTION

STA. 178+41.86 TO STA. 184+21.21(*)
STA. 184+21.21 TO STA. 195+68.49(**)
STA. 195+68.49 TO STA. 219+15.68(*)
STA. 219+15.68 TO STA. 251+65.25(***)
STA. 251+65.25 TO STA. 259+31.36(*)

SHEET NUMBER 4a

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT:
STATE PROJECT:

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER: RAUL H. RIEGOS
LICENSE #: 34066
DATE: 7/1/14

PRELIMINARY NOT FOR CONSTRUCTION, BIDDING, REGISTRATION, POWERMAKE SALES OR RECORDATION, THE ISSUANCE OF A PERMIT.

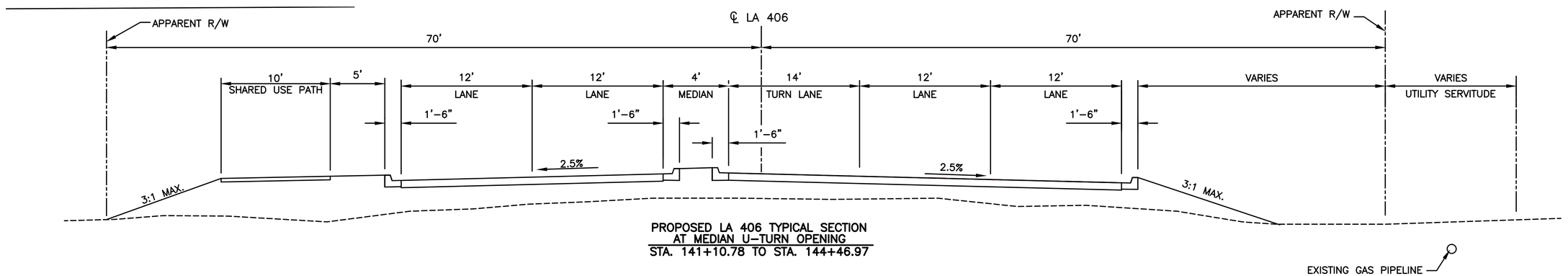
STATE OF LOUISIANA · REGISTERED ENGINEER

TYPICAL SECTIONS

WOODLAND HIGHWAY/LA 406 WIDENING

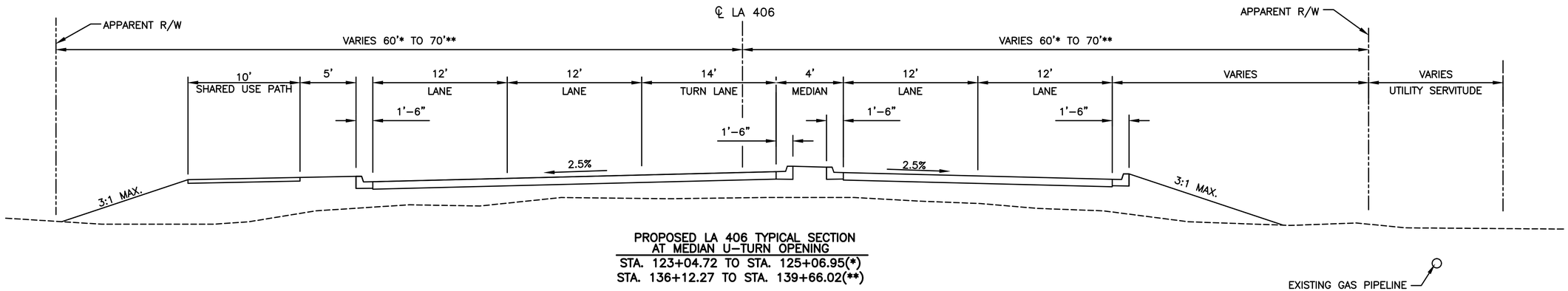
REGIONAL PLANNING COMMISSION

VOLKERT



PROPOSED LA 406 TYPICAL SECTION
AT MEDIAN U–TURN OPENING
STA. 141+10.78 TO STA. 144+46.97

EXISTING GAS PIPELINE



PROPOSED LA 406 TYPICAL SECTION
AT MEDIAN U–TURN OPENING
STA. 123+04.72 TO STA. 125+06.95(*)
STA. 136+12.27 TO STA. 139+66.02(**)

EXISTING GAS PIPELINE

SHEET NUMBER 4b

PARISH	FEDERAL PROJECT	STATE PROJECT
PLAQUEMINES/ORLEANS		

DESIGNED	RR	DETAILED	SG	DATE	07/01/2014
CHECKED	JE	CHECKED	RR	SHEET	

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER RAUL R. RIOS
LICENSE # 34066
DATE 7/1/14

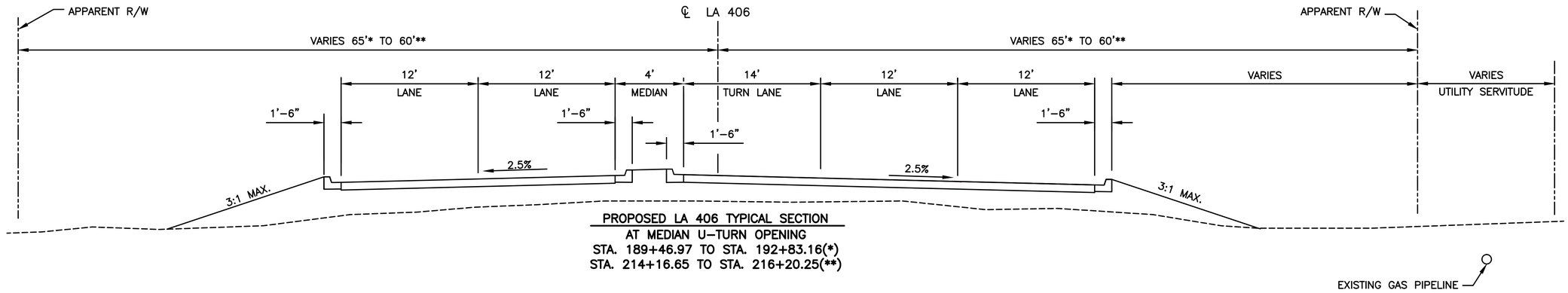
PRELIMINARY NOT FOR CONSTRUCTION, BIDDING, REGISTRATION, POWERMAKE SALES OR RECORDATION, THE ISSUANCE OF A PERMIT.

TYPICAL SECTIONS

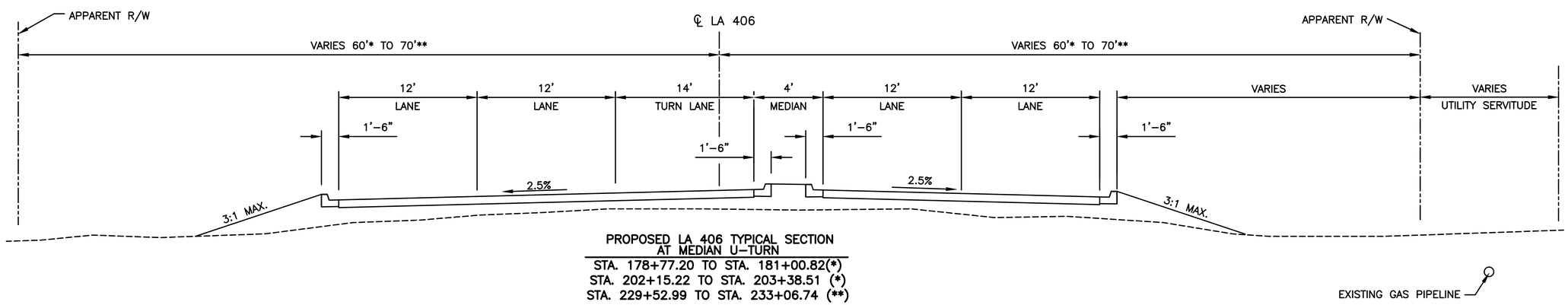
WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT



PROPOSED LA 406 TYPICAL SECTION
AT MEDIAN U–TURN OPENING
STA. 189+46.97 TO STA. 192+83.16(*)
STA. 214+16.65 TO STA. 216+20.25(**)



PROPOSED LA 406 TYPICAL SECTION
AT MEDIAN U–TURN
STA. 178+77.20 TO STA. 181+00.82(*)
STA. 202+15.22 TO STA. 203+38.51 (*)
STA. 229+52.99 TO STA. 233+06.74 (**)

SHEET NUMBER 4C

PARISH	FEDERAL PROJECT	STATE PROJECT
PLAQUEMINES/ORLEANS		

DESIGNED	RR	DETAILED	SG	DATE	07/01/2014
CHECKED	JE	CHECKED	RR	SHEET	

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER RAUL R. REGIS
LICENSE # 34066
DATE 7/1/14

PRELIMINARY NOT FOR CONSTRUCTION, BIDDING, REGISTRATION, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

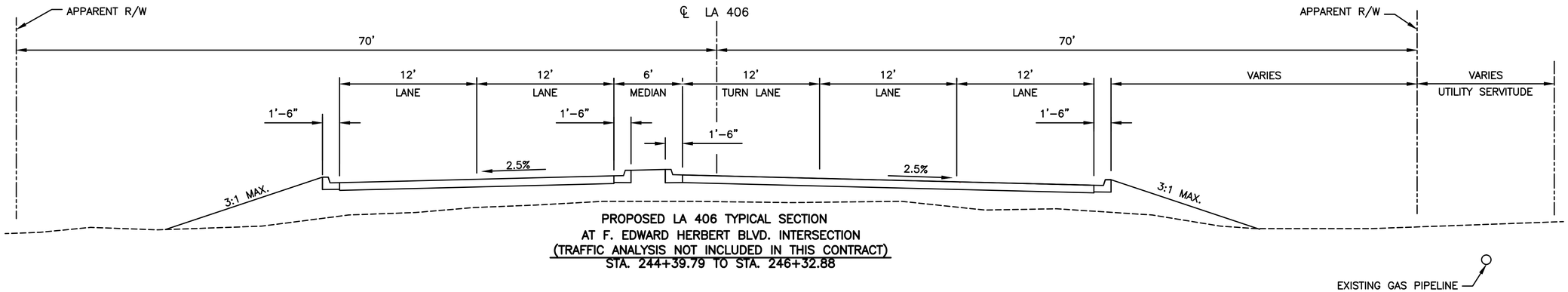
STATE OF LOUISIANA REGISTERED PROFESSIONAL ENGINEER

TYPICAL SECTIONS

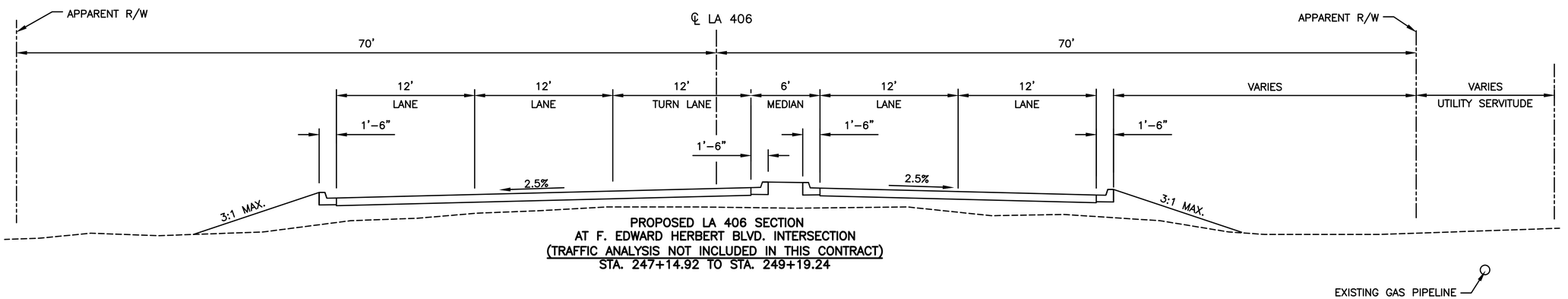
WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT



PROPOSED LA 406 TYPICAL SECTION
AT F. EDWARD HERBERT BLVD. INTERSECTION
(TRAFFIC ANALYSIS NOT INCLUDED IN THIS CONTRACT)
STA. 244+39.79 TO STA. 246+32.88



PROPOSED LA 406 SECTION
AT F. EDWARD HERBERT BLVD. INTERSECTION
(TRAFFIC ANALYSIS NOT INCLUDED IN THIS CONTRACT)
STA. 247+14.92 TO STA. 249+19.24

SHEET NUMBER 4d

PARISH	FEDERAL PROJECT	STATE PROJECT
PLAQUEMINES/ORLEANS		

DESIGNED	RR	DETAILED	SG	DATE	07/01/2014
CHECKED	JE	CHECKED	RR	SHEET	

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER RAUL R. RIEGOS
LICENSE # 34066
DATE 7/1/14

PRELIMINARY NOT FOR CONSTRUCTION, BIDDING, REGISTRATION, POWERMAKE, SALES OR RECORDATION, THE ISSUANCE OF A PERMIT.

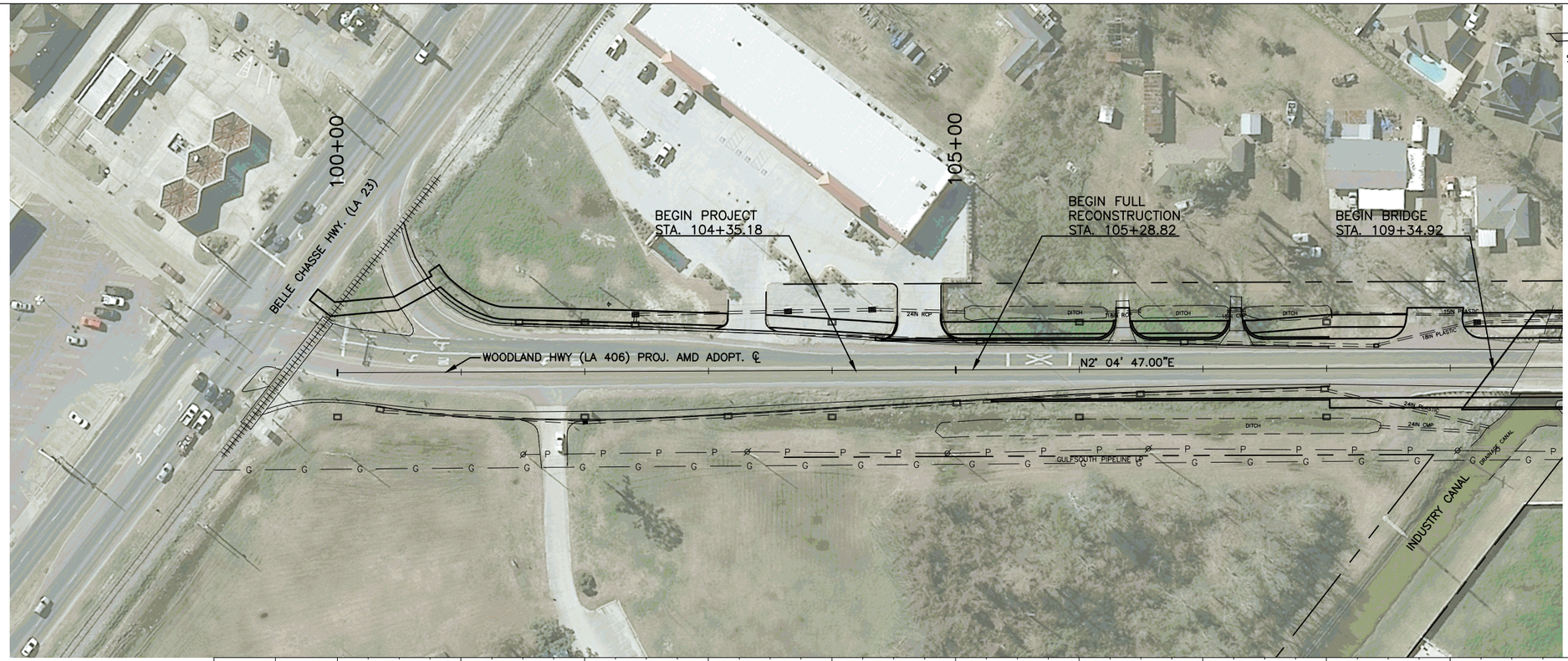
STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

TYPICAL SECTIONS

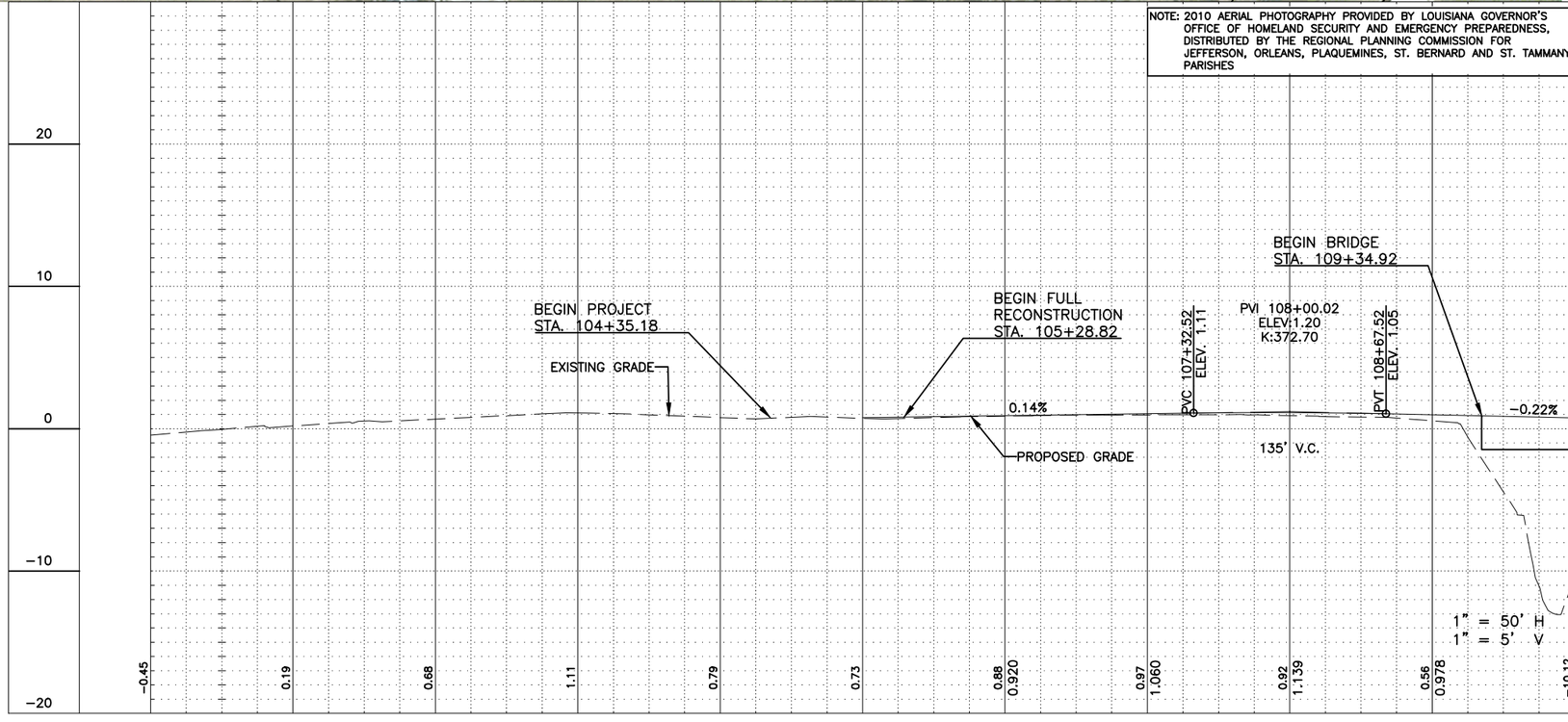
WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT



NOTE: 2010 AERIAL PHOTOGRAPHY PROVIDED BY LOUISIANA GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS, DISTRIBUTED BY THE REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES



DESIGNED	RR	PARISH	PLAQUEMINES/ORLEANS
CHECKED	JE		
DETAILED	SG	FEDERAL PROJECT	
CHECKED	RR		
DATE	07/01/2014	STATE PROJECT	
SHEET			

SHEET NUMBER 5

PRELIMINARY
Louisiana Department of Transportation and Development
ENGINEER
LICENSE #
DATE

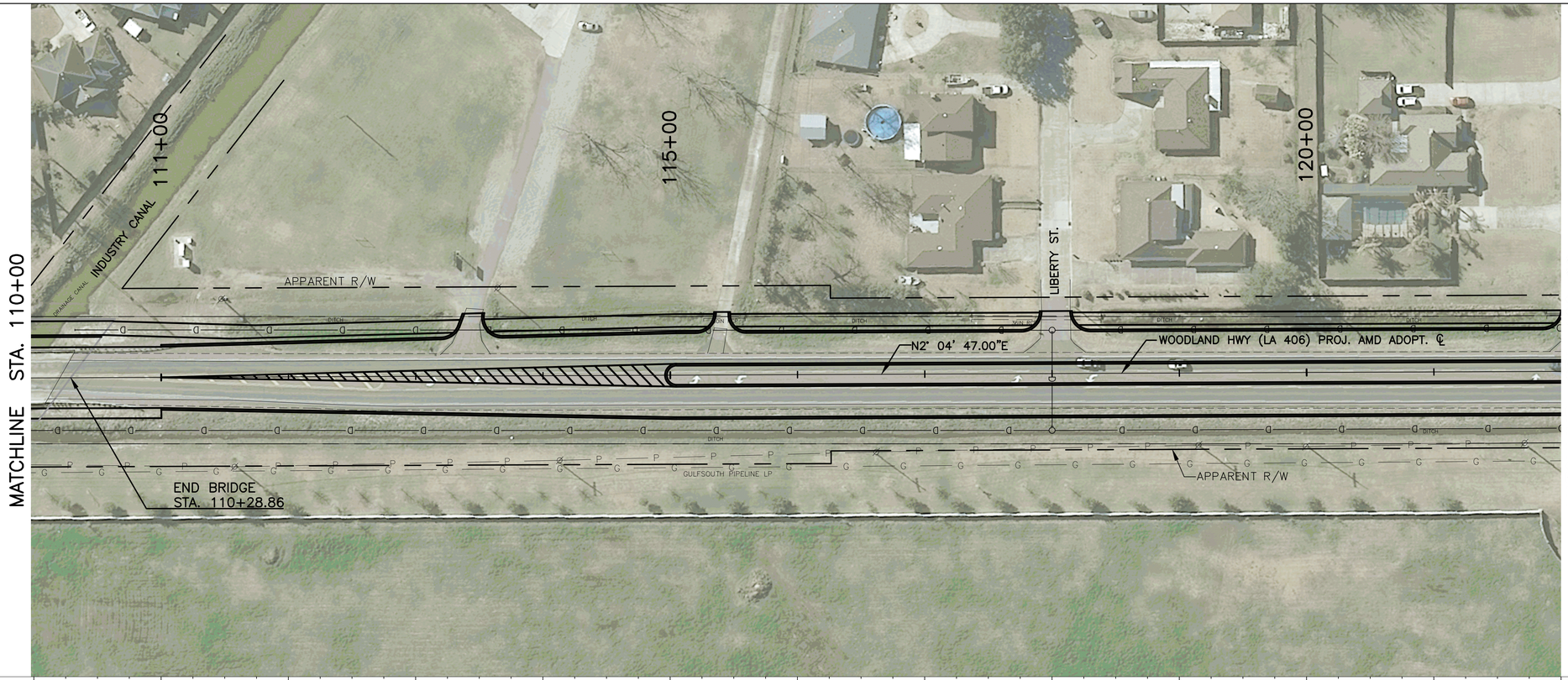
PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, RECORDATION, CONVEYANCES OR AS THE BASIS FOR ISSUING A BUILDING PERMIT.

PLAN SHEET

WOODLAND HIGHWAY/LA 406 WIDENING

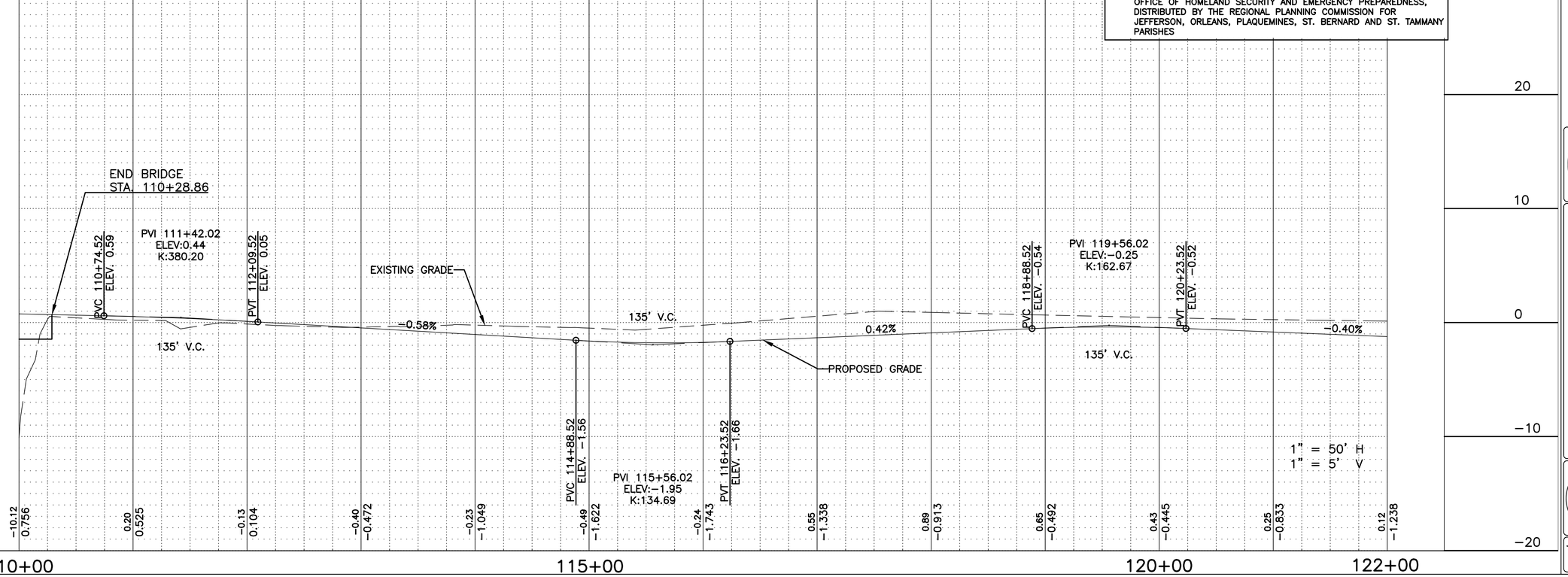
REGIONAL PLANNING COMMISSION

VOLKERT



Scale : 1" = 50'

NOTE: 2010 AERIAL PHOTOGRAPHY PROVIDED BY LOUISIANA GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS, DISTRIBUTED BY THE REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES



SHEET NUMBER	6
PARISH	PLAQUEMINES/ORLEANS
FEDERAL PROJECT	
STATE PROJECT	
DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER: RAUL H. RIOS
LICENSE # 34056
DATE: 7/1/14

PRELIMINARY NOT FOR CONSTRUCTION, BIDDING, REGULATORY, CONVEYANCE, SALES OR RECORDING PURPOSES. THE ISSUANCE OF A PERMIT

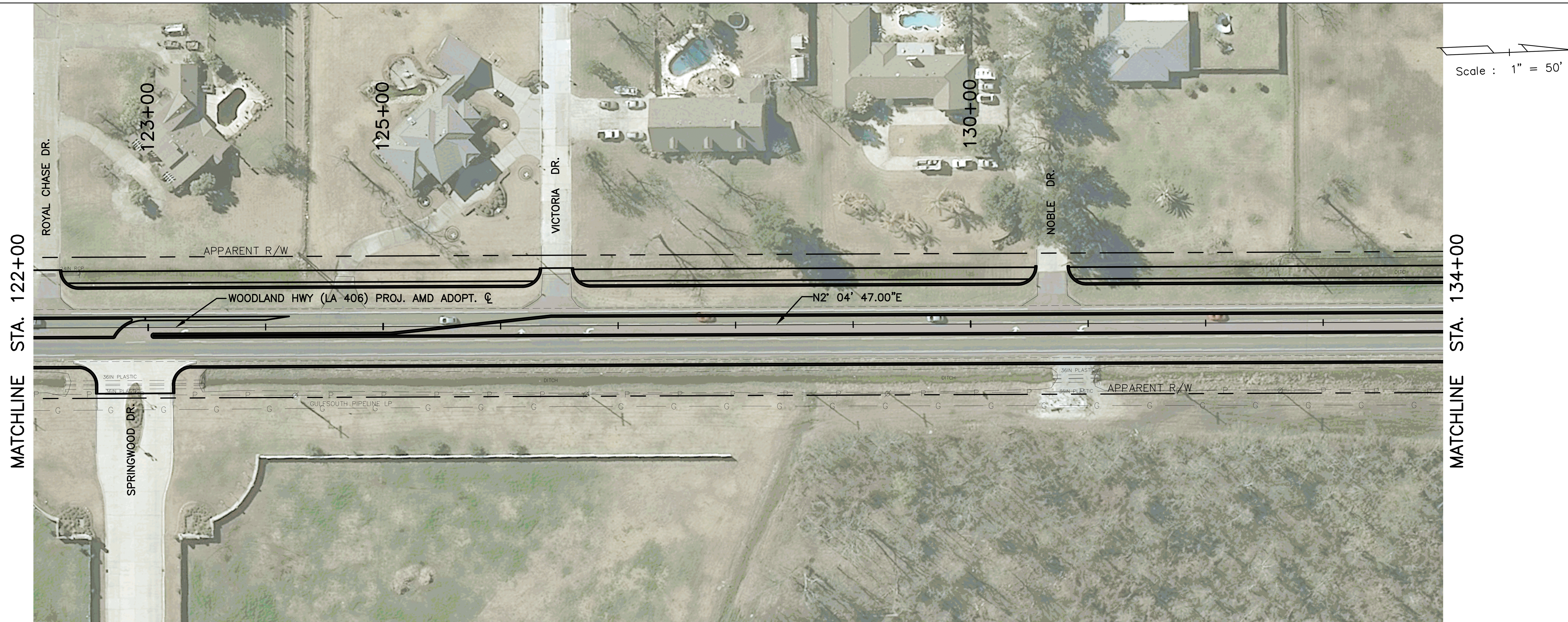
STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

