



TRANSPORTATION SYMPOSIUM

2019

General Tolling Requirements (GTR)

James E. Beverly Jr.

Why does the GTR exist?

- Toll systems have specific infrastructure requirements for accuracy of performance



Why does the GTR exist?

- Detailed criteria that provides toll site infrastructure for:
 - Toll site (includes tolling pavement area), (civil and electrical)
 - Toll equipment building (TEB) (architectural, structural, mechanical, and electrical)
 - Toll gantry (structural and electrical)



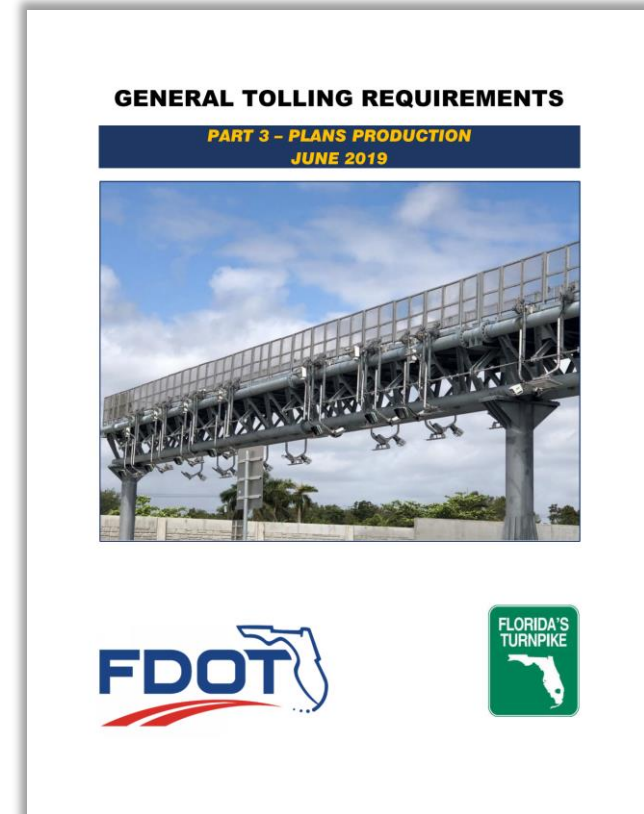
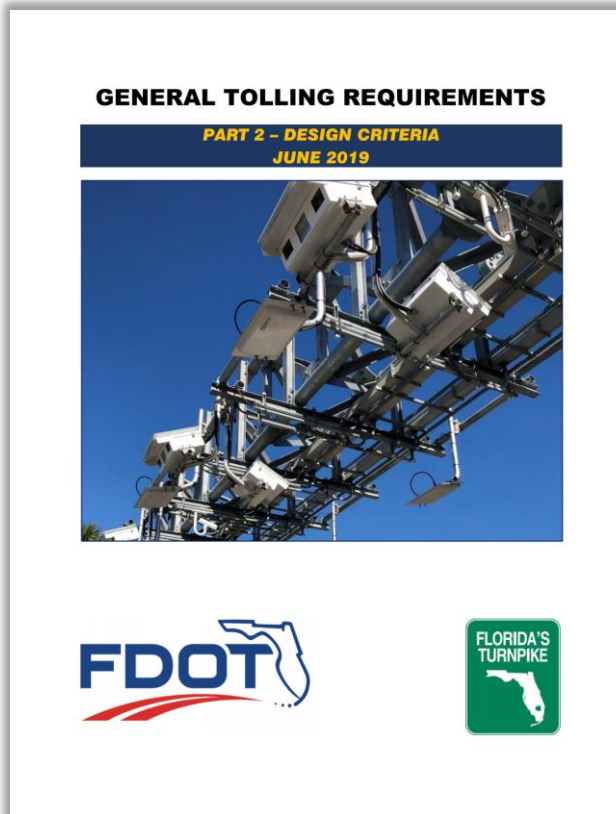
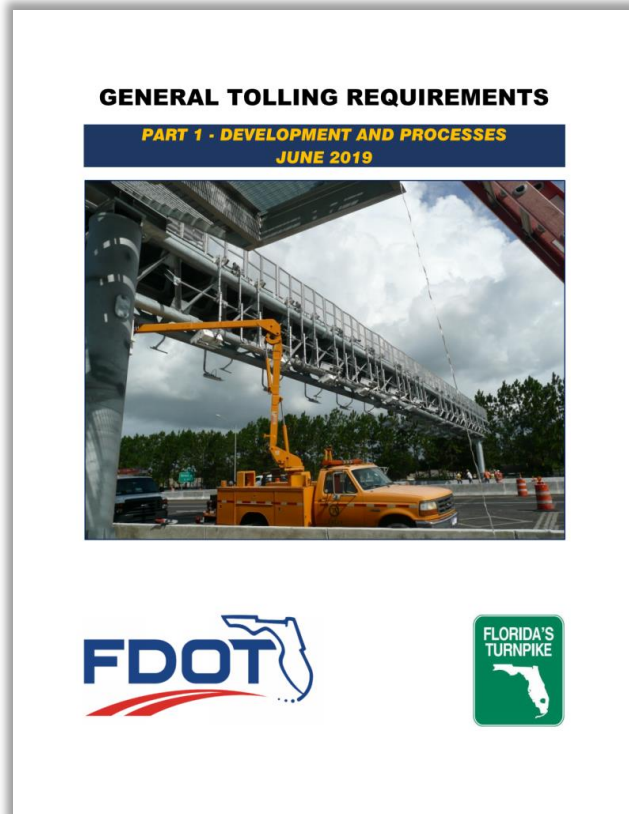
Why does the GTR exist?

- Developed Tolling Infrastructure Requirements (TIR) for each project:
 - Created confusion for everyone
 - Required staff to develop a TIR for each project



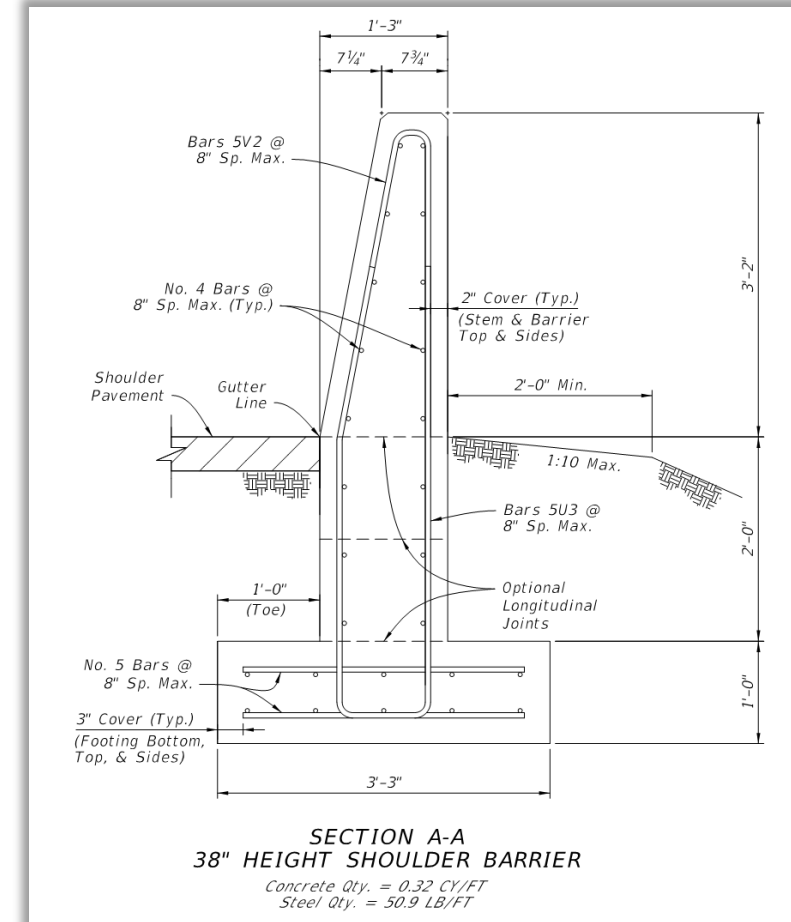
Why does the GTR exist?

- A single document that can be used for FDOT toll sites, (including express lanes) which support all Tolling Equipment Contractors (TECs)



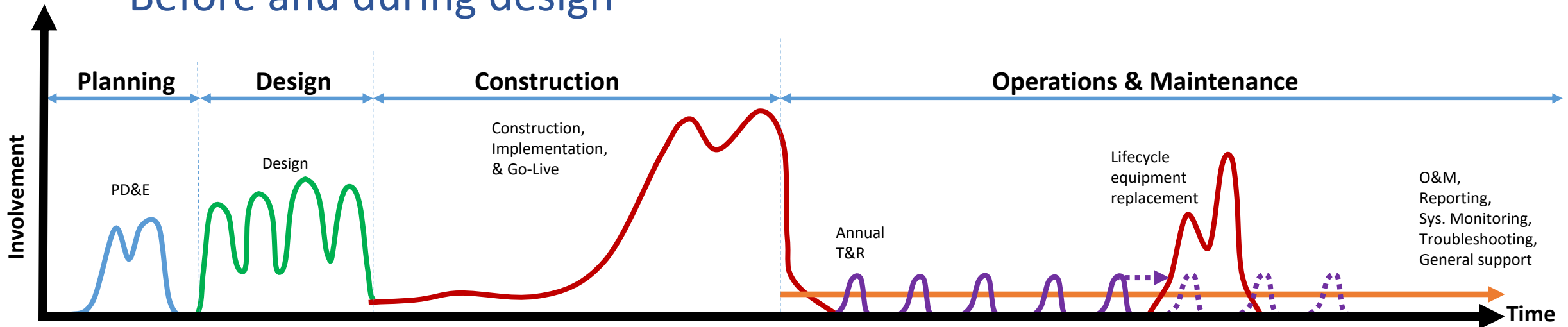
Why does the GTR need to be updated?

- TEC's toll system requirements change
- New TEC toll system is added
- Governing codes change (FBC, NEC, NFPA)
- Standard plans and specifications change
- Lessons learned during construction
- When specified equipment is no longer available



When do you need the GTR?

- As early as possible
- During PD&E
 - Express lane diagram development
 - Validates approved concept alternative
- Before and during design



Who is the GTR addressing?

- Written to the **EOR**
 - Blue boxes are for non-conventional projects
- GTR Part 2, Appendix - 1 TSP sections are written to the **Contractor**

100.2.1 Organization

The **GTR** has three parts:

- (1) **Part 1** contains development and processes
- (2) **Part 2** contains design criteria
- (3) **Part 3** contains the plans preparation and assembly requirements

Special requirements for Non-Conventional Projects are shown in a “Modification for Non-Conventional Projects” box. See example below:

Modification for Non-Conventional Projects:

Delete **102.2.1 (1)** and replace with the following:

Issues the RFP that identifies the project scope. The Department reviews ATCs in accordance with the procedures set forth in the RFP.

Part 1 – Development and Processes

- Purpose
- Procedure
- Key terms
 - Toll Site and Toll Facility
 - General Toll Lane (GTL)
 - General Use Lane (GUL)
 - Toll Equipment Building
 - Toll loop pavement area
 - Toll site envelope
 - Tolling movement
- Responsibilities
 - Department
 - AOR/EOR
 - TEC
- TSTM and GTR deviations
- Standard forms and templates
- Plan development process

Part 1 – Development and Processes

General Tolling Requirements

May 2019

100 Introduction

100.1 Purpose

The ***General Tolling Requirements (GTR)*** is the source of toll infrastructure requirements for project delivery methods, such as, Conventional Projects (Design-Bid-Build), and Non-Conventional Projects (Design-Build, Design-Build Finance, and Public-Private-Partnership). The intent of the GTR is to provide criteria for a complete and standardized toll infrastructure design.

