

# SECTION 11

## FACILITY BUILDINGS / TOLL PLAZAS

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## **SECTION 11**

### **FACILITY BUILDINGS / TOLL PLAZAS**

#### **11.1 GENERAL**

This section addresses the design and construction of the various facility buildings and toll plazas on the New Jersey Turnpike and Garden State Parkway.

The buildings addressed are the maintenance district buildings, utility buildings at the toll plazas, salt storage domes, and other secondary buildings. Providing guidance for the planning and construction of these various buildings shall assist the Authority in standardization of facilities throughout the system.

The toll plaza is a facility built to collect tolls on the New Jersey Turnpike and Garden State Parkway. It typically consists of the toll plaza area formed of islands, toll booths, pavement, tunnel and canopy. Adjacent to the plaza is the utility building which is built to house the toll collectors and equipment necessary to process tolls in a secure environment. For all new plazas, a tunnel usually connects the utility building to the toll booths located on the islands. A parking lot or parking area is typically required for the toll collector's vehicles as well as maintenance or state police vehicles.

Since an Architect is generally employed by the Authority for the design or renovation of the toll building, close design coordination between the Architect and Engineer is required and the limits of responsibility for each must be clearly defined. Many of the design responsibilities are outlined in the following Subsections. A sample "Coordination of Work" is attached at the end of this section. A similar listing shall be developed during Phase "A" of each project as an aid in the coordination of the many contracts that will be prepared.

#### **11.2 DEPARTMENT OF COMMUNITY AFFAIRS PROCEDURES**

All buildings and toll plazas must have their design documents submitted to the Department of Community Affairs, Division of Codes and Standards, Bureau of Construction Project Review, commonly identified as the DCA. All portions of habitable buildings, as well as the toll plaza tunnels, stairways, railings, access and egress, toll booths and toll plaza canopies must be designed in conformance with the currently adopted codes.

The adopted Code and Sub-codes for work on Authority facilities are as follows:

Code: New Jersey Uniform Construction Code, UCC (NJAC 5:23)

Sub-codes: International Building Code, IBC – New Jersey Edition  
National Electric Code, NEC  
National Standard Plumbing Code, NSPC  
International Mechanical Code, IMC  
International Fuel Gas Code, IFGC  
Rehabilitation, UCC 5:23-6

Barrier Free, UCC 5:23-7 and ANSI A117.1  
Elevator, ASME A17.1  
Energy ASHRAE 90.1

In addition to those listed above, other ancillary Sub-codes may be needed for specialized work and construction. The Engineer shall contact the DCA to verify the currently adopted Code and Sub-codes for the work being designed at the time of the design. Currently adopted codes can be found at:

<http://www.nj.gov/dca/codes>.

Special design standards are required for all renovation, rehabilitation, addition, and change of use projects. The Engineer and Architect shall coordinate with the DCA to determine these requirements during Phase "A" design.

Contract plans, specifications and design calculations for the building and toll plaza work must be submitted to the DCA for review and concurrence to ensure that the documents are in conformance with the codes. The documents must be signed and sealed, as appropriate, by a Professional Engineer or Architect Licensed in the State of New Jersey and should represent the final design, specifications and plans slated for construction. Instructions for submittal of design calculations, specifications and plans, along with the project review application and the fee schedule associated with the reviews can be found under Construction Project Review at:

<http://www.state.nj.us/njbusiness/license/permits/construct/forms.shtml>

Approval of the submission and any subsequent revisions will result in a release for construction.

The fee to the DCA, for review of the contract documents, will be paid by the Engineer or Architect and reimbursed by the Authority.

#### **11.2.1 DCA Submission Schedule**

For most design-bid-build contracts, a complete plan release should be requested. This entails a complete submission of all plans, specifications, design calculations and fees for review by the DCA at one time after the design is complete. Since the portion of the contract affected by DCA procedures must be basically complete for this type of submission, the Phase "C" submission date is the latest date for initial submittal to the DCA. The DCA has a period of 20 working days from the date the submission is accepted to review and comment on the initial submittal. Subsequent submittals for corrections or revisions will be reviewed within a period of 7 working days from the date the subsequent submission is accepted. Several review cycles are often required.

If partial plan releases are requested on projects that require construction of elements before the entire project is designed, such as design-build projects, then each element of submission will have its own 20 working day review period. The fee for the entire project must be submitted with the initial elements along with a schedule of anticipated submission dates for the

remainder of elements to be reviewed. The Engineer or Architect shall submit the required record copies and request at least one (1) signed and sealed approved copy from the DCA for record purposes. Once plans are complete, permits shall be coordinated by the Contractor.

If any standard drawings are required to be submitted to the DCA for review, the Authority's Engineering Department will forward signed and sealed copies to the Engineer or Architect upon request.

### **11.3 FACILITY BUILDINGS**

The facility buildings addressed include district maintenance buildings, utility buildings at the toll plazas, salt domes and other secondary types of facility buildings.

#### **11.3.1 District Maintenance Buildings**

1. The district maintenance buildings are usually designed and constructed as a separate contract with an Architect as the lead for building design and a Civil Engineer for the site work. The buildings shall comply with the DCA procedures as written in Subsection 11.2.
2. The design of a new district maintenance building shall follow the directions given in Subsection 11.4.5 as an overall planning program for the work to be accomplished.
3. Room sizes, locations, equipment, storage capacity and materials for the building shall be discussed with the representatives of the Authority's Maintenance Division during Phase "A" of the design process so that recommendations can be established before final design and plan preparation.

The district maintenance building shall be a one story facility with the following rooms and facilities subject to the Authority's Maintenance Department approval:

- 2 Supervisor's offices
- Separate Men and Women Restrooms/ Locker Rooms/ Bunk Rooms
- Lunch Room with cooking facilities
- Stock & Inventory Room w/ Maintenance Record Clerk office within
- Mechanic's Room
- Mechanical Room with Secure Storage Area
- Network Equipment Room
- Janitor's Closet
- Garage Bays, number and size to be determined, includes exhaust removal system
- Vehicle Wash Area
- Intercom System
- Other security and communications systems as directed by the Authority

4. Site design for a maintenance building facility shall provide for the below listed items subject to the Authority's Maintenance Department approval:

- Tire Storage in a separate building (shed)
- Stand by Generator
- Tank Storage Area
- Ground Mounted Exterior Compressors with Interior Air Handling Units Fuel Facilities with Gasboy and Veeder-Root System
- Security System and Cameras compatible with the most recent approved systems
- Electric Diesel Heater Power Supply
- Covered Vehicle Storage Area
- Parking for Employees and Maintenance Vehicles
- Provisions for Stockpile Bins

### **11.3.2 Utility (Toll) Buildings**

For a complete discussion of the design parameters on the Utility Buildings, refer to Subsection 11.4.5.

### **11.3.3 Salt Storage Facilities**

1. These structures are constructed for the purpose of stockpiling de-icing material to be used in the ice and snow control program for the Authority. They are primarily located at the various Maintenance Districts for direct and quick access by maintenance forces throughout the length of the New Jersey Turnpike and Garden State Parkway.
2. The salt storage facilities shall conform to a high quality bulk storage structure as manufactured by Dome Corporation of North America, Saginaw, MI, or an approved equal. The structures shall be mounted on a 12 inch thick reinforced concrete retaining wall approximately 8 feet in height above the ground.
3. The Engineer or Architect shall discuss the parameters of the salt storage facility design and construction with the Authority's Maintenance Department during Phase "A" design to establish the size, storage capacity, number of entrances, electrical facilities and possible site condition aspects of the project.
4. All electrical work in the salt storage facilities shall be performed in conformance with the proper NEC code, the requirements of Subsections 7.4 and 7.5 in this Manual and be subject to review and inspection by the DCA.