PLAN SHEET

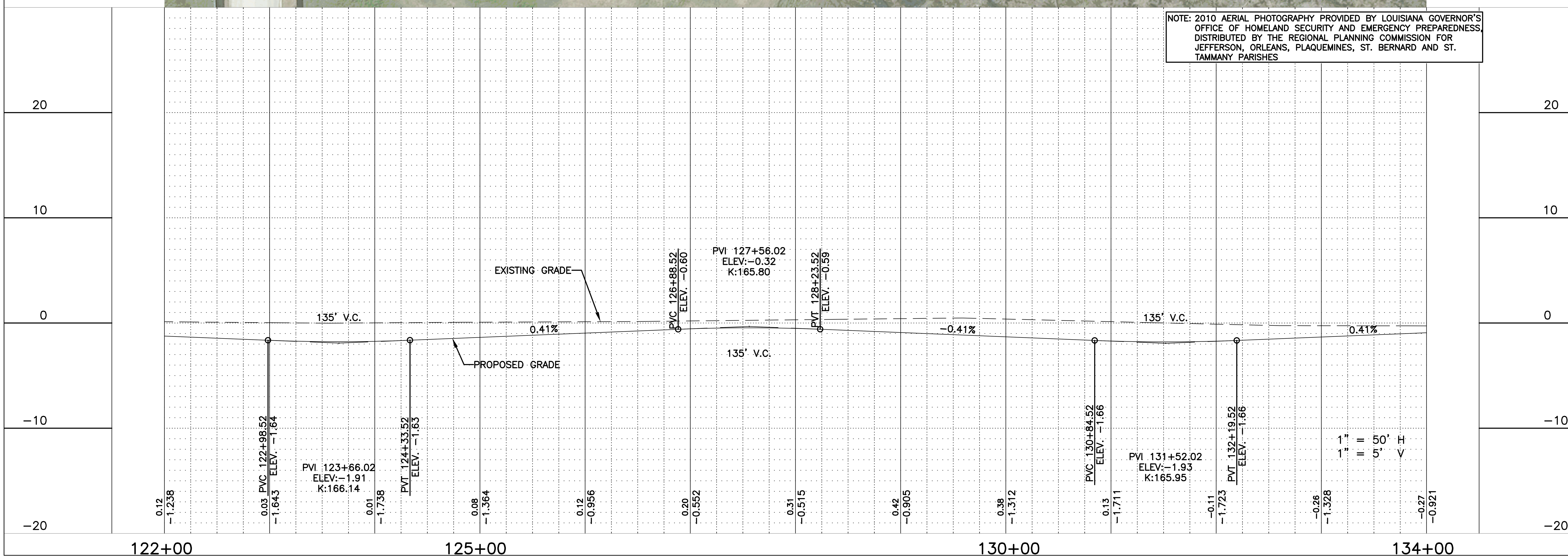
WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT



NOTE: 2010 AERIAL PHOTOGRAPHY PROVIDED BY LOUISIANA GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS, DISTRIBUTED BY THE REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES



SHEET NUMBER	7
PARISH	PLAQUEMINES/ORLEANS
FEDERAL PROJECT	
STATE PROJECT	
DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PRELIMINARY
PRELIMINARY NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.
Louisiana Department Of Transportation And Development

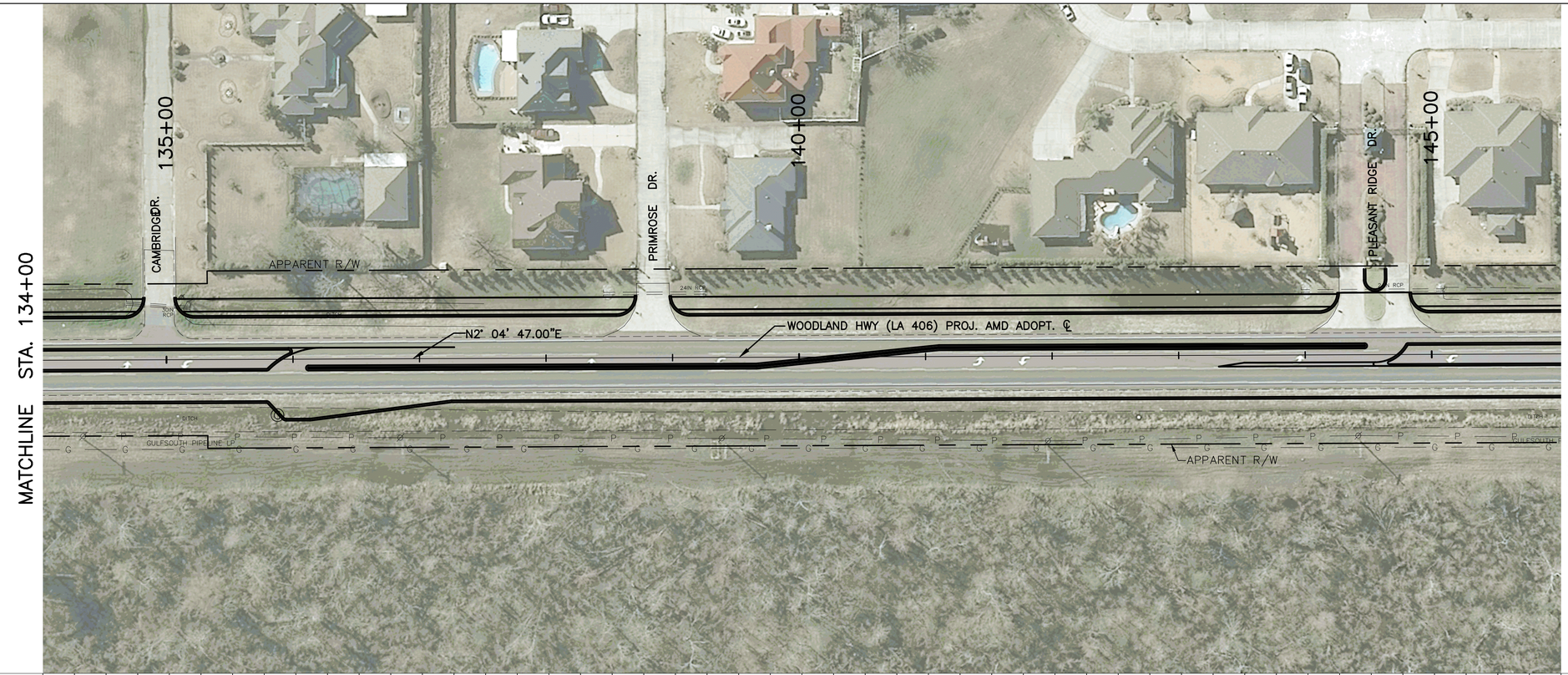
STATE OF LOUISIANA

PLAN SHEET

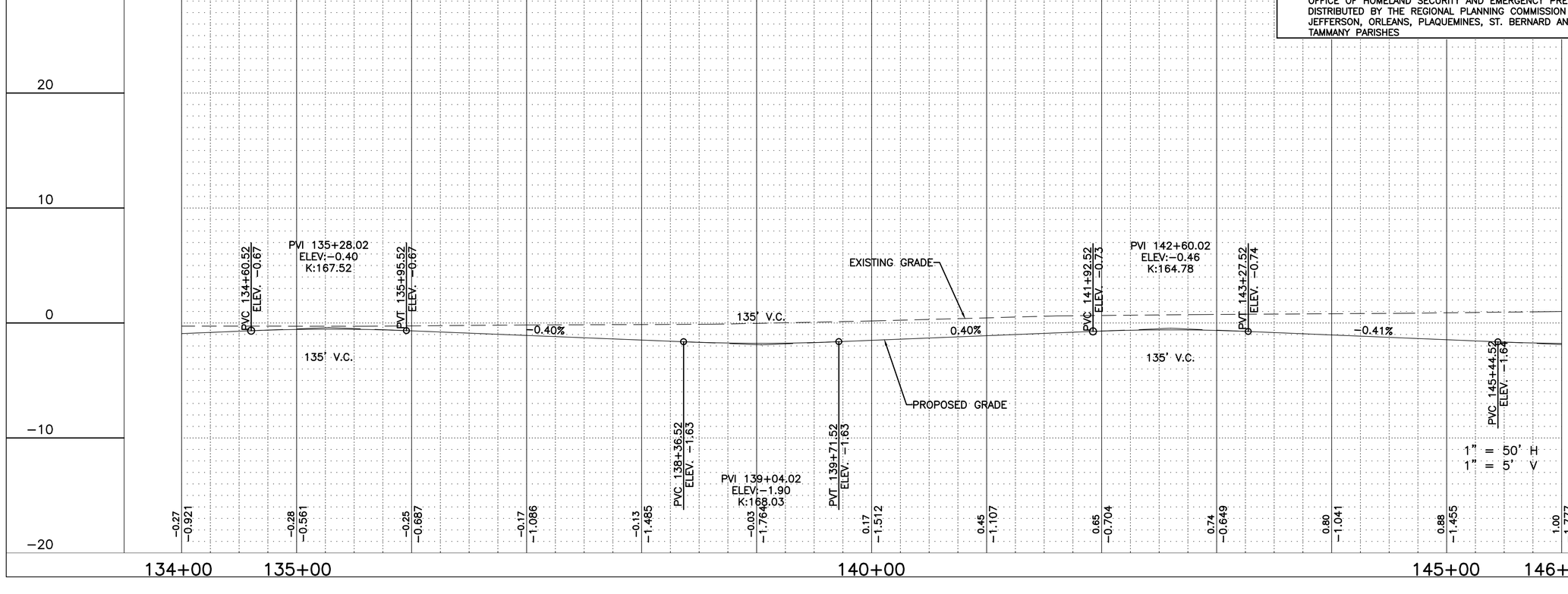
WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT



NOTE: 2010 AERIAL PHOTOGRAPHY PROVIDED BY LOUISIANA GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS, DISTRIBUTED BY THE REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES



PRELIMINARY
Louisiana Department of Transportation And Development
NOT FOR CONSTRUCTION OR BIDDING
REVIEW UNDER THE AUTHORITY OF ENGINEER RAUL R. RIOS
LICENSE # 34066
DATE: 7/1/14
PURPOSES, SALES OR THE ISSUANCE OF A PERMIT

SHEET NUMBER	8
PARISH	PLAQUEMINES/ORLEANS
FEDERAL PROJECT	
STATE PROJECT	
DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PLAN SHEET

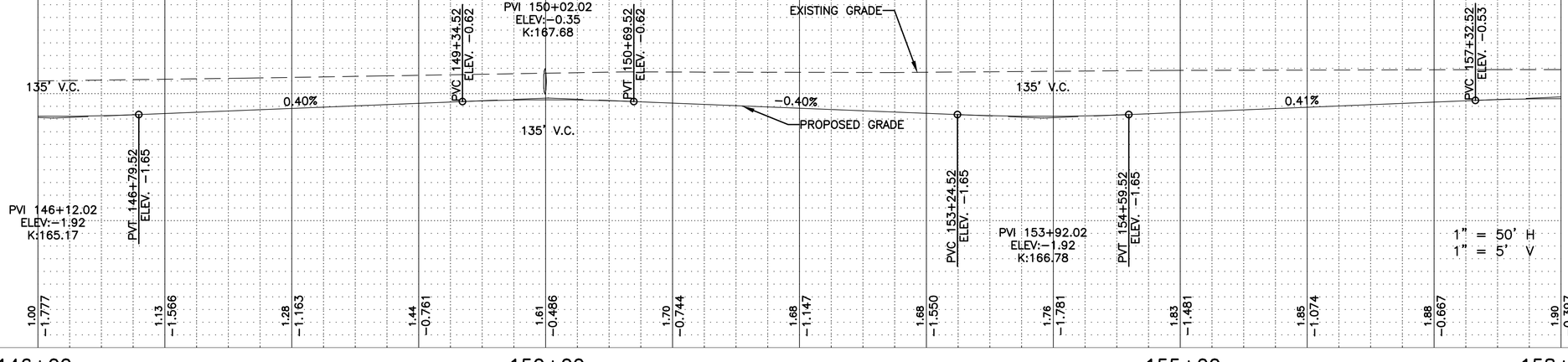
WOODLAND HIGHWAY/LA 406 WIDENING

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

REGIONAL PLANNING COMMISSION

VOLKERT

NOTE: 2010 AERIAL PHOTOGRAPHY PROVIDED BY LOUISIANA GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS, DISTRIBUTED BY THE REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES



SHEET NUMBER	9
PARISH	PLAQUEMINES/ORLEANS
FEDERAL PROJECT	
STATE PROJECT	
DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER: RAUL R. RIOS
LICENSE # : 34056
DATE: 7/1/14

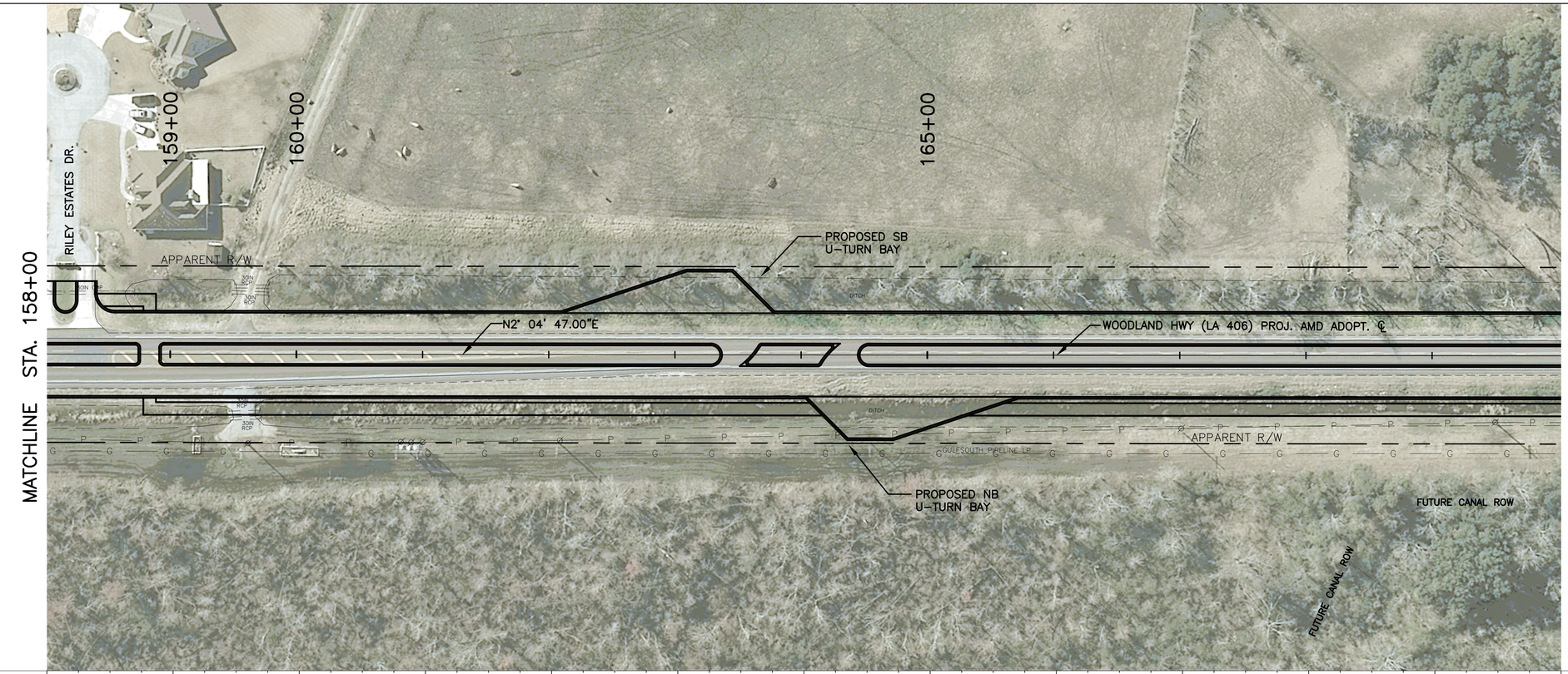
PRELIMINARY NOT FOR CONSTRUCTION, BIDDING, REGULATORY, OR RECORDING PURPOSES, OR FOR THE ISSUANCE OF A PERMIT

PLAN SHEET

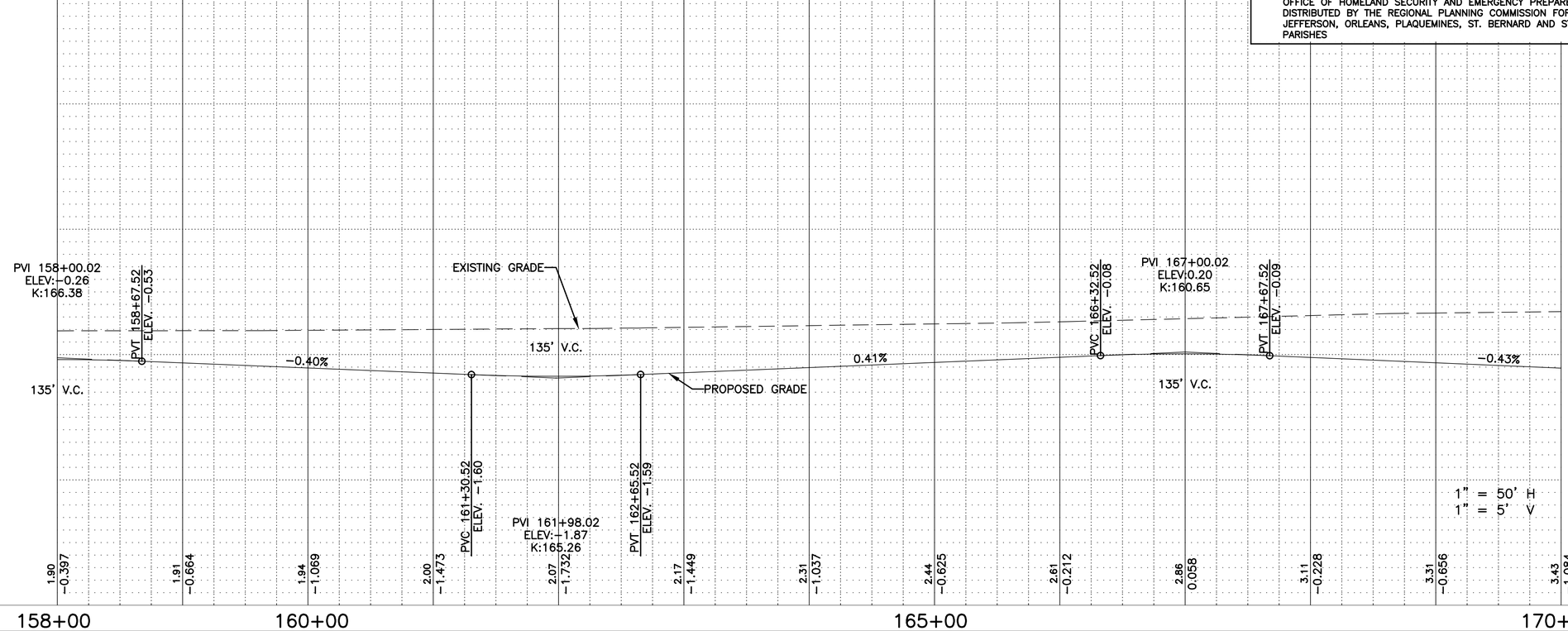
WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT



NOTE: 2010 AERIAL PHOTOGRAPHY PROVIDED BY LOUISIANA GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS, DISTRIBUTED BY THE REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES



SHEET NUMBER 10

PARISH	PLAQUEMINES/ORLEANS		
		FEDERAL PROJECT	STATE PROJECT
DESIGNED RR CHECKED JE		DETAILED SG CHECKED RR	DATE 07/01/2014 SHEET

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER RAUL R. RIGGS
LICENSE # 34055
DATE 7/1/14

PRELIMINARY NOT FOR CONSTRUCTION OR BIDDING. REGISTERED ENGINEER CONVEYANCE, SALES OR LEASE OF THE ISSUANCE OF A PERMIT

PLAN SHEET

WOODLAND HIGHWAY/LA 406 WIDENING

VOLKERT

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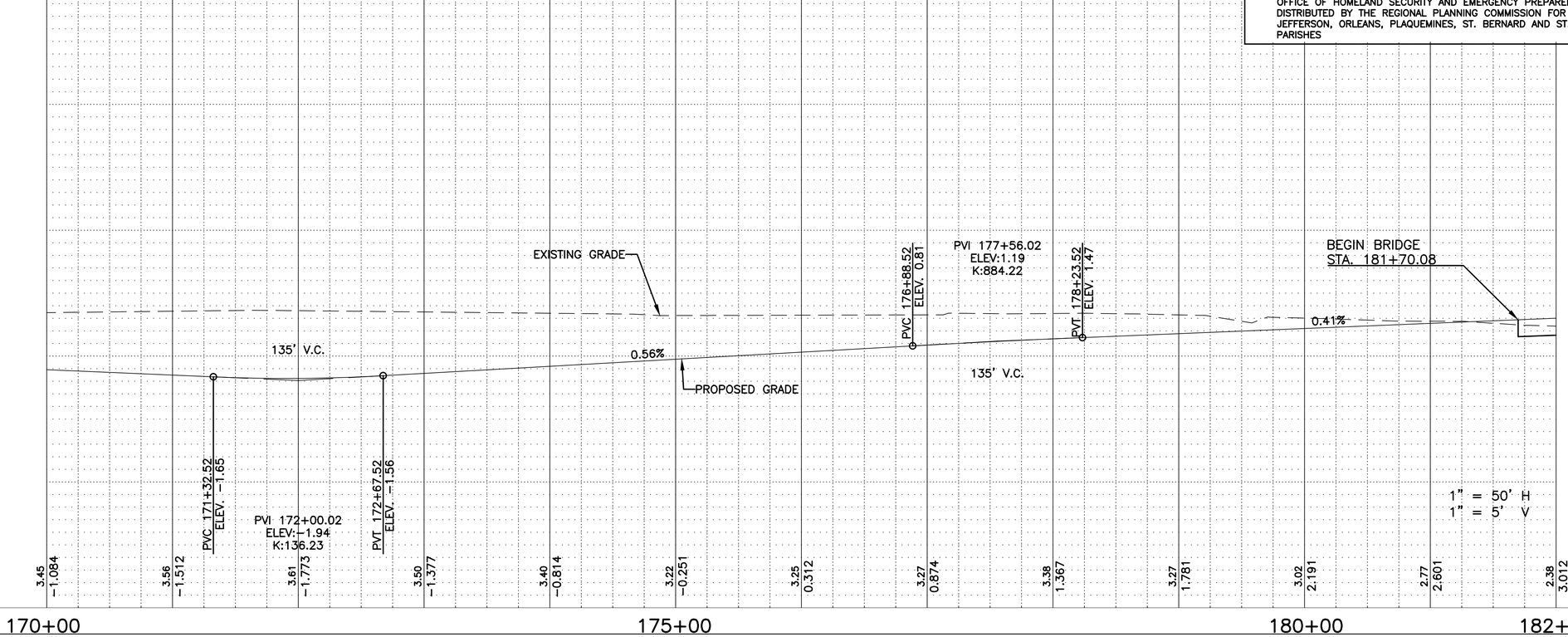


SHEET NUMBER	11
PARISH	PLAQUEMINES/ORLEANS
FEDERAL PROJECT	
STATE PROJECT	
DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER: BASIL H. REGIS
LICENSE # : 34055
DATE: 7/1/14

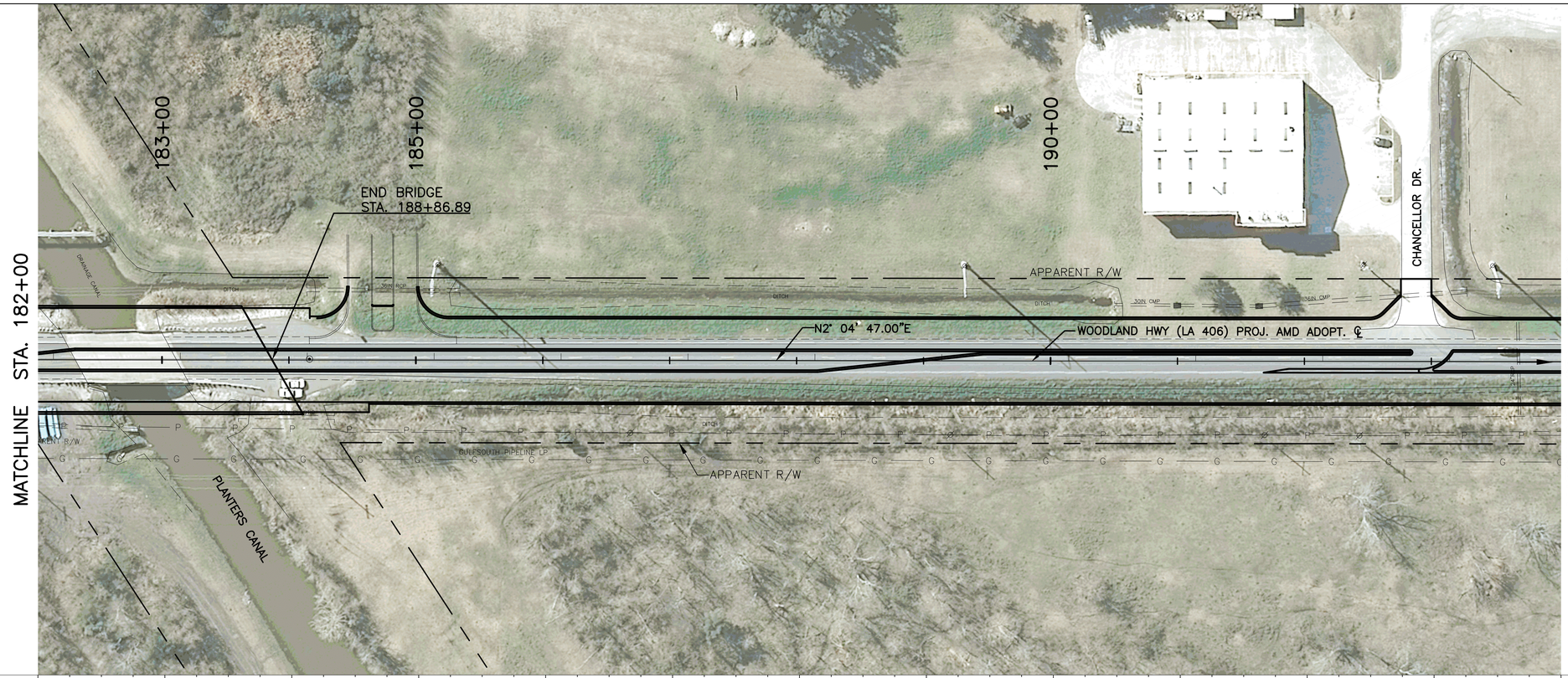
PRELIMINARY NOT FOR CONSTRUCTION OR BIDDING. REVIEWED, COMPLIANCE, ACCEPTANCE, OR APPROVAL BY THE ISSUANCE OF A PERMIT

PLAN SHEET

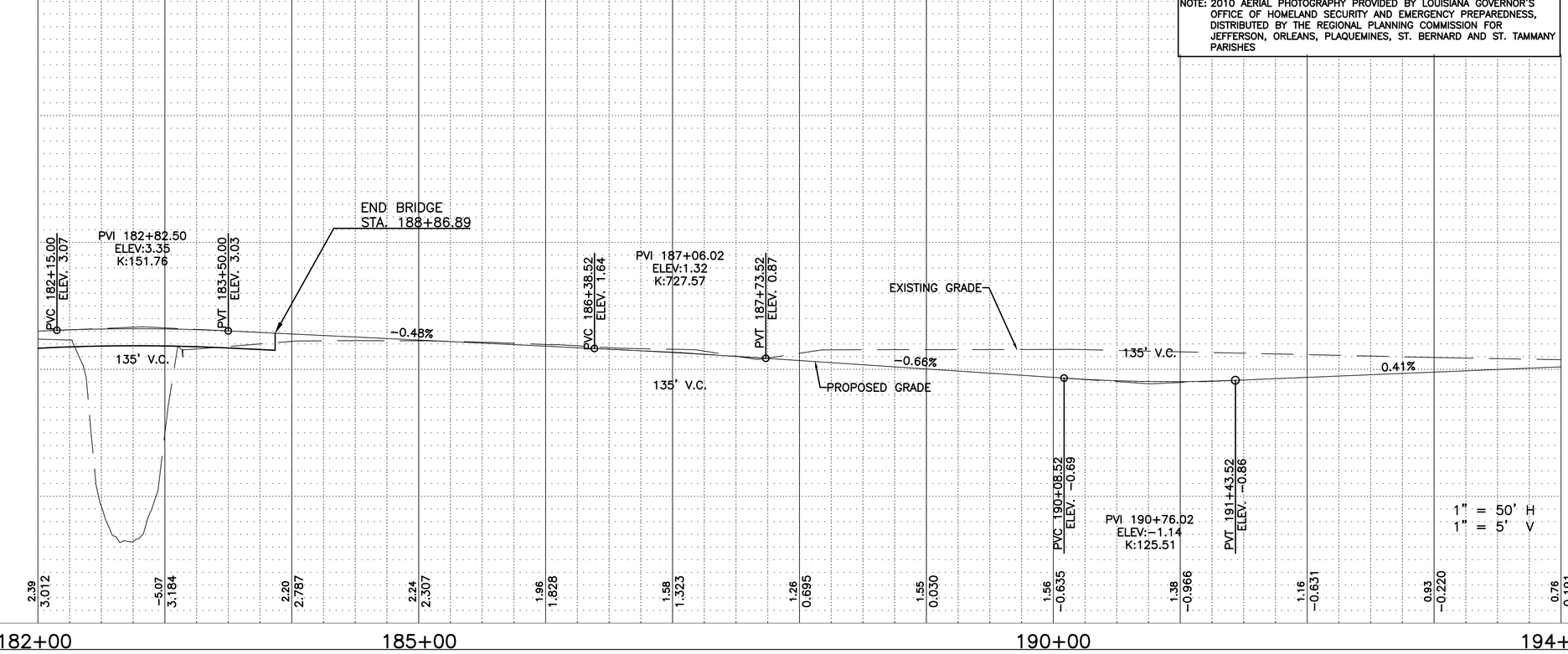
WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT



NOTE: 2010 AERIAL PHOTOGRAPHY PROVIDED BY LOUISIANA GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS, DISTRIBUTED BY THE REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES



SHEET NUMBER	12
PARISH	PLAQUEMINES/ORLEANS
FEDERAL PROJECT	
STATE PROJECT	
DESIGNED / CHECKED	RR / JE
DETAILED / CHECKED	SG / RR
DATE SHEET	07/01/2014

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDATION
Louisiana Department of Transportation And Development
ENGINEER RAN H. REUSS
LICENSE # 34056
DATE 7/1/14

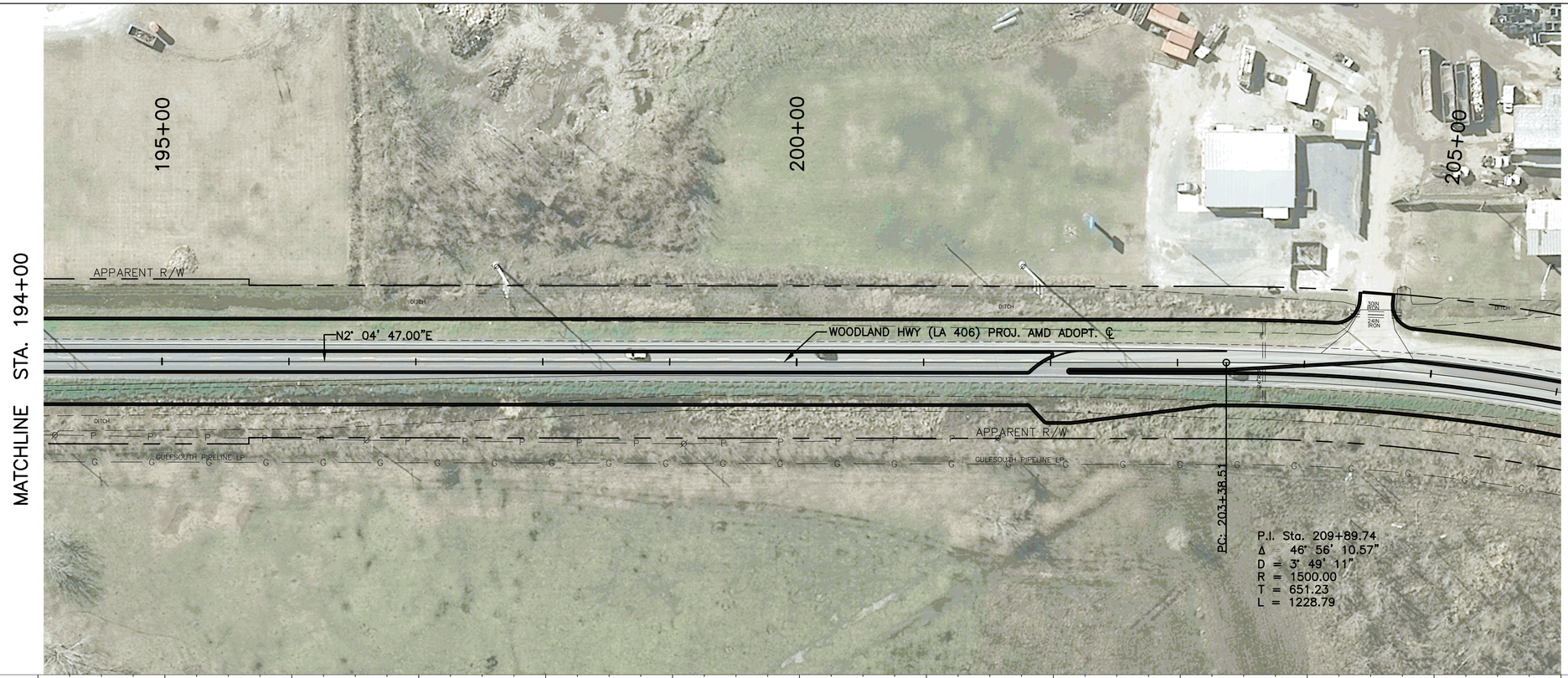
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDATION
THESE PLANS ARE PRELIMINARY AND ARE NOT TO BE USED FOR CONSTRUCTION, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

PLAN SHEET

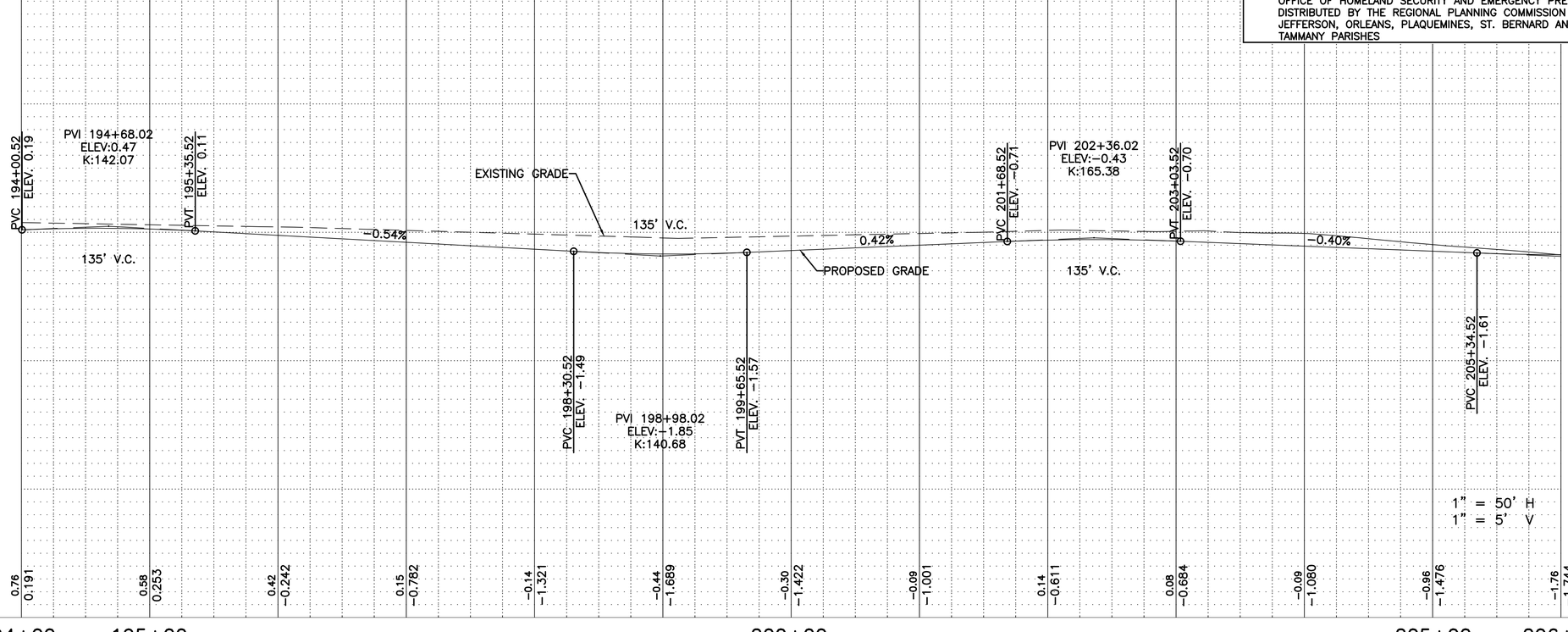
WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT



NOTE: 2010 AERIAL PHOTOGRAPHY PROVIDED BY LOUISIANA GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS, DISTRIBUTED BY THE REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES



SHEET NUMBER 13

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT:
STATE PROJECT:

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER RAUL R. RIOS
LICENSE # 34066
DATE 7/1/14

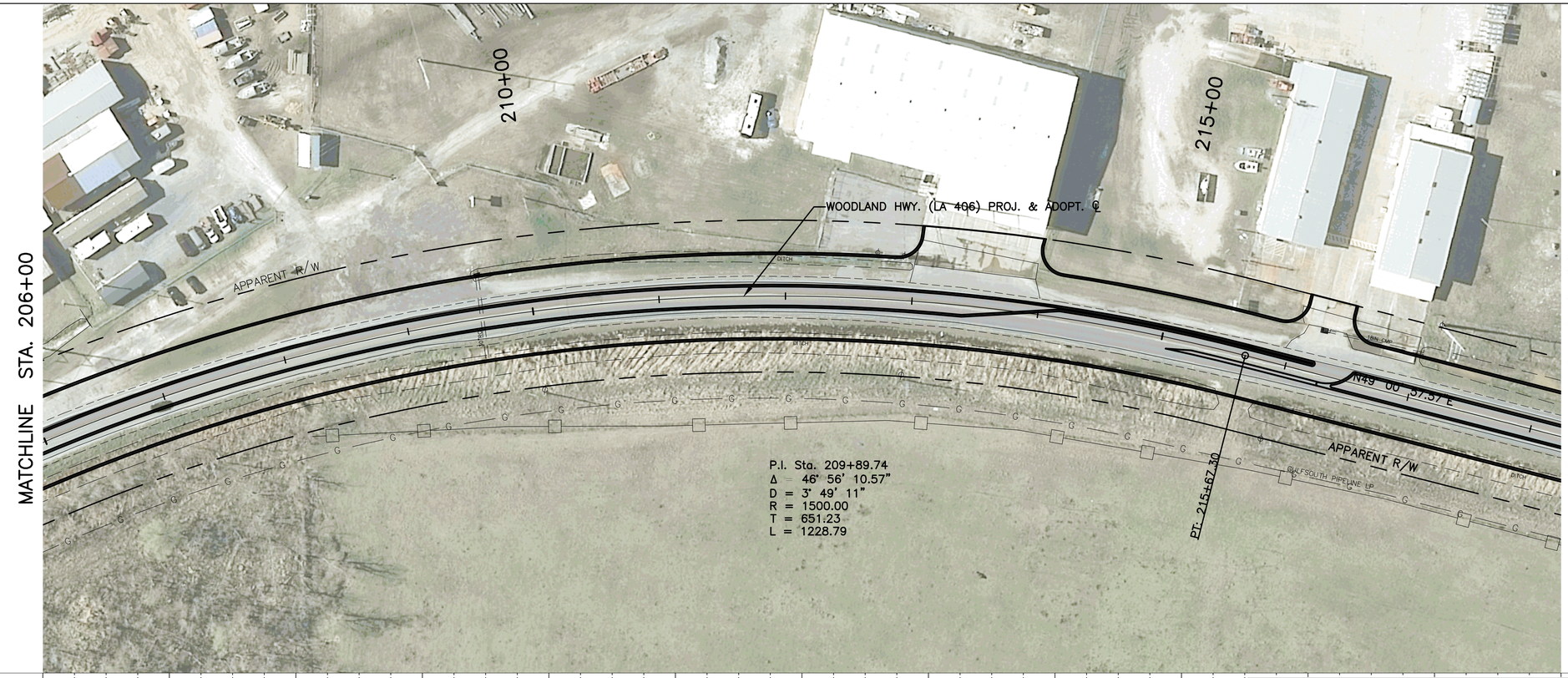
PRELIMINARY NOT FOR CONSTRUCTION OR BIDDING REPRESENTS WORK CONDITIONS UNDER THE PERMANENT ISSUANCE OF A PERMIT

PLAN SHEET

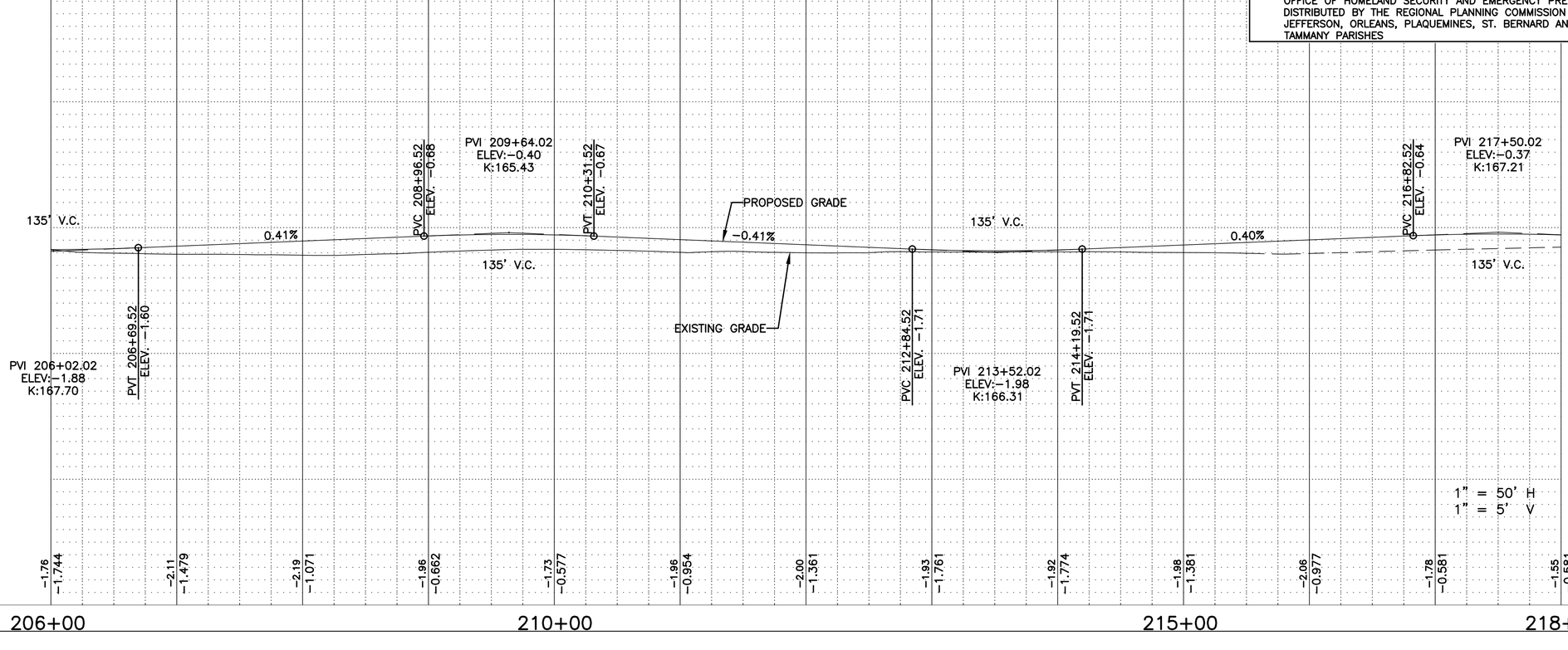
WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT



NOTE: 2010 AERIAL PHOTOGRAPHY PROVIDED BY LOUISIANA GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS, DISTRIBUTED BY THE REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES



SHEET NUMBER 14

PARISH	FEDERAL PROJECT	STATE PROJECT
PLAQUEMINES/ORLEANS		

DESIGNED	RR	DATE	07/01/2014
CHECKED	JE	SHEET	
DETAILED	SG		
CHECKED	RR		

PRELIMINARY
Louisiana Department of Transportation And Development
PRELIMINARY NOT FOR CONSTRUCTION, BIDDING, REGISTRATION, POWERMAKE SALES OR RECORDATION, OR THE ISSUANCE OF A PERMIT
ENGINEER RAUL R. RIOS
LICENSE # 34055
DATE 7/1/14

PLAN SHEET

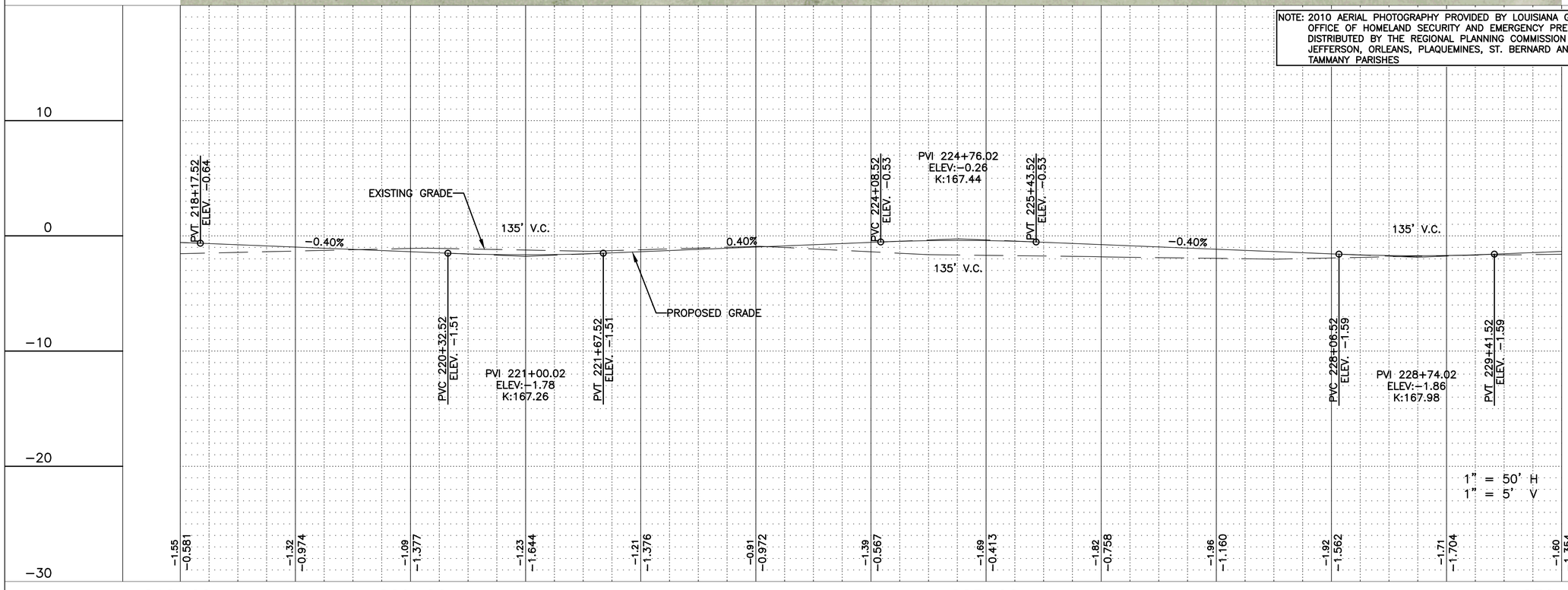
WOODLAND HIGHWAY/LA 406 WIDENING

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

REGIONAL PLANNING COMMISSION

VOLKERT

NOTE: 2010 AERIAL PHOTOGRAPHY PROVIDED BY LOUISIANA GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS, DISTRIBUTED BY THE REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES



SHEET NUMBER 15

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT:
STATE PROJECT:

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER: RAUL H. RIOS
LICENSE #: 34066
DATE: 7/1/14

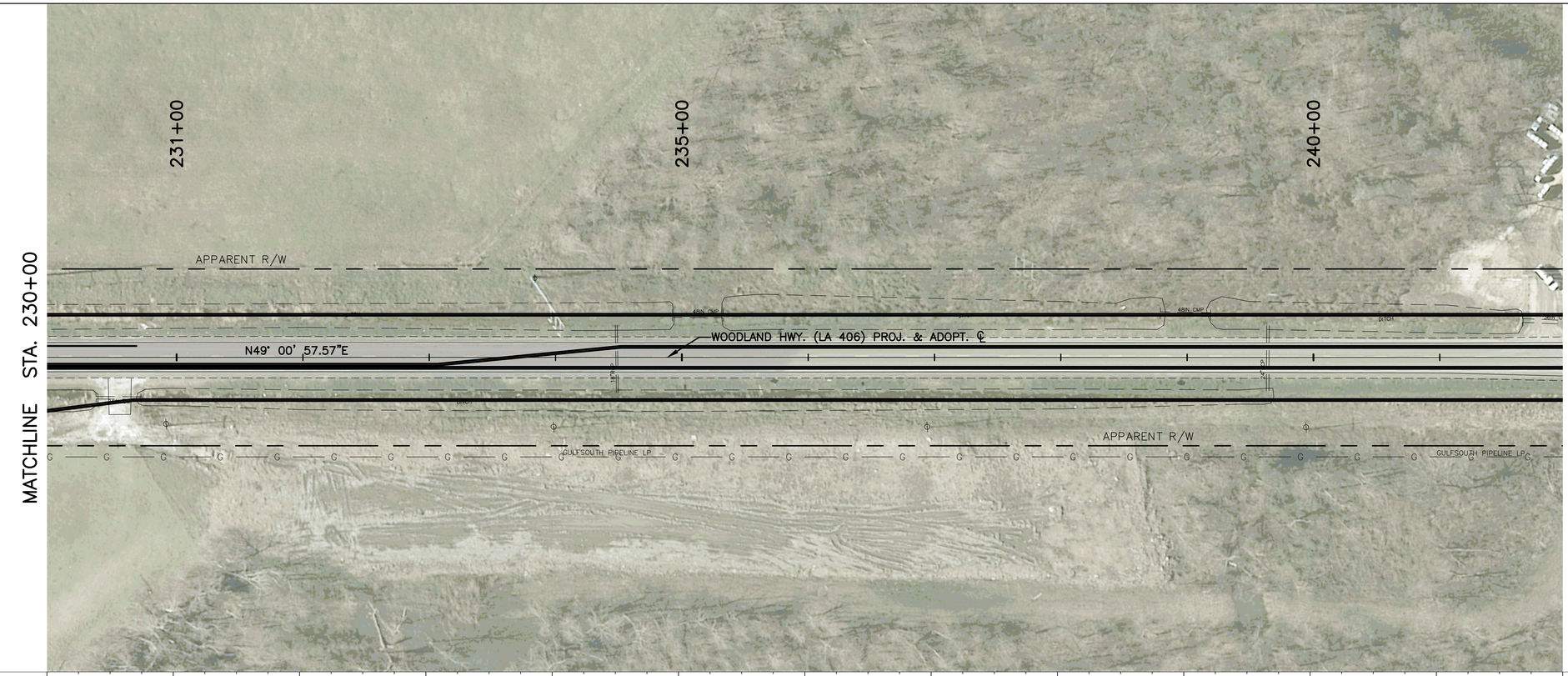
PRELIMINARY
NOT FOR CONSTRUCTION
FOR BIDDING, REGULATORY, CONCEPTUAL OR DESIGN REVIEW PURPOSES ONLY
THE ISSUANCE OF A PERMIT

PLAN SHEET

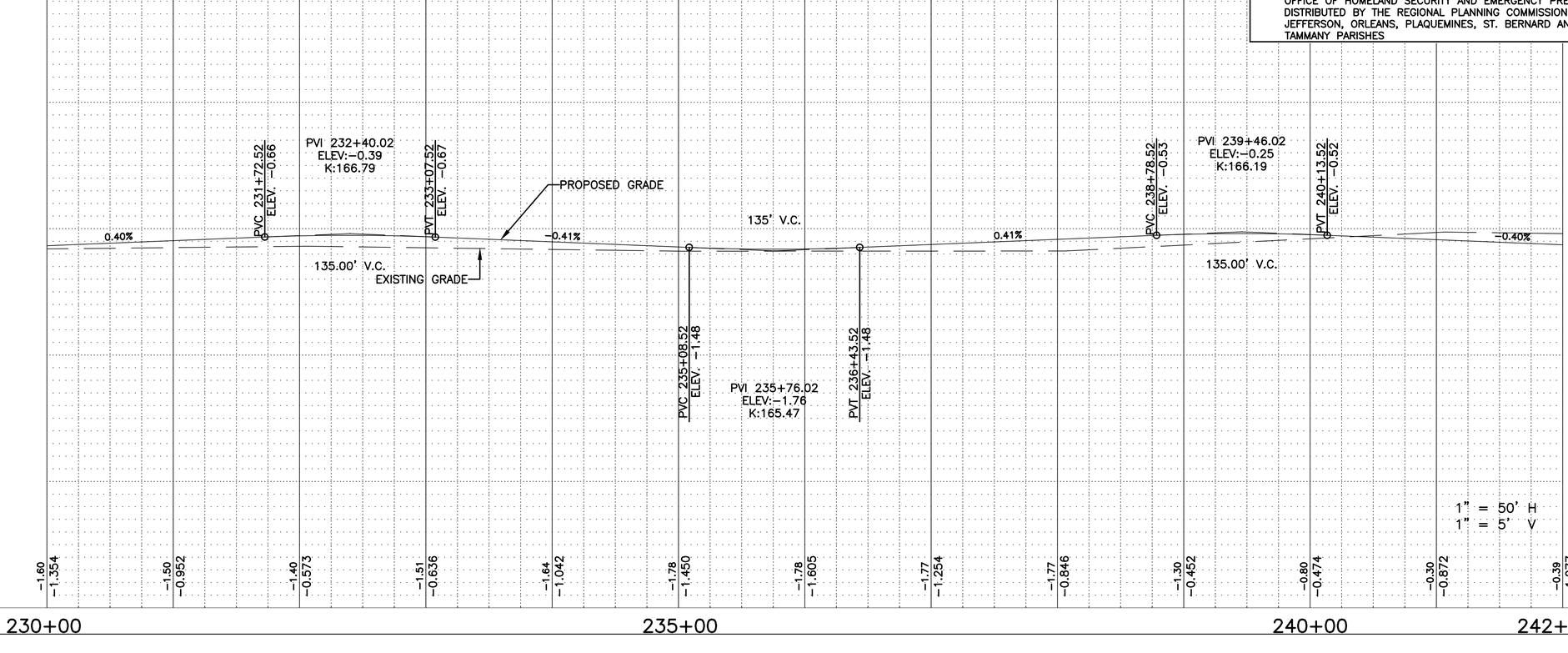
WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION
JEFFERSON ORLEANS PLAQUEMINES ST. BERNARD ST. TAMMANY

VOLKERT



NOTE: 2010 AERIAL PHOTOGRAPHY PROVIDED BY LOUISIANA GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS, DISTRIBUTED BY THE REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES



SHEET NUMBER	16
PARISH	PLAQUEMINES/ORLEANS
FEDERAL PROJECT	
STATE PROJECT	
DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER RAUL R. RIOS
LICENSE # 34066
DATE 7/1/14

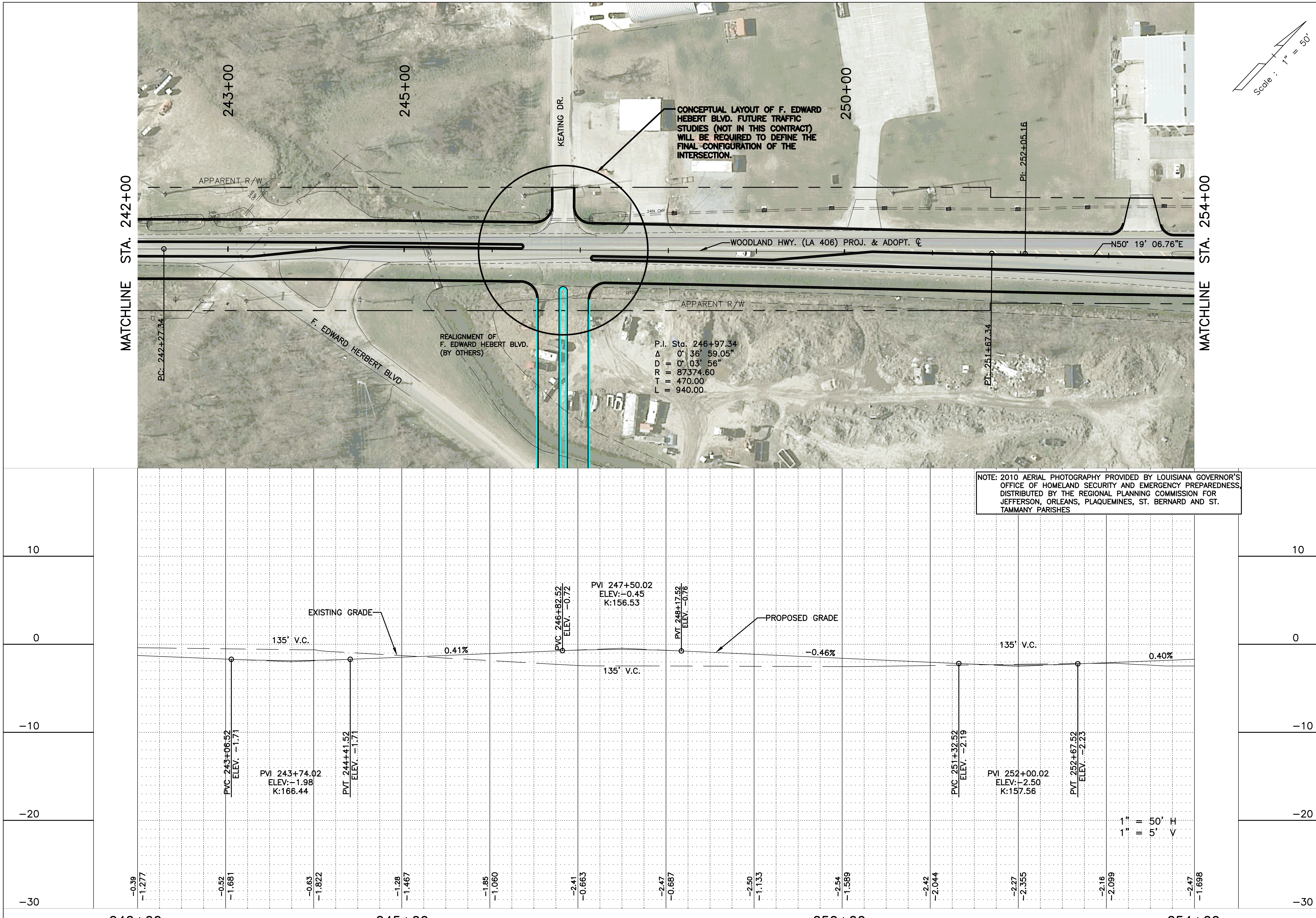
PRELIMINARY NOT FOR CONSTRUCTION OR BIDDING, REGULATORY, OR PERMITTING PURPOSES. THE ISSUANCE OF A PRELIMINARY