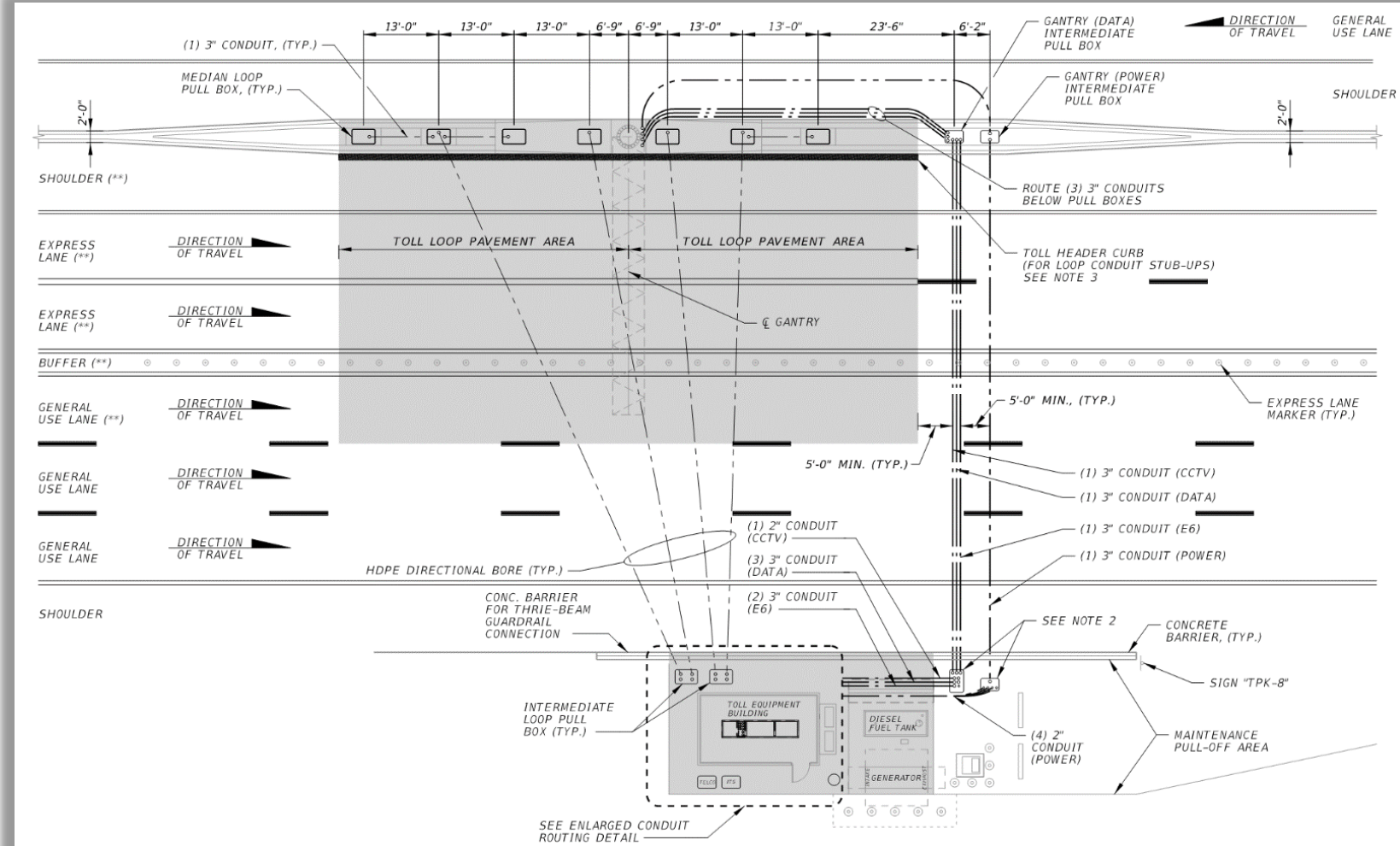
Part 1 – Development and Processes

100.2 Procedure

Criteria in this document are for toll sites on the Department's toll roads and express lanes. Requests for deviations from these requirements must be approved by the Florida's Turnpike Enterprise (FTE) through the GTR deviations process as outlined in ***GTR 110***.



Part 1 – Development and Processes

- Toll Site and Toll Facility
- General Toll Lane (GTL)
- General Use Lane (GUL)
- Toll Equipment Building
- Toll loop pavement area
- Toll site envelope
- Tolling movement



Part 1 – Development and Processes

- Prepare the Toll Siting Technical Memorandum (TSTM) from the approved PD&E concept alternative
 - Preliminary TSTM
 - Express lane diagram
- GTR deviation form identifies and provides justification for design criteria that **cannot** be met



Toll Siting Technical Memorandum

Project Name _____

Financial Project ID: XXXXX-X-XX-XX

Prepared For:
Florida Department of Transportation
Florida's Turnpike Enterprise / District X *(As applicable)*
Client Address Line 1 _____
Client Address Line 2 _____

Prepared By:
Consultant Company Name _____
Consultant Address Line 1 _____
Consultant Address Line 2 _____
Consultant Contact Phone Number _____
Consultant Contact e-mail _____

Engineer of Record: PE Name
P.E. No: xxxxx

[Notes to preparer are shown in brackets and italics.]

May 2019

GTR DEVIATION SUBMITTAL LETTER

To: Choose or enter name _____ Date: Enter a date _____
Tolls Design Administrator

Financial Project ID: FPI# _____

Project Name: Enter Project Name in full _____

GTR Version: Choose version _____

Toll Site ID: Toll Site ID _____ Toll Site #: Site # _____

Affected GTR Section(s): Include all Non-conforming sections _____

GTR Deviation Description:

Identify first deviation. Provide detailed reasons/justification for the deviation. Attach plans/ profiles /sections for the deviation (If the deviation is identified and this letter is submitted as part of the final TSTM additional documentation is not required). Recommend mitigations to the deviation that will be included in the design of the toll site.

Identify second deviation (If additional deviations are needed at the same site). Provide detailed reasons/justification for the deviation. Attach plans/ profiles /sections for the deviation (If the deviation is identified and this letter is submitted as part of the final TSTM additional documentation is not required). Recommend mitigations to the deviation that will be included in the design of the toll site.

Add information as described above, for any additional deviations as needed

Recommended by:

Enter Engineer's Name _____ Date: Enter a date _____

Concurrences:

James E. Beverly, Tolls Design Administrator Date: _____

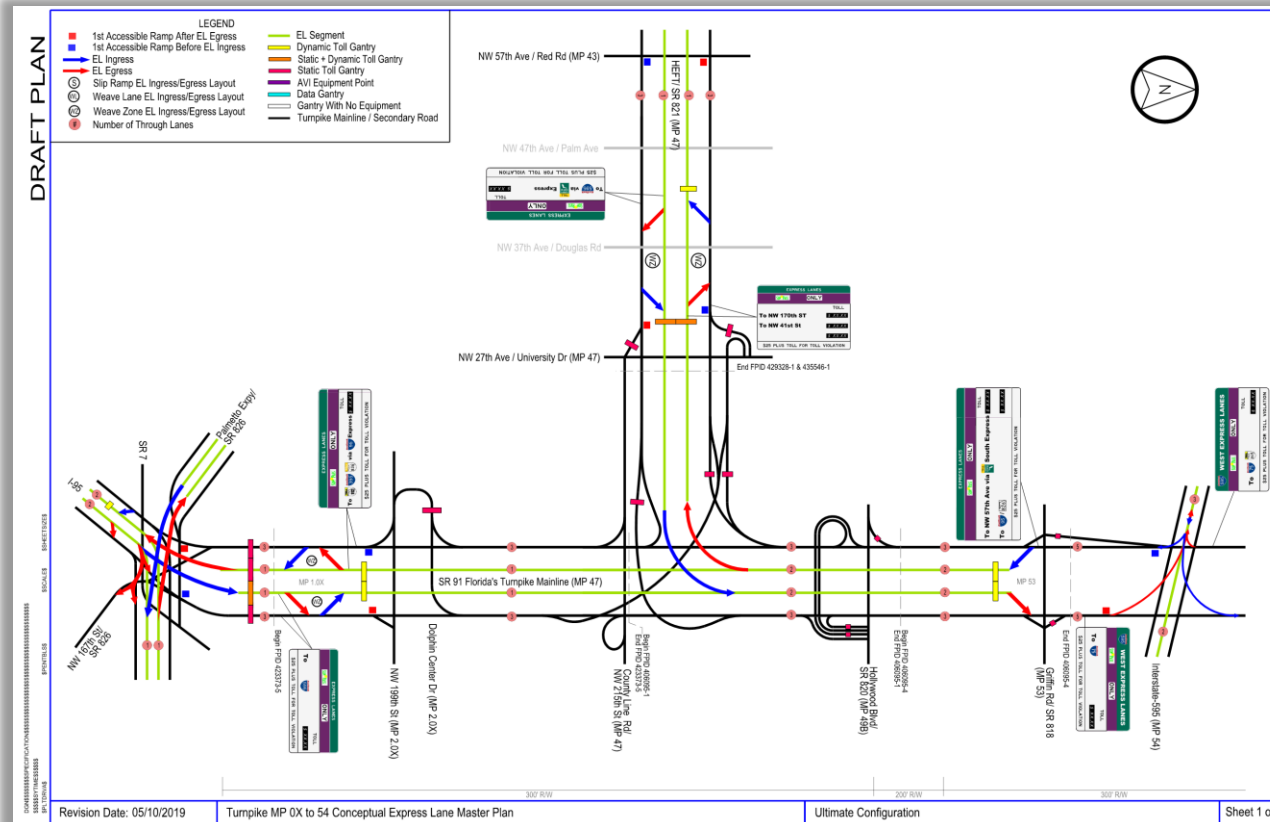
Patrick M. Muench, P.E., Turnpike Design Engineer Date: _____

GTR DEVIATION SUBMITTAL LETTER

Rev. 05-17-2019

Part 1 – Development and Processes

- Accepted express lane diagram must be included in the TSTM



C. Express Lane Diagrams [Express Lane Projects Only- This is the EL diagram for the corridor or region of which the project is a part including all interim and ultimate conditions.]



Figure 2 - Single Line Concept Express Lane Diagrams

II. Evaluation Criteria

[Provide a list and summary description of all the criteria utilized in the evaluation of these toll sites.]

Criteria: The following criteria was utilized to evaluate the limits of the project to establish recommended tolling point locations:

1. Current GTR Version: [Input the applicable version.]

2. Florida Gas Transmission

[Site locations must consider any impacts to any FGT infrastructure located within the proximity of the tolling site.]

3. Roadway Design Criteria

[Roadway design criteria that is not met due to toll site requirements must be documented.]

FPID: XXXXXX-X-XX-XX Toll Siting Technical Memorandum
Prepared By: Consultant Firm

Page 5 of 11

Part 1 – Development and Processes

IV. Tabulation of Recommended Sites

The following table summarizes criteria analysis provided in part III against the recommended toll sites:

[Provide up to 5 site columns as needed to get the full summary of all sites and all interim and ultimate conditions that are applicable. When quantity of sites exceeds 5 instances, create additional tables as needed.]

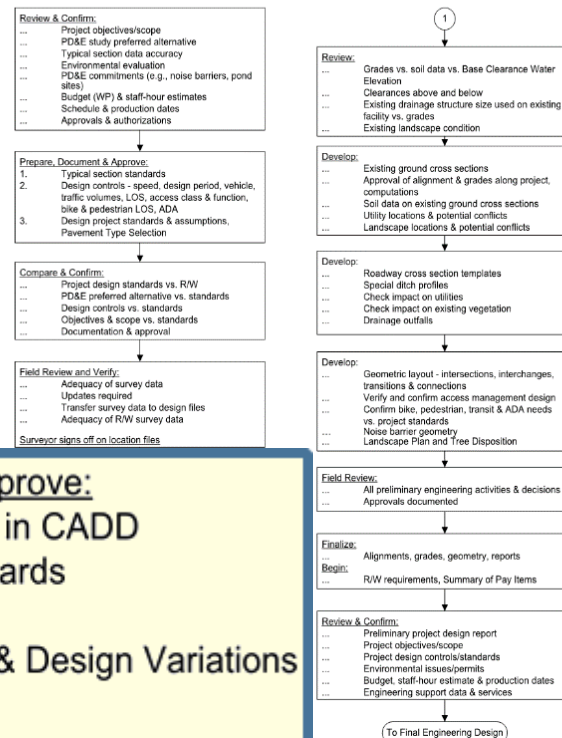
Criteria	Description	Pass/Fail					Notes
		Site 1 Station Toll Site ID	Site 2 Station Toll Site ID	Site 2 Station Toll Site ID	Site 3 Station Toll Site ID	Site 4 Station Toll Site ID	
		Site 1	Site 2 Interim	Site 2 Ultimate	Site 3	Site 4	
220.2(1)	Located on tangent or curve greater than 3000'	Pass	Fail	Fail	Pass	Pass	[Be as descriptive as possible for each item regardless of pass or fail condition. Fail conditions should document why the condition cannot be met for the recommended site location. For anything requiring a specified distance or length requirement, provide the measured value for that distance or length here.]
220.2(2) & (3)	Centerline of gantry must be perpendicular or radial to travel lanes						
220.2(4)	Located outside of low points of sag vertical curves or areas susceptible to standing water						
220.2(5)	Lane, shoulder, and buffer widths are constant through 100 feet of tolling pavement						
220.2(6)	Toll sites are not permitted to be located within superelevation transitions or cross slope transitions						
220.2(7) & (8)	No merge or weave conditions.						
220.2(9) & 110.2(2)	Roadway cross slope under gantry must not result in an elevation difference of more than 26" between the highest and lowest j-arm.						[Site 1 - 20" Site 2 Interim - 14" Site 2 Ultimate - 18" Site 3 - 19" Site 4 - 11"]
220.2(10)	Gantry must be located within 1 mile of express lane entry points						
221.1.1(1) & (2)	Tolling point must be 100 feet with gantry at the midpoint						
221.1.2(2),(3) & (4)	Lane and shoulder widths at the toll site meet GTR requirements.						
221.5(2)	Tolling pavement must be free of metal objects						
230.2(1)	Electromagnetic field emitting sources must be located at least 5 feet from the toll site envelope and loop infrastructure.						
230.2(2)	Low voltage power lines (120/240 V or 480V) AC or DC power must be located at least 5 feet from the toll site						

Part 1 – Development and Processes

Topic #625-000-002
FDOT Design Manual

January 1, 2019

Figure 110.1.1 Major Activities – Initial Engineering Process



Review, Confirm & Approve:
... Alignment and topo in CADD
... Alignment vs. standards
... New alignments
... Design Exceptions & Design Variations
Initiate utility contact

110-Initial Engineering Design Process

General Tolling Requirements

May 2019

120 Plan Development Process

120.1 Introduction

The **FDM 110** through **112** discusses the plan development process. This chapter identifies the additional processes that are required for toll projects.