### **11.3.4 Other Buildings**

Buildings for purposes other than those indicated above include but are not limited to, small communications shelters required for toll plaza systems, radio and microwave towers, and cellular phone installations. Before beginning design of these structures, the Engineer shall determine the specific requirements of the Authority's Engineering and Technology

Administrative Services (TAS) Departments, and prepare a preliminary design memo for the Phase "A" Submission for review by the Authority's Engineering Department.

## **11.4 TOLL PLAZAS**

### **11.4.1 Geometrics**

The toll plaza geometric design criteria presented herein describe the essential standards and policies for the design of a widened or new plaza. The criteria apply to the general type of plazas utilized by the Authority with a toll utility building on one side of a barrier type plaza with or without reversible lanes. Split toll plazas with the toll utility building in the median area between opposite direction roadways will be considered non-standard toll plazas and are to be addressed on an individual basis. The type of plaza to be used on a given project will be dictated by the Authority's Engineering Department.

#### **1. Design Speed**

The design speed for the toll plaza area varies from a stop condition at the booths to the controlling ramp or mainline design speed. Both horizontal and vertical geometry must be compatible with this variable design speed.

#### **2. Horizontal Alignment**

- a. Length - The desirable minimum half-length of the toll plaza area is 500 feet from the plaza centerline to either the ramp nose split or normal roadway width. The length of the toll plaza area is dependent upon the geometric controls of the site.
- b. Width - The plaza width is controlled by the number of lanes dictated by the Authority's Engineering Department.
- c. Configuration - Each standard plaza should taper symmetrically from the ramp nose to the end of the concrete toll plaza slab. Equal reverse curves are generally used for plaza edge geometry in order to attain such a taper.

Each split plaza shall be oriented such that the right edge of the lanes approaching the plaza is approximately tangent, thereby permitting traffic to disperse to its left, a more natural pattern. Similarly, the configuration of the lanes leaving the plaza shall also encourage the natural merge left pattern.

#### **3. Vertical Alignment**

- a. Grades - An initial negative 0.5 percent grade away from the plaza centerline for about 200 feet is required for all plazas. It is desirable that relatively flat grades (2 percent or less) be held for at least 500 feet in each direction.
- b. Vertical Curves - At the plaza centerline, a vertical curve shall not be used. A 1 percent break in profile shall be designed.

- c. Superelevation - For the limits of the concrete plaza slab (See Pavement below) there is to be a 0.0 percent cross slope. From the edge of the slab there is a transition to a normal ramp cross slope of 1.5 percent in about 100 feet. Care must be taken to investigate edge profiles such that ponding of water is avoided and the profile does not exceed 3 percent. For wide plazas, increased cross slopes may be required.
  - d. Clearances - The minimum vertical clearance under the canopy is to be 17 feet 0 inches. Overheight vehicle detectors, if required, shall be set at 13 feet 6 inches above the toll lane pavement. See Subsection 11.4.6.
4. Pavement
- a. Pavement types will be established by the Authority's Engineering Department. For the initial 500 feet or to the ramp nose, whichever is less, the shoulder pavement, if present, shall be replaced with full depth pavement.
  - b. For concrete pavement details, see TI Standard Drawings. For new toll plazas, the approach and exit pavements shall be 10" Thick Portland Cement Concrete Pavement reinforced with #5 bars at 10" o. c., top and bottom, both longitudinally and transversely. The approach pavements shall have 6 slabs at 33'-4" long (200 feet). The exit pavements shall have 3 slabs at 33'-4" long (100 feet). All slabs shall be 16'-6" wide.

For widening of existing toll plazas, the approach and exit pavements should match the dimensional layout of the adjacent slabs. All new pavement slabs shall be reinforced as noted above.

Care shall be taken during design to prevent interference between vehicle detector loops and reinforcement steel in concrete pavement. The Engineer shall coordinate with the loop manufacturer as designated by the Authority's ETC Department to ensure compliance with all installation guidelines.

5. Plaza Layout
- The standard layout for the toll plazas includes the following parameters, the Standard Drawings TI-1 to TI-7, Exhibit 11 - 4 and Exhibit 11 - 5 at the end of this Section.
- a. 10'-0" lanes widths (normal)
  - b. 6'-6" toll island widths
  - c. 12'-0" lane widths for each outside lane to allow for oversized or wide loads
  - d. Tunnel placed beneath the entire width of plaza and connected to adjacent utility (toll) building basement.



- e. Stairways from island to tunnel placed so that toll collector has to cross only one lane of traffic (maximum) to get to assigned toll booth.
- f. A canopy approximately 40 feet wide that covers all toll plaza lanes and approximately one-half of the outside lanes (as a minimum).

Such items as the number of lanes, future lanes, staircases, parking spaces, toll booth types and E-ZPass lanes will be provided by the Authority's Engineering Department for each toll plaza. Designs shall account for a future plaza widening in all respects, unless directed otherwise by the Authority's Engineering Department. Express E-ZPass lanes shall be designed as mainline roadways.

#### **11.4.2 Toll Booths and DATIM Enclosures**

Toll booths for use on the Turnpike shall be manufactured in conformance with the Standard Drawings TB-1 to TB-7. DATIM enclosures (used on Turnpike only) are toll booths that have been designed and manufactured to hold the dual automatic ticket issuing machine (DATIM) at entry lanes designated for the specific purpose of providing toll tickets to patrons. The DATIM enclosure is the same overall size as the standard toll booth but has been modified to hold the DATIM machine and not manned by a toll collector.

Toll booths for use on the Parkway are not the same construction as those used on the Turnpike. [Standard Drawings for Parkway Toll Booths will be published at a later date.] All Parkway toll booths shall be designed and constructed to accept a coin machine of the current design used by the Parkway, as well as blister and violation observation window.

Toll booth construction is usually contracted for separately and installed later by the toll plaza contractor. The toll booths fabricated shall be Industrialized Building Commission (IBC) Certified in conformance with Section 519.03 of the Standard Specifications. The DCA must have the certified plans (shop drawings) submitted to them before there is final approval and release of the interior and exterior building construction for the toll plaza tunnel. This requirement promotes the development of an earlier, separate contract for the toll booths so that toll plaza construction will not be compromised or delayed waiting for toll booth certification.

#### **11.4.3 Tunnels, Islands and Canopies**

Details for islands, tunnels and bumper blocks are indicated on Standard Drawings TI-1 to TI-5. These details are applicable to standard and split plazas. Standard (two way) plazas would incorporate Standard Drawing TI-2 for all the islands at the plaza. Unidirectional or split plazas would incorporate Standard Drawing TI-1 for the islands. Plans for previously constructed plazas would be supplied to the Engineer for use in developing contract plans for widened plazas. Island lengths other than present standards may be considered by the Authority's Engineering Department if geometry at the toll plaza may preclude the use of the standard islands.

Depending on the Engineering Agreement, the responsibility for canopy design may lie with either the Engineer or the Architect. Unless specifically requested by the Authority's Engineering Department, canopy design shall require adaptation of earlier canopy designs to match aesthetic appearances. The canopy is usually part of the overall toll plaza contract but may be a separate contract from the tunnel and islands, if so dictated by the Authority's Engineering Department.

The canopy contract (if separate) usually includes other items such as traffic signals, overhead vehicle detectors, canopy lighting, E-Z Pass equipment supports, and roof drains and leaders. The canopy column grillage beam anchorage is included in the canopy contract while the anchor bolts are placed by the plaza contractor. The construction limits of these various items must be clearly shown on the Plans if the canopy is not in the toll plaza contract.

#### **11.4.4 Toll Plaza Contract**

The Engineer is responsible for preparing a toll plaza contract which is to include the following items and other items detailed later in this section. This contract may be included as part of a larger contract with the approval of the Authority's Engineering Department. The limits of responsibility are as detailed on Exhibit 11 - 4, Exhibit 11 - 5 and Standard Drawings TI-1 to TI-7. Work generally includes all conduits, pipes, etc. that are embedded in concrete.