PLAN SHEET

WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT



SHEET NUMBER	17
PARISH	PLAQUEMINES/ORLEANS
FEDERAL PROJECT	
STATE PROJECT	
DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PRELIMINARY

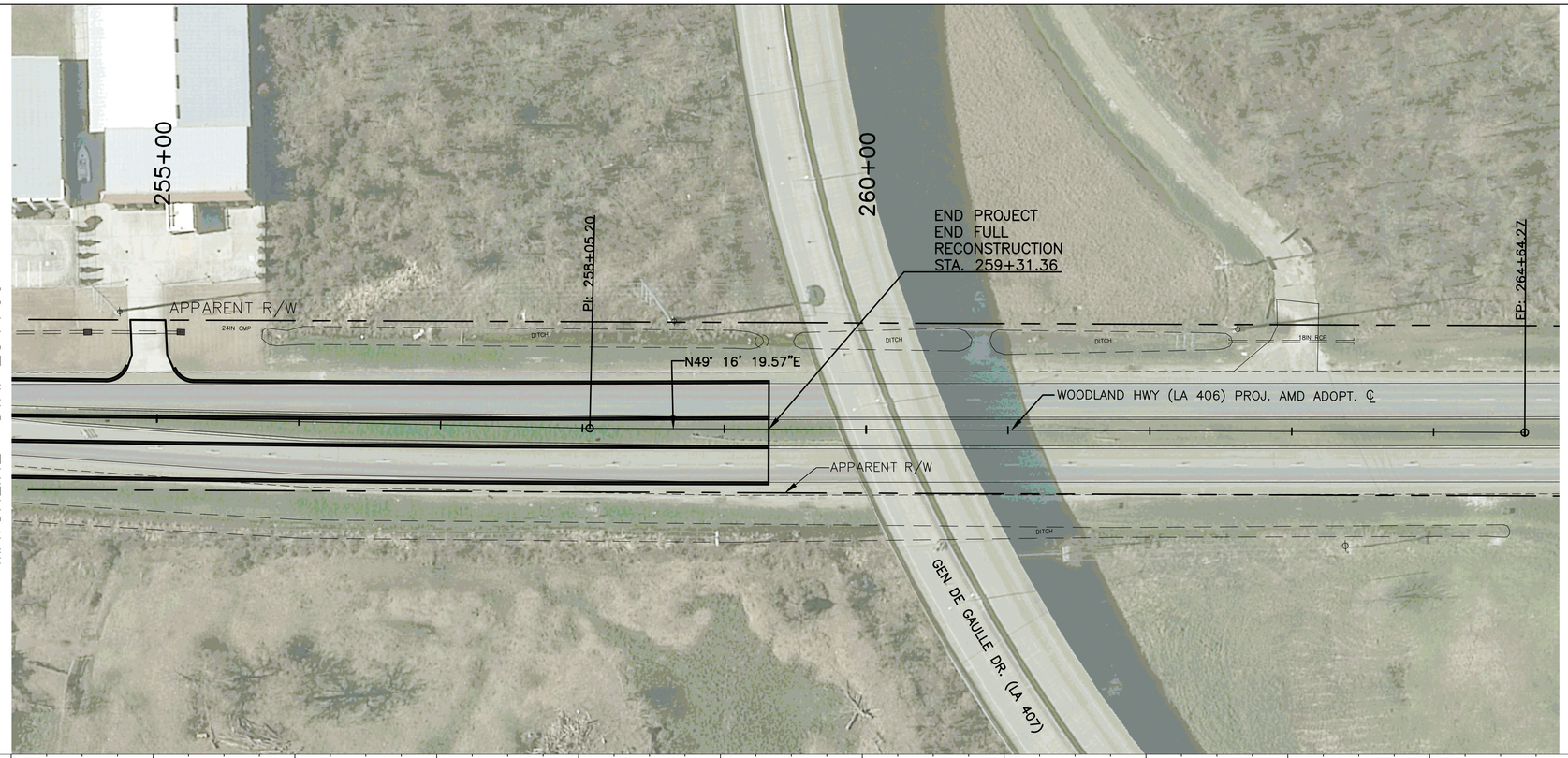
PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

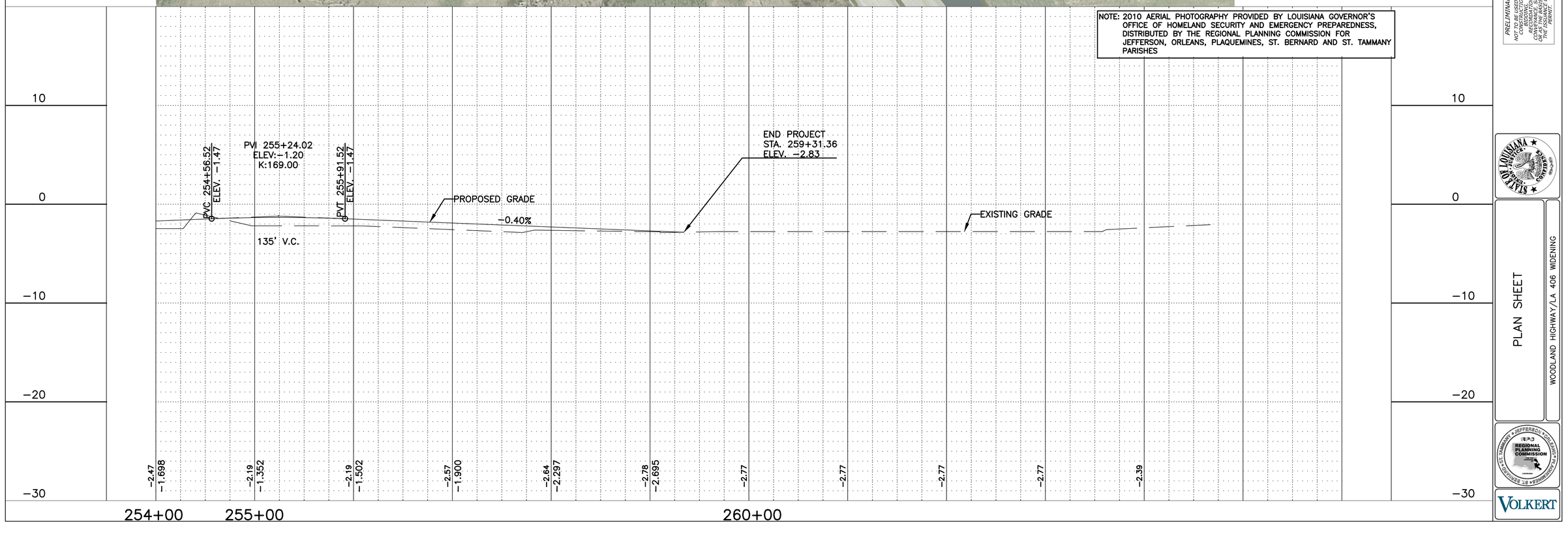
Louisiana Department Of Transportation And Development
ENGINEER: RAUL H. REGIS
LICENSE #: 34006
DATE: 7/1/14

PLAN SHEET

WOODLAND HIGHWAY/LA 406 WIDENING

VOLKERT





NOTE: 2010 AERIAL PHOTOGRAPHY PROVIDED BY LOUISIANA GOVERNOR'S OFFICE OF HOMELAND SECURITY AND EMERGENCY PREPAREDNESS, DISTRIBUTED BY THE REGIONAL PLANNING COMMISSION FOR JEFFERSON, ORLEANS, PLAQUEMINES, ST. BERNARD AND ST. TAMMANY PARISHES

SHEET NUMBER	18
PARISH	PLAQUEMINES/ORLEANS
FEDERAL PROJECT	
STATE PROJECT	
DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER RAUL R. RIGGS
LICENSE # 34066
DATE 7/1/14

PRELIMINARY NOT FOR CONSTRUCTION, BIDDING, REGULATORY, CONVEYANCE, SALES OR RECORDATION PURPOSES. THE ISSUANCE OF A PRELIMINARY PLAN

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

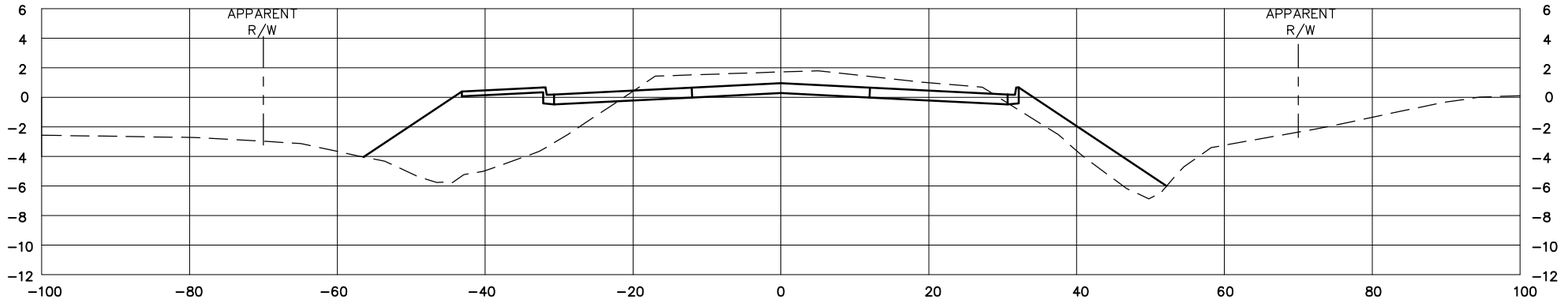
PLAN SHEET

WOODLAND HIGHWAY/LA 406 WIDENING

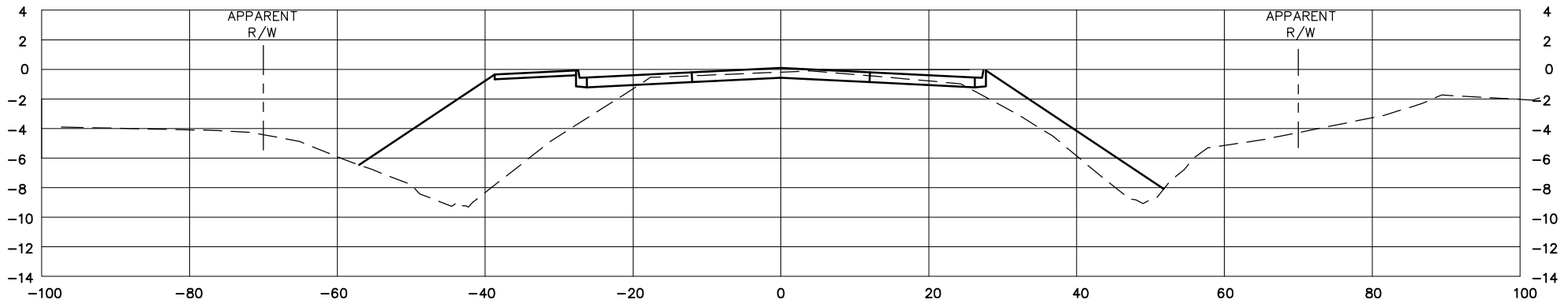
REGIONAL PLANNING COMMISSION

VOLKERT

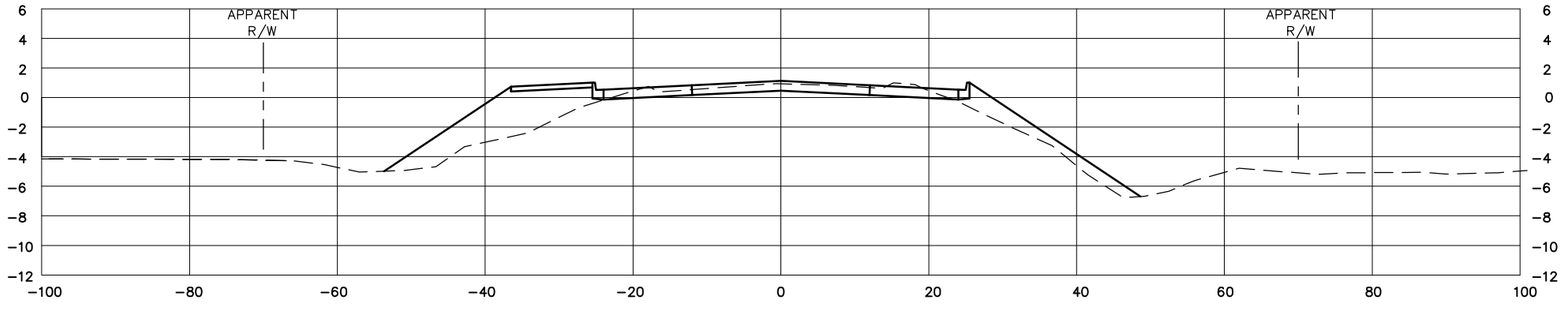
114+00.00



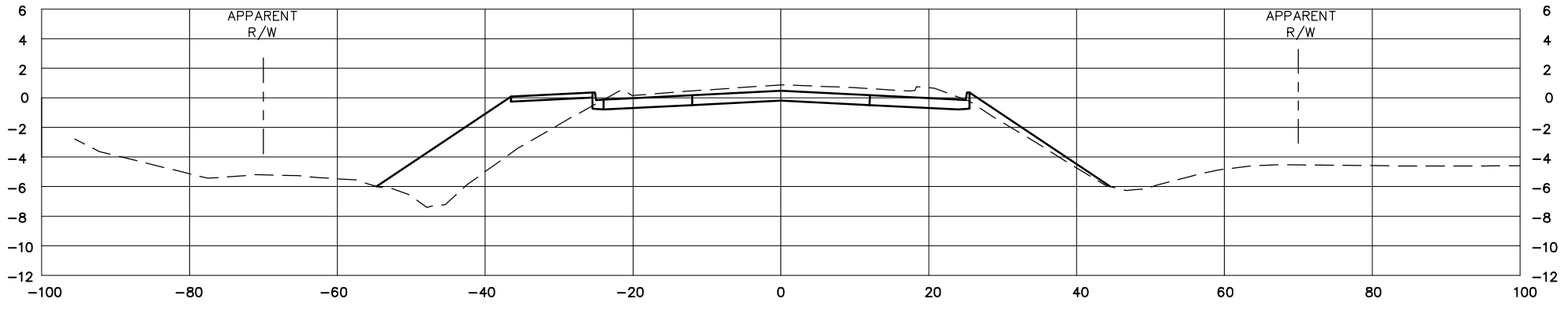
112+00.00



108+00.00



106+00.00



SHEET NUMBER 100

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT:
STATE PROJECT:

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE SHEET 07/01/2014

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, RECORDATION, CONVEYANCE, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

PRELIMINARY
Louisiana Department Of Transportation And Development
ENGINEER: BAILA H. ABDOU
LICENSE #: 24308
DATE: 2/12/14

STATE OF LOUISIANA

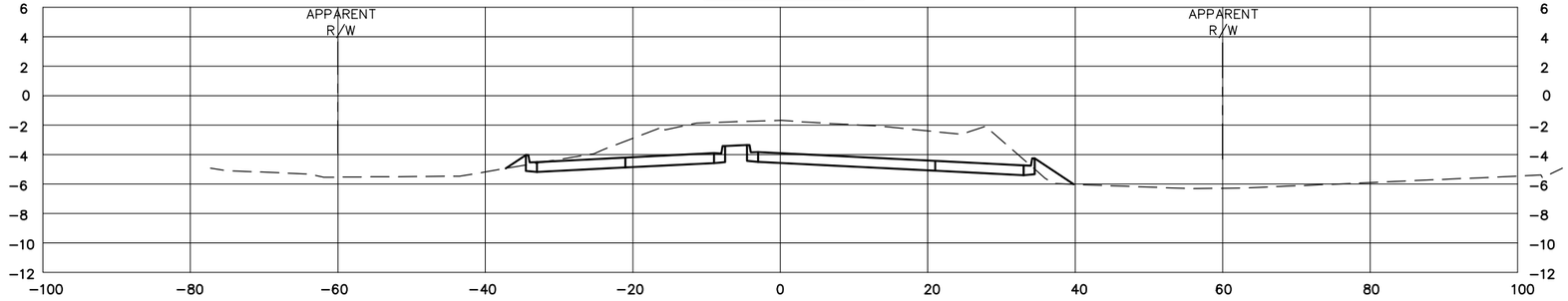
SECTION SHEET – (1)

WOODLAND HIGHWAY/LA 406 WIDENING

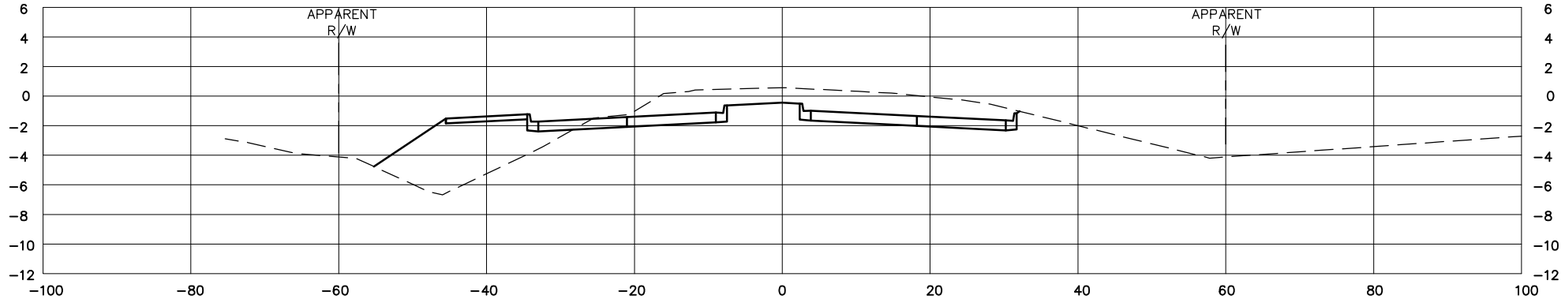
REGIONAL PLANNING COMMISSION

VOLKERT

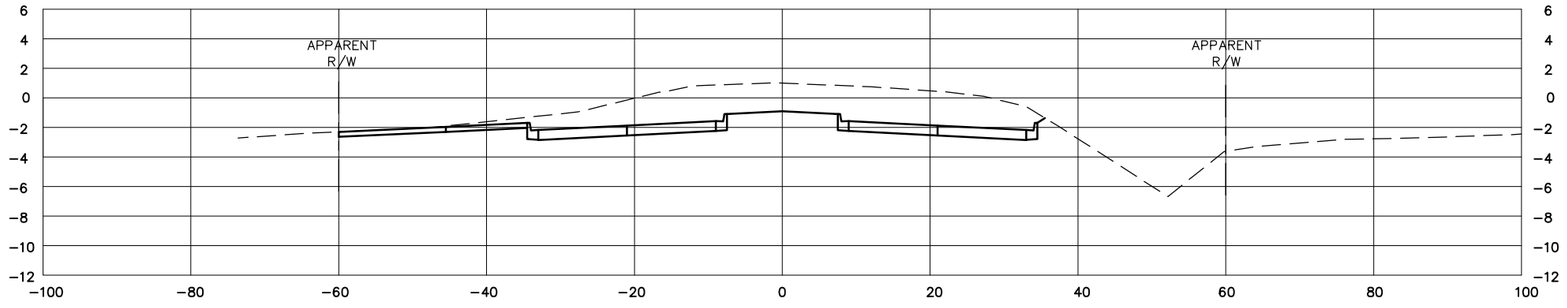
122+00.00



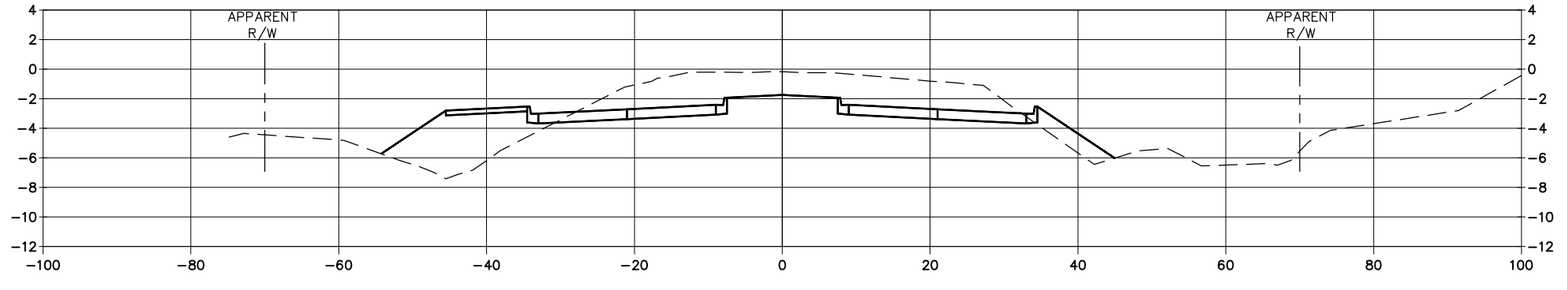
120+00.00



118+00.00



116+00.00



SHEET NUMBER 101

PARISH: PLAQUEMINES/ORLEANS

FEDERAL PROJECT:

STATE PROJECT:

DESIGNED RR
CHECKED JE

DETAILED SG
CHECKED RR

DATE 07/01/2014
SHEET

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, RECORDATION, CONVEYANCE, OR AS THE BASIS FOR THE ISSUE OF A PERMIT

PRELIMINARY
Louisiana Department Of Transportation And Development
ENGINEER: BAILA H. ABDOU
LICENSE #: 24308
DATE: 7/1/14

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

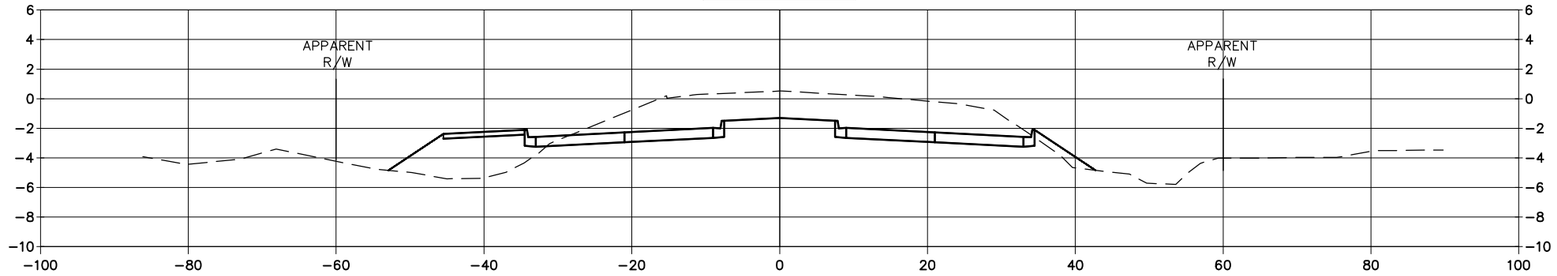
SECTION SHEET - (2)

WOODLAND HIGHWAY/LA 406 WIDENING

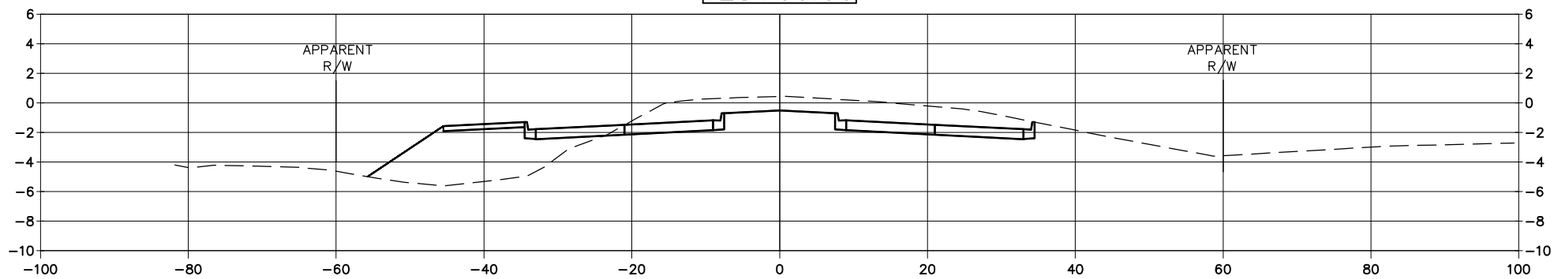
REGIONAL PLANNING COMMISSION

VOLKERT

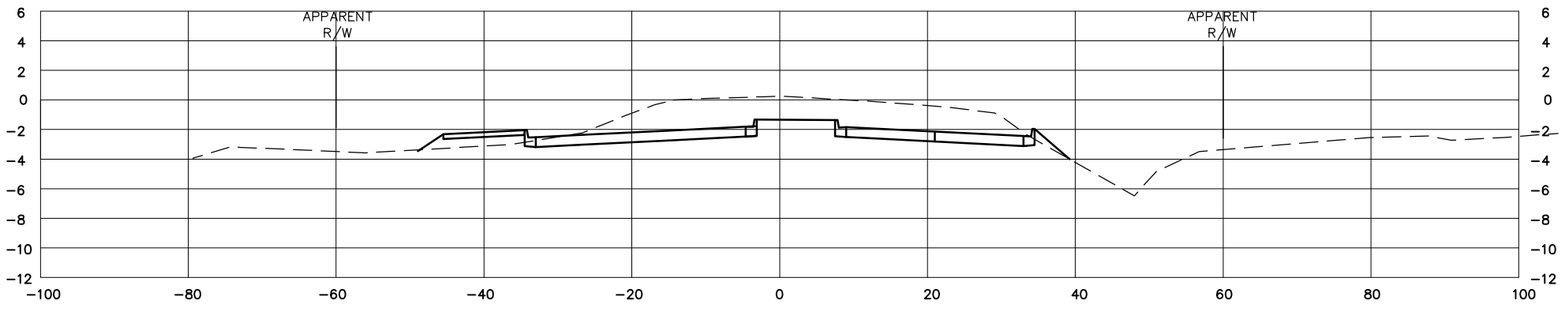
130+00.00



128+00.00



126+00.00



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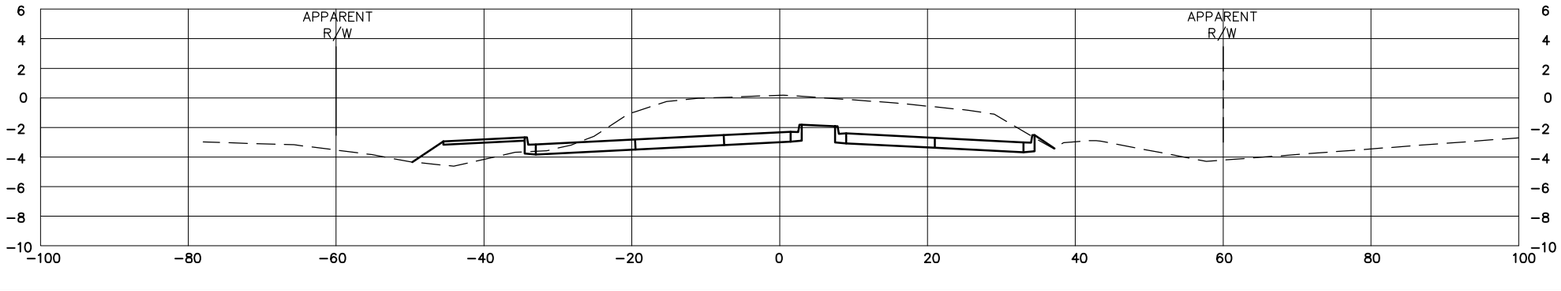


SHEET NUMBER 102

PLAQUEMINES/ORLEANS

PARISH | FEDERAL PROJECT | STATE PROJECT

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING OR RECORDATION. THESE PLANS ARE RELEASED AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

PRELIMINARY
Louisiana Department Of Transportation And Development
ENGINEER: RAUL H. RIEGER
LICENSE #: 24308
DATE: 7/1/14

SECTION SHEET – (3)