All toll projects require the development of a TSTM prior to the start of the plan development process. See **GTR 202** for details regarding the TSTM.

120.2 Initial Engineering Design Process

Tolling projects must have additional major activities included in the various steps of the flow chart presented in **FDM Figure 110.1.1** as follows:

(1) Add to the activities in the fifth step of the flow chart "Review, Confirm, & Approve" the following:
(a) Express lanes ingress and egress locations
(b) Conceptual locations for toll facilities

(3) Add to the activities in the last step of the flow chart "Review and Confirm" the following:
(a) Express lanes ingress and egress locations
(b) Toll site locations
(c) GTR Deviation Submittal Letter
(d) Preliminary TSTM

120 – Plan Development Process

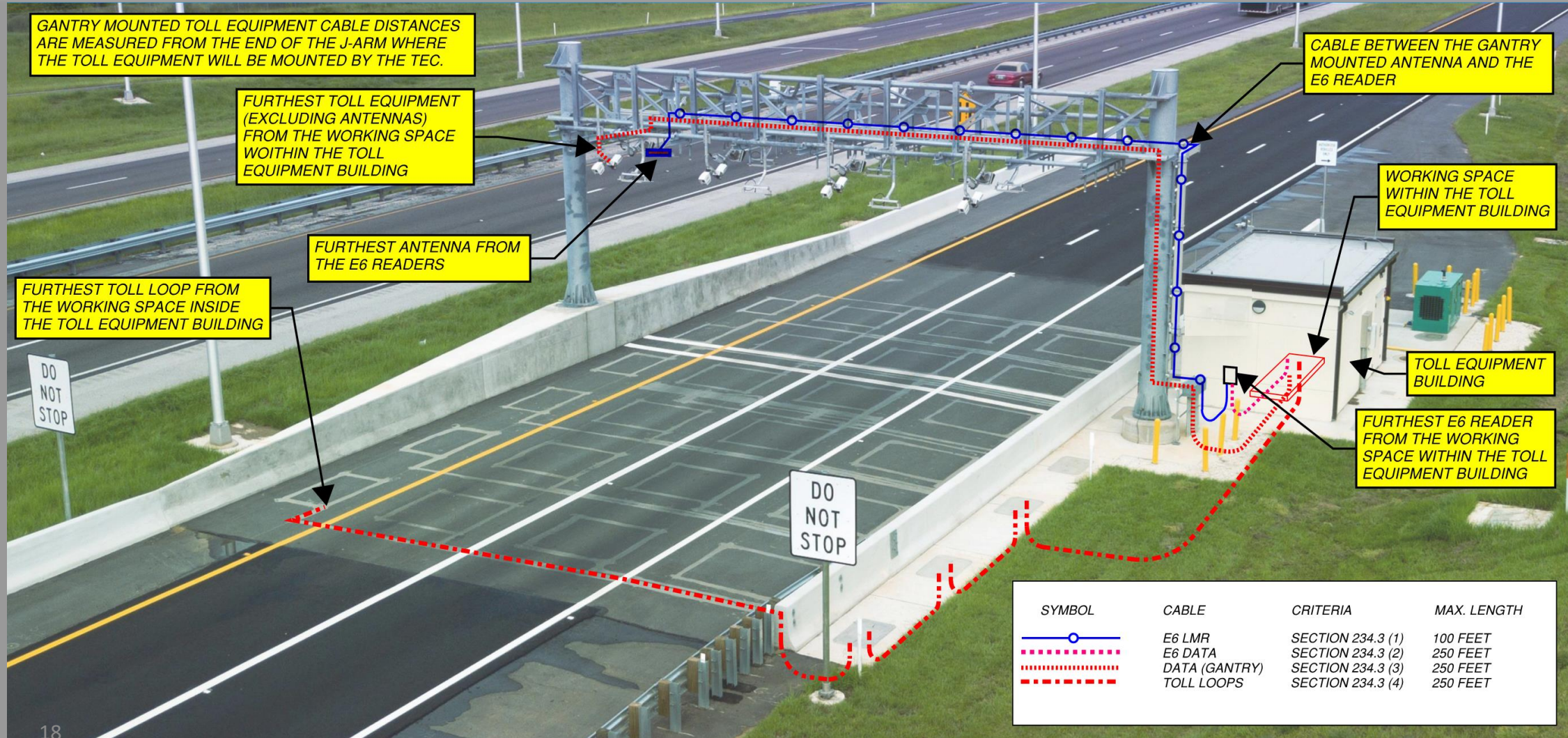
14

Part 2 – Design Criteria

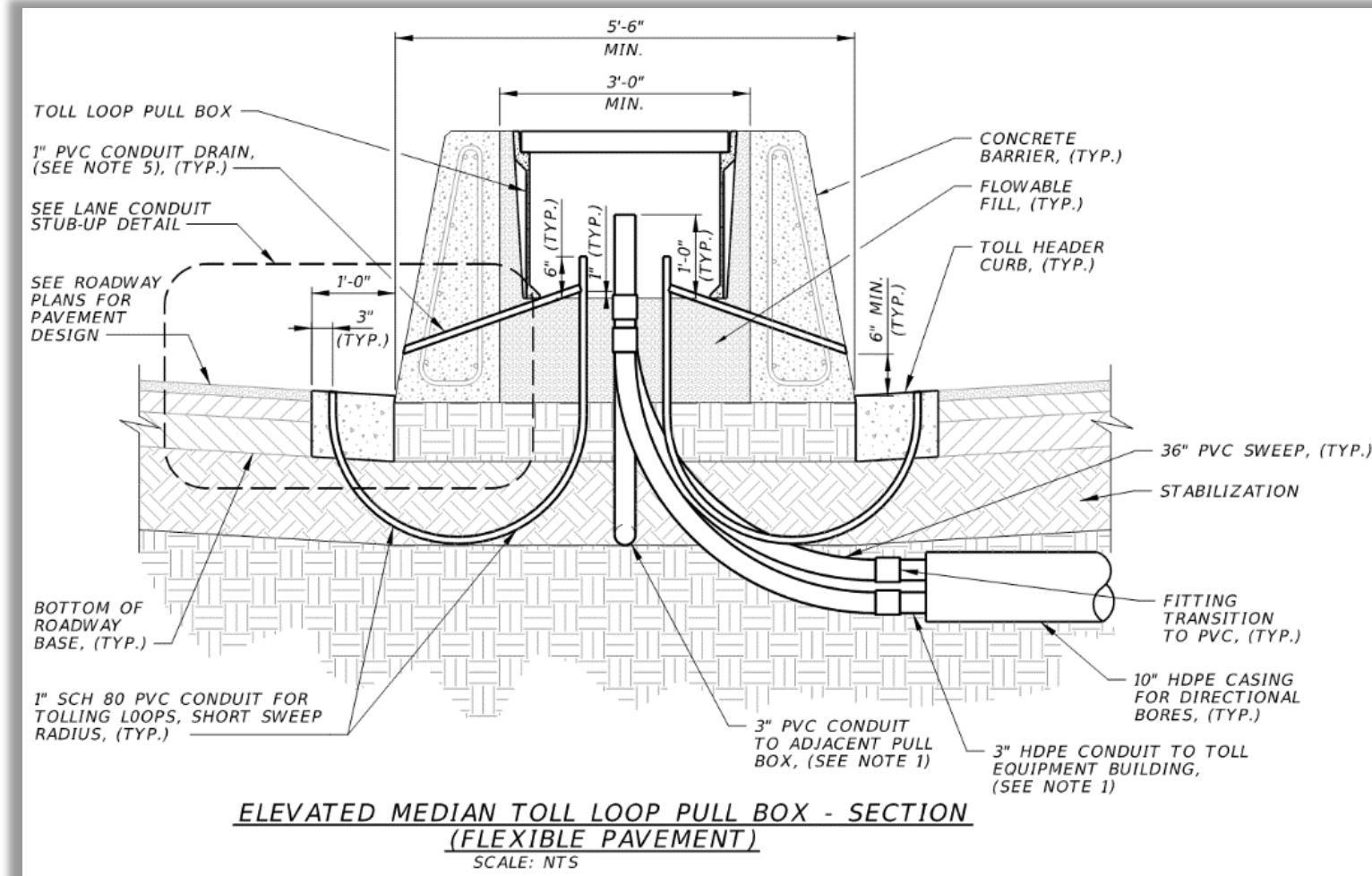
- Toll site
- Toll Building (TEB)
- Toll gantry
- Communications
- Building permits
- Appendix -1 (TSP)