1. Excavating, paving, drainage (tunnel pumping if required) and grading (including building site).
2. Tunnel, tunnel doors, islands and concrete plaza slab.
3. Canopy and associated items (unless the canopy is considered for a separate contract)
4. Piles, reinforced with caps for buildings and/or tunnel if required.
5. Conduits with pull wire embedded in tunnel roof, concrete plaza slab and islands and other electrical, communication, and toll equipment as detailed in the Engineering Agreement and described in Subsection 11.4.6.
6. Treadle frames, curb boxes, electric roughing (conduit installation for electric service) and treadle drainage. Treadle frames are required in exit lanes only on the Turnpike and at all lanes on the Parkway.
7. Canopy anchor bolts.
8. Coordination of delivery and installation of toll booths (supplied by toll booth contractor).

## 9. Equipment

See Subsection 11.4.6 for Equipment requirements.

## 10. Utilities

The utility relocations associated with toll plazas are generally discussed in Section 7 (Utility Installations, Relocations and Adjustments) of the Procedures Manual. The Engineer is responsible for coordinating at least the following relocations with both the Architect and utility company.

- a. Telephone - Service shall be installed to the utility building to a demarcation point (the "Verizon Demark located in the Radio Room. The Engineer shall coordinate with the Authority's Technology and Administrative Services (TAS) Department to determine a point of contact for the recommended vendor).
- b. Sanitary - If connection to a public system is feasible, the Engineer shall make the necessary provisions. If a septic field or tank is required, the Architect will make the necessary provisions.
- c. Power - The Engineer shall provide the conduits to and make the arrangements for power services to pad mounted transformers outside the utility building. The Architect is responsible for connections from the transformer to the building. Load requirements for the building, the toll booth equipment, the interchange lighting, etc. must both be considered.
- d. Water - The water supply to the utility building is the responsibility of the Engineer if supplied by a utility company. If the supply is from a well, the Architect is to supply the necessary service.
- e. Fiber Optic – Connection of backbone cable via lateral to building.

## 11. Drainage

As previously indicated, the drainage pattern in the toll plaza area is an important consideration in the development of both the horizontal and vertical geometry. Ponding of water is not permitted in the pavement area. Transverse drainage troughs or slotted drains are not allowed in the toll plaza area. Treadle drains for new construction, as shown on Standard Drawing TI-7, are to be provided in each New Jersey Turnpike exit lane and each Garden State Parkway lane.

## 12. Lighting

All lighting associated with a toll plaza is to be provided as outlined in Section 7 (Lighting and Power Distribution Systems) of this Manual.

## 13. Signing and Striping

All signing and pavement striping associated with a toll plaza are to be provided as outlined in Section 6A and 6B (Signing and Striping) of this Manual and Standard Drawing PM-1. A preliminary striping layout for the plaza should be submitted to the Authority's Engineering Department at Phase "A" as an aid in evaluating the plaza geometry.

#### 14. Maintenance and Protection of Traffic

Where maintenance and protection of traffic is required for the widening of an existing plaza, as many lanes of traffic as possible must be maintained through the existing plaza. Any scheme requiring closing of existing lanes must be approved by the Authority's Operations Department. The number of lanes required during any stage of construction will be determined by the Authority's Operations Department.

#### 11.4.5 Utility Building

1. Architectural design shall be performed by an Architect registered in the State of New Jersey. The Architecture design team including the related building engineering disciplines - such as mechanical, electrical, and plumbing - is usually contracted for separately by the Authority.
2. The architectural design quality and language of the utility building shall become definitive through exploration of multiple schemes, the consideration of existing conditions and direct design coordination with the Authority's Engineering Department. High performance / "green building" design strategies shall be explored where schedule and budget allows.
3. The building site design and preparation is the responsibility of the Engineer. This includes the taking of the necessary borings to be provided to the Architect. The Engineer is also responsible for the rough grading of the building site. Coordination of the building foundation requirements is necessary at all stages of design. It may be found that the toll plaza contractor should install the piles for the building.

The building design team's responsibilities generally include all areas up to five feet outside the limits of the building with the following additional items being included although outside the five-foot limit.

- a. Septic tanks or disposal fields (if required).
- b. Oil storage tank.
- c. Well and pump and piping (if required).
- d. Power transformers.
- e. Generators.

Reference is also made to the Exhibit 11 - 2 "Toll Plaza Coordination of Work" included at the end of this Section. The Engineer is responsible for providing sanitary and water utility service from adjacent local roads if it can be justified economically.

4. Materials and finishes considered for the utility building shall be cost effective, durable and low maintenance. Consideration shall be given to materials that are derived from renewable resources and contain a high recycled content. The exterior of new buildings should be comprised of highly durable and long lasting materials such as brick, masonry or pre-cast concrete. Roofing should consist of energy efficient standing seam

systems. Glazing systems should consist of “low e” insulated glass. The interior floor finishes should consist of porcelain tile for the lobby and corridor areas and ceramic tile floors and walls in restrooms and locker areas. Office areas, count rooms and swing rooms should have linoleum, cork, or rubber floor coverings. Use of vinyl composition tile is discouraged as a health and environmental hazard and use of carpet is discouraged for maintenance reasons.

5. Interface with the Traveling Public/ Lobby

In accordance with Authority policies, access to the toll utility buildings is restricted to those persons conducting Authority business. In emergency situations, access may be granted to patrons for use of restroom facilities in the lobby, or other appropriate and supervised reasons. Due to Authority policy, patron entry shall be allowed via a controlled access entry door where the plaza supervisor can securely buzz a patron in. Upon entering the lobby, the patron can then interface with the plaza supervisor via a secure, glazed transaction window. Access beyond the lobby is restricted only to Authority personnel and controlled via another access door. For security reasons, access to and from the tunnel must be through the lobby area of the Utility Building. Amenities such as a drinking fountain, an accessible unisex restroom, a public telephone and, if space permits, vending machines should be located in the lobby.

6. Building Program/Space Allocation

The standards below are a flexible list of core spatial requirements that are adjusted for each plaza building based on number of employees and special requirements unique to the specific plaza. A utility building for a full interchange shall contain the following rooms for use by the Authority. Room sizes, locations and materials for the building should be discussed with the Authority's Toll, Operations, ETC, TAS and Maintenance Departments during Phase A of the design process so that recommendations can be established prior to final design and plan preparation. The typical size of a plaza utility building is 6000-8000 square feet depending upon the size of the staff at the plaza.

The plaza level shall contain, subject to Authority's review:

- Public Lobby with Unisex Restroom
- Plaza Supervisor's Office with storage closets
- Counting Room – 30 square feet per count station
- Ticket Room
- Clerk's Office
- Interchange Manager Office
- State Police Office (as required based on location of plaza)
- Break Room with seating and kitchen (30 square feet per person)
- Women's and Men's Lockers (12 square feet per locker)
- Women's and Men's Restrooms
- Janitor's Closet
- Storage Closets
- Loading Dock

The basement level shall contain, subject to Authority's approval:

- Electrical Room
- Mechanical Room
- ETC Room
- Radio Room
- Storage Room
- Janitor's Closet
- Access to the Tunnel

Refer to Exhibit 11 - 3 "Utility Building Standard Operational Plan Diagram" at the end of this Section for suggested operational layout of a proposed utility building.