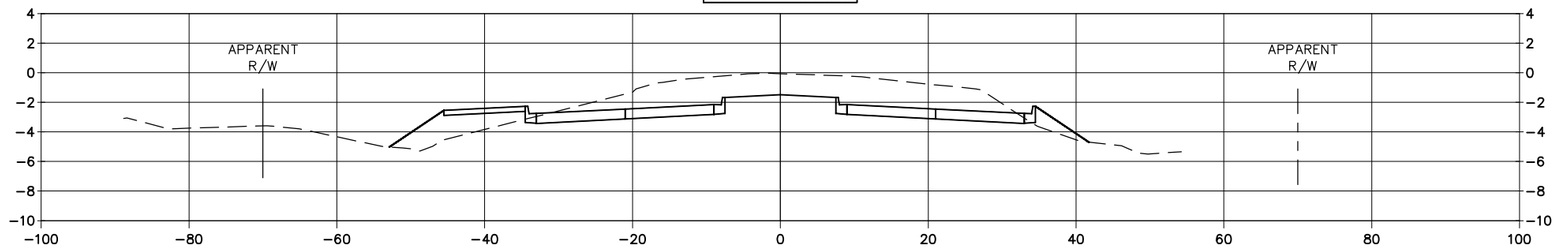
WOODLAND HIGHWAY/LA 406 WIDENING

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

REGIONAL PLANNING COMMISSION

VOLKERT

138+00.00



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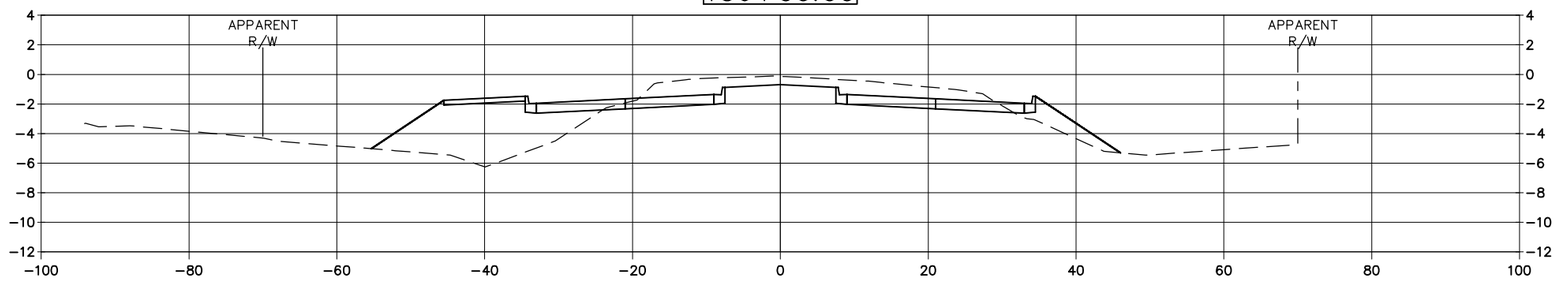

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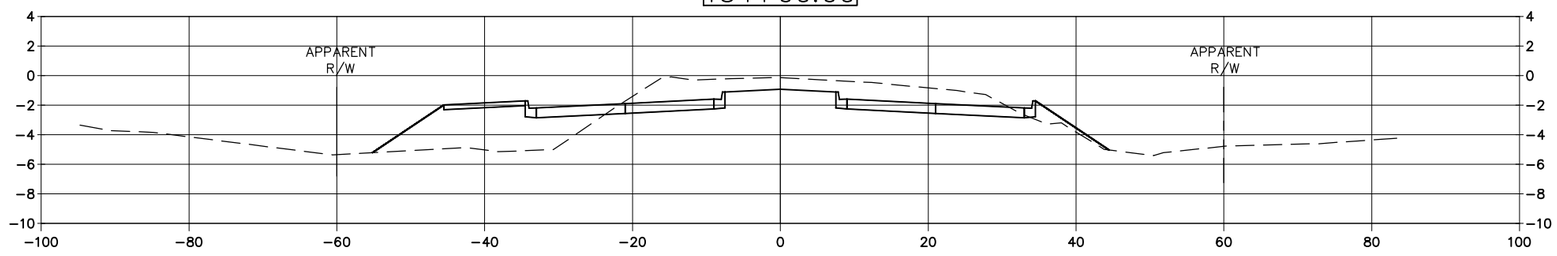

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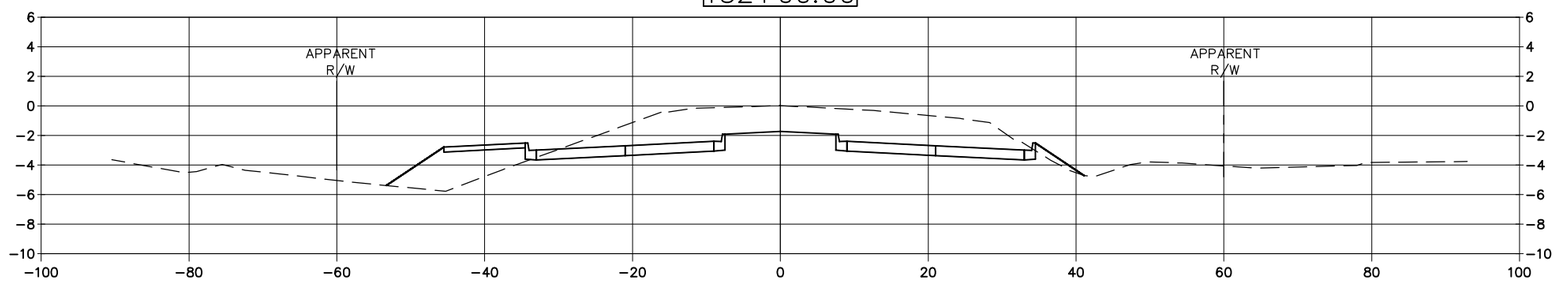


SHEET NUMBER 103

PARISH	FEDERAL PROJECT	STATE PROJECT
PLAQUEMINES/ORLEANS		

DESIGNED	RR	DETAILED	SG	DATE	07/01/2014
CHECKED	JE	CHECKED	RR	SHEET	

PRELIMINARY
PRELIMINARY NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR RECORDATION. UNLESS OTHERWISE NOTED OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

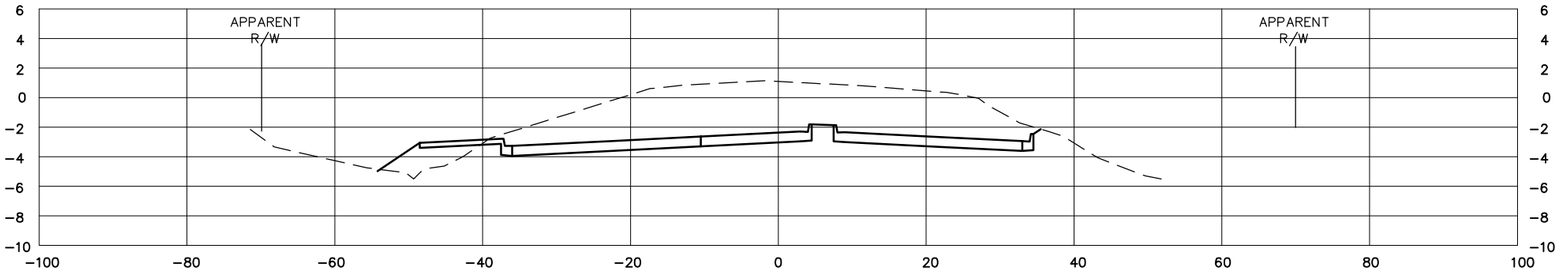
Louisiana Department Of Transportation And Development
ENGINEER: RAUL H. RIVERS
LICENSE #: 24308
DATE: 7/1/14

SECTION SHEET – (4)

WOODLAND HIGHWAY/LA 406 WIDENING

VOLKERT

146+00.00



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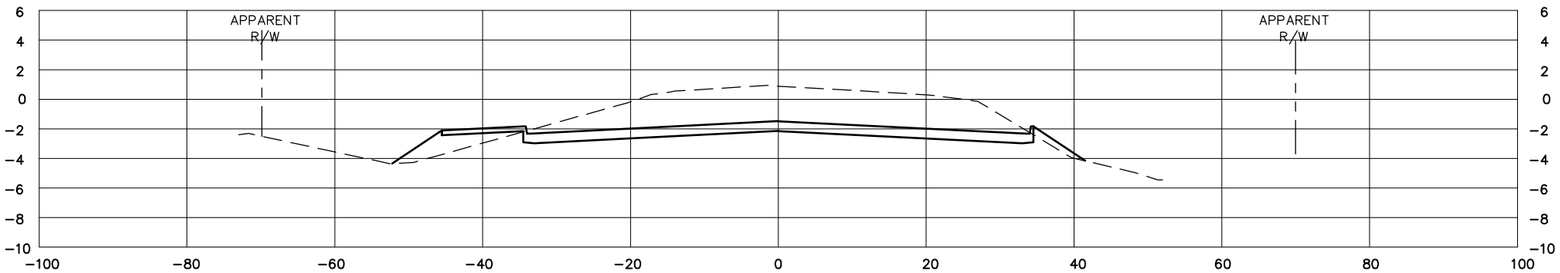

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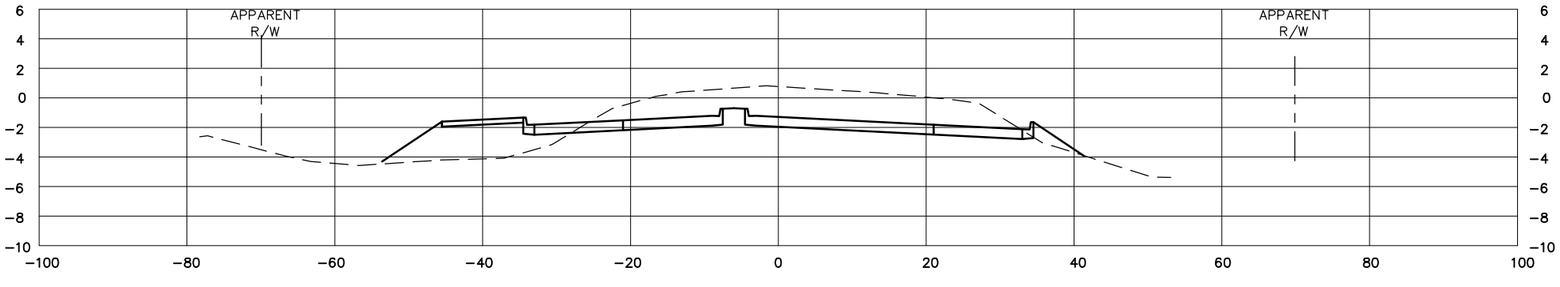

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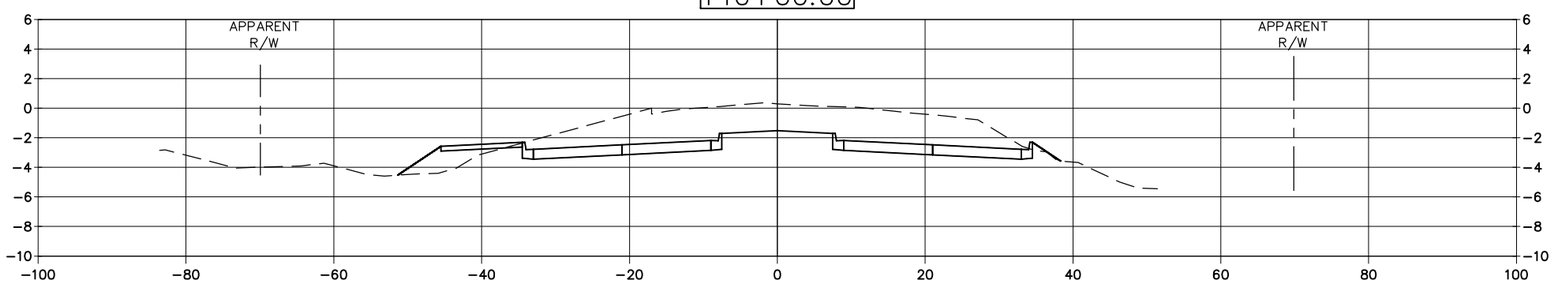


SHEET NUMBER 104

PARISH	FEDERAL PROJECT	STATE PROJECT
PLAQUEMINES/ORLEANS		

DESIGNED	RR	DETAILED	SG
CHECKED	JE	CHECKED	RR
		DATE SHEET	07/01/2014

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, RECORDATION, CONVEYANCE, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

PRELIMINARY
Louisiana Department Of Transportation And Development
ENGINEER: RAUL H. RIVERA
LICENSE #: 24308
DATE: 7/1/14

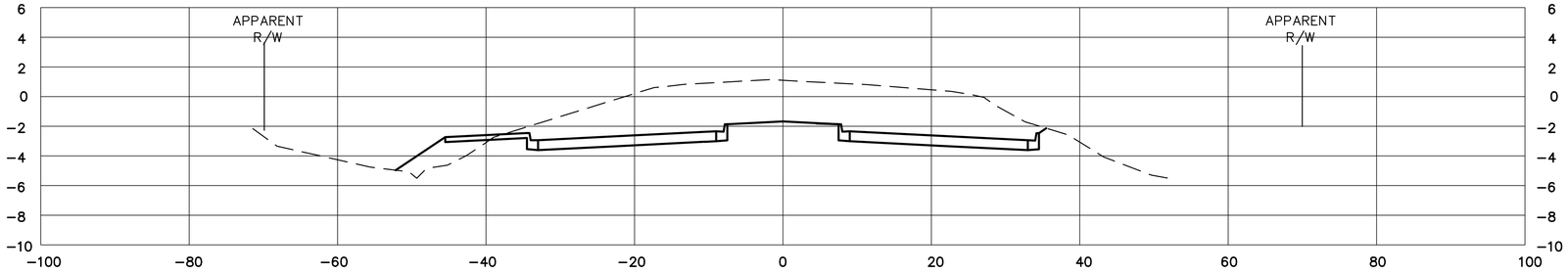
SECTION SHEET – (5)

WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT

146+00.00



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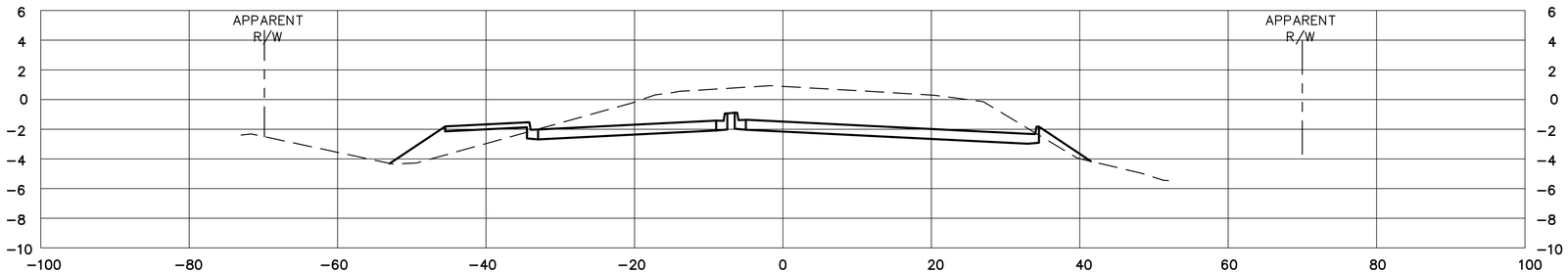

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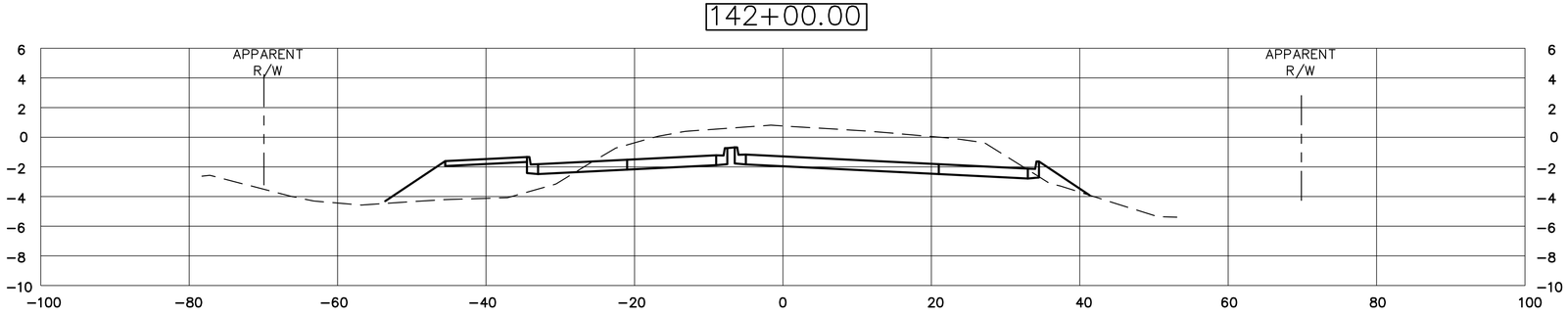

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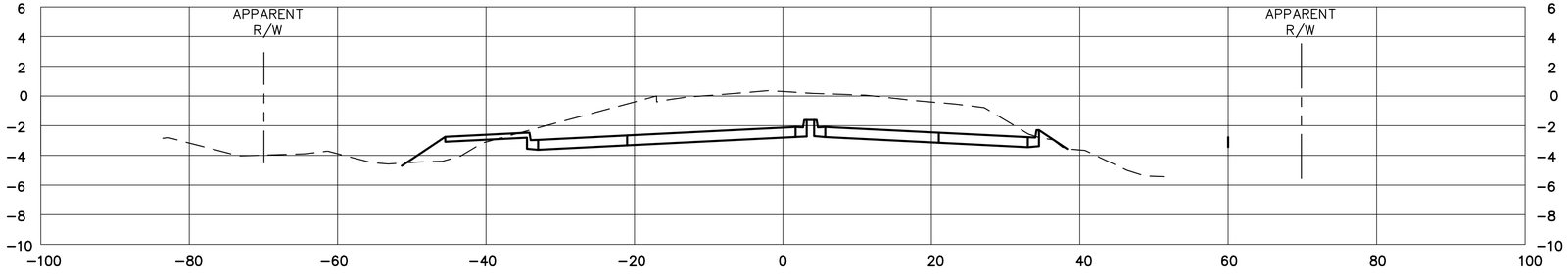


SHEET NUMBER 104

PLAQUEMINES/ORLEANS

PARISH | FEDERAL PROJECT | STATE PROJECT

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

PRELIMINARY
Louisiana Department of Transportation And Development
PRELIMINARY NOT TO BE USED FOR CONSTRUCTION, BIDDING, REGISTRATION, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS OF THE ISSUANCE OF A PERMIT.
ENGINEER RAUL R. REGIS
LICENSE # 34056
DATE 7/1/14

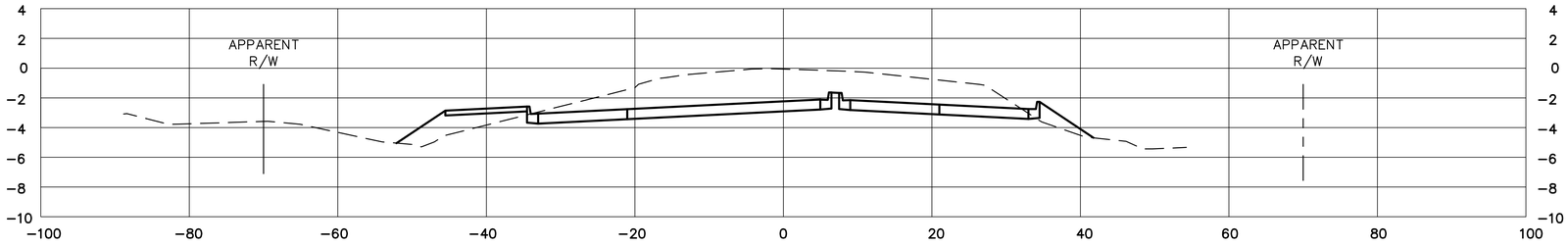
SECTION SHEET – (5)

WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT

138+00.00



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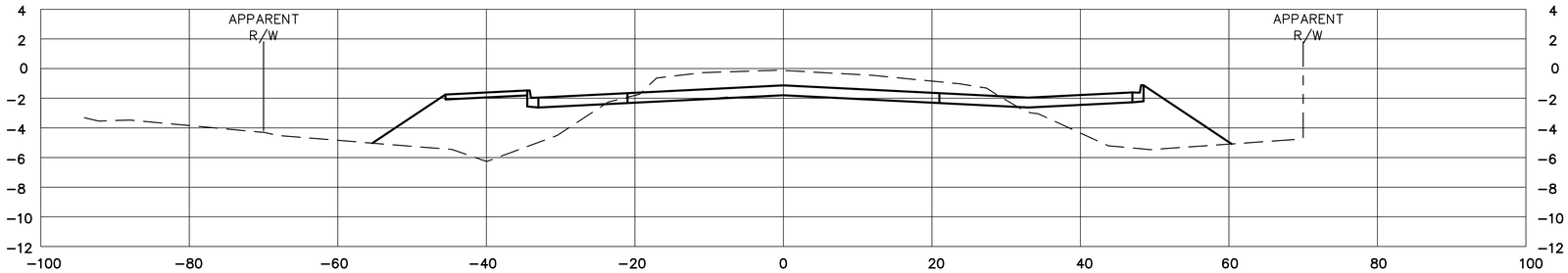
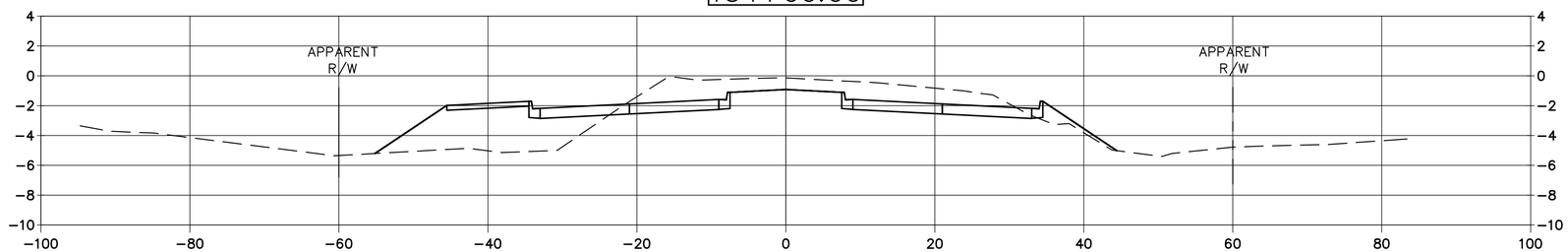
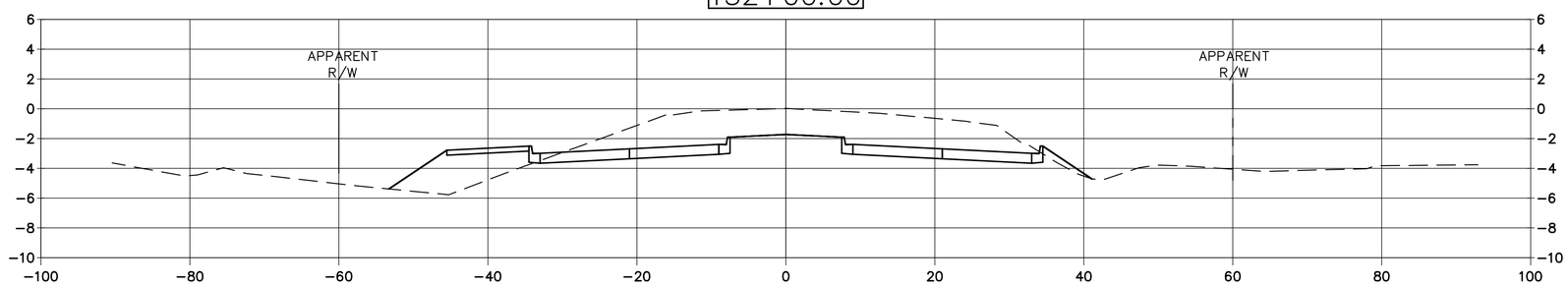


134+00.00



132+00.00



SHEET NUMBER 103

PARISH	FEDERAL PROJECT	STATE PROJECT
PLAQUEMINES/ORLEANS		

DESIGNED	RR	DETAILED	SG
CHECKED	JE	CHECKED	RR
DATE	07/01/2014		
SHEET			

PRELIMINARY
Louisiana Department of Transportation And Development
ENGINEER RAUL R. REGIS
LICENSE # 34066
DATE 7/1/14

PRELIMINARY NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES. REVISIONS WILL BE MADE BY THE ISSUANCE OF A FINAL PLAN.

STATE OF LOUISIANA REGISTERED PROFESSIONAL ENGINEER

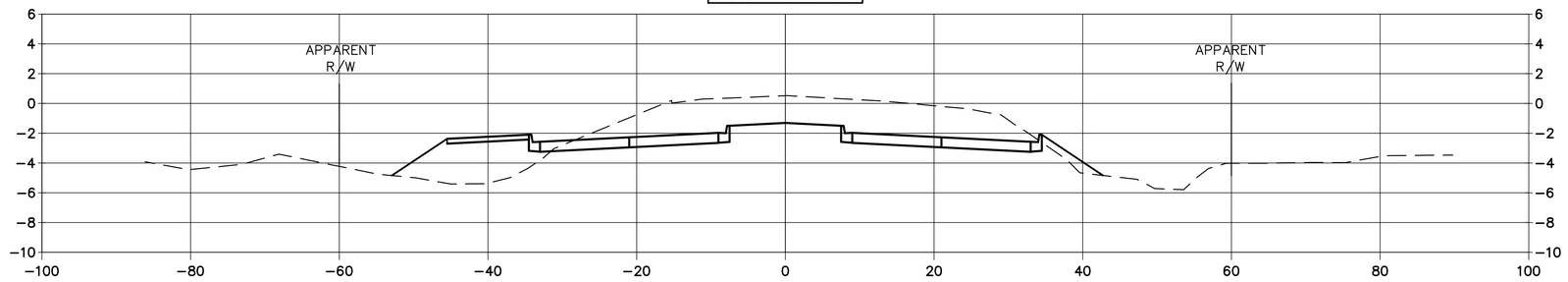
SECTION SHEET - (4)

WOODLAND HIGHWAY/LA 406 WIDENING

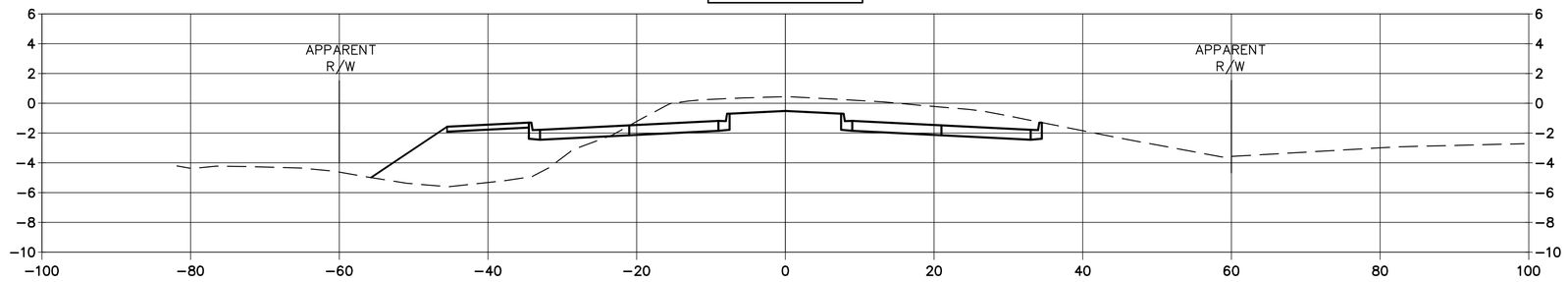
JEFFERSON • PLAQUEMINES • ORLEANS • ST. TAMMANY • ST. BERNARD • ST. CHARLES • LAFOURCHE • TERREBONNE • 18 REGIONAL PLANNING COMMISSION

VOLKERT

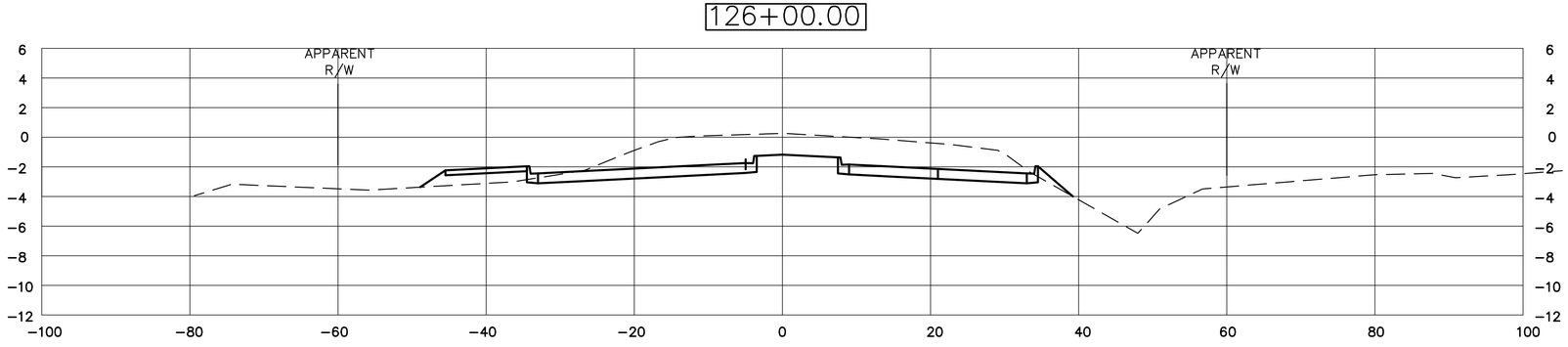
130+00.00



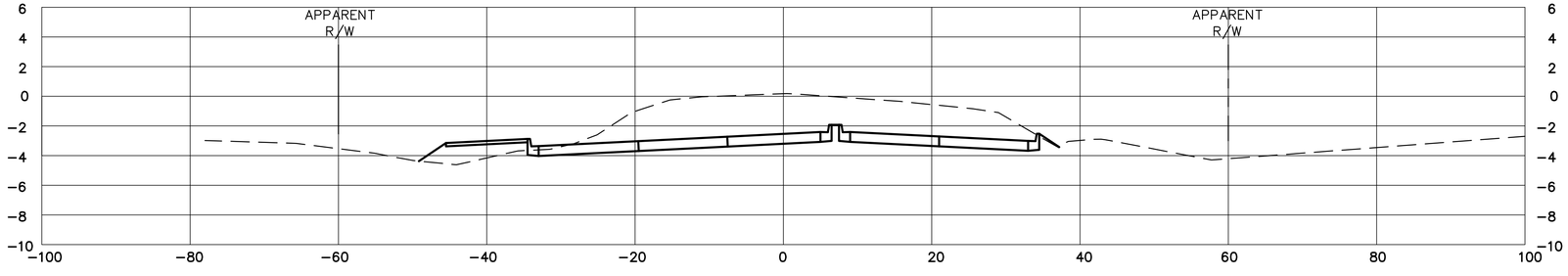
128+00.00



126+00.00



124+00.00



SHEET NUMBER 102

PARISH	PLAQUEMINES/ORLEANS		
FEDERAL PROJECT			
STATE PROJECT			
DESIGNED	RR		
CHECKED	JE		
DETAILED	SG		
CHECKED	RR		
DATE	07/01/2014		
SHEET			