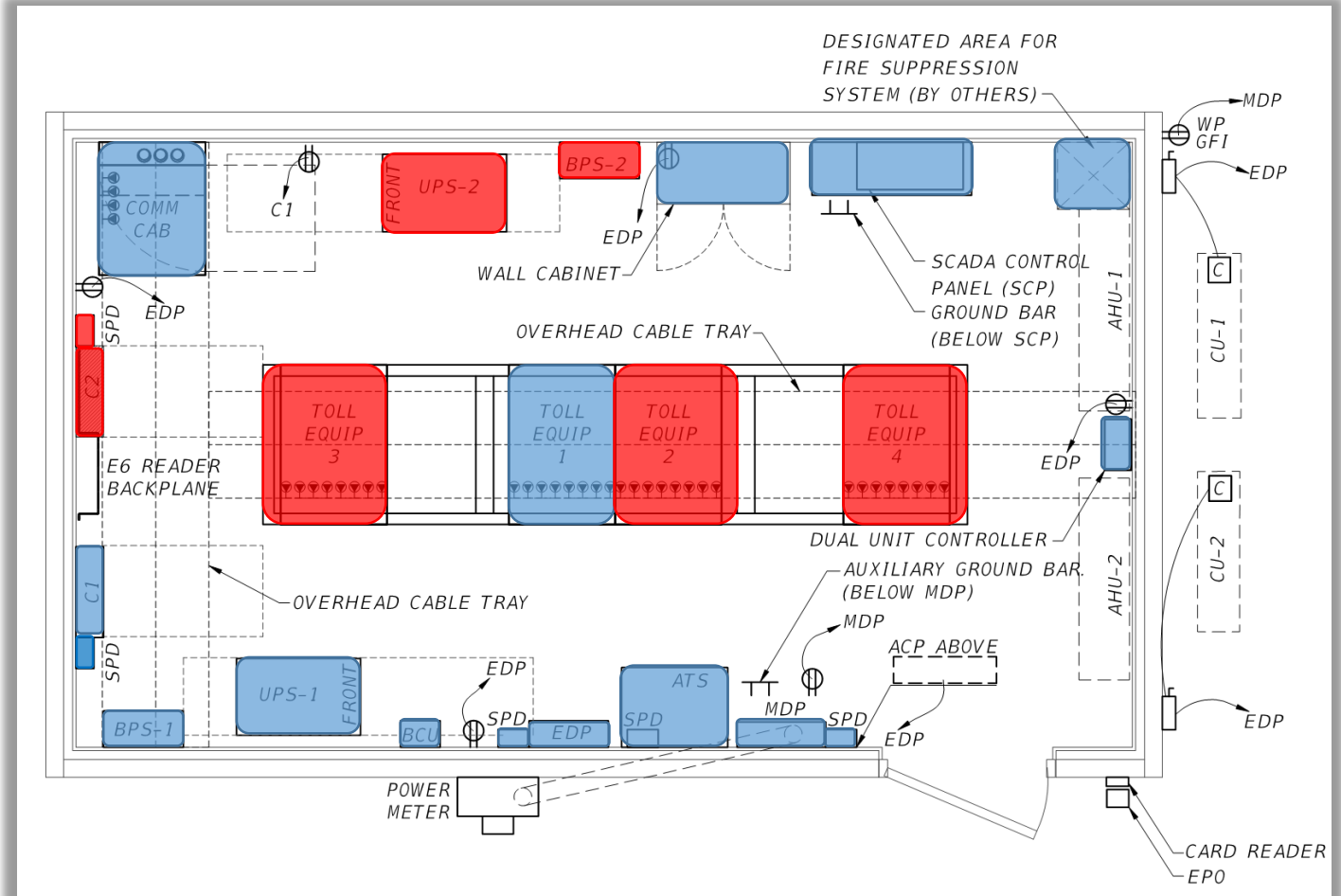
Part 2 – Design Criteria



Part 2 – Design Criteria



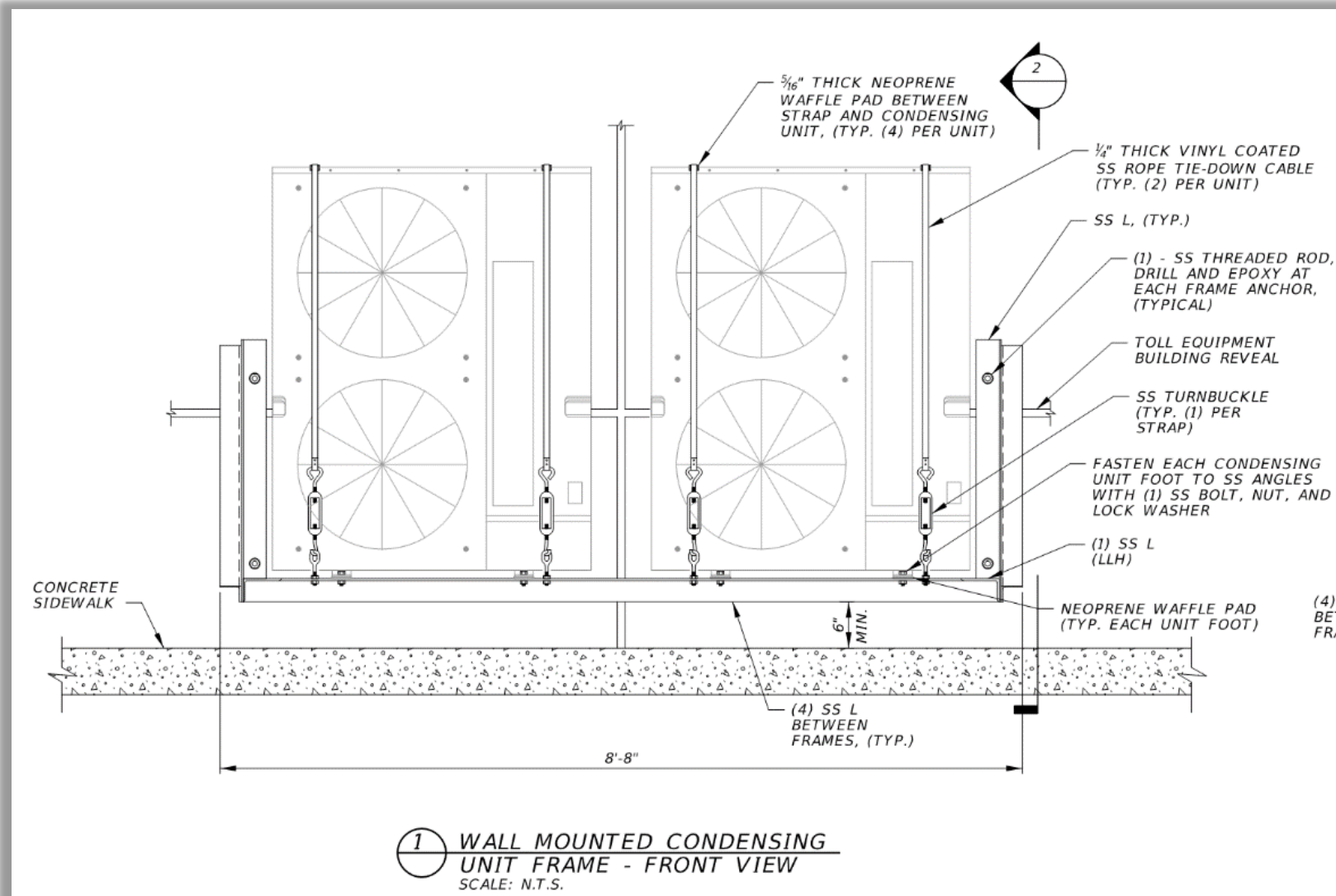
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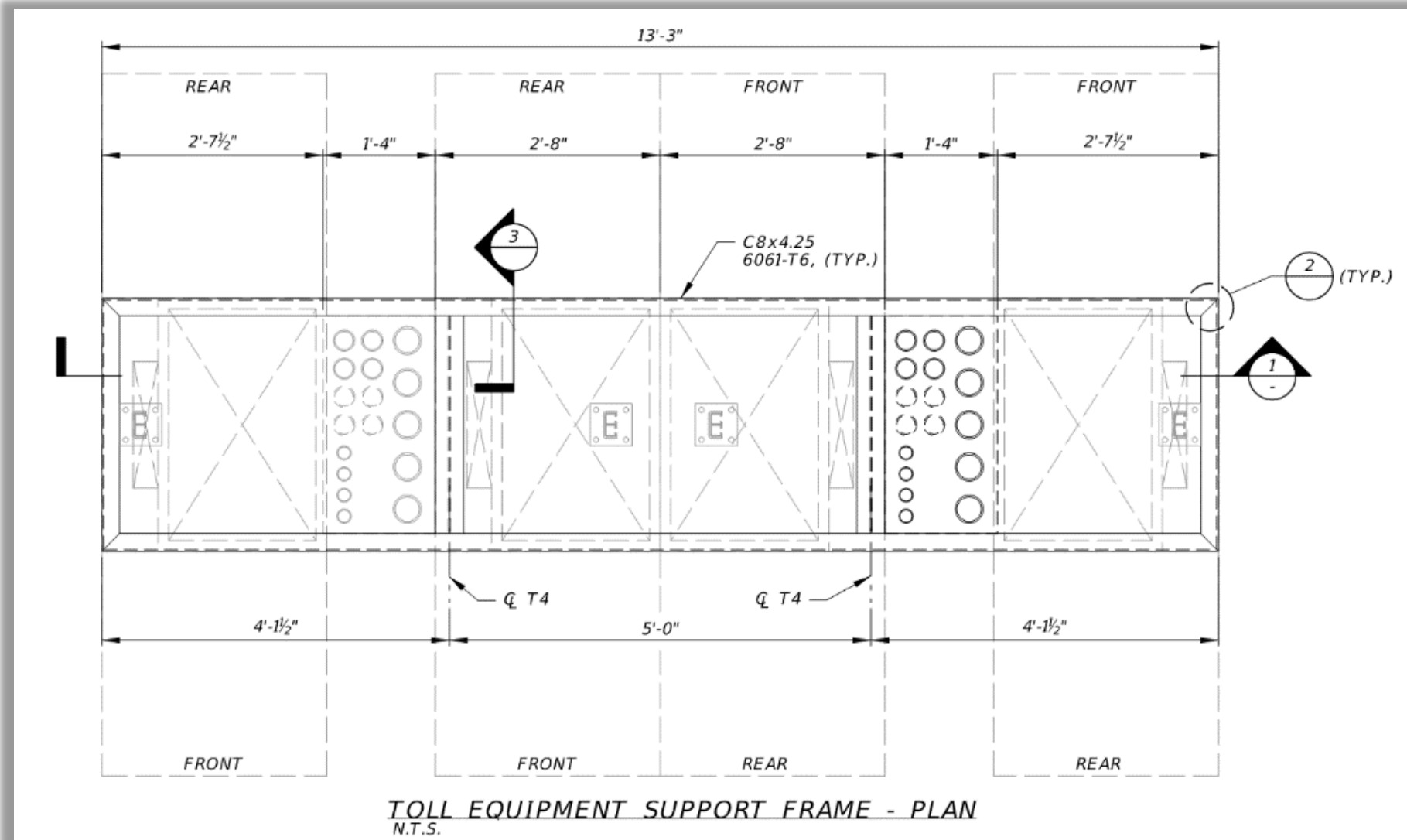
Part 2 – Design Criteria



Part 2 – Design Criteria



Part 2 – Design Criteria



Part 2 – Design Criteria

- Gantry types
 - Non-accessible
 - Cantilever
(Standard plans 700-040)
 - Span
(Standard plans 700-041)
 - Accessible



Part 2 – Design Criteria

- Gantry types
 - Non-accessible
 - Cantilever
(Standard plans 700-040)
 - Span
(Standard plans 700-041)
 - Accessible



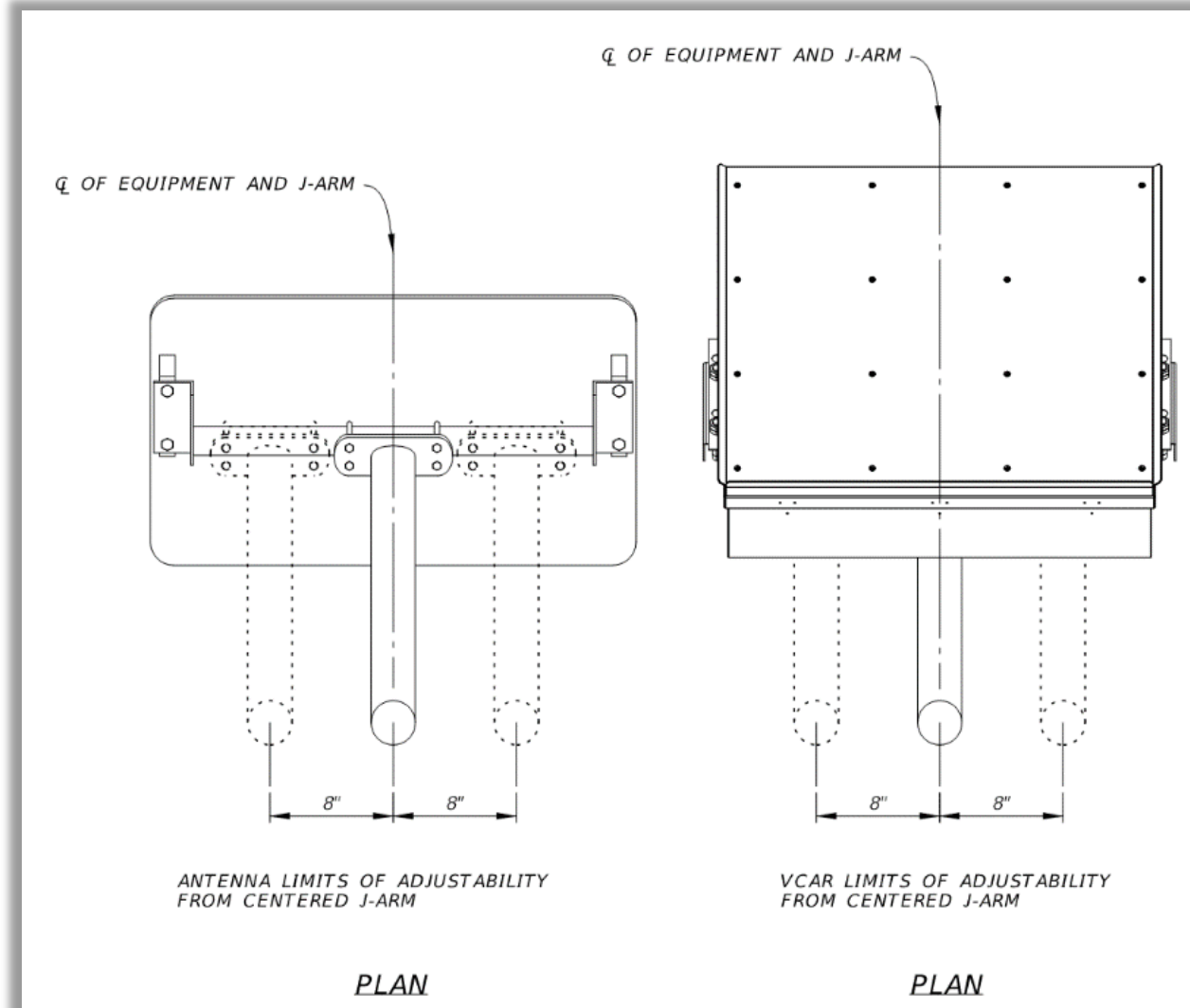
Part 2 – Design Criteria

- Gantry types
 - Non-accessible
 - Cantilever
(Standard plans 700-040)
 - Span
(Standard plans 700-041)
 - Accessible