7. **Furnishings and Equipment:** Furnishings and equipment for the utility building shall be included in the contract documents, unless otherwise indicated by the Authority. These typically include office desks and chairs, breakroom tables and chairs, lockers, kitchen appliances, safes, file storage units, etc., and should be evaluated during Phase "A" of project development.
8. **Depository vaults** shall be located in the plaza supervisor office. Deposits are made from the count room, and collection happens within the plaza supervisor office. Special consideration shall be given to the supervisor's view of the plaza as well as the supervisor's view to the lobby and count room.
9. **Installation of a Building Management System (BAMS)** that can communicate over the internet with secure remote access and allows for complete monitoring of building systems is recommended for installation at all buildings.
10. **Utility building** shall conform to the requirements of Subsection 10.2, DCA Procedures. The review and approval for construction may take 3 months or more and can be separated from the DCA submittal of the tunnel and canopy. The separation of the two elements may provide a better construction scenario if either the building or the toll plaza is on an accelerated construction schedule.

#### **11.4.6 Toll Plaza Systems**

This Subsection details the design requirements for the various systems to be installed at each toll plaza location. Due to continuous innovations in technology and the requirements of the Authority's Engineering, ETC, Internal Security and TAS Departments, designs for many of these systems are continuously changing, however the requirements for each system and basic design criteria detailed below should be utilized unless otherwise directed by the Authority.

The Engineer shall coordinate with the Authority's Engineering, ETC, Internal Security and TAS Departments to determine the most recent direction, model

information, and installation requirements for each of the below Systems, and any additional systems that may be required. This coordination shall occur during the Phase "A" design, and a report shall be put together detailing the requirements and system design intent, including block diagrams of each system, for the Phase "A" Submission. Many of the systems require components to be installed in both the toll plaza booths, tunnel, and utility buildings. The Engineer and Architect shall coordinate accordingly.

1. Power Distribution and UPS System

All toll plazas shall be provided with backup generator. The backup generator shall be adequately sized to handle all loads of the toll plaza building and toll booth operations, including all roadway lighting and ITS devices fed from the utility building.

All toll plazas shall also be provided with Uninterruptible Power Supply (UPS) systems. This system shall be fed from the Emergency panel, and shall be used to power only the critical loads of toll collection, revenue, and communications systems. To allow for future expansion and reliability of operation, the UPS shall be sized to run at no more than 50% capacity and shall run for at least 30 minutes for all connected loads. Where possible, three-phase redundant "hot-backup" systems shall be installed to ensure maintenance is possible without any power outages to connected equipment. The Engineer shall coordinate with the TAS and ETC Departments to determine if any additional design criteria are required for the UPS installation.

2. E-ZPass™ Toll Collection

An independent System Vendor is separately contracted by the Authority for the purposes of installing and maintaining the E-ZPass™ Toll Collection System. For this reason, unless otherwise directed by the Authority, the Engineer is not responsible for the layout and specification of specific toll collection equipment. The Engineer, however, is responsible for properly designing the toll plaza islands, canopy, booths, tunnels, and power and communication infrastructure to accommodate the E-ZPass™ equipment layout and design that is performed by others.

The Engineer shall coordinate with the Authority's System Vendor to determine an appropriate delineation of work between the Plaza Contract and the System Vendor. An example table showing delineation of work on a recent contract is shown in Exhibit 11 - 1. The Engineer shall analyze each item, determine if additional items are necessary, and shall confirm all assumptions with the System Vendor. The Engineer shall also coordinate development of the delineation of work with the Coordination of Work between various plaza contracts as shown in Exhibit 11 - 2. The delineation of work shall be shown in the Plaza Contract in a format similar to that shown on Exhibit 11 - 1 and shall be submitted at the Phase "A" Submission for review. The Plaza Contract documents shall be developed according to the delineation criteria, and all work not in the contract shall be shown "by others."

Items usually installed by the Plaza Contract include treadle frames, antenna mounting brackets, all island boxes and conduits, canopy signs, and Lane Use Signals (see Exhibit 11 - 1 for more information).

The Engineer shall utilize the standard toll equipment layout shown in Standard Drawing XX (to be published at a later date) in order to properly locate the equipment for all low-speed toll lanes. Locations of equipment shall be shown on the plans within the tolerances allowed, but installation shall be shown by others. Continuous paths consisting of conduit, wireway, and raceway shall be provided between the lane equipment and the Lane Equipment Cabinets mounted either in the tunnel and/or booths according to the requirements of Standard Drawing XX (to be published at a later date).

Where aesthetics or structural designs require, the Engineer shall design and include in the Plaza Contract structural mounting frames for antennas, profilers, or other equipment in order to provide a mounting location within the proper tolerances. The Engineer shall coordinate with the Authority's ETC Department to determine the need for, and design of, structural mounting supports.

The Engineer shall contact the Authority's Engineering, TAS, and ETC Departments during the Phase A design to determine any specific requirements for E-ZPass™ systems that may be supplemental to the direction given here.

Unless otherwise directed by the Authority's Engineering Department, the Engineer shall not be required to develop plans for the installation work of the System Vendor. However, the Engineer shall be required to coordinate closely with the System Vendor throughout the duration of design and construction. Coordination is also necessary with the Architect for such items as conduit requirements, mounting, etc.

All installation plans shall be reviewed by the System Vendor, and approval shall be obtained before the Phase "D" Submission.



## EXHIBIT 11 - 1

### SAMPLE DELINEATION OF TOLL SYSTEM CONSTRUCTION WORK

| Description                                                   | Furnished   | Installed   | Connected   |
|---------------------------------------------------------------|-------------|-------------|-------------|
| <b>Toll Booths With Accessories</b>                           |             |             |             |
| Toll Booth - Manual/E-ZPass                                   | Contractor  | Contractor  | Contr/NJTA  |
| Toll Booth - Manual/Automatic/E-ZPass                         | Contractor  | Contractor  | Contr/NJTA  |
| <b>Toll Recording Room Equipment</b>                          |             |             |             |
| Table                                                         | NJTA        | NJTA        | N/A         |
| Chair                                                         | NJTA        | NJTA        | N/A         |
| Lane Controller Racks                                         | NJTA        | NJTA        | N/A         |
| Lane Controller Computers                                     | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| Fiber Lateral to Lane Controller Racks                        | Adesta      | Adesta      | Adesta      |
| Lane Controller Power Outlets in Floor                        | Contractor  | Contractor  | Contractor  |
| <b>Toll Plaza Signage</b>                                     |             |             |             |
| E-ZPass Sign Assemblies                                       | Contractor  | Contractor  | Contractor  |
| E-ZPass Sign Panels                                           | Contractor  | Contractor  | Contractor  |
| Toll Island Advisory Signs                                    | NJTA        | NJTA        | NJTA        |
| Toll Booth Window Signs                                       | NJTA        | NJTA        | NJTA        |
| <b>Treadle</b>                                                |             |             |             |
| Treadle Frame with filler strip                               | Contractor  | Contractor  | N/A         |
| Treadle                                                       | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| <b>Communications Systems</b>                                 |             |             |             |
| Telephone Cables                                              | Contractor  | Contractor  | NJTA        |
| Police Radio Cables                                           | Contractor  | Contractor  | NJTA        |
| Alarm Cables                                                  | Contractor  | Contractor  | NJTA        |
| CCTV Cables                                                   | Contractor  | Contractor  | NJTA        |
| Communications Systems Equipment                              | NJTA        | NJTA        | NJTA        |
| <b>Automatic Toll Collection Equipment</b>                    |             |             |             |
| Automatic Coin Machine                                        | NJTA        | NJTA        | NJTA        |
| Automatic Toll Lane Gate                                      | NJTA        | NJTA        | NJTA        |
| ACM Vault                                                     | NJTA        | NJTA        | NJTA        |
| <b>Electronic Toll Collection (ETC) Equipment</b>             |             |             |             |
| Infrared Light Curtains (Transmitter & Receiver)              | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| AVI Antennas                                                  | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| AVI Reader Cabinet Enclosures                                 | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| AVI Reader Cabinet Interiors                                  | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| Lane Equipment Cabinet (LEC) Enclosures (Primary & Secondary) | Contractor  | Contractor  | Contractor  |
| Lane Equipment Cabinet (LEC) Interiors (Primary & Secondary)  | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| ETC Panels                                                    | Contractor  | Contractor  | Contractor  |
| Patron Feedback Displays with Doppler Radar (PFD)             | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| Bus Height Sensor (Oversized Vehicle Height Detector)         | NJTA        | NJTA        | NJTA        |
| Vehicle Detector Loops                                        | Contractor  | Contractor  | NJTA        |
| Overhead Vehicle Separators (SICK units)                      | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| Violation Enforcement System (VES) Cameras                    | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| Violation Enforcement System (VES) Lights                     | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| Card readers                                                  | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| Canopy Override Switch Box                                    | Sys. Vendor | Sys. Vendor | Sys. Vendor |
| Lane Use Signals                                              | Contractor  | Contractor  | N/A         |