PRELIMINARY
Louisiana Department of Transportation And Development

PRELIMINARY NOT FOR CONSTRUCTION, BIDDING, REGISTRATION, POWERMAKE SALES OR RECORDATION THE ISSUANCE OF A PERMIT

ENGINEER RAUL H. RIGGS
LICENSE # 34056
DATE 7/1/14

SECTION SHEET – (3)

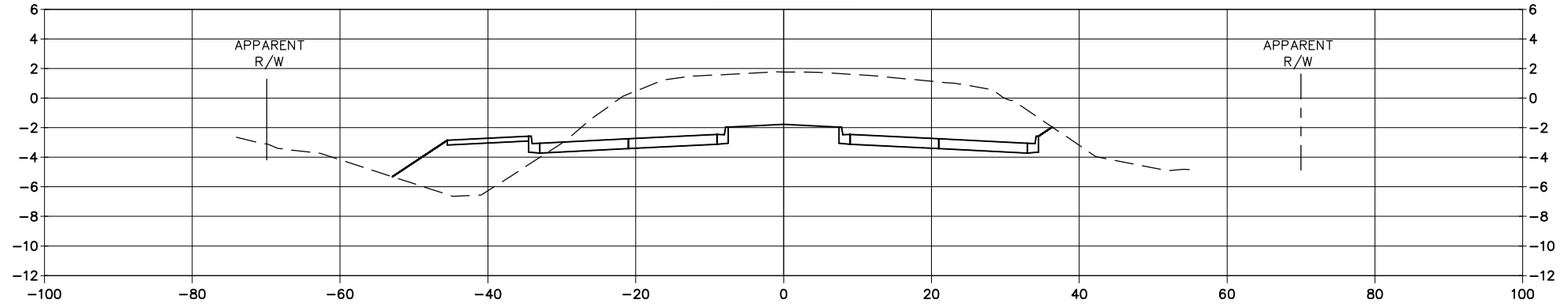
WOODLAND HIGHWAY/LA 406 WIDENING

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

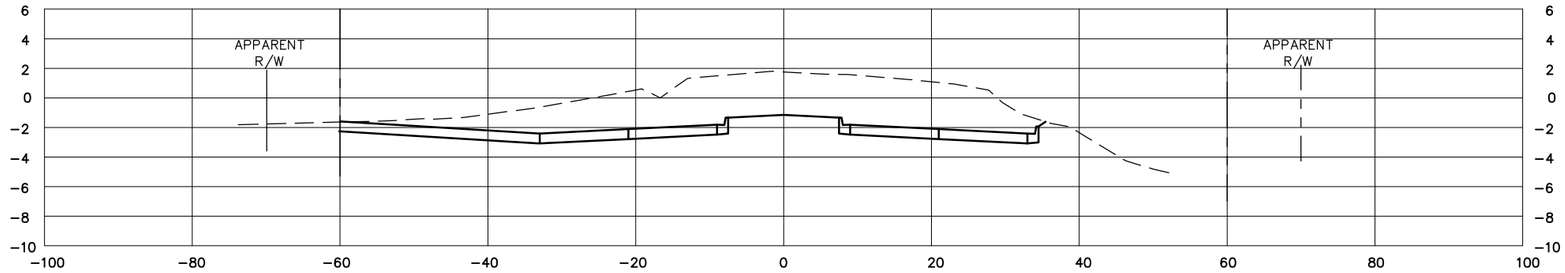
REGIONAL PLANNING COMMISSION

VOLKERT

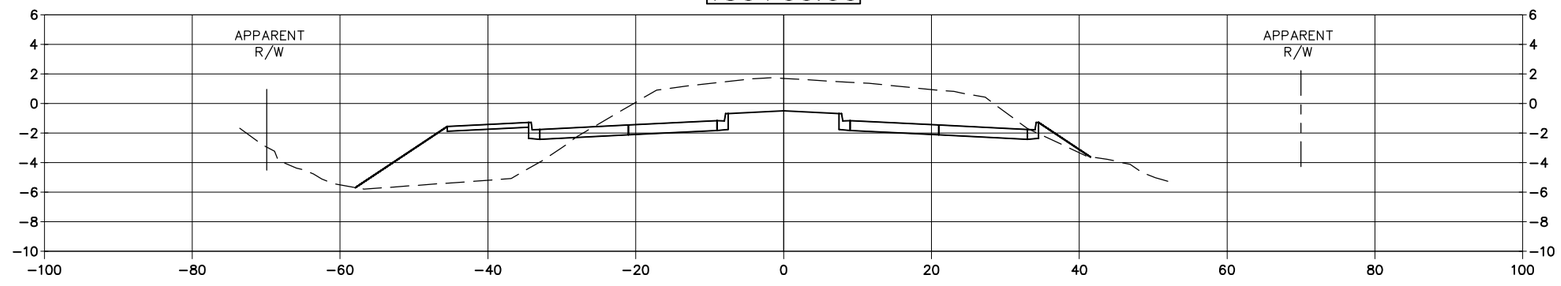
154+00.00



152+00.00



150+00.00



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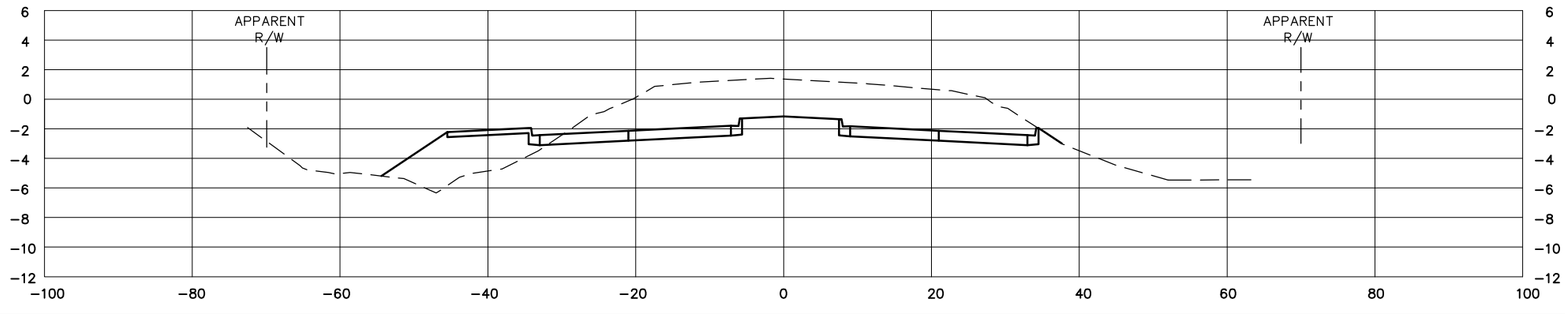


SHEET NUMBER 105

PARISH	PLAQUEMINES/ORLEANS	FEDERAL PROJECT	STATE PROJECT
DESIGNED RR CHECKED JE		DETAILED SG CHECKED RR	DATE 07/01/2014 SHEET

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR RECORDATION PURPOSES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

Louisiana Department Of Transportation And Development

ENGINEER: RAUL H. REGIS
LICENSE #: 24308
DATE: 7/1/14

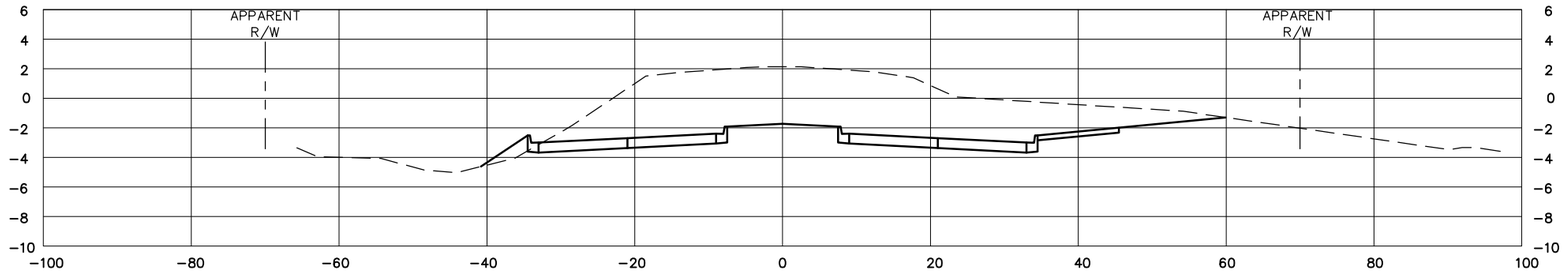
SECTION SHEET – (6)

WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT

162+00.00



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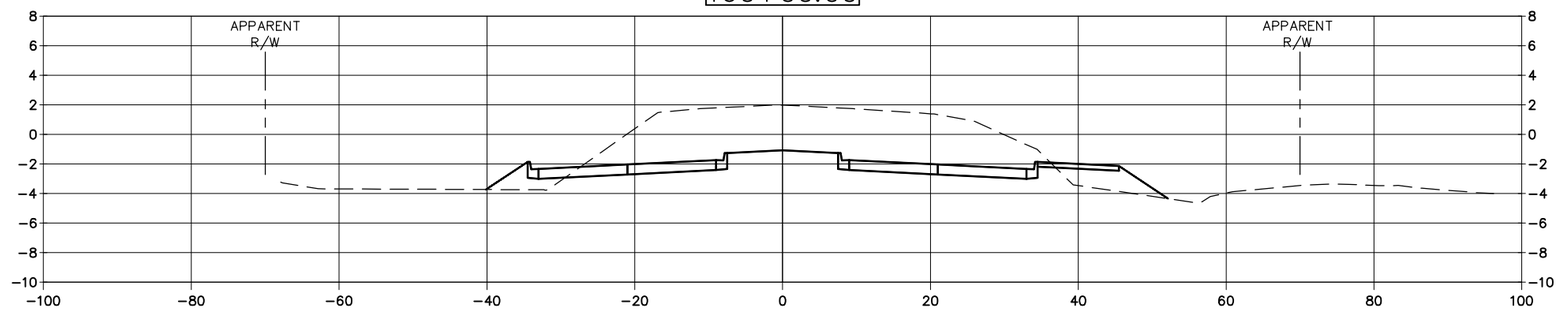
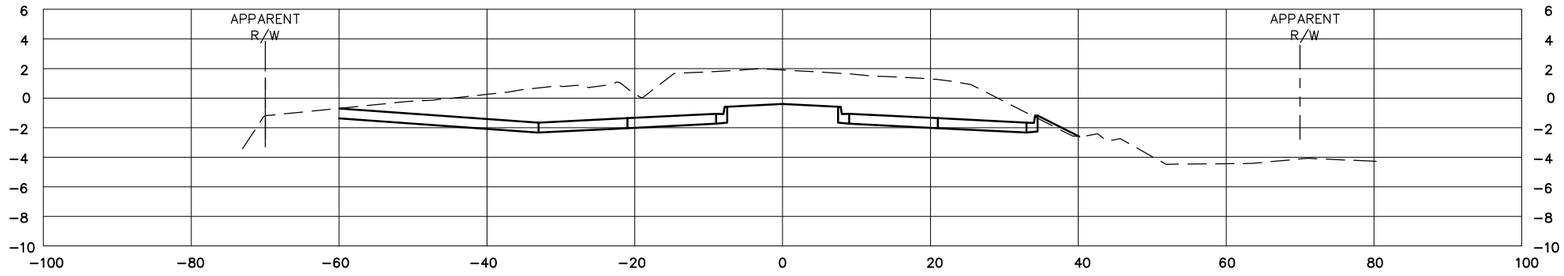
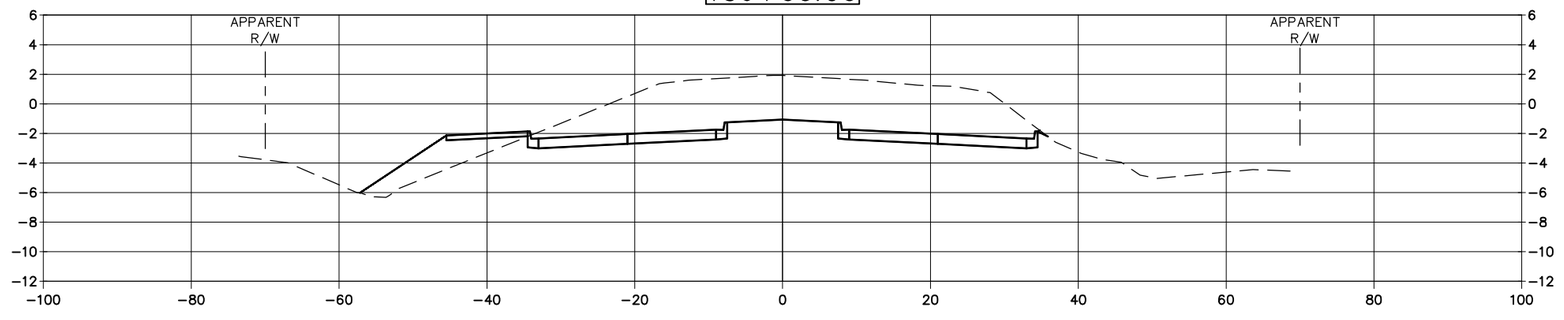


158+00.00



156+00.00



SHEET NUMBER 106

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT:
STATE PROJECT:

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE SHEET 07/01/2014

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING OR RECORDATION.
Louisiana Department Of Transportation And Development
ENGINEER: RAUL H. REGIS
LICENSE #: 24308
DATE: 7/1/14
PRELIMINARY PLANS ARE SUBJECT TO CHANGES AND ADDITIONS OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

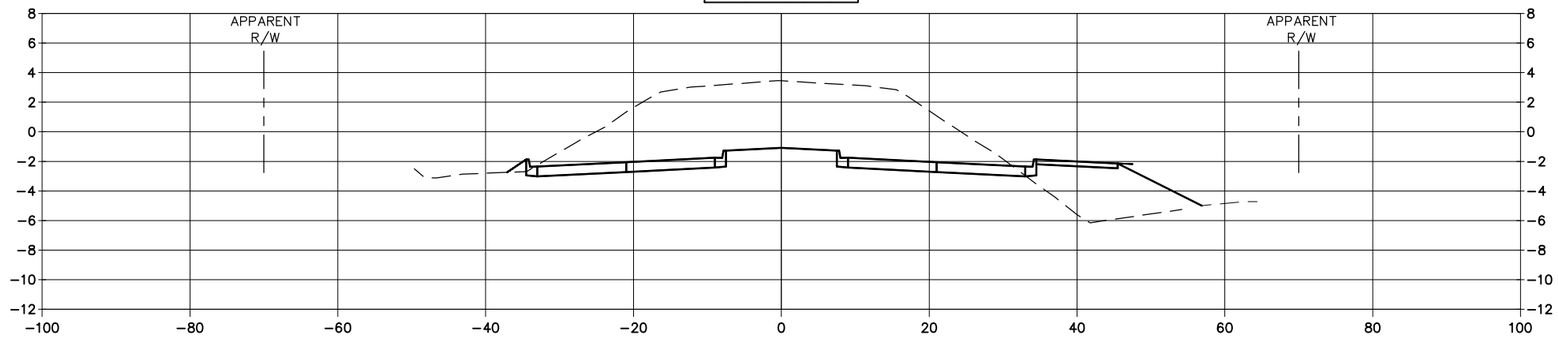
SECTION SHEET – (7)

WOODLAND HIGHWAY/LA 406 WIDENING

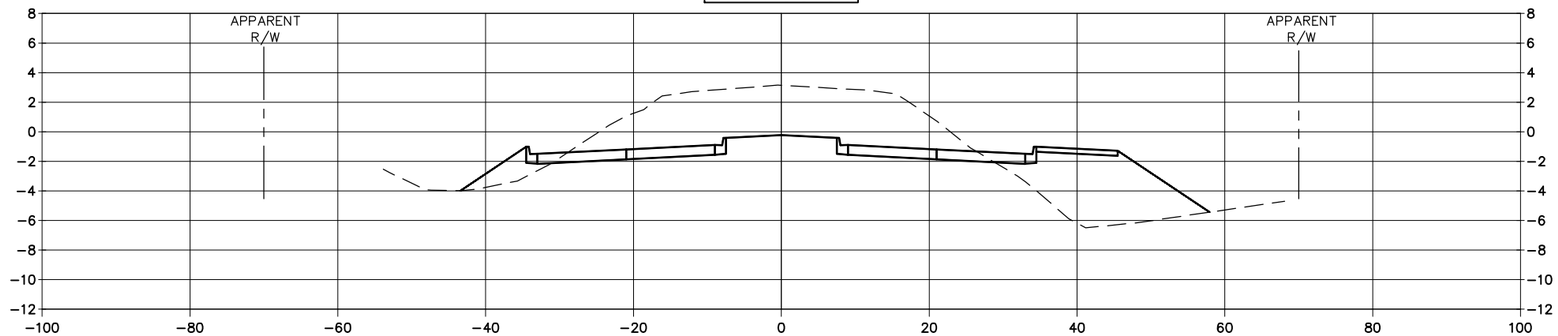
REGIONAL PLANNING COMMISSION

VOLKERT

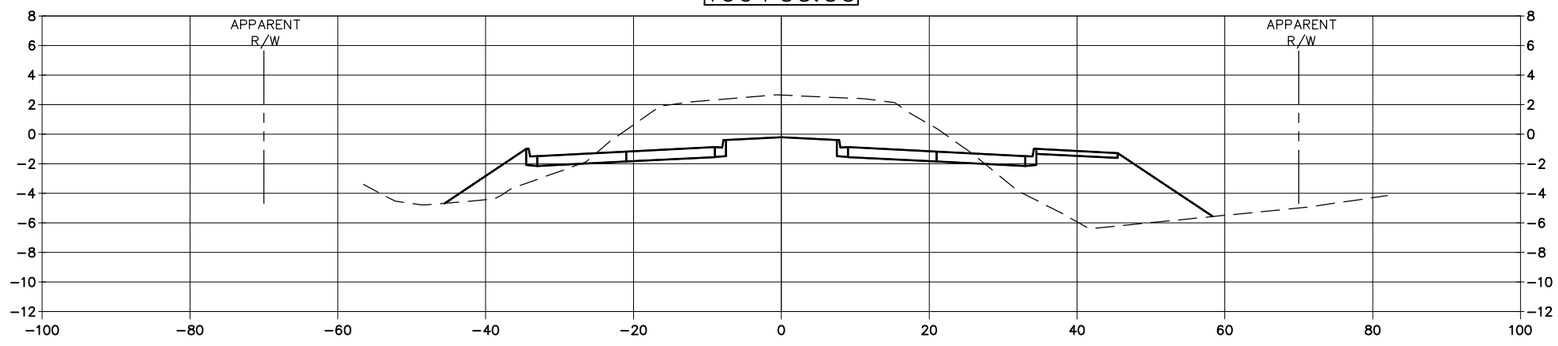
170+00.00



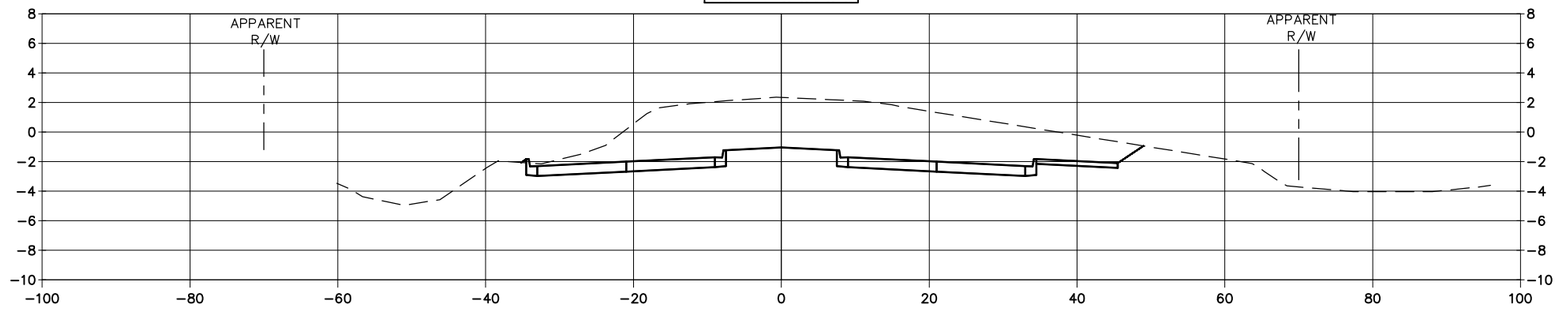
168+00.00



166+00.00



164+00.00



SHEET NUMBER 107

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT:
STATE PROJECT:

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

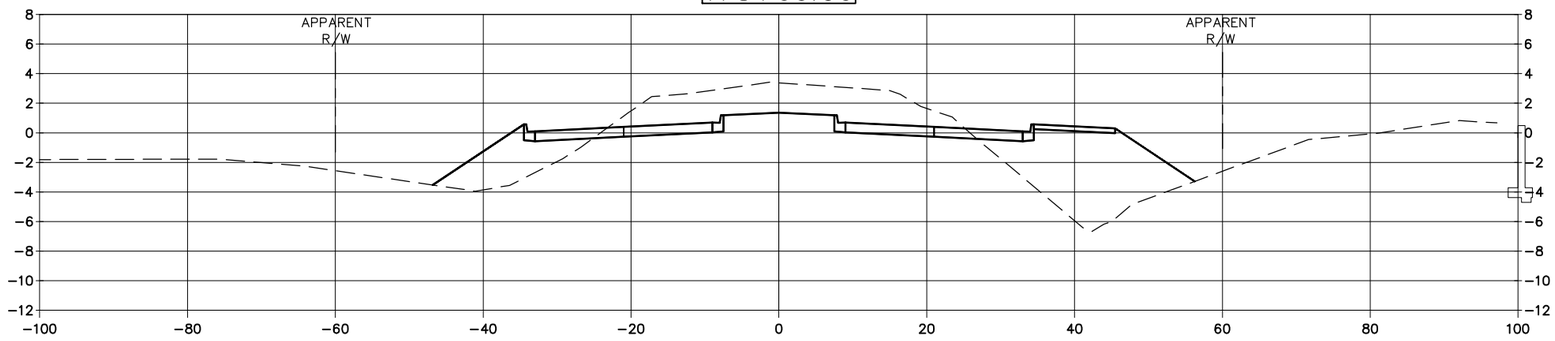
PRELIMINARY
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
ENGINEER: RAUL H. RIVERA
LICENSE #: 24308
DATE: 7/1/14
PRELIMINARY PLANS NOT TO BE USED FOR CONSTRUCTION, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

SECTION SHEET - (8)

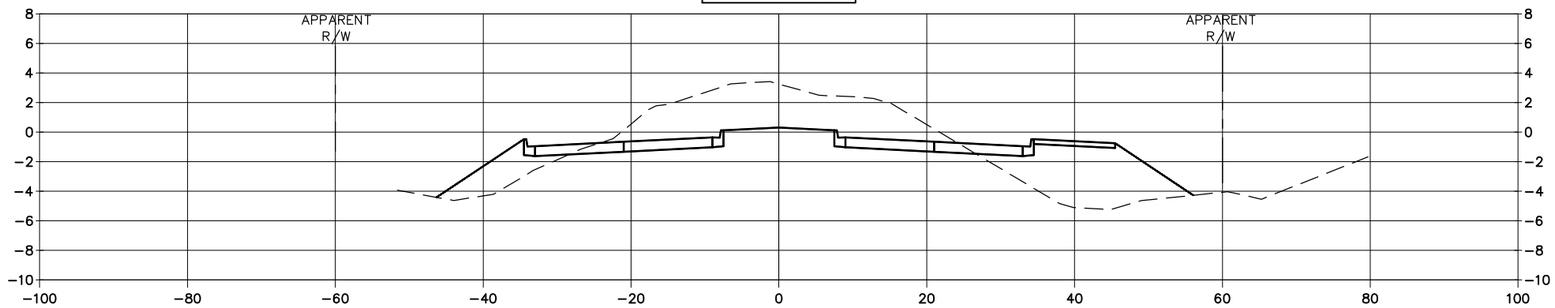
WOODLAND HIGHWAY/LA 406 WIDENING

VOLKERT

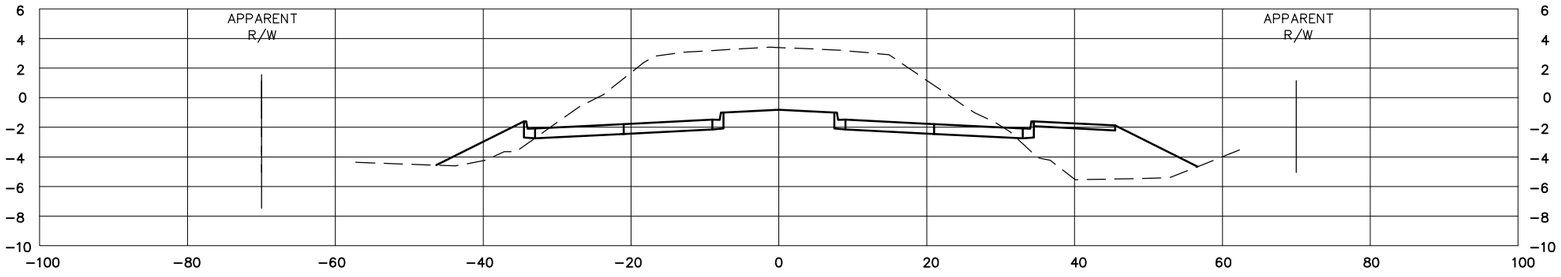
178+00.00



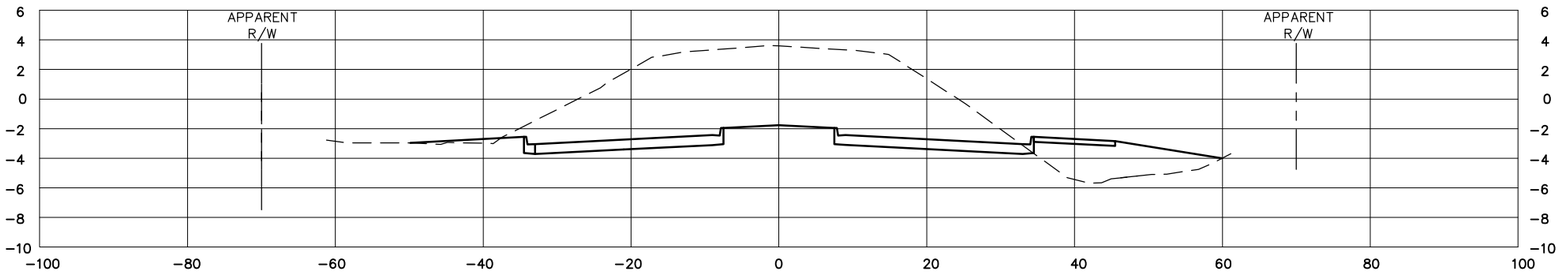
176+00.00



174+00.00



172+00.00



SHEET NUMBER 108

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT:
STATE PROJECT:

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR RECORDATION PURPOSES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR RECORDATION PURPOSES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

Louisiana Department Of Transportation And Development

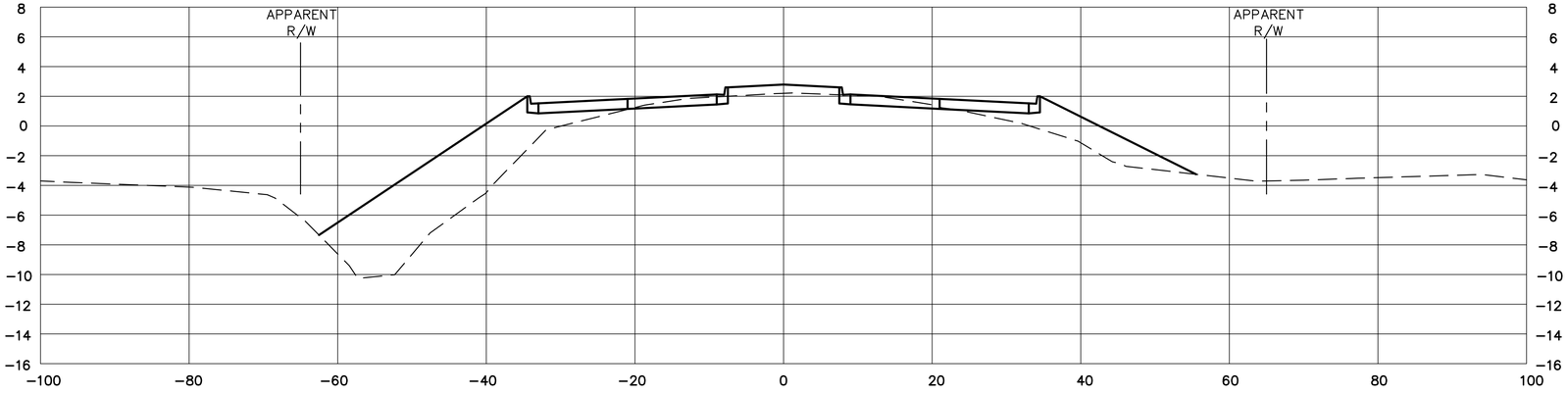
ENGINEER: RAUL H. RIVERA
LICENSE #: 24308
DATE: 7/1/14

SECTION SHEET – (9)

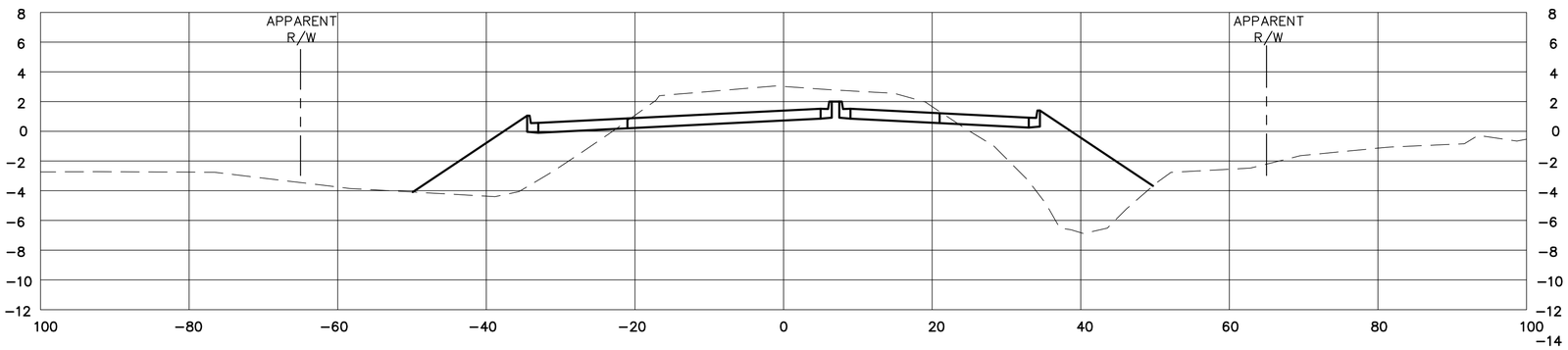
WOODLAND HIGHWAY/LA 406 WIDENING

VOLKERT

184+00.00



180+00.00



SHEET NUMBER	109
PARISH	PLAQUEMINES/ORLEANS
FEDERAL PROJECT	
STATE PROJECT	
DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PRELIMINARY
PRELIMINARY - Louisiana Department of Transportation And Development
NOT FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR FINANCING PURPOSES
ENGINEER - RAUL H. REGIS
LICENSE # - 34056
DATE - 7/1/14
THE ISSUANCE OF A PERMIT.