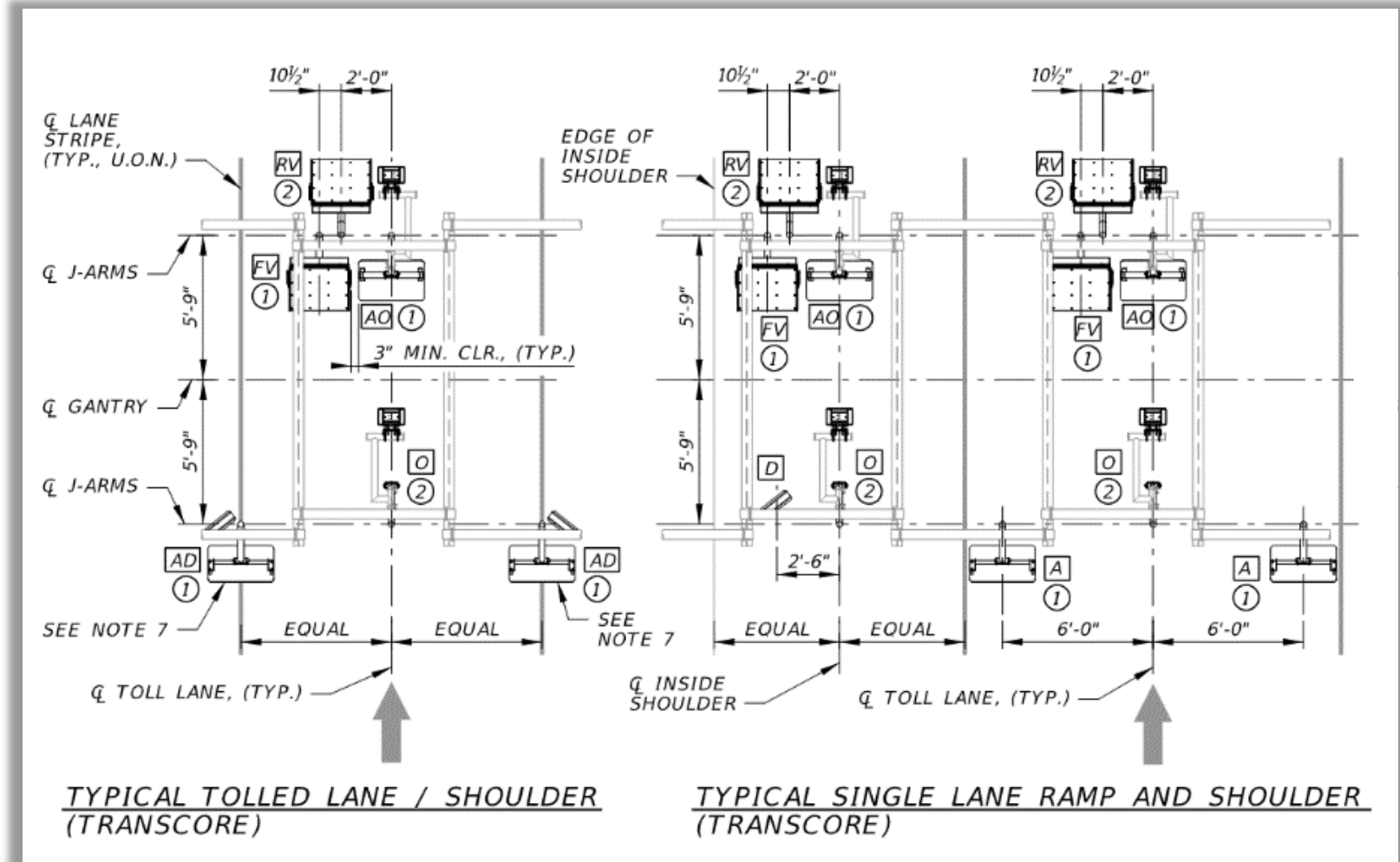
Part 2 – Design Criteria

- Toll equipment layout
 - Horizontal Adjustability



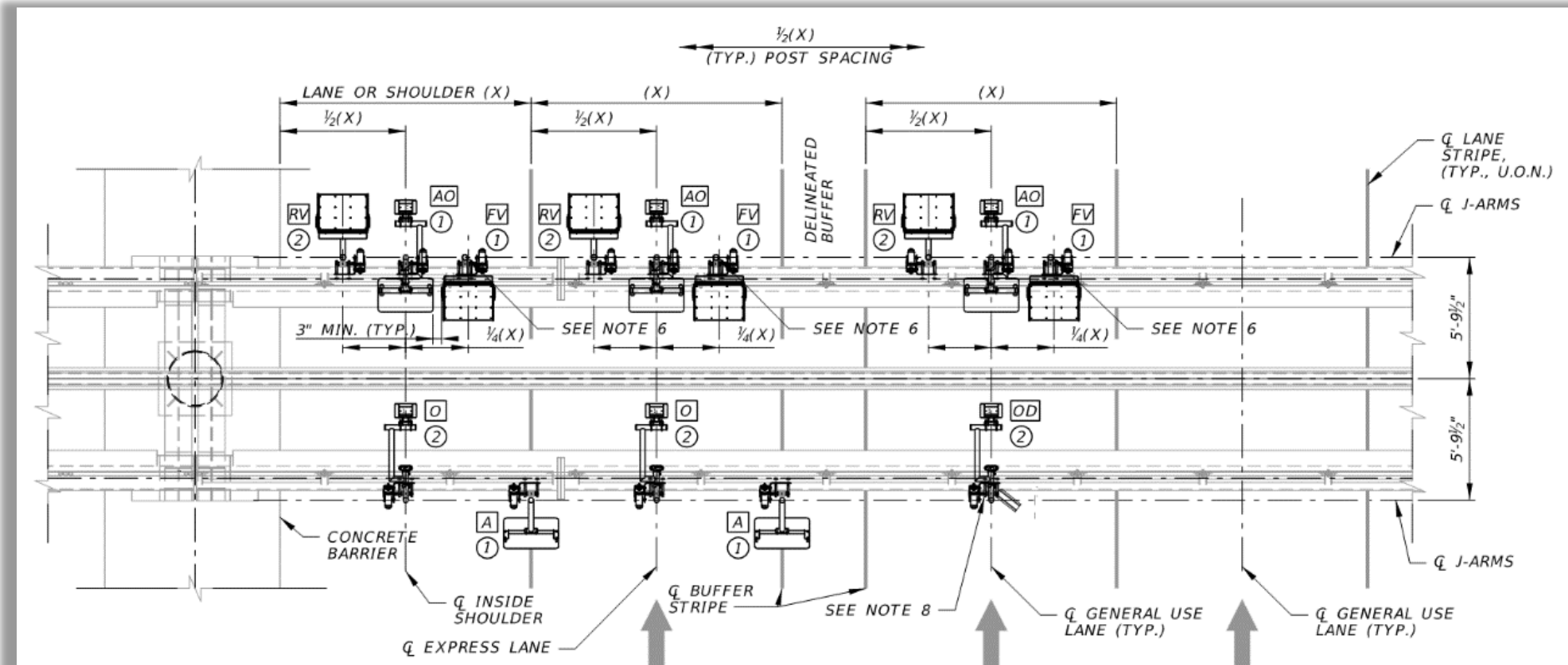
Part 2 – Design Criteria

- Toll equipment layout
 - Non-accessible



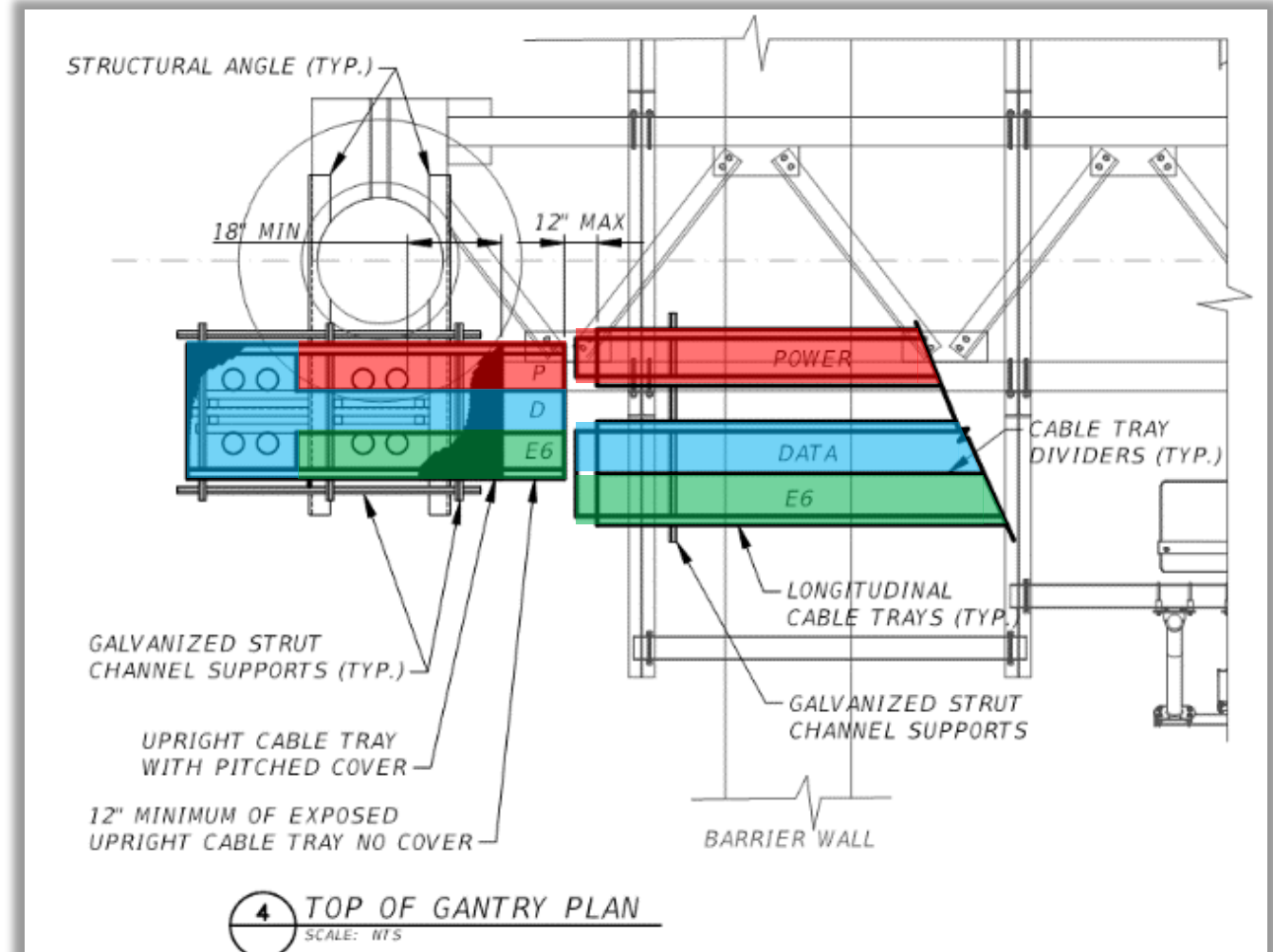