| <b>Description</b>                                            | <b>Furnished</b> | <b>Installed</b> | <b>Connected</b> |
|---------------------------------------------------------------|------------------|------------------|------------------|
| Ticket Readers                                                | Sys. Vendor      | Sys. Vendor      | Sys. Vendor      |
| Dual Height Automatic Ticket Issuing Machines (DATIMs)        | Sys. Vendor      | Sys. Vendor      | Sys. Vendor      |
| Wiring to Lane Signals                                        | Contractor       | Contractor       | Sys. Vendor      |
| Touch Terminals, Receipt Printers                             | Sys. Vendor      | Sys. Vendor      | Sys. Vendor      |
| Conduits, Handholes, Junction Boxes in Tunnel                 | Contractor       | Contractor       | Contractor       |
| Conduits, Handholes, Junction Boxes in Booth (ETC)            | Sys. Vendor      | Sys. Vendor      | Sys. Vendor      |
| Conduits, Handholes, Junction Boxes in Booth (Power and Comm) | Contractor       | Contractor       | Contractor       |
| Lightning Protection System                                   | Contractor       | Contractor       | Contractor       |
| Communications wiring (LEC to booth, island equipment)        | Sys. Vendor      | Sys. Vendor      | Sys. Vendor      |
| ETC Fibers from LEC to Lane Controller Racks                  | Sys. Vendor      | Sys. Vendor      | Sys. Vendor      |
| VTDM cameras, equipment, and wiring                           | Sys. Vendor      | Sys. Vendor      | Sys. Vendor      |
| VTDM poles, raceways                                          | Contractor       | Contractor       | N/A              |

### 3. Telephone

Telephone systems shall be installed in the booths and/or tunnel as detailed below:

All Parkway Toll Plazas utilize external ("Bell Phone") lines. Some plazas are supplemented with internal ("GSP Phone") lines in addition to the external lines. Terminated phone jacks and cable shall be installed and tested in all rooms and toll booths. The cable shall be home-run and terminated on a Type 66 communications punch block in the Radio Room. All cables shall be labeled on both ends so cables can be identified in the future.

All Turnpike Toll Plazas utilize external ("Grey Phone") lines. Terminated phone jacks and cable shall be installed and tested in all rooms and toll booths. The cable shall be home-run and terminated on a Type 66 communications punch block in the Radio Room. All cables shall be labeled on both ends so cables can be identified in the future.

The Engineer shall coordinate with the Authority's TAS Department to determine the exact location of end devices and communications distribution equipment.

### 4. Ethernet

Terminated Category 5e Ethernet jacks and cable shall be installed and tested in all rooms and toll booths at all toll plazas on the Parkway and Turnpike. All cables shall be terminated on a Category 5e Patch Panel mounted to a 19 inch open rack. All hardware shall be provided by the Contractor. The Authority's TAS Department will designate the exact quantity and specific locations of these jacks.

### 5. Intercom

Intercom stations shall be provided in all booths, and a master intercom station shall be provided in the Toll Plaza Supervisor's office, located in the utility building. Appropriate intercom cabling shall be used to connect the various equipment to ensure a completely operational system.

The intercom system manufacturer used is the same for both roadways, however specific model numbers differ, as different equipment is installed. The Engineer shall coordinate with the Authority's TAS Department for further direction regarding the intercom system.

The Plans shall note that all installations of intercom systems shall be performed by a manufacturer-certified installer/maintainer. Notes shall be provided on the Plans indicating that the complete system shall come with a complete on site one-year warranty and must interact with all current intercom systems installed across the various Authority facilities. As the intercom system is viewed as an employee and patron safety issue, the Contractor shall repair any failures that occur within six (6) hours.

6. Police Radio (Parkway only)

Plazas on the Parkway use a police radio system, which allows toll collectors to monitor the police radio, and contact the police in case of emergency. Police radio stations shall be installed in all manned booths, and appropriate cabling connected to the Police Radio distribution panel in the utility building. Owing to the proprietary nature of the Police Radio system, the Engineer shall contact the Authority's Engineering Department for specific requirements for the installation of this system on all Parkway toll plazas.

7. Plaza Security System

A comprehensive security system shall be installed for all facilities. The system shall be designed to meet all current Authority requirements, and may interface or connect several of the systems listed in this subsection.

At toll plazas, the system shall include, at a minimum, installation of a panic button in a location to be determined by the Authority, and installation of a host system in the utility building that is fully integrated with the Authority's other system equipment. Additional components may be required, such as cameras, motion sensors, and/or blue beacons mounted to the top of each toll booth or canopy sign that indicate where the duress alarm was activated.

For more specific requirements, the Engineer shall coordinate with the Authority's Internal Security and Engineering Departments.

8. Closed-Circuit Television (CCTV)

CCTV systems shall be provided throughout the toll plaza building and facility to allow the toll plaza supervisor to monitor all areas of the site. Typically, this requires certain fixed cameras mounted in the building aimed at the vault, counting stations, and exits, and pan-tilt-zoom (PTZ) cameras mounted in the hallways, and on site lighting or other poles to allow a clear view of all plaza entry and exit roadways. This camera system is independent of the Traffic Surveillance Cameras provided for the purposes of surveillance of traffic as described below.

CCTV systems are installed throughout Authority facilities using a single set of equipment that is designed to be interoperable. The Engineer shall

design the CCTV system to the requirements as directed by the Authority's TAS Department.

9. Traffic Surveillance Cameras

The Traffic Surveillance Camera system is designed to allow central Operations personnel a priority view of all critical roadways, and is independent of the facility CCTV system.

The Engineer shall show installation of Traffic Surveillance Cameras at the locations in the project as determined by the Operations Department. Installation of the cameras are often performed by outside vendors, however, at a minimum, it is the responsibility of the Engineer to provide proper poles for mounting and 24-hour power circuits to the locations requested by the Authority's Operations Department.

Technical requirements for the Traffic Surveillance Camera system shall be as directed by the Authority's TAS Department, and all work shall be included in the Plaza Construction Contract.

See Section 8 (ITS and Communication Systems) of this Manual for more information.

10. Video Transaction Data Monitoring (VTDM)

The VTDM system allows for monitoring of the toll collection activities, and is installed for all Parkway plazas, and on the exit side of Turnpike plazas only. In a typical installation, cameras are installed approximately 200 to 300 feet from the plaza on a light standard or separate pole, and are aimed back at the booths. One camera shall be provided for every four (4) booths at a minimum. Fiber-Optic connection and 24-hour power shall be connected from the cameras, through the lighting or independent raceway systems, back to the ETC hut or ETC room in the utility building.

The layout of VTDM cameras shall be approved by the Authority's ETC Department during the Phase "B" design. The Engineer shall also determine the delineation of work, if any is required, between the Plaza Contract and the System Vendor, who on occasion installs VTDM systems.