STATE OF LOUISIANA

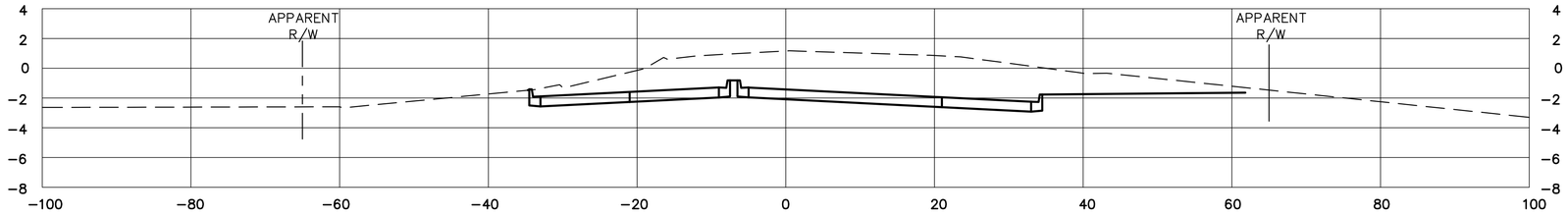
SECTION SHEET - (10)

WOODLAND HIGHWAY/LA 406 WIDENING

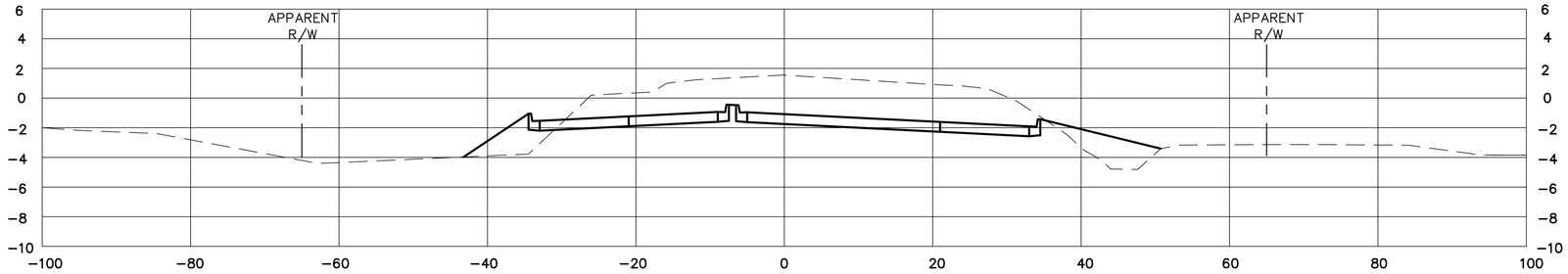
REGIONAL PLANNING COMMISSION

VOLKERT

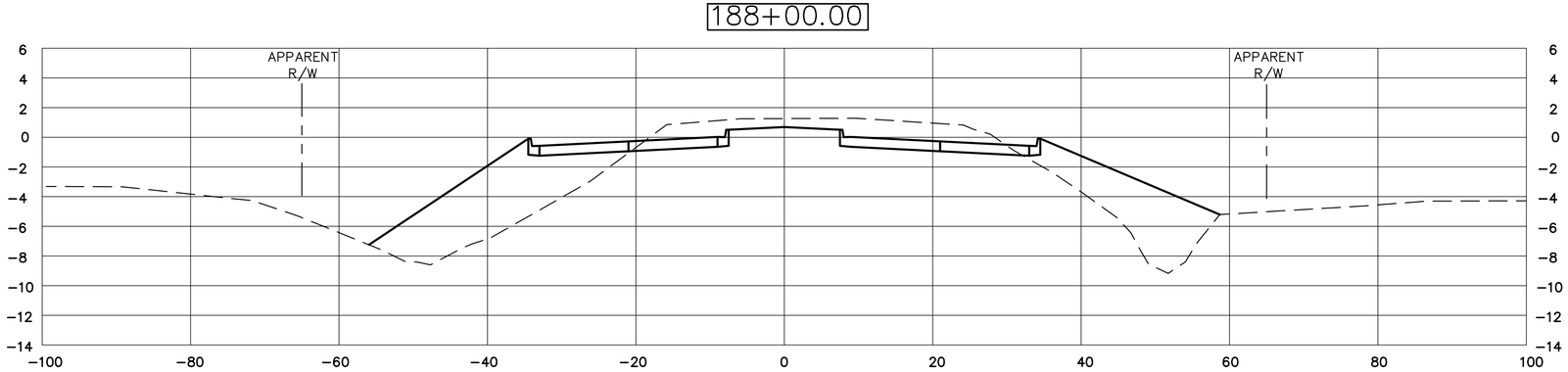
192+00.00



190+00.00



188+00.00



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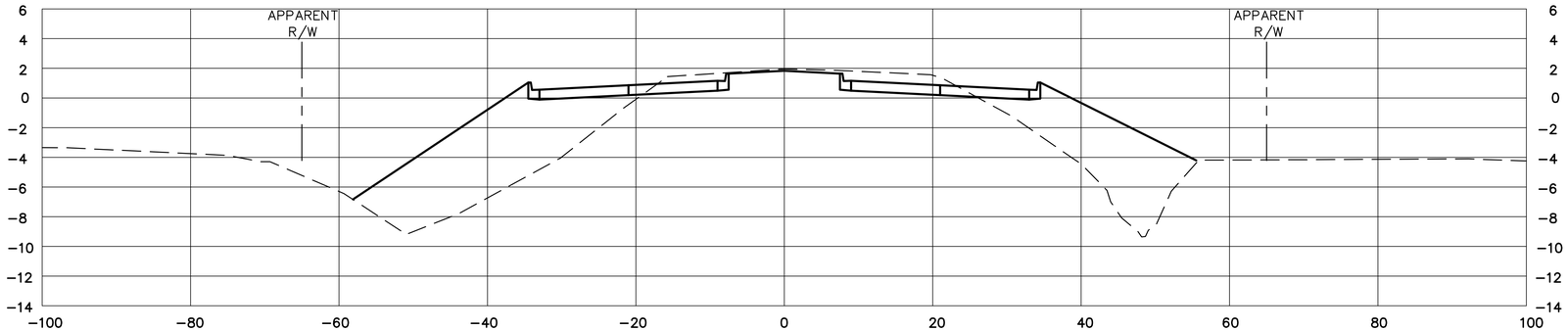


SHEET NUMBER 110

PARISH	FEDERAL PROJECT	STATE PROJECT
PLAQUEMINES/ORLEANS		

DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PRELIMINARY
PRELIMINARY PLANS FOR CONSTRUCTION, BIDDING, RIGHT-OF-WAY ACQUISITION, CONSTRUCTABILITY REVIEWS, OR OTHER PURPOSES. THE ISSUANCE OF A PERMIT.

Louisiana Department of Transportation And Development

ENGINEER RAUL H. REGIS
LICENSE # 34066
DATE: 7/1/14

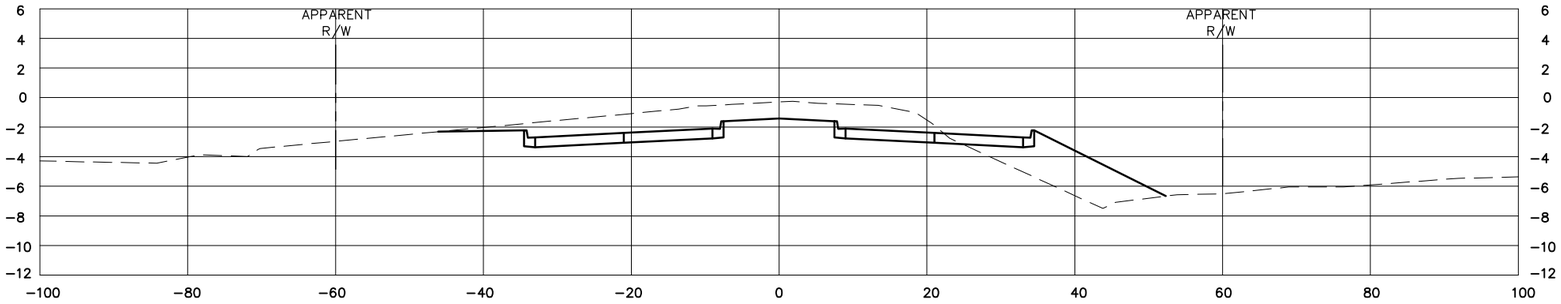
SECTION SHEET – (11)

WOODLAND HIGHWAY/LA 406 WIDENING

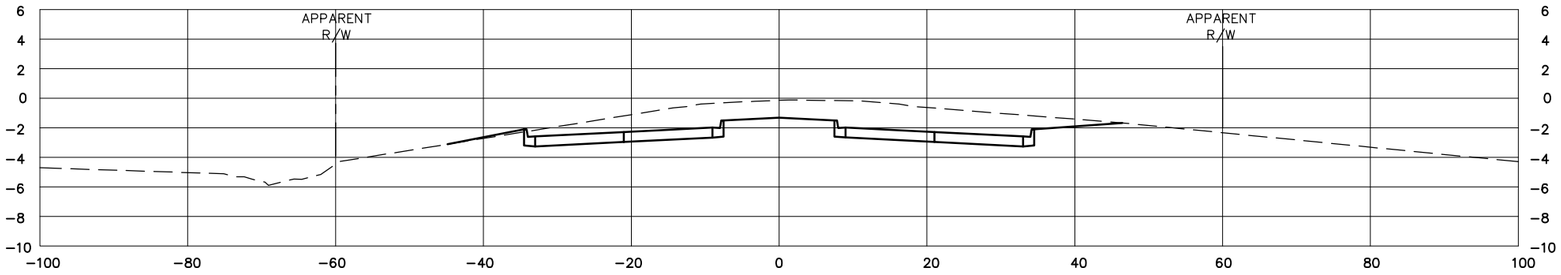
REGIONAL PLANNING COMMISSION

VOLKERT

200+00.00



198+00.00



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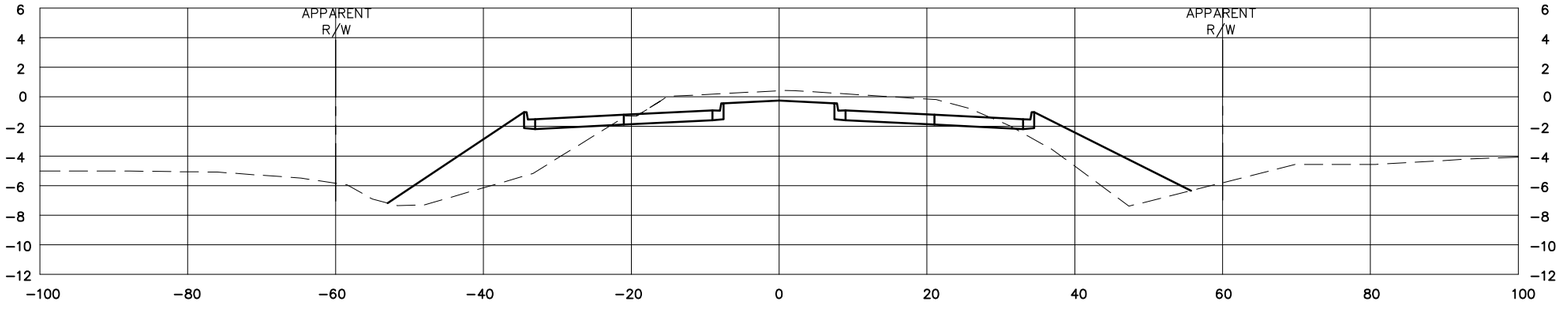

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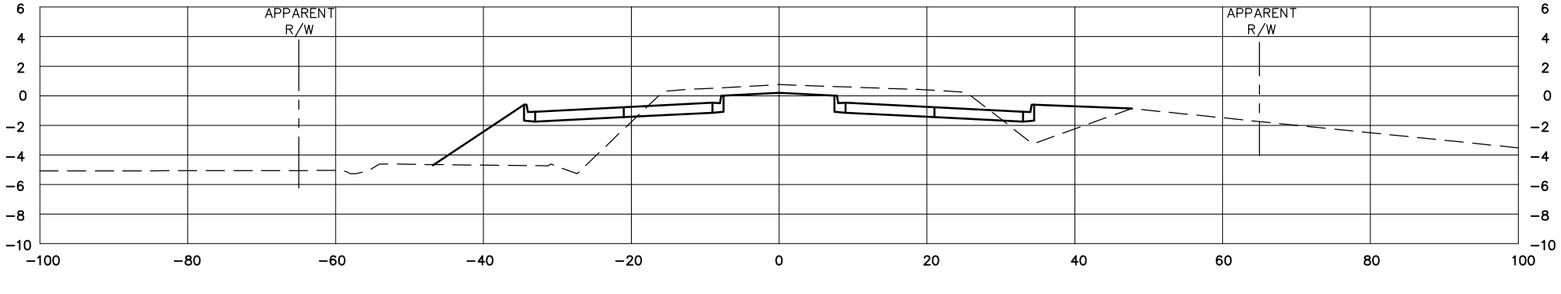


SHEET NUMBER 111

PARISH PLAQUEMINES/ORLEANS

FEDERAL PROJECT

STATE PROJECT

DESIGNED RR
CHECKED JE

DETAILED SG
CHECKED RR

DATE 07/01/2014
SHEET

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, RECORDATION, CONVEYANCE, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

LOUISIANA Department Of Transportation And Development

ENGINEER: RAUL H. RIEGO
LICENSE #: 24308
DATE: 7/1/14

STATE OF LOUISIANA

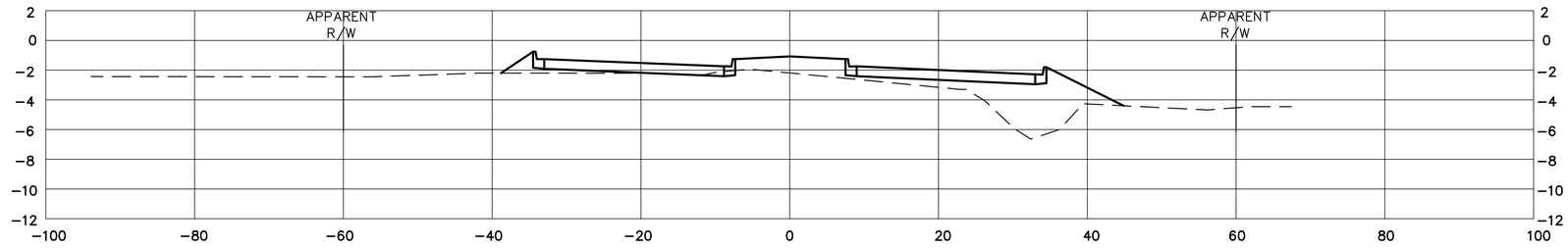
SECTION SHEET – (12)

WOODLAND HIGHWAY/LA 406 WIDENING

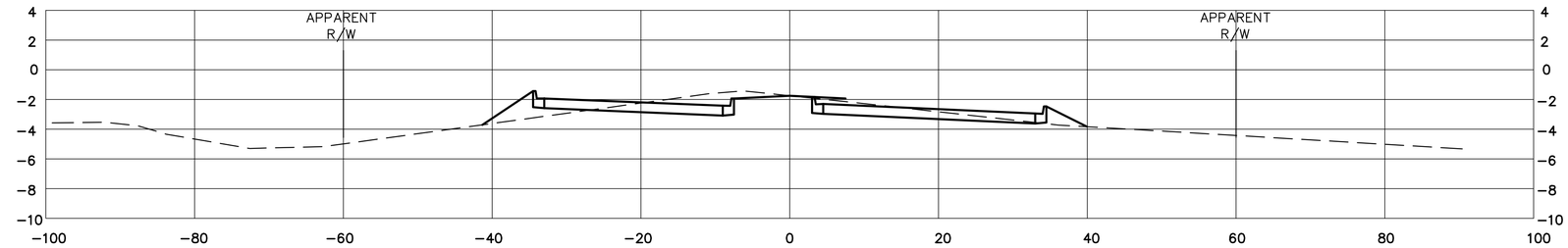
REGIONAL PLANNING COMMISSION

VOLKERT

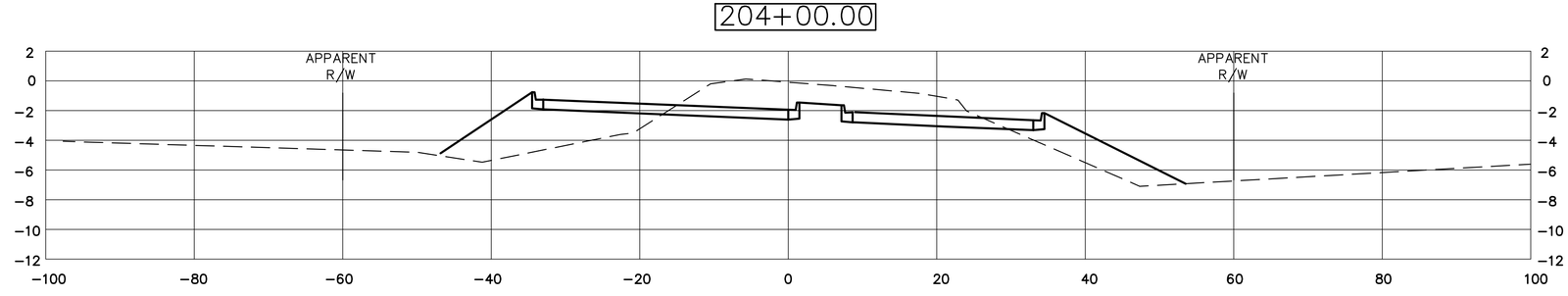
208+00.00



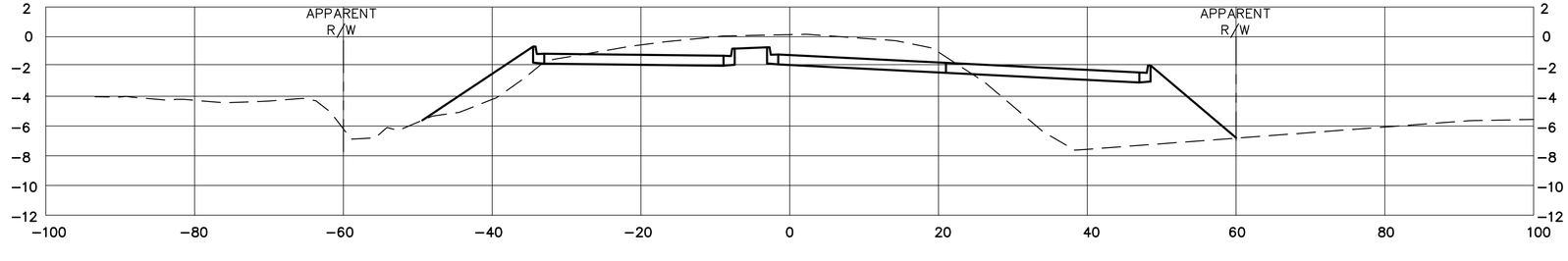
206+00.00



204+00.00



202+00.00



SHEET NUMBER	112
PARISH	PLAQUEMINES/ORLEANS
FEDERAL PROJECT	
STATE PROJECT	
DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION OR BIDDING, REPURPOSE, SALES OR RECORDATION, THE ISSUANCE OF A PERMIT.

Louisiana Department of Transportation And Development

ENGINEER RAUL H. RIGGS
LICENSE # 34056
DATE 7/1/14

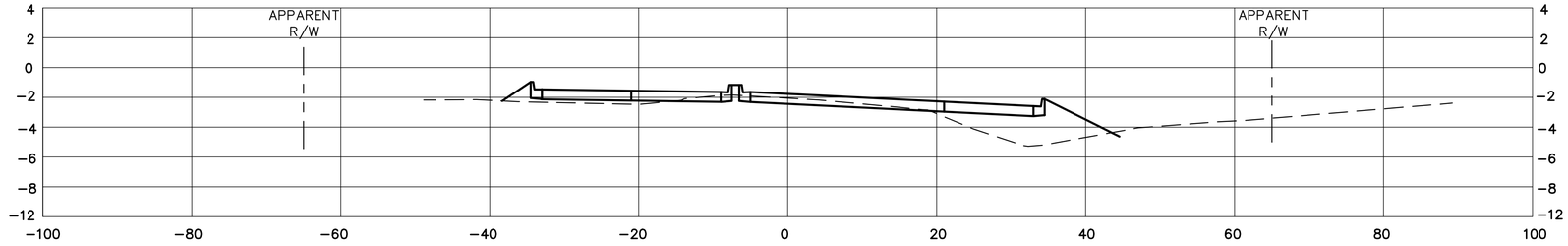
SECTION SHEET – (13)

WOODLAND HIGHWAY/LA 406 WIDENING

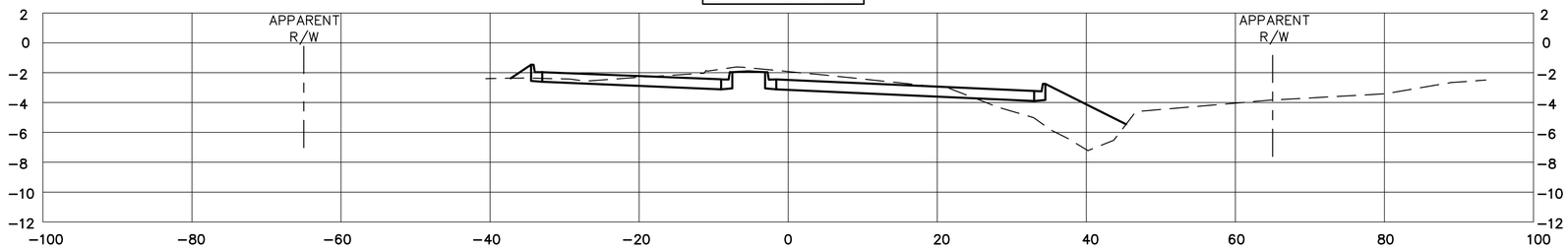
REGIONAL PLANNING COMMISSION

VOLKERT

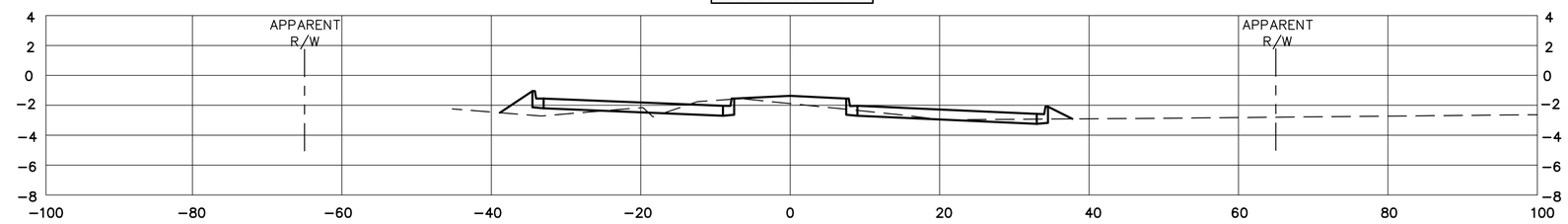
216+00.00



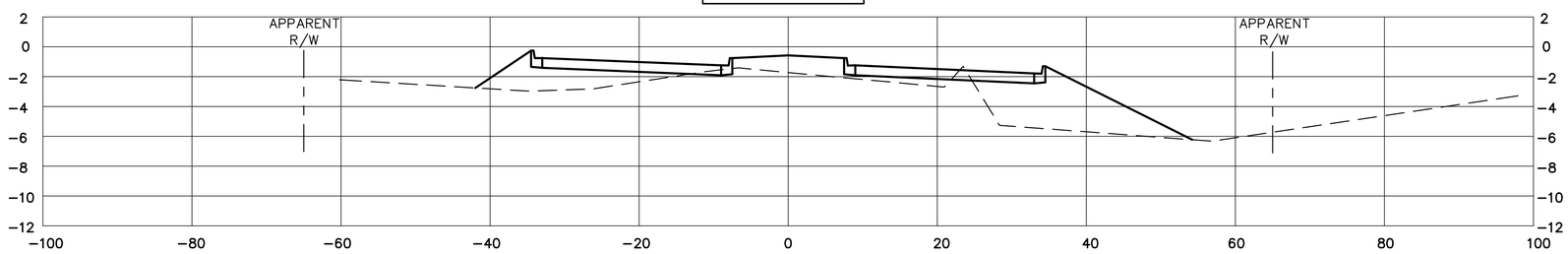
214+00.00



212+00.00



210+00.00



SHEET NUMBER 113

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT:
STATE PROJECT:

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

PRELIMINARY
Louisiana Department of Transportation And Development
PRELIMINARY NOT FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR THE ISSUANCE OF A PERMIT.
ENGINEER RAUL H. REGIS
LICENSE # 34088
DATE: 7/1/14

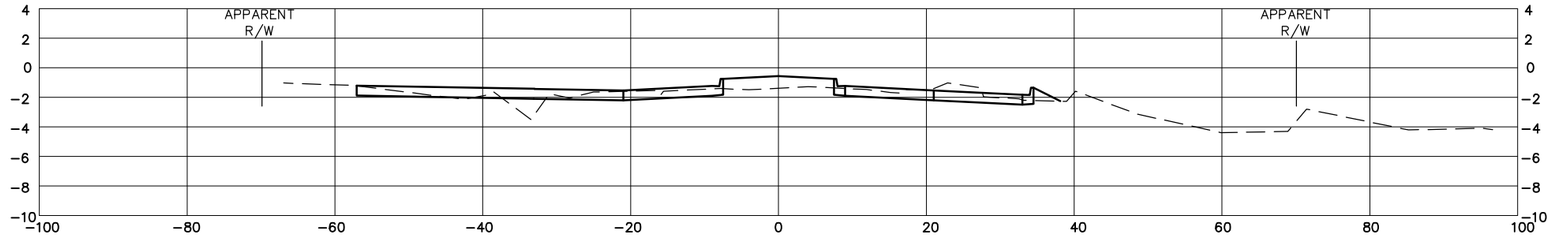
SECTION SHEET - (14)