Part 2 – Design Criteria

- Toll equipment layout
 - Accessible



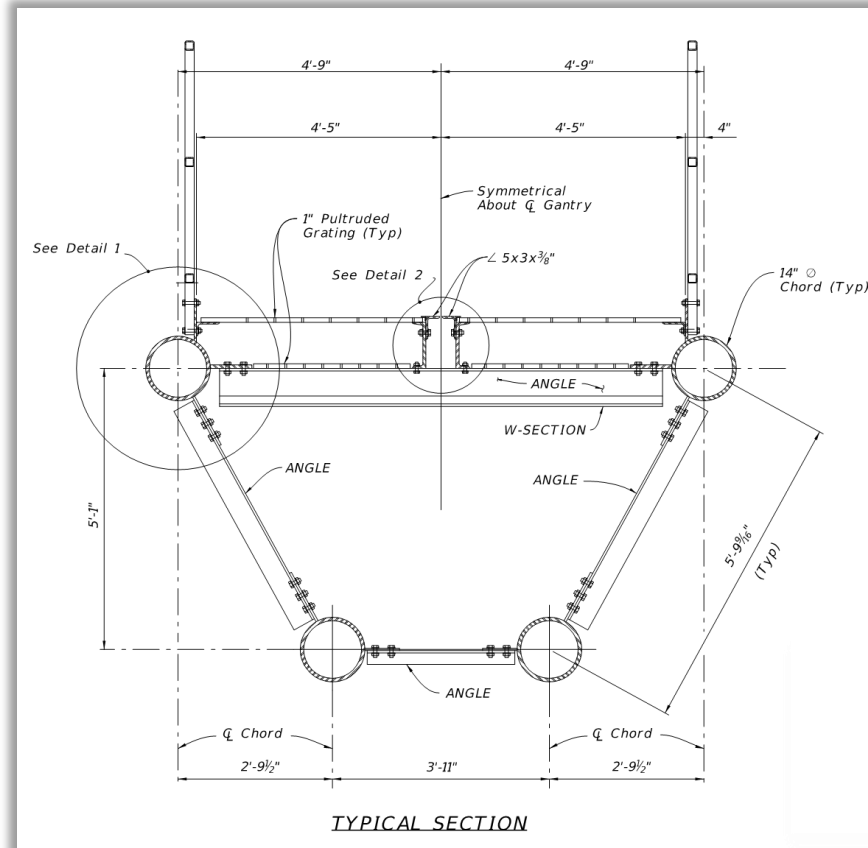
Part 2 – Design Criteria

- Gantry electrical
 - Non-accessible

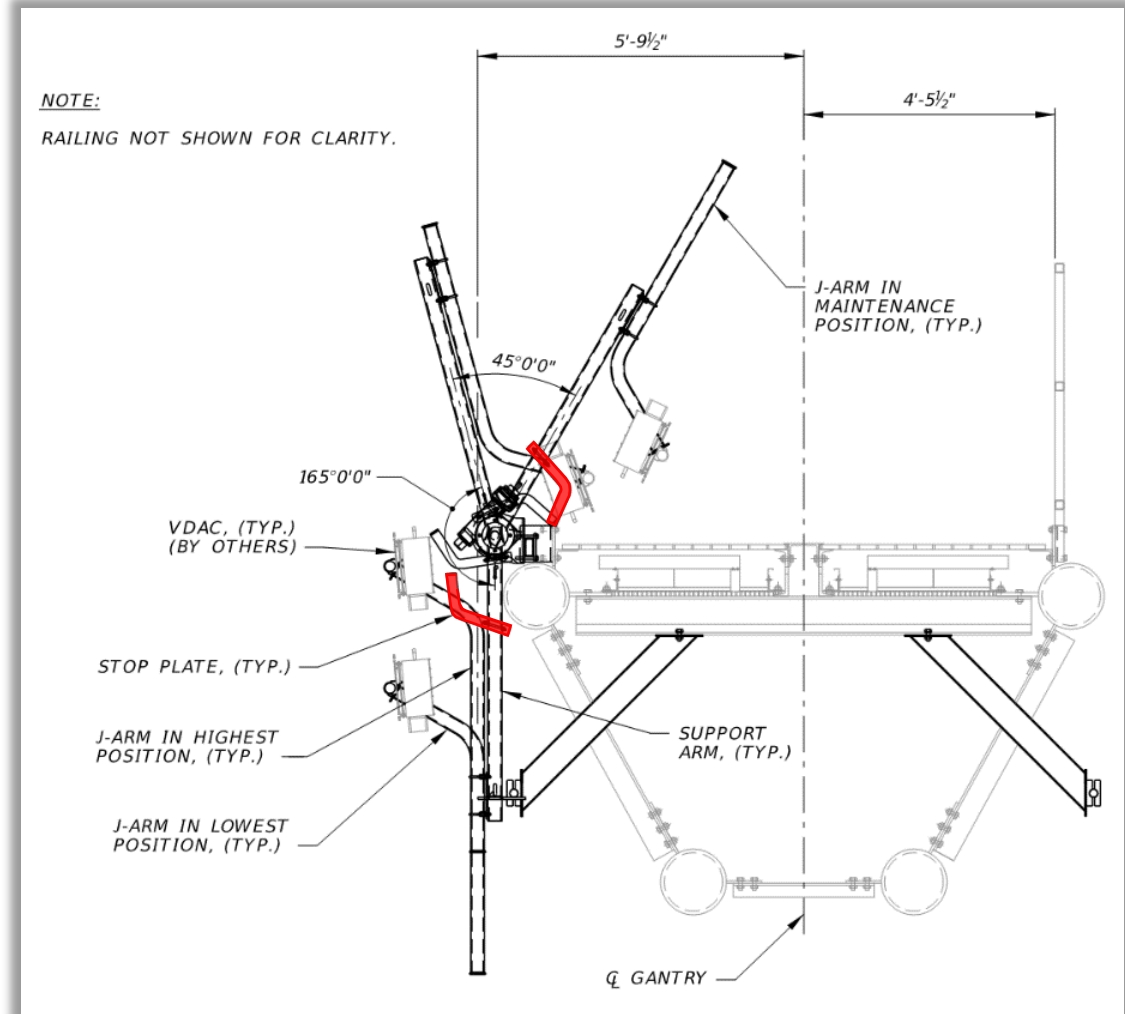
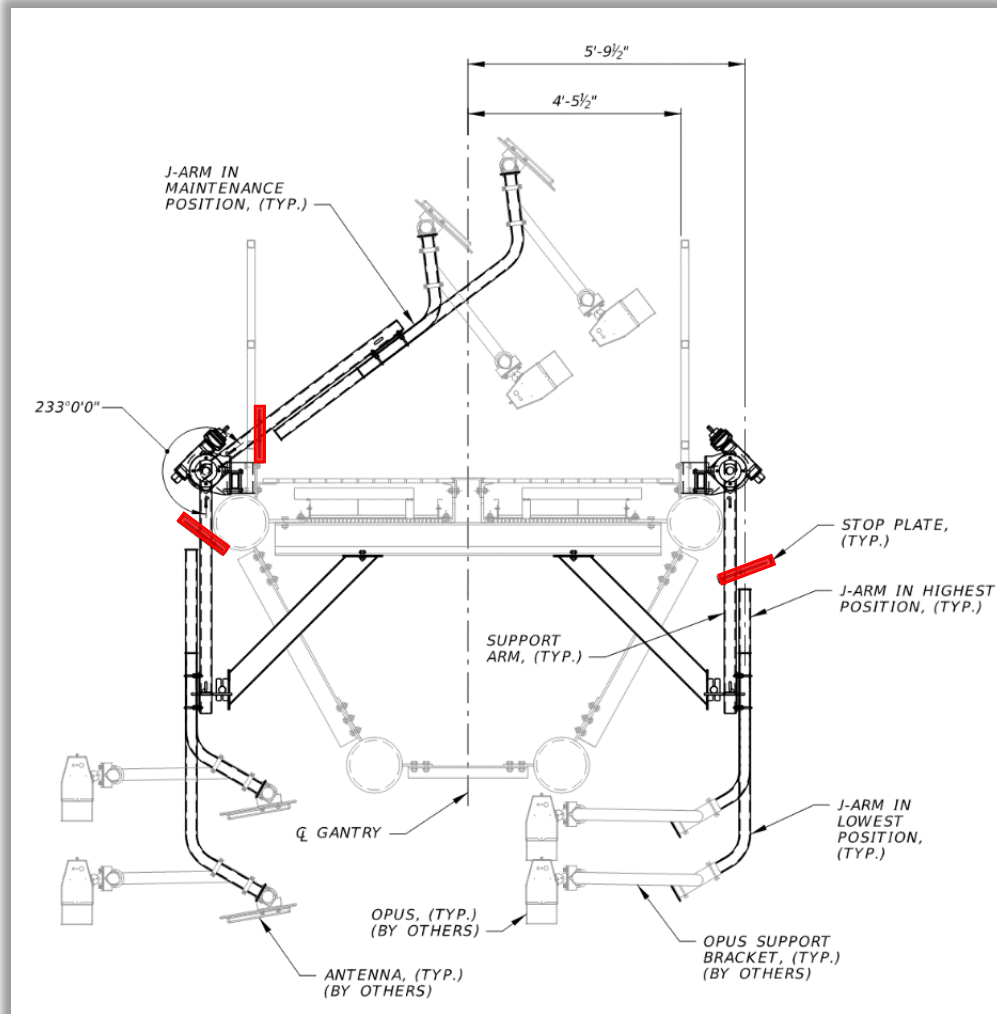