11. Fire Suppression

Due to the sensitive and revenue-critical nature of the systems installed in the tunnel, the need for a Fire Suppression system should be avoided in the tunnel and booths. According to International Building Code requirements as of the writing of this manual, Fire Suppression systems do not need to be installed in the tunnel, if the following criteria are met:

- a. Each stairwell leads directly to grade.
- b. Exits (stairwells) are located at a distance of no more than 50 feet on center for the length of the tunnel (this equates to every 3<sup>rd</sup> lane).
- c. The distance from the last stairwell to the end of the tunnel is less than 20 feet.

The Engineer shall design the tunnel to meet these requirements and avoid the need for Fire Suppression in the tunnel.

12. Fire Detection and Egress

Fire Detection Systems shall be installed throughout the utility building and tunnel to the requirements of the DCA. Fire Pull stations shall be provided at all tunnel exits, and horn/strobe units shall be included in the tunnel, but specifically designed to sound at minimum allowable volume.

13. Heating, Ventilation, and Air Conditioning (HVAC)

On the Parkway, HVAC systems are provided as part of the pre-fabricated booth. A chiller is located on the roof of the booth, and supplemental heaters are mounted in various locations inside the booth. All installations shall be as shown on the Standard Drawings (to be published at a later date).

On the Turnpike, air supply to booths shall be by central duct system. Air supply shall be taken from a clean-air location near the utility building, fed through the tunnel through a large stainless steel duct, and directed to each booth through a Variable Air Volume (VAV) damper, located in the tunnel. Hydronic piping shall be run through the length of the tunnel and connected to heat exchangers for control of temperature. Thermostats shall be provided inside each booth for control. Each booth shall be provided with 2 vents, one located under each counter, and the vents shall be connected by means of a recessed floor pan cast into the island concrete under the booth. Design air volume per booth shall be 400 CFM.

14. Canopy and Overheight Vehicle Detection Systems

Overheight Vehicle Detection Systems shall not be installed, unless directed otherwise by the Authority's Engineering Department. See Subsection 11.4.1.

Lane Use Signals ("X-Arrow Signals") shall be utilized on the front canopy fascia of each active toll lane. Lane Use signals shall be incorporated into the design as shown on Standard Drawing XX (to be published at a later date). Mounting shall be through-bolted to canopy fascia. The Plaza Contract shall include all conduit and wiring for the Lane Use Signals, and the wiring shall be coiled and left for termination by the System Vendor at the coordinated location.

Lane Signs and Sign Lighting shall be designed as directed by the Authority's Engineering Department, and shown on Standard Drawing XX (to be published at a later date).

15. Lightning Protection

Lightning Protection Systems shall be installed on all Authority buildings and toll plaza canopies. The Lightning Protection System shall be installed by an Underwriters Laboratories (UL)-certified Master Installer, according to the requirements of National Fire Protection Association Publication NFPA 780. The Lightning Protection System shall be

required to be provided with a Master Label certifying the installation before any toll collection equipment is utilized. If construction staging requires installation of the Lightning Protection System in stages, each stage shall be independently certified as compliant before the lanes can be opened.

Because there are many accepted details for the installation of Lightning Protection System devices, please see Standard Drawing XX (to be published at a later date) for details to be utilized at various plazas and buildings.

#### 16. Other Building Systems

Additional systems will likely be required in the utility building, by direction of the Authority's Engineering Department, through coordination with the Operations, Tolls, ETC, TAS, or Maintenance, or Tolls Departments, or because of code requirements. The Engineer and Architect shall perform the necessary coordination to ensure that all requirements are met, and that the toll plaza systems interface adequately to those located within the building, especially where these systems are networked or connected to other Authority facilities.

### EXHIBIT 11 - 2 TOLL PLAZA COORDINATION OF WORK

#### SAMPLE

#### COORDINATION OF WORK (To be developed for each toll plaza)

| ITEM                                      | BUILD.<br>CONTR. | TOLL<br>PLAZA<br>CONTR. | CANOPY<br>CONTR.<br>** | TOLL<br>BOOTH<br>CONTR. | TOLL<br>EQUIP.<br>CONTR. | REMARKS                                                               |
|-------------------------------------------|------------------|-------------------------|------------------------|-------------------------|--------------------------|-----------------------------------------------------------------------|
| 1. EXC., GRAD. & PAVING                   |                  | F & I                   |                        |                         |                          | Including building site (rough & finish grading).                     |
| 2. TUNNEL & TOLL ISLAND                   |                  | F & I                   |                        |                         |                          |                                                                       |
| 3. PILES, REINF. CAPS W/DOWELS FOR BLDGS. |                  | F & I                   |                        |                         |                          | If required.                                                          |
| 4. HYDRANTS @ ISLANDS                     |                  | F & I                   |                        |                         |                          | Connection in tunnel by building contractor.                          |
| 5. UTILITY BUILDINGS                      | F & I            |                         |                        |                         |                          | (See extent of tunnel in building contract)                           |
| 6. SITE WORK AND PAVING                   |                  | F & I                   |                        |                         |                          | Verify limits with NJTA.                                              |
| 7. SANITARY SEWER                         | 5' from build.   | F & I                   |                        |                         |                          | Public Sewer if avail. Lifting Sta. if necessary by Toll Plaza Contr. |

| ITEM                                                               | BUILD.<br>CONTR.  | TOLL<br>PLAZA<br>CONTR. | CANOPY<br>CONTR.<br>** | TOLL<br>BOOTH<br>CONTR. | TOLL<br>EQUIP.<br>CONTR. | REMARKS                                                      |
|--------------------------------------------------------------------|-------------------|-------------------------|------------------------|-------------------------|--------------------------|--------------------------------------------------------------|
| 8. SEPTIC TANK OR DISPOSAL FIELD                                   | F & I             |                         |                        |                         |                          | If required include lifting Sta. for building sewer.         |
| 9. WATER                                                           | to 5' from Bldg.  | F & I                   |                        |                         |                          | Well and pump, if required, by plaza contr.                  |
| 10. FUEL & DIESEL OIL STOR. TANKS (INCL. MASONRY VAULTS)           | F & I             |                         |                        |                         |                          | Including conc. Pads, piping & backfill to rough grade elev. |
| 11. STORM DRAINAGE                                                 | to 5' from Bldg.  | F & I                   |                        |                         |                          | Sump pump if necessary                                       |
| 12. POWER                                                          | From pad to Bldg. | F & I                   |                        |                         |                          |                                                              |
| 13. PLAZA & SITE LIGHTING                                          |                   | F & I                   |                        |                         |                          | Excl. canopies, if there is a canopy contract                |
| 14. PLAZA & SITE LIGHT. PHOTO-ELEC. CONTROL                        | F & I             |                         |                        |                         |                          |                                                              |
| 15. ALL CONDUITS W/PULL WIRE, EMBEDDED IN CONC. IN TUNNEL & ISLAND |                   | F & I                   |                        |                         |                          |                                                              |
| 16. TREADLE FRAMES & CURB BOXES                                    |                   | F & I                   |                        |                         |                          |                                                              |
| 17. TREADLES                                                       |                   |                         |                        |                         | F & I                    |                                                              |
| 18. ELEC. ROUGHING TREADLES                                        |                   | F & I                   |                        |                         |                          |                                                              |
| 19. TREADLE DRAINAGE                                               |                   | F & I                   |                        |                         |                          |                                                              |
| 20. "M" BOXES                                                      |                   |                         |                        |                         | F & I                    |                                                              |
| 21. COLLECTION EQUIPMENT ELECTRIC ROUGHING                         |                   | F & I                   |                        |                         |                          |                                                              |
| 22. CABLE TRAYS AND RACKS                                          | F & I @ Buildings | F & I @ Tunnel          |                        |                         |                          |                                                              |