WOODLAND HIGHWAY/LA 406 WIDENING

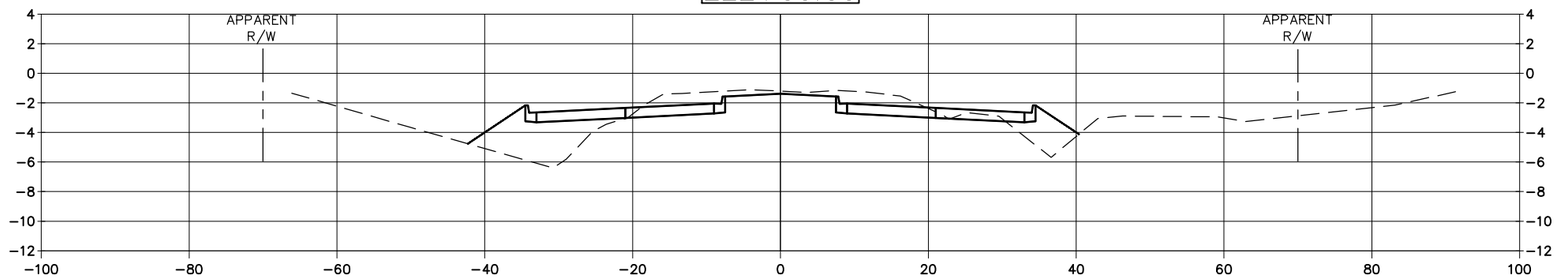
REGIONAL PLANNING COMMISSION

VOLKERT

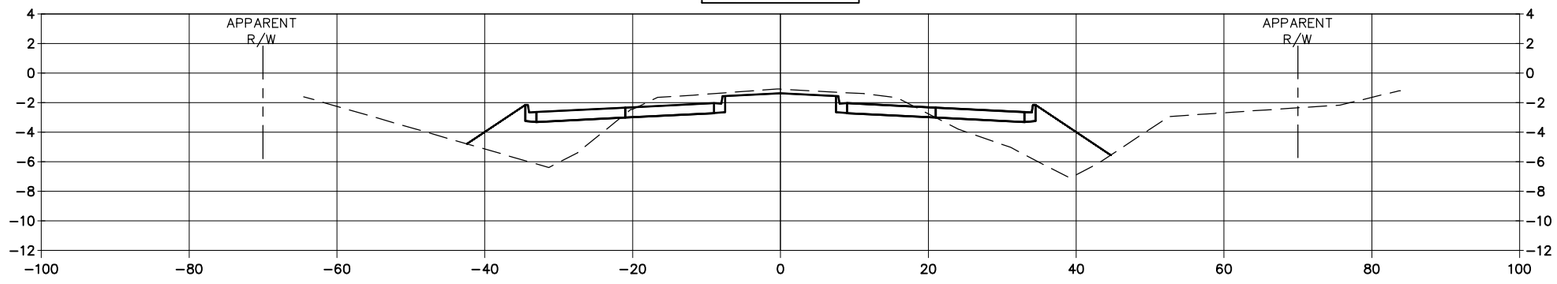
224+00.00



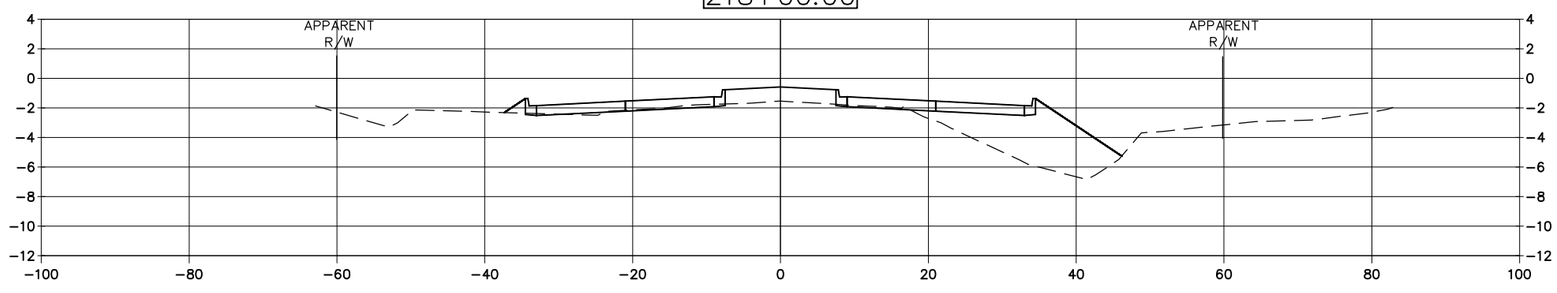
222+00.00



220+00.00



218+00.00



SHEET NUMBER 114

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT:
STATE PROJECT:

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, RECORDATION, CONVEYANCE, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

PRELIMINARY
Louisiana Department Of Transportation And Development
ENGINEER: RAUL H. RIVERA
LICENSE #: 24308
DATE: 2/1/14

STATE OF LOUISIANA

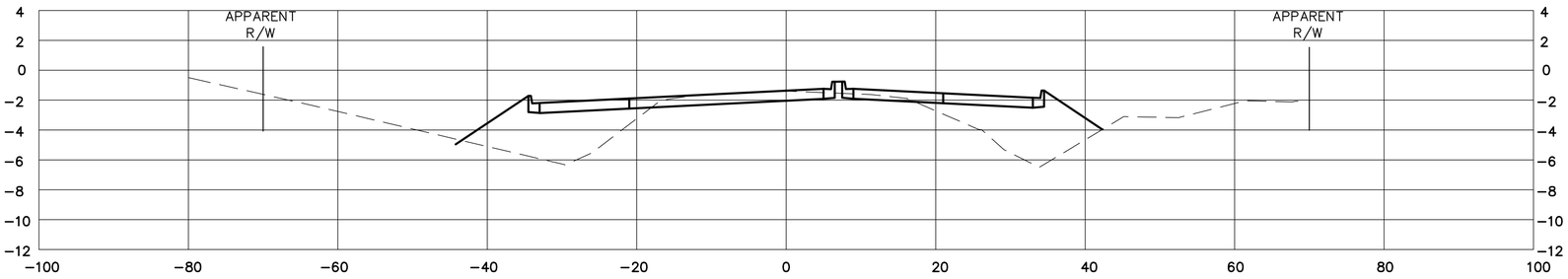
SECTION SHEET - (15)

WOODLAND HIGHWAY/LA 406 WIDENING

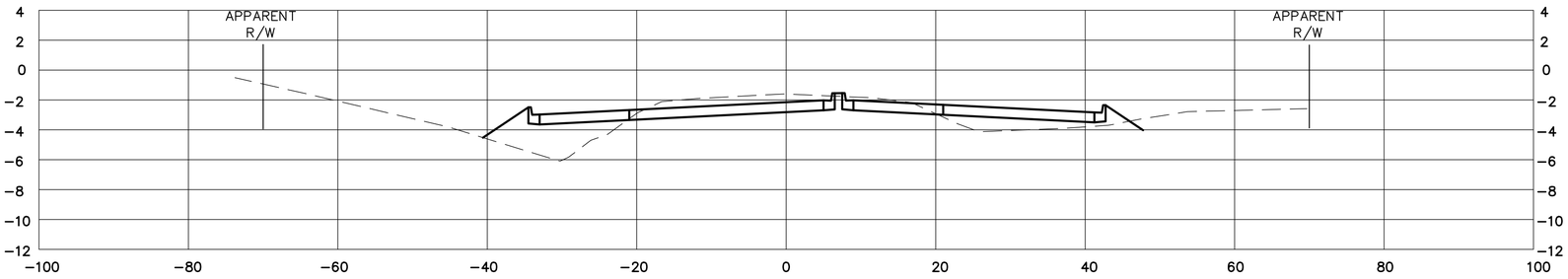
REGIONAL PLANNING COMMISSION

VOLKERT

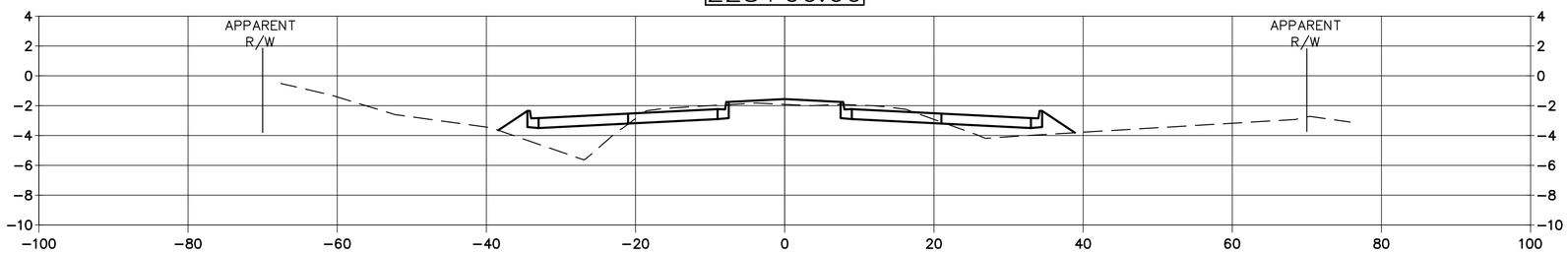
232+00.00



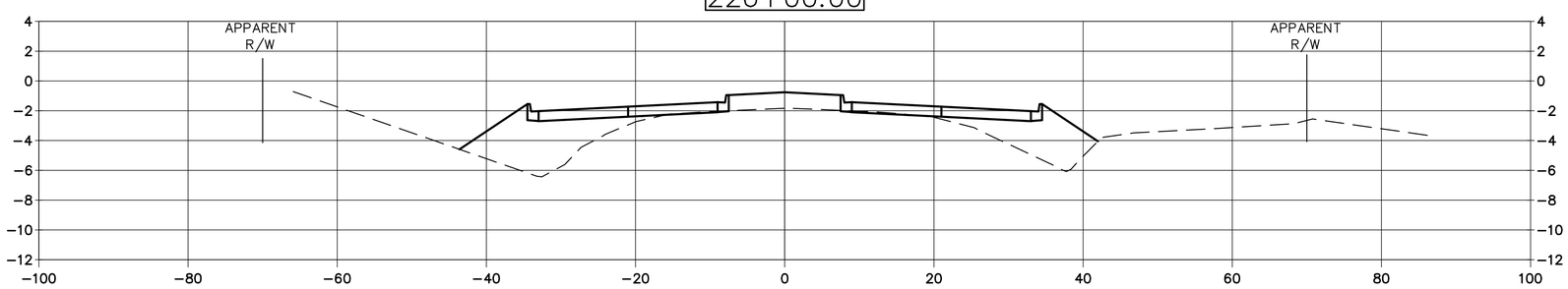
230+00.00



228+00.00



226+00.00



SHEET NUMBER 115

PARISH	FEDERAL PROJECT	STATE PROJECT
PLAQUEMINES/ORLEANS		

DESIGNED	RR
CHECKED	JE
DETAILED	SG
CHECKED	RR
DATE	07/01/2014
SHEET	

PRELIMINARY
Louisiana Department of Transportation And Development
PRELIMINARY NOT TO BE USED FOR CONSTRUCTION, BIDDING, REGISTRATION, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.
ENGINEER RAUL H. RIGGS
LICENSE # 34056
DATE 7/1/14

SECTION SHEET – (16)

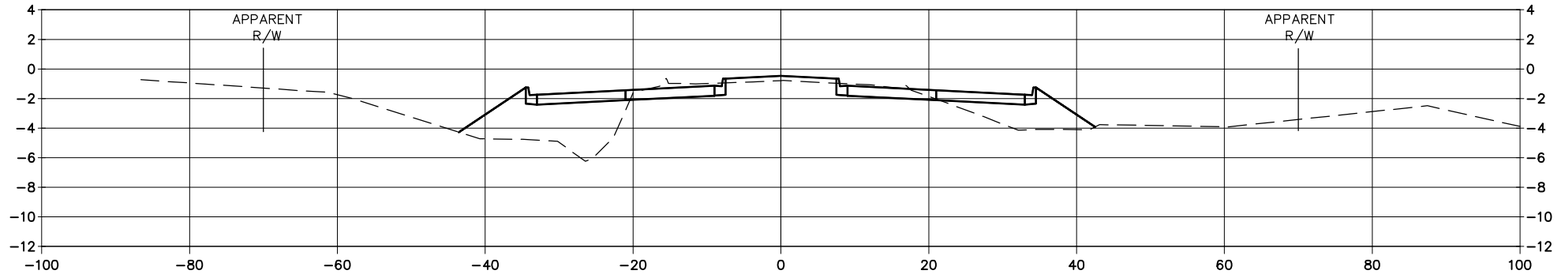
WOODLAND HIGHWAY/LA 406 WIDENING

STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

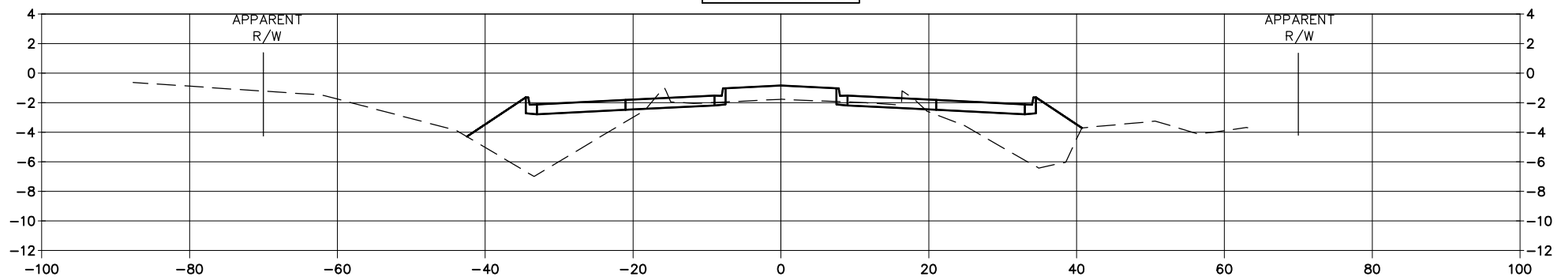
REGIONAL PLANNING COMMISSION

VOLKERT

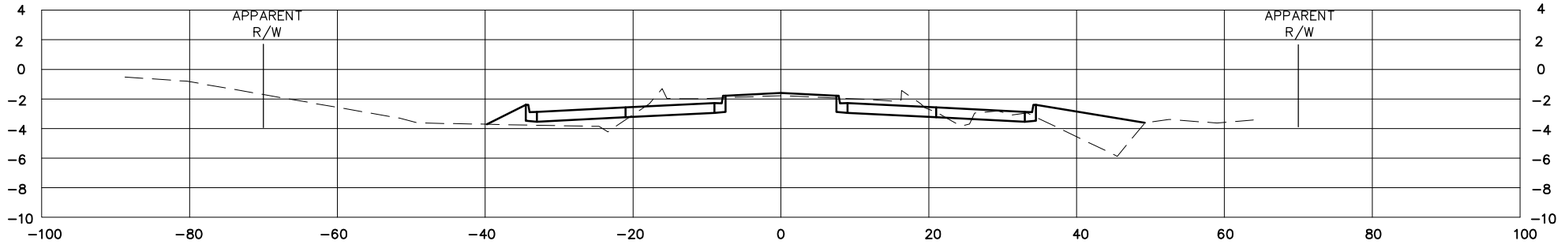
240+00.00



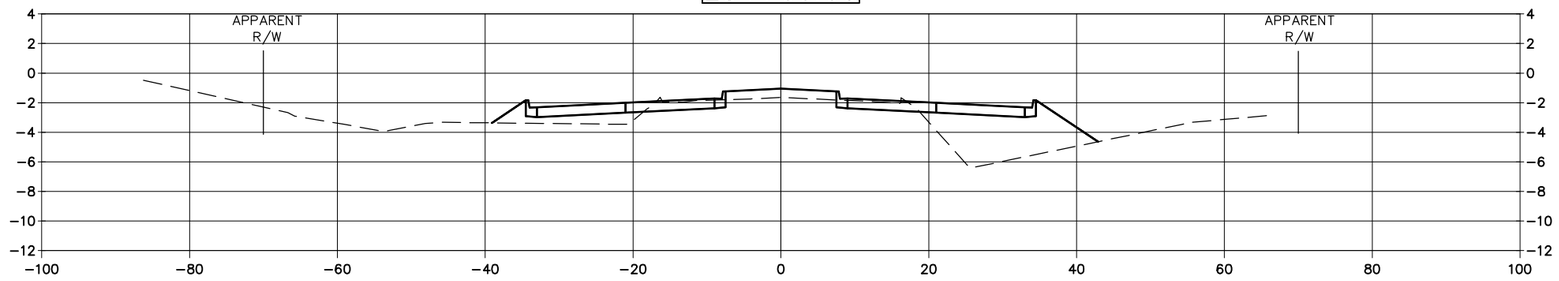
238+00.00



236+00.00



234+00.00



SHEET NUMBER 116

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT:
STATE PROJECT:

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING OR RECORDATION PURPOSES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

PRELIMINARY
Louisiana Department Of Transportation And Development
ENGINEER: RAUL H. RIEGER
LICENSE #: 24308
DATE: 7/1/14

STATE OF LOUISIANA

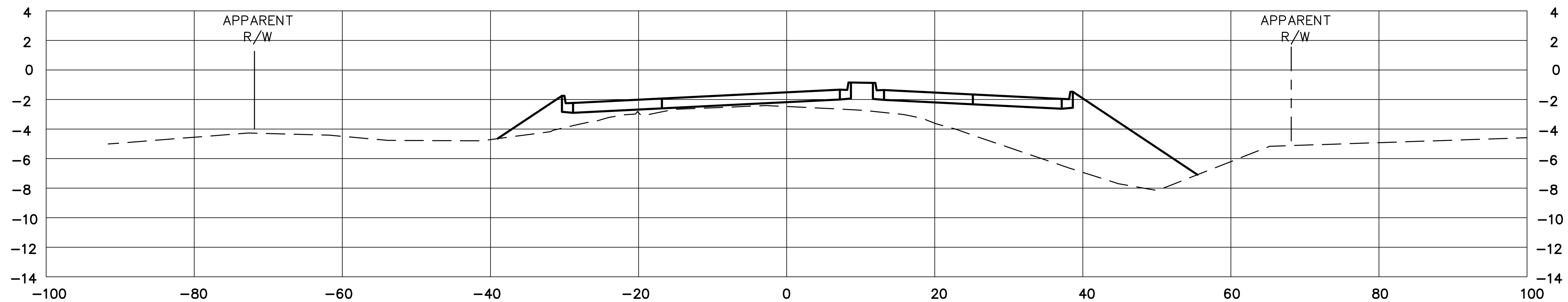
SECTION SHEET – (17)

WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT

248+00.00



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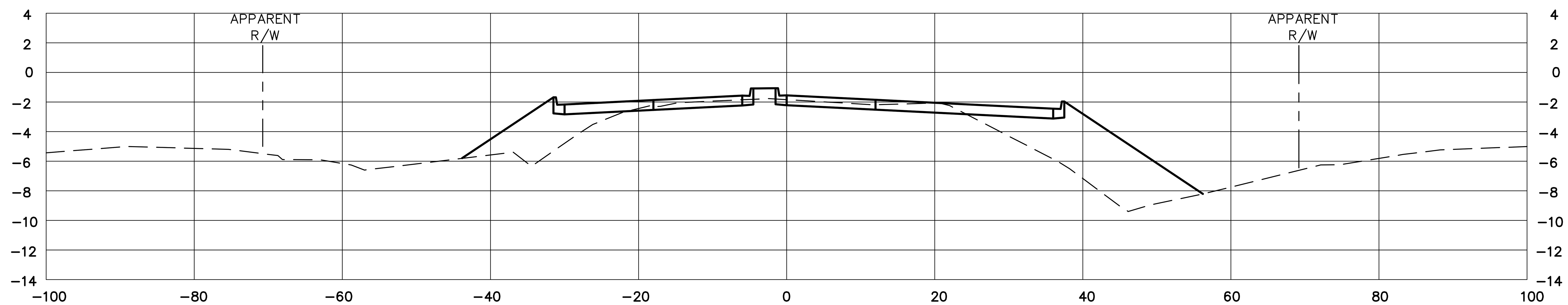

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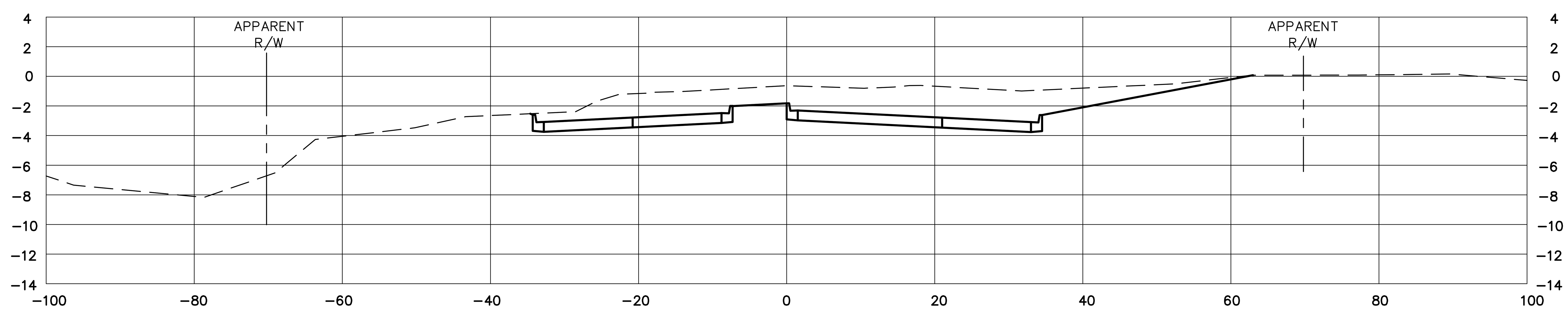

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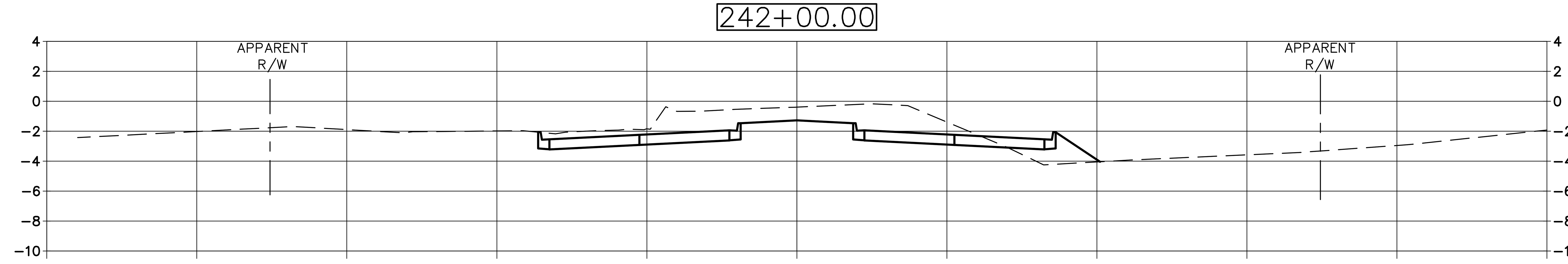


SHEET NUMBER 117

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT
STATE PROJECT

DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

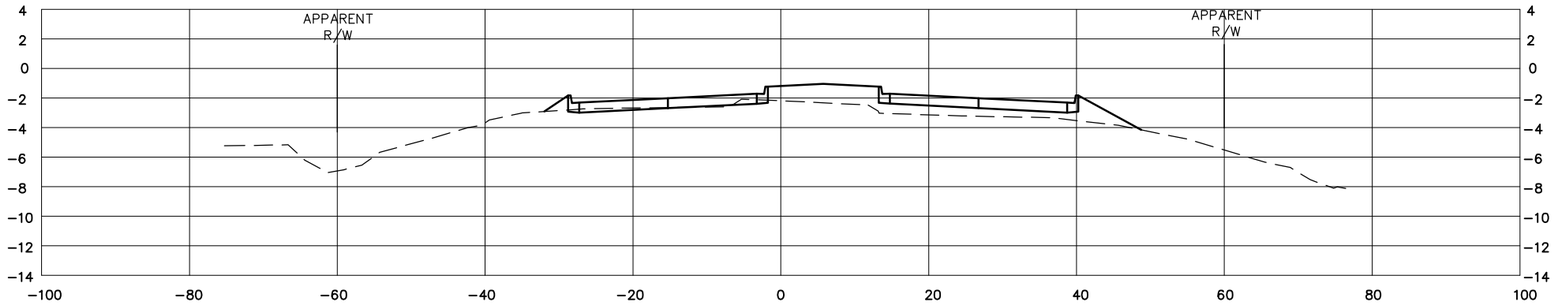
SECTION SHEET – (18)

WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

VOLKERT

256+00.00



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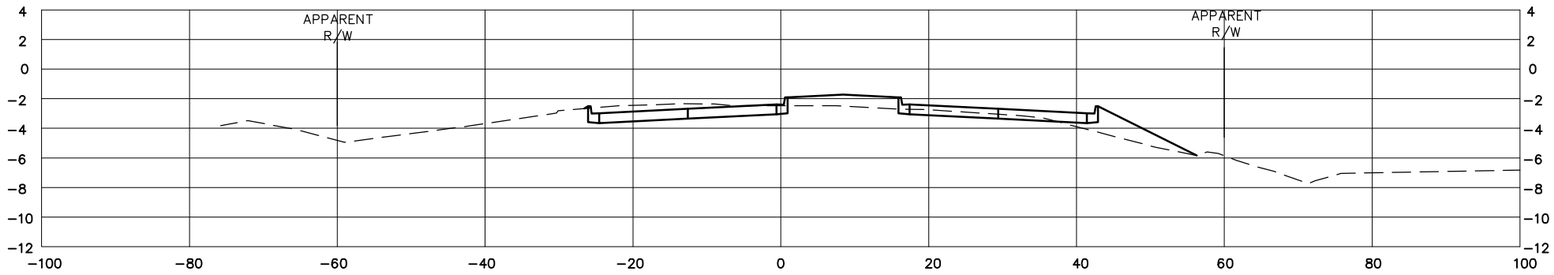

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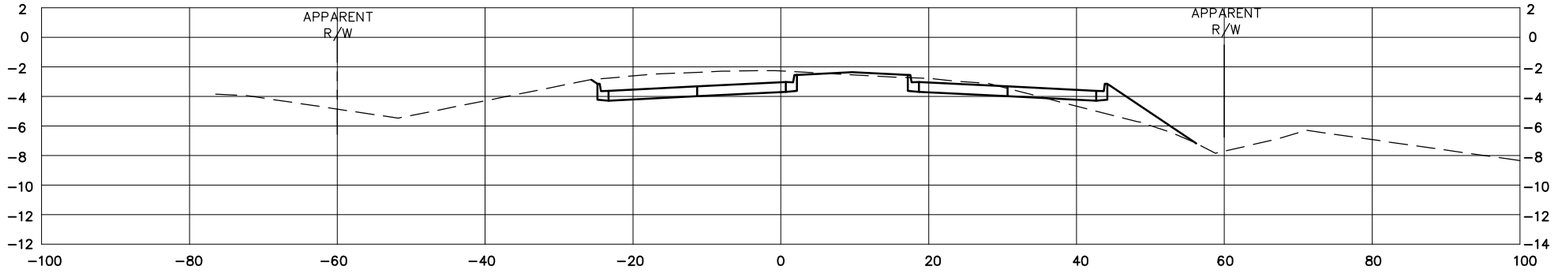

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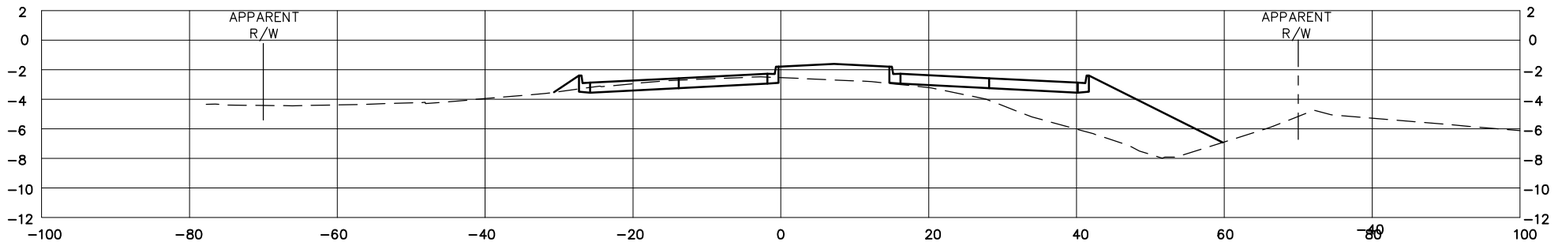


SHEET NUMBER 118

PARISH: PLAQUEMINES/ORLEANS
FEDERAL PROJECT:
STATE PROJECT:

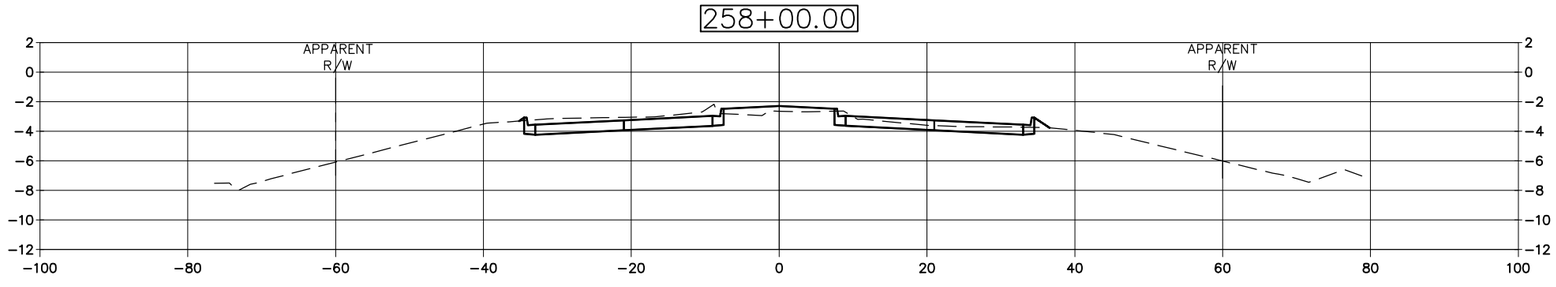
DESIGNED RR
CHECKED JE
DETAILED SG
CHECKED RR
DATE 07/01/2014
SHEET

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR RECORDATION. ENGINEER OF RECORD IS NOT RESPONSIBLE FOR THE USE OF THESE PLANS FOR ANY PURPOSE OTHER THAN THOSE AUTHORIZED BY THE ENGINEER OF RECORD.
Louisiana Department Of Transportation And Development
ENGINEER: RAUL H. RIVERA
LICENSE #: 24308
DATE: 7/1/14

SECTION SHEET – (19)

WOODLAND HIGHWAY/LA 406 WIDENING

VOLKERT



PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION, RECORDATION, CONVEYANCE, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

PRELIMINARY
Louisiana Department Of Transportation And Development
ENGINEER: RAUL H. REGIS
LICENSE #: 24308
DATE: 2/1/14

DESIGNED	RR	PARISH	PLAQUEMINES/ORLEANS
CHECKED	JE		
DETAILED	SG	FEDERAL PROJECT	
CHECKED	RR		
DATE SHEET	07/01/2014	STATE PROJECT	

SHEET NUMBER 119

STATE OF LOUISIANA

SECTION SHEET - (20)

WOODLAND HIGHWAY/LA 406 WIDENING

REGIONAL PLANNING COMMISSION

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