Part 2 – Design Criteria

- Gantry typical section
 - Accessible

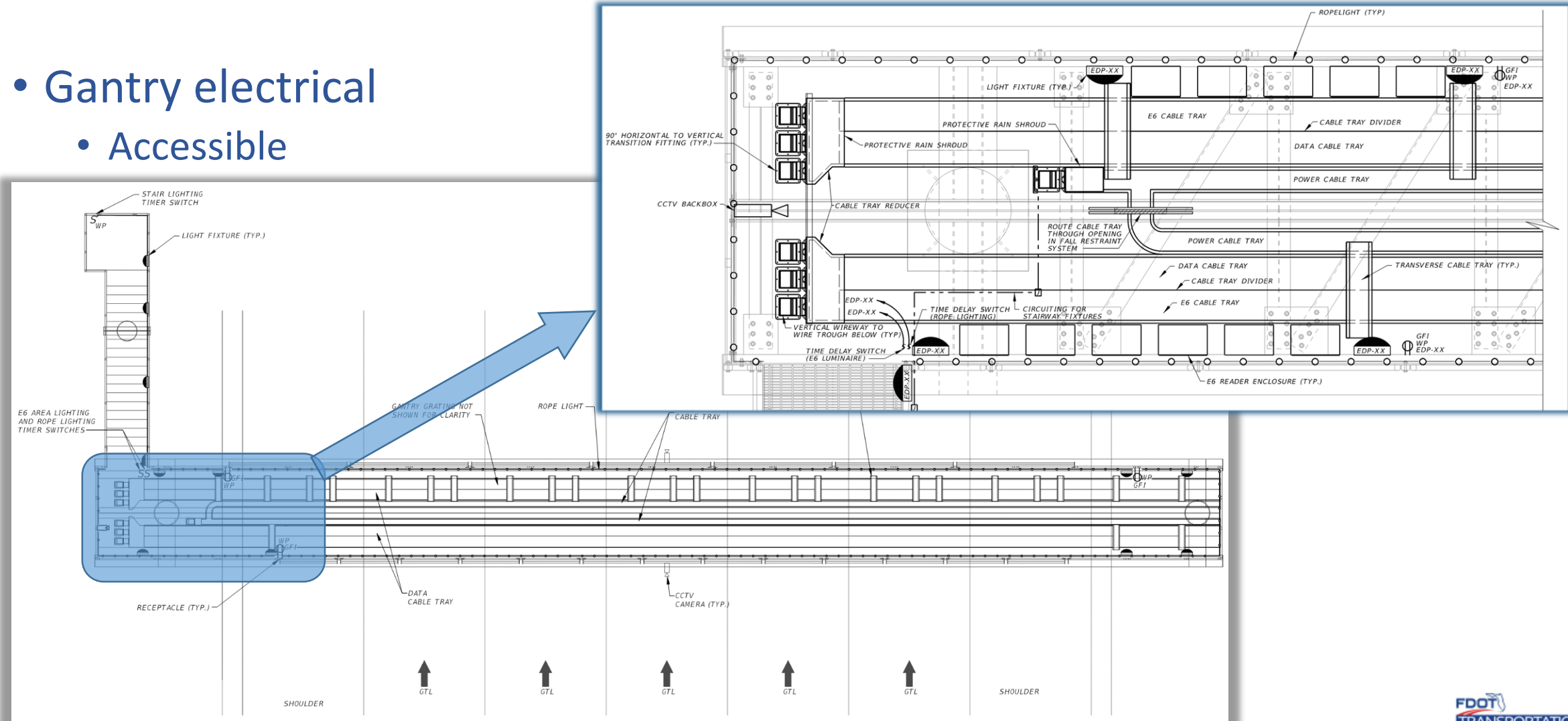


Part 2 – Design Criteria

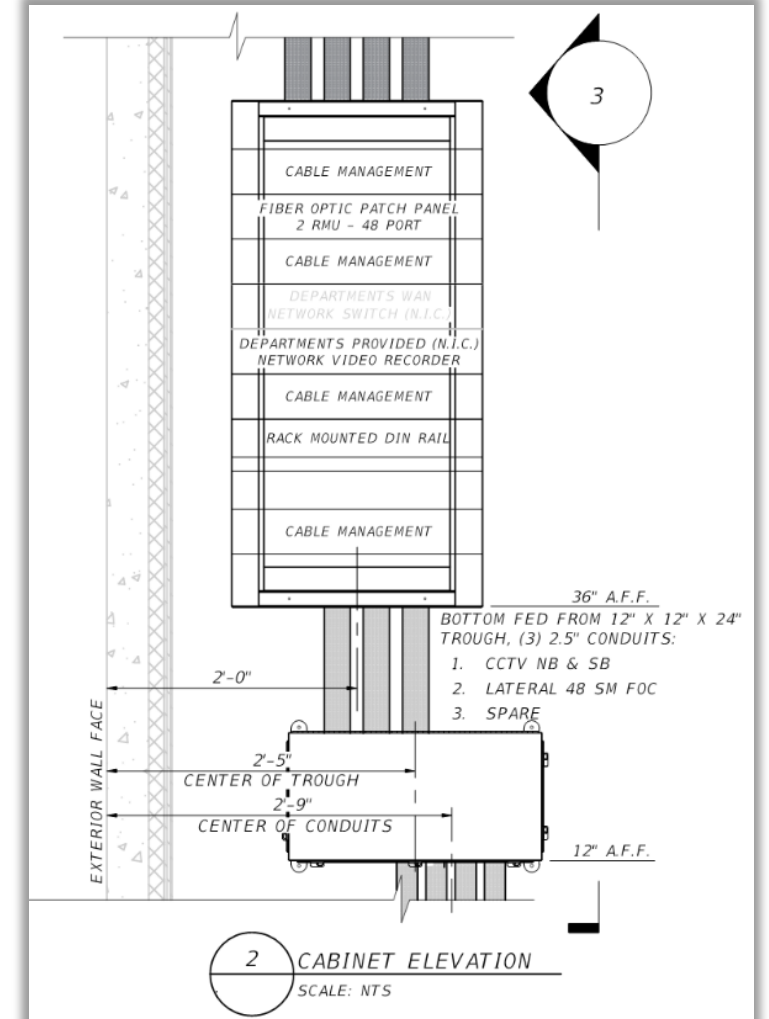
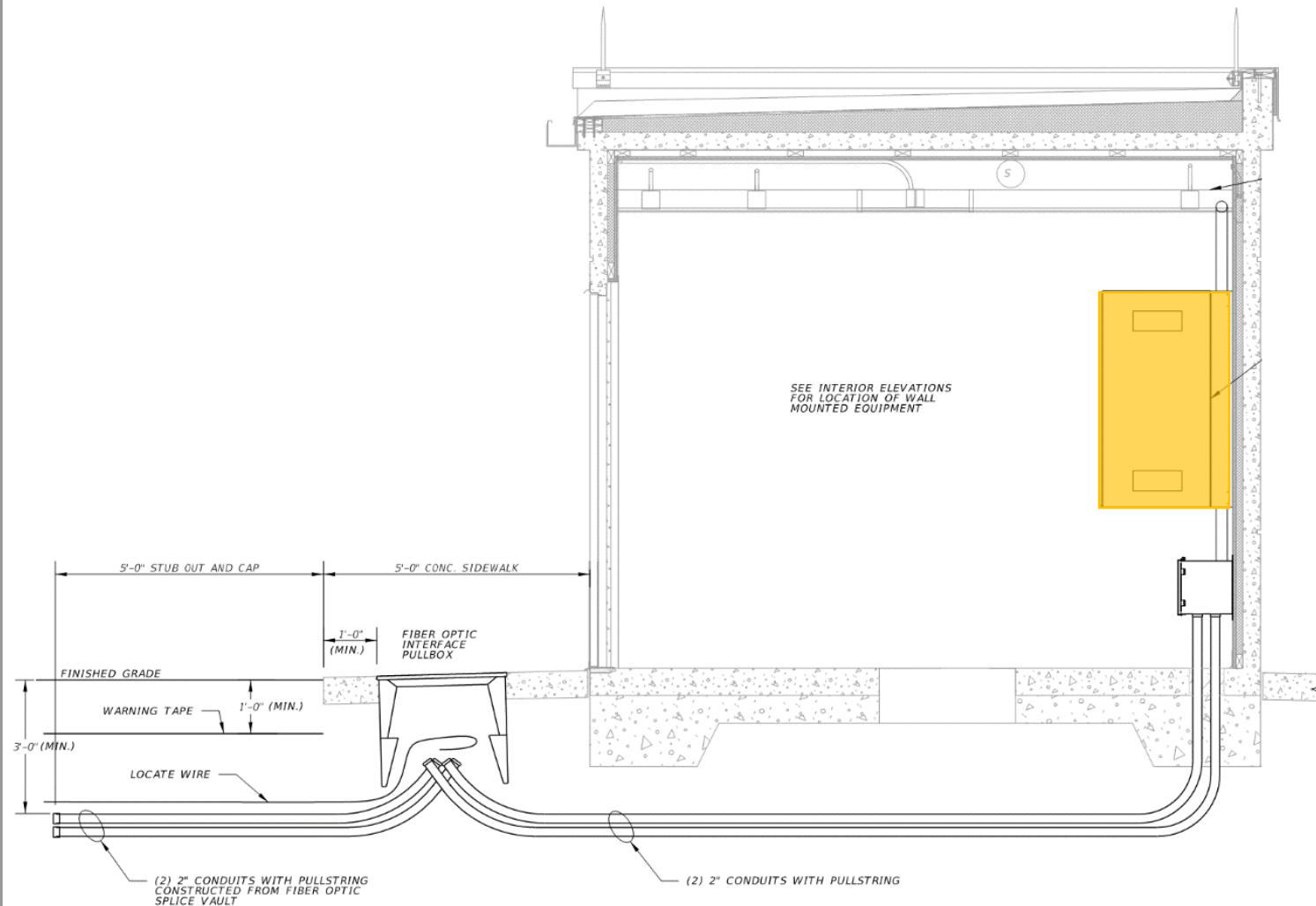


Part 2 – Design Criteria

- Gantry electrical
 - Accessible

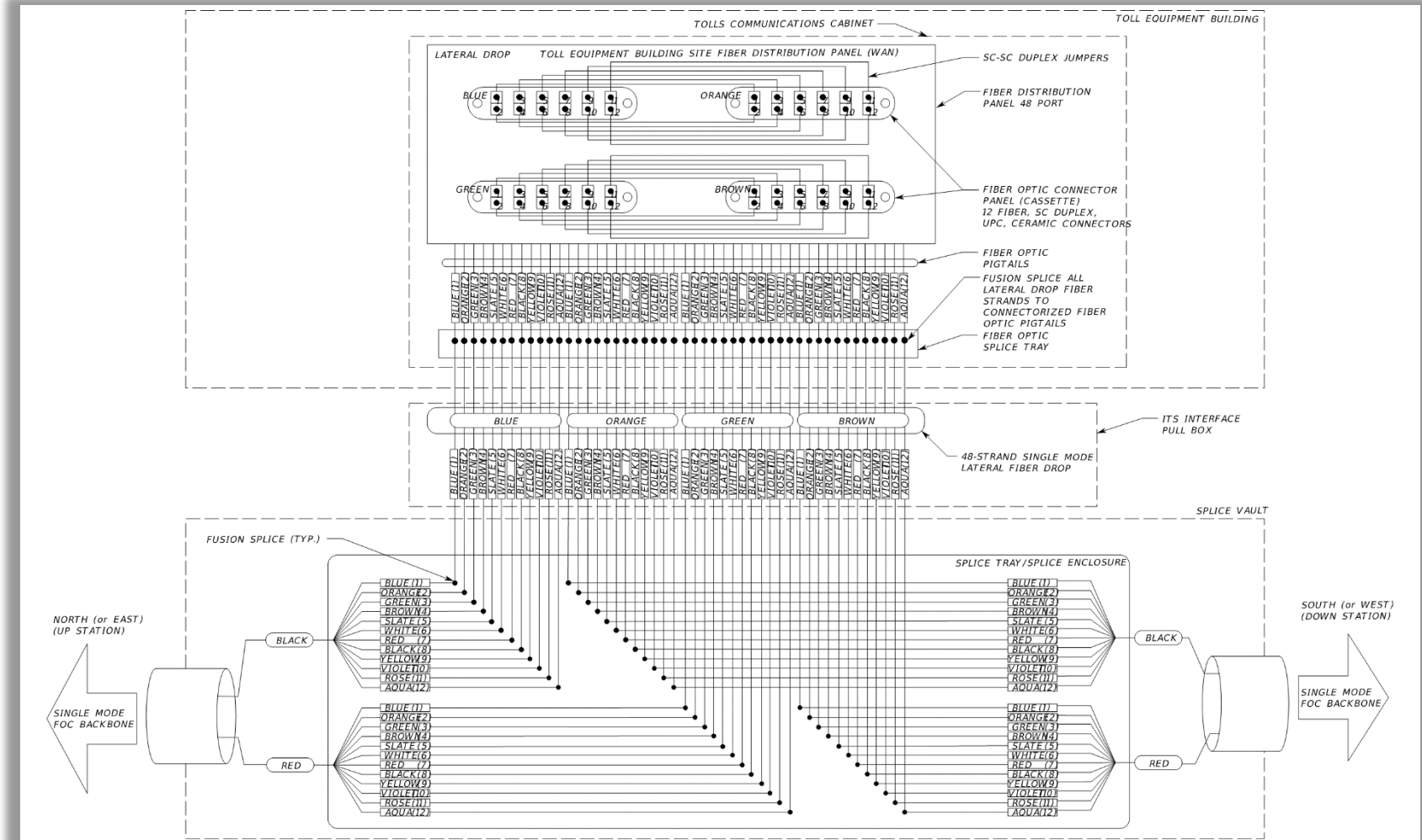


Part 2 – Design Criteria



Part 2 – Design Criteria

- Communications
 - Black and red buffer tubes (fusion spliced into each TEB)



Part 2 – Design Criteria

270 Building Permits

270.1 Introduction

- (1) FTE is authorized by the Florida Statutes to enforce the FBC for Toll Collection Facilities. FTE may issue its own building permits for toll collection facilities.
- (2) FTE applies for permits through local building departments having jurisdiction for any buildings that are not toll collection facilities.
- (3) State Fire Marshal will issue permits separately for toll collection facilities.

270.2 Building Code Administrator

FTE has acquired the services of a Building Code Administrator (BCA) to perform permitting services for toll collection facilities.

270.3 Building Permit Coordinator

- (1) FTE has a Building Permit Coordinator who is the liaison to the Building Code Administrator.
- (2) The Building Permit Coordinator's shipping information is:
Mr. John Provost-Heron
Building Permit Coordinator

Part 2 – Instructions to Contractor

- Technical Special Provision (TSP)
 - Provided for EOR
 - Part 2 – Appendix - 1
 - Civil
 - Structural
 - Architectural
 - Mechanical
 - Electrical
- Shop Drawings
 - Included in each TSP section



Part 3 – Plans Production

- Toll submittal requirements
 - Conventional
 - Non-conventional

300 Toll Submittal Requirements

300.1 General

- (1) The Toll Facility Plans component is comprised of a series of sub-component plan sets. Each sub-component plan set must be prepared as described herein.
- (2) Each sub-component plan set includes a key sheet with the sub-component index of sheets.
- (3) A Google Earth ready KMZ/KML file must be prepared and submitted to FTE with each toll project. The file must have both existing and proposed information for each discipline. KMZ/KML files must be created in the format described in FTE's KMZ Deliverable Standards, which is located at:
<http://www.floridasturnpike.com/design/disciplines/roadway.html>
- (4) The requirements provided in **GTR Part 3** and the **FDOT** CADD Manual form the basis for contract plans format and assembly.
- (5) When integrated 3D models are required, the Toll Site must be fully integrated into the adjacent roadway model.
- (6) **GTR Part 3** includes additional requirements for assembly of toll facility related TSP section updates and calculations.
- (7) Prerequisites
 - (a) The Preliminary TSTM for the preferred alternative must be developed during the PD&E.
 - (b) The Draft TSTM must be developed from the Preliminary TSTM during 15% Line and Grade development.
 - (c) All outstanding comments must be resolved in the Final TSTM and accepted by FTE Tolls Design prior to Phase II submittal.
 - (d) All GTR deviations must be approved by FTE Tolls Design prior to Phase III submittal.

Modification for Non-Conventional Projects:

Delete **items (a), (b), (c), and (d)** above and replace with the following:

- (a) The Final TSTM is developed during RFP Development phase.
- (b) A revised Final TSTM is required where identified in **GTR 202**.
- (c) All GTR deviations must be approved by FTE Tolls Design prior to 90% plans submittal.

Part 3 – Plans Production

- Master plans
 - **Master key sheet**
 - Signature sheet(s)
 - Toll site location map

TOLL FACILITIES PLANS SUBCOMPONENTS

TOLL FACILITIES DEMOLITION PLANS
TOLL FACILITIES SITE PLANS
TOLL FACILITIES BUILDING PLANS
TOLL FACILITIES GANTRY PLANS

A DETAILED INDEX APPEARS ON
THE KEY SHEET OF EACH SUBCOMPONENT

INDEX OF TOLL FACILITIES MASTER PLANS

SHEET NO.	SHEET DESCRIPTION
TF-001	Toll Facilities Master Key Sheet
TF-002	Toll Facilities Master Signature Sheet (Not Included)
TF-003	Toll Site Location Map

APPLICABLE DESIGN STANDARDS:

GOVERNING STANDARDS AND TOLLING CRITERIA:
GENERAL TOLLING REQUIREMENTS (GTR) DATED 2018
AS AMENDED BY CONTRACT DOCUMENTS.