| ITEM                                                                                      | BUILD.<br>CONTR.   | TOLL<br>PLAZA<br>CONTR.  | CANOPY<br>CONTR.<br>** | TOLL<br>BOOTH<br>CONTR. | TOLL<br>EQUIP.<br>CONTR. | REMARKS                                                                |
|-------------------------------------------------------------------------------------------|--------------------|--------------------------|------------------------|-------------------------|--------------------------|------------------------------------------------------------------------|
| 23. FIRE EXTINGUISHERS                                                                    |                    | F & I                    |                        |                         |                          | See plaza plan.                                                        |
| 24. LANE SIGNALS                                                                          |                    |                          | F & I                  |                         |                          | Terminate at block, system vendor will hookup.                         |
| 25. CANOPY ROOF DRAINS & LEADERS                                                          |                    |                          | F & I                  |                         |                          | To top of tunnel only & hook to drain system.                          |
| 26. TUNNEL DOORS, GRATING, RAILINGS, LIGHTING FIXTURES & NON-SLIP NOSING AT TUNNEL STAIRS |                    | F & I                    |                        |                         |                          | Incl. hardware.                                                        |
| 27. TOLL BOOTH ANCHORAGE                                                                  |                    | F & I                    |                        |                         |                          |                                                                        |
| 28. CANOPY COLUMN ANCHORAGE                                                               |                    | F & I                    |                        |                         |                          | Anchor bolts only.                                                     |
| 29. TELEPHONE SERVICE                                                                     |                    | F & I                    |                        |                         |                          | To hookup point outside of Bldg.                                       |
| 30. OUTDOOR TEL. INCL. POWER                                                              |                    | F & I                    |                        |                         |                          |                                                                        |
| 31. TOLL COLLECTION EQUIPMENT                                                             |                    |                          |                        |                         | F & I                    |                                                                        |
| 32. GRAY PHONE ROUGHING                                                                   | F & I @ Bldg.      | F & I @ Toll Booths      |                        |                         |                          |                                                                        |
| 33. BELL PHONE ROUGHING                                                                   | F & I              | F & I @ Toll Booths      |                        |                         |                          |                                                                        |
| 34. RADIO PHONE ROUGHING                                                                  | F & I              | F & I @ Toll Booths      |                        |                         |                          |                                                                        |
| 35. GREY PHONE EQUIP.                                                                     | Rough only @ Bldg. | Rough only @ Toll Booths |                        |                         |                          | Equip. & hookup by NJTA<br>Demarcation point decided during design.    |
| 36. BELL PHONE EQUIP.                                                                     | F & I              | F & I                    |                        |                         |                          | If not provided by Tel. Co.<br>Demarcation point decided during design |
| 37. RADIO PHONE EQUIP.                                                                    |                    |                          |                        |                         |                          | Separate contract                                                      |
| 38. RADIO EQUIPMENT                                                                       |                    |                          |                        |                         |                          | Separate contract                                                      |
| 39. INTERCOM ROUGHING                                                                     | F & I @ Bldg.      | F & I @ Toll Booths      |                        |                         |                          | Demarcation point decided during design                                |

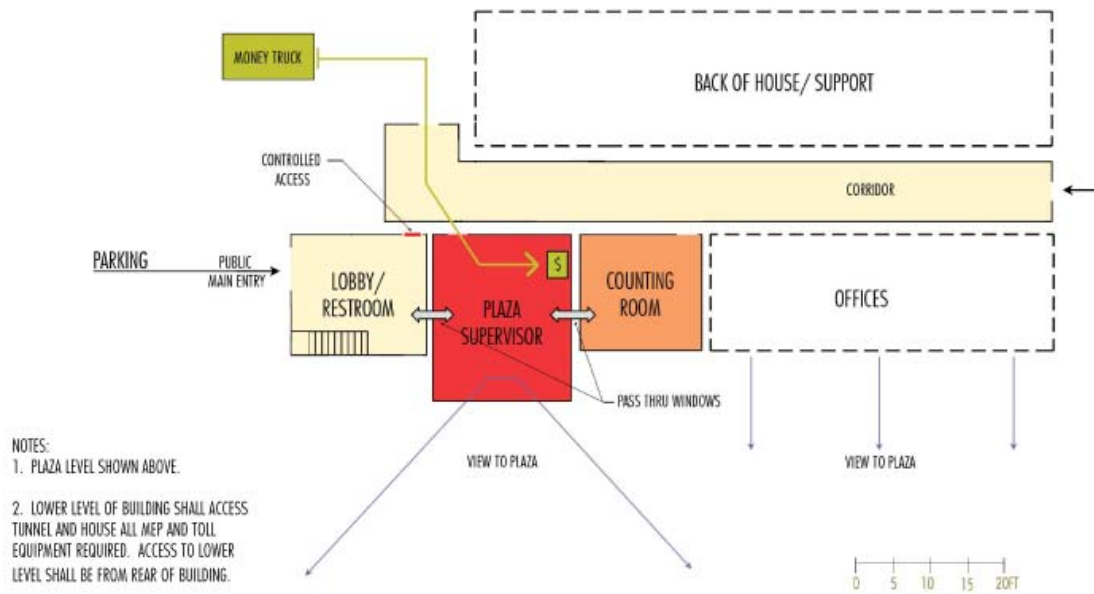


| ITEM                                             | BUILD.<br>CONTR. | TOLL<br>PLAZA<br>CONTR. | CANOPY<br>CONTR.<br>** | TOLL<br>BOOTH<br>CONTR.     | TOLL<br>EQUIP.<br>CONTR. | REMARKS                                                                          |
|--------------------------------------------------|------------------|-------------------------|------------------------|-----------------------------|--------------------------|----------------------------------------------------------------------------------|
| 40. INTERCOM EQUIPMENT                           |                  |                         |                        |                             |                          | Separate contract                                                                |
| 41. CLOSED CIRCUIT TV EQUIP. WIR. & MTG.         | F & I            |                         |                        |                             |                          |                                                                                  |
| 42. CLOSED CIRC. TV ROUGHING                     | F & I            |                         |                        |                             |                          |                                                                                  |
| 43. ELECT. VEHICLE HT. MONITOR EQ. & WIR.        |                  | F & I                   |                        |                             |                          | Not used unless specifically directed by the Authority's Engineering Department. |
| 44. ELECTR. VEHICLE HT. MONITOR ROUGHING         |                  | F & I                   |                        |                             |                          | Not used unless specifically directed by the Authority's Engineering Department. |
| 45. ROADWAY LTG. DISTR. EQUIPMENT                | F & I            | F & I* (see remarks)    |                        |                             |                          | Conduits by Bldg. Contr. 5' from Bldg. *Remainder in plaza contract.             |
| 46. RADIO ANTENNA                                | F & I            |                         |                        |                             |                          | If required                                                                      |
| 47. TOLL BOOTHS                                  |                  | I                       |                        | F (Deliv. Only)             |                          |                                                                                  |
| 48. TOLL BOOTHS – SLEEVES FOR DUCTS & PIPES      |                  | F & I                   |                        |                             |                          |                                                                                  |
| 49. TOLL BOOTHS – MECH'L HOOKUP                  | F & I            |                         |                        |                             |                          |                                                                                  |
| 50. TOLL BOOTHS – HEATING COIL CONTROLS & WIRING | F & I            | F & I (Cond. Only)      |                        | 120v Power Hookup & M-Block |                          |                                                                                  |
| 51. E-Z PASS EQUIPMENT                           |                  |                         |                        |                             | F & I                    |                                                                                  |
| 52. E-Z PASS EQUIPMENT SUPPORTS ON CANOPY        |                  |                         | F & I                  |                             |                          |                                                                                  |

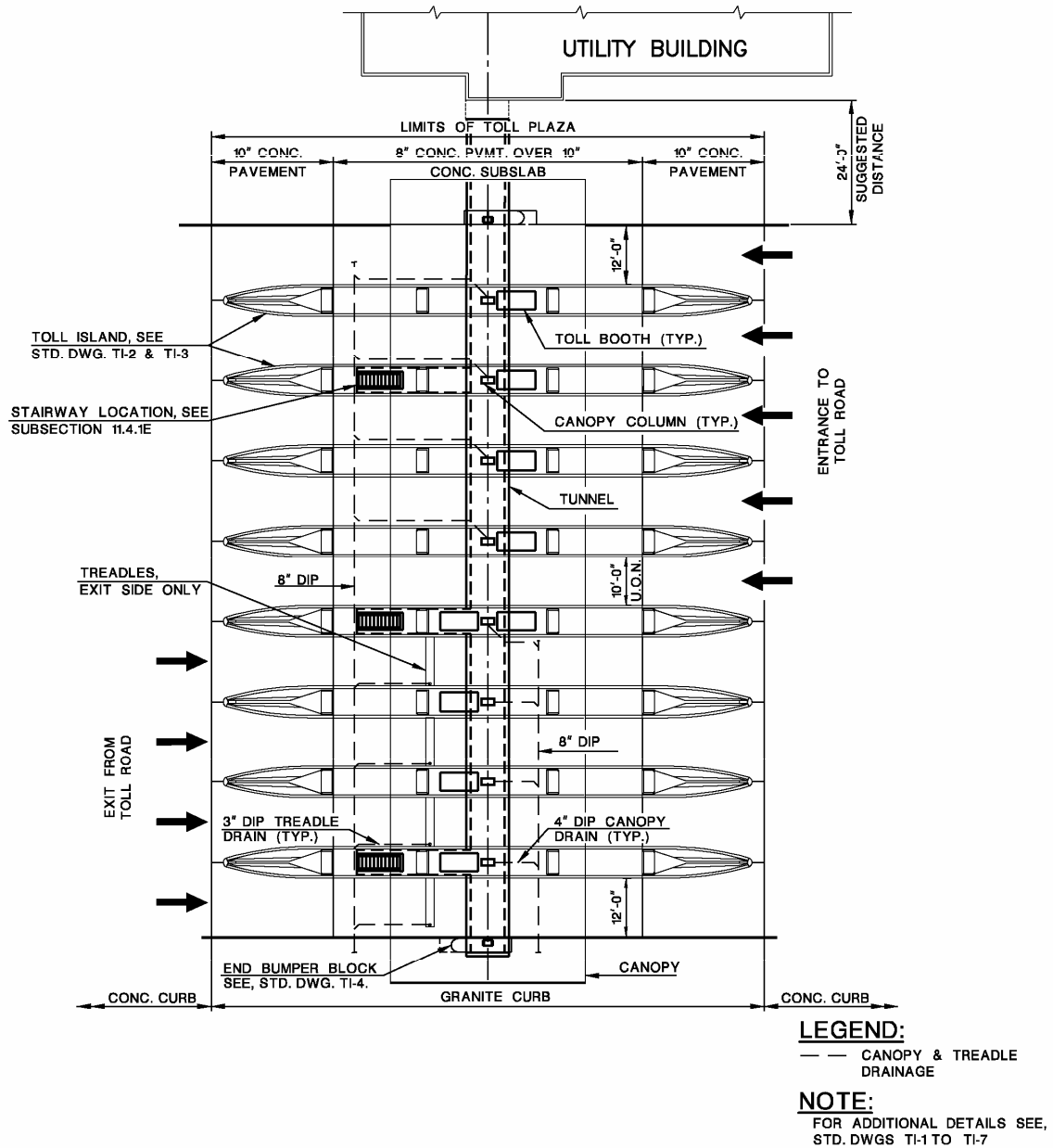
\*\* If there is no separate canopy contract, this work is included with toll plaza contract.

F= Furnish    I= Install    CONTR = Contractor

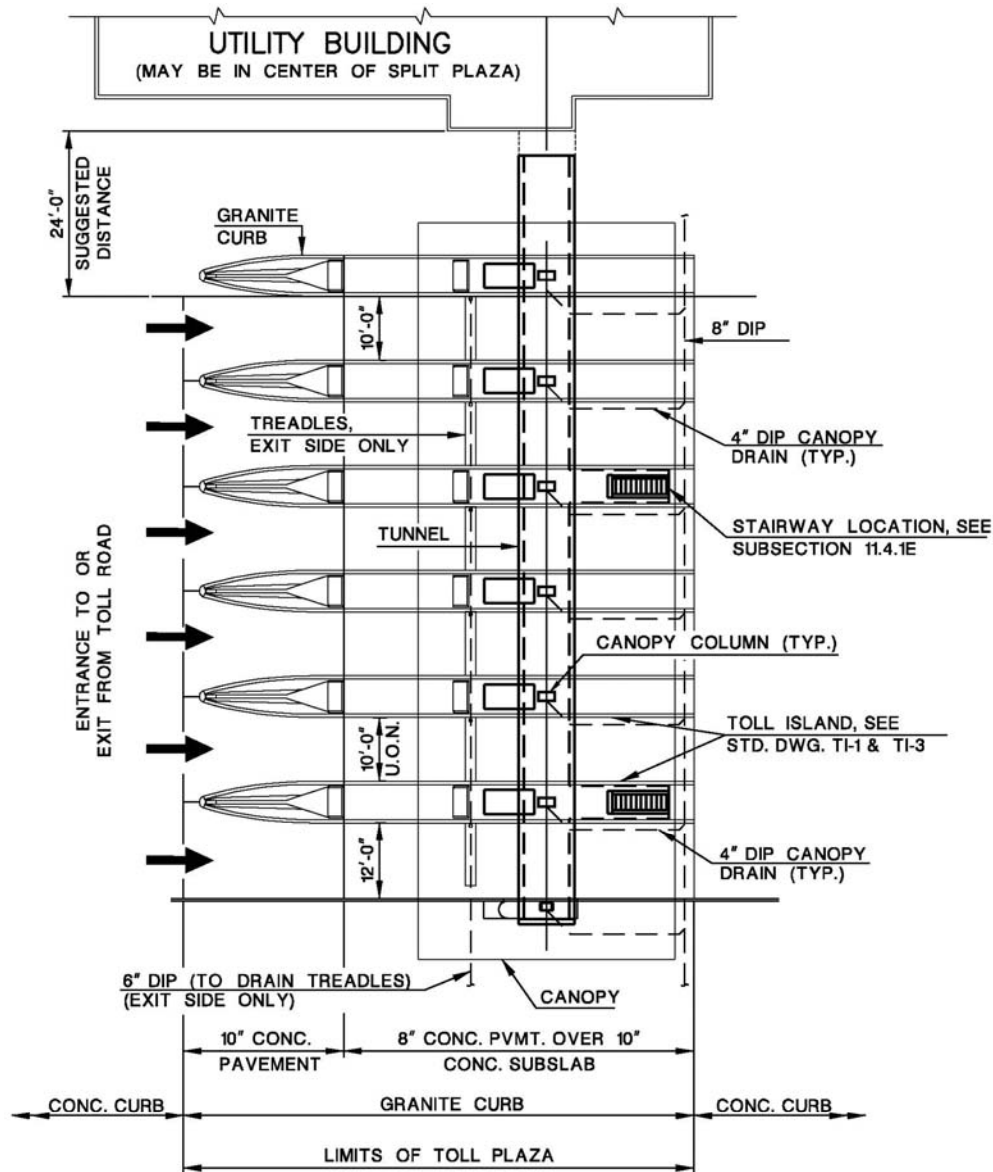
### EXHIBIT 11 - 3 UTILITY BUILDING STANDARD OPERATIONAL PLAN DIAGRAM



## EXHIBIT 11 - 4 TWO WAY TOLL PLAZA LAYOUT



### EXHIBIT 11 - 5 ONE WAY TOLL PLAZA LAYOUT



#### LEGEND:

— — CANOPY & TREADLE  
DRAINAGE

#### NOTE:

FOR ADDITIONAL DETAILS SEE,  
STD. DWGS TI-1 TO TI-7