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

CONTRACT PLANS

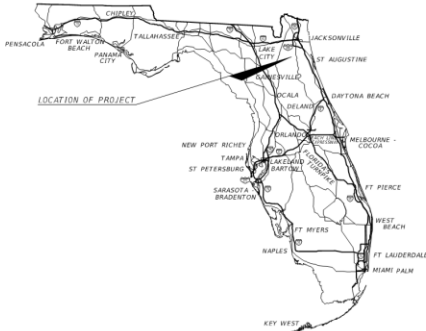
FINANCIAL PROJECT ID _____
(_____)

____ COUNTY (____)

STATE ROAD NO. ____

PROJECT DESCRIPTION WITH PROJECT LIMITS AND MILEPOST LIMITS

TOLL FACILITIES PLANS



LOCATION OF PROJECT

TOLL FACILITY PLANS
ENGINEER OF RECORD:

FDOT PROJECT MANAGER:

KEY SHEET REVISIONS

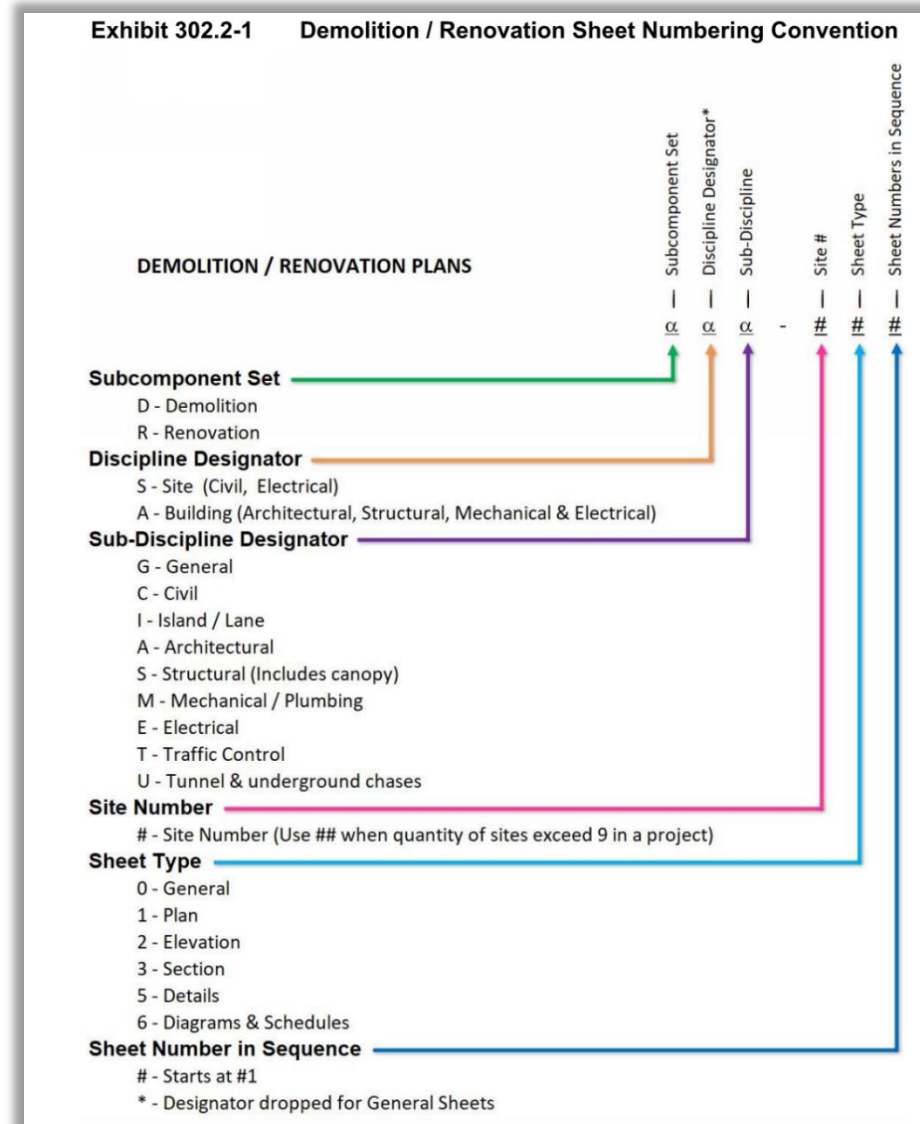
DATE	DESCRIPTION

CONSTRUCTION CONTRACT NO.	FISCAL YEAR	DRAWING NO.	SHEET NO.
XXXXX	XX	TF-001	1

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

Part 3 – Plans Production

- Subcomponents
 - Toll facility demolition plans
 - Toll facility site plans
 - Toll facility building plans
 - Toll facility gantry plans



Part 3 – Plans Production

- Subcomponents
 - Toll facility demolition plans
 - Toll facility site plans
 - Toll facility building plans
 - Toll facility gantry plans

Sheet No.	Sheet Description
DG-101	KEY SHEET
DG-102	GENERAL NOTES, LEGEND, AND PAY ITEMS – SITE 1
DSC-101	ABBREVIATIONS, SYMBOLS, AND DEMOLITION NOTES – SITE 1
DSC-111	OVERALL SITE DEMOLITION / RENOVATION PLAN – SITE 1
DSC-11#	SITE GRADING PLAN(S) – SITE 1
DST-11#	SITE CIVIL DEMOLITION / RENOVATION PLAN(S) PHASE #
DSE-11#	SITE ELECTRICAL DEMOLITION / RENOVATION PLAN(S) PHASE #
DSI-11#	ISLAND / LANE DEMOLITION / RENOVATION PLAN(S) PHASE #
DSM-11#	ISLAND / LANE MECHANICAL / PLUMBING DEMOLITION / RENOVATION PLAN(S) PHASE #
DSE-11#	ISLAND / LANE ELECTRICAL DEMOLITION / RENOVATION PLAN(S) PHASE #
DST-12#	CANOPY DEMOLITION / RENOVATION ELEVATION(S) PHASE #
DSI-13#	ISLAND / LANE DEMOLITION / RENOVATION SECTION(S)
DSS-15#	CANOPY DEMOLITION / RENOVATION DETAIL(S)
DAU-11#	OVERALL TUNNEL DEMOLITION / RENOVATION PLAN(S) (Structural) (Includes phased demolition of Structural and temporary shoring to support MOT phasing) – SITE 1
DAU-11#	OVERALL TUNNEL DEMOLITION / RENOVATION PLAN(S) (Mechanical / Plumbing) (Includes phased demolition of Mechanical and Plumbing systems to support MOT phasing) – SITE 1
DAU-11#	OVERALL TUNNEL DEMOLITION / RENOVATION PLAN(S) (Electrical) (Includes phased demolition of Electrical systems to support MOT phasing) – SITE 1
DAA-11#	BUILDING ARCHITECTURAL DEMOLITION / RENOVATION FLOOR PLAN(S)
DAS-11#	BUILDING STRUCTURAL DEMOLITION / RENOVATION FLOOR PLAN(S)

Part 3 – Plans Production

- Phase submittals
 - Conventional
 - Non-conventional

Exhibit 303.1-1 Summary of Phase Submittals for Conventional Projects

Provide the listed sub-component sets as applicable:

ITEM	PHASE I	PHASE II	PHASE III	PHASE IV
Toll facility plans				
Master key sheet and sub-component key sheets	P	P	C	F
Demolition / Renovation		P	C	F
Site civil	P	P	C	F
Site electrical	P	P	C	F
Architectural (building)	P	P	C	F
Structural (building)		P	C	F
Mechanical / plumbing (building)		P	C	F
Electrical (building)		P	C	F
Structural (non-accessible / accessible gantry)	P	P	C	F
Electrical (non-accessible / accessible gantry)		P	C	F
Engineer's Estimate		P	C	F
Design analysis reports (mechanical and electrical)		P	C	F
KMZ/KML files- civil, electrical, utility / communications. (site plans)		P	C	F
Technical Special Provision sections		P	C	F
Modified Special Provision(s)		P	C	F
Toll Siting Technical Memorandum	See GTR 300.1			

Status Key:

P – Preliminary

C – Complete but subject to change

F – Final

Part 3 – Plans Production

- Phase submittals
 - Conventional
 - Non-conventional

Exhibit 304.1-1 Summary of Phase Submittals for Non-Conventional Projects

Provide the listed sub-component sets as applicable:

ITEM	TECHNICAL PROPOSAL	90% PLANS	FINAL PLANS
Toll facility plans			
Master key sheet and sub-component key sheets	P	C	F
Demolition		P	F
Site civil	P	C	F
Site electrical	P	C	F
Architectural (building plans)	P	C	F
Structural (building plans)		C	F
Mechanical / plumbing (building plans)		C	F
Electrical (building plans)		C	F
Structural (non-accessible / accessible gantry)	P	C	F
Electrical (non-accessible / accessible gantry)		C	F
Schedule of Values		C	F
Design analysis reports (mechanical and electrical)		C	F
KMZ/KML files - civil, electrical, utility / communication (site plans)	P	C	F
Technical Special Provision sections	P	C	F
Modified Special Provision(s)		C	F

Status Key:

P – Preliminary

C – Complete but subject to change

F – Final

Part 3 – Plans Production

- Design analysis reports
 - Mechanical
 - Building load analysis and equipment selection
 - Fuel oil piping
 - Electrical
 - Power design
 - Short circuit calculations
 - Electrical distribution
 - Generator sizing
 - Photometric calculations



Part 3 – Plans Production

- Pay items
 - Each toll site (lump sum) per Basis of Estimates (BOE)
 - New construction – Toll plaza
 - Modify existing or phased demolition – Toll plaza (Modify existing)
 - Toll plaza island / lane work – Toll plaza island
 - Toll site demolition – Clearing and grubbing

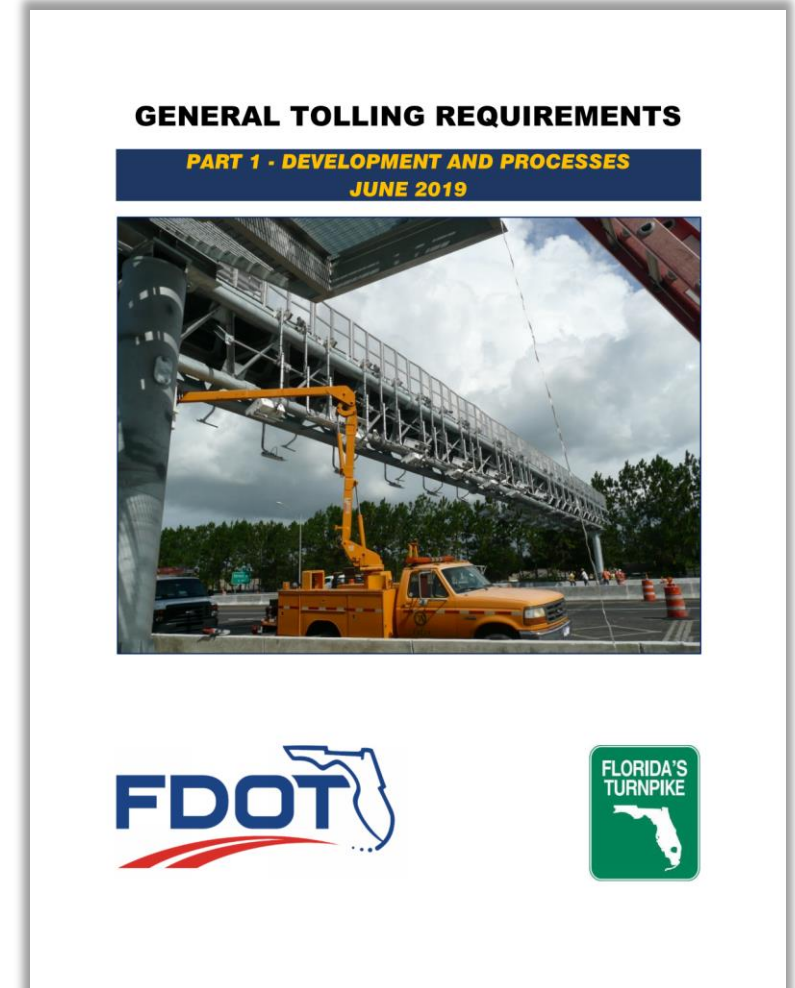


Part 3 – Plans Production

- Roadway pay items not included in the Toll's lump sum pay item
 - Roadway pavement
 - Concrete barriers
 - Guardrail
 - Sodding
 - Traffic control
 - Retaining walls (any type)
 - CIAC for primary power
 - Removal pavement, sidewalks, slabs, etc.
 - Delivery of salvageable materials
 - Flowable fill

How to obtain the GTR and related documents?

- GTR (redacted)
- TSTM template
- GTR deviation form
- EOR estimates template
- External website:
 - <http://www.floridasturnpike.com/design.html>



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