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Section 1 - POLICIES

1.1. GENERAL

The Authority operates pursuant to applicable New Jersey statutes, Executive Orders as well as policies and regulations that have been adopted by the Authority's Board of Commissioners. These dictate the manner in which the Authority is able to conduct its operations. A partial list of the statutes, Executive Orders and Authority Policies and Regulations is provided below. Please note that this is not a complete list. It is assumed that all parties retained by the Authority will be aware of, observe and comply with all applicable Federal and State laws, Executive Orders and Authority Policies and Regulations that apply to the scope of services listed in the individual agreement.

1.1.1. New Jersey Statutes

1.1.1.1. P.L. 2005, Ch. 51 (N.J.S.A. 19:44A-20.13-20.25), formerly Executive Order 134 (Pay to Play)

In order to safeguard the integrity of State government procurement by imposing restrictions to insulate the award of State contracts from political contributions that pose the risk of improper influence, purchase of access or the appearance thereof, this Executive Order was signed and later passed into law. The restrictions set forth therein apply to all business entities and their principals placing limits on the amount of contributions and on the receipts of same. This will be addressed during the procurement process. The following website contains more detailed information, as well as sample forms that must be completed and submitted:

http://www.nj.gov/treasury/purchase/forms.htm#eo134

1.1.1.2. N.J.A.C. 17:14-5.2 (Small Business Enterprise)

The Authority policy is committed to the employment of small business enterprises (SBE's) in all forms of procurements including the purchase of goods, provision of professional services and award of construction contracts. In general, the overall Authority goal is 25 percent participation. In order to achieve this level, the Authority may set aside contracts for certain material purchases, consulting services and construction projects solely for award to SBE firms. Many Authority contracts provide that the firm serving as the primary provider, if not an SBE, exerts a good faith effort to subcontract at least 25 percent of the contract value to firms that qualify as SBE's as defined by the New Jersey Commerce and Economic Growth Commission and the State Department of the Treasury. This will be addressed during the procurement process. The following website contains additional information:

http://www.state.nj.us/commerce/smbus_overview.shtml

1.1.1.3. Open Public Records Act (OPRA)

Allows access to the Authority's public records as provided by law. The Authority's website contains additional information.

1.1.2. Professional Services Executive Orders

1.1.2.1. P.L. 1997, Ch. 399 Executive Order 26 (Quality Based Selection)

Sets forth the procedures related to professional services contracting. This law provides for quality based selection at fair and reasonable compensation.

1.1.2.2. Executive Order No. 215 of 1989 (Environmental Assessment)

Sets forth the requirements related to the level of environmental documentation needed regarding the design of Authority projects. This Executive Order sets the threshold for triggering compliance as outlined below:

Level 1 Projects with anticipated construction costs in excess of $1 million shall be subject to the preparation of an Environmental Assessment (EA). The EA follow guidelines prepared by the State of New Jersey Department of Environmental Protection ("NJDEP"). Alternatively, environmental assessments prepared to support a "Finding of No Significant Impact" under the National Environmental Policy Act may be substituted for an assessment otherwise required pursuant to NJDEP guidelines; or

Level 2 Projects with construction costs in excess of $5 million and land disturbance in excess of five acres shall be subject to the preparation of an Environmental Impact Statement (EIS). The EIS shall follow guidelines prepared by NJDEP.

The provisions of this Executive Order shall not apply to the following types of projects:

1. Maintenance or repair projects,
2. Facilities or equipment replaced in kind at same location,
3. Renovations or rehabilitation of existing buildings;
4. Expansions or additions of existing buildings provided that the expansion or addition does not increase the building's capacity by more than 25 percent,
5. Projects subject to review pursuant to the provisions of the Coastal Area Facility Review Act or the Municipal Wastewater Treatment Financing Program;

6. Projects which will require a full environmental impact statement pursuant to the National Environmental Policy Act;
7. Projects classified as categorical exclusions pursuant to regulations promulgated in accordance with the National Environmental Policy Act; or
8. Projects involving loans or tax exempt financing to private sector applicants by departments, agencies or authorities of the State of New Jersey.

The following website contains additional information:

http://www.nj.gov/dep/opppc/reports.html

1.1.2.3. Executive Order 172 of 1987 (Public Comment)

Sets forth the requirements under which public hearings must be conducted during all Authority projects. This Executive Order sets the procedures for public participation. The Authority must:

1. Provide adequate public notice to advise that the proposed project unless it is an emergency or routine maintenance project;
2. Provide a forum which allows the Authority to make a public presentation of its plans and which provides those affected with an opportunity to adequately voice their opinions;
3. Respond to recommendations and suggestions in a timely manner;
4. Evaluate and respond to all public comments as an integral part of the project development process.

1.1.3. Authority Board Actions

1.1.3.1. Policy for Construction of Noise Barriers

Sets forth the circumstances under which noise barriers should be considered for construction at the Authority's expense in proximity to the Authority's roadways. In addition, the requirement for determining eligibility for noise barrier consideration, as well as the design criteria to be used for noise barrier construction is identified. The Authority's website contains additional information.

1.2. AGREEMENTS

1.2.1. Policy

The Authority enters into written Agreements with any municipality, county, railroad, utility company or legally constituted authority or agency affected by an Authority project. It will be the responsibility of the Authority's Law Department to prepare a

draft of every Agreement to be utilized by the Authority in their dealings with the other party.

1.2.2. Exhibits

With each Agreement, exhibits that graphically depict the area presented in the Agreement are required and are to be prepared by the Engineer as directed by the Authority's Law Department. An exhibit is generally at a scale of 1" = 200' and should be properly cross-referenced to the Agreement. The exhibit should be detailed enough to adequately describe the information presented in the Agreement. All Exhibits shall be submitted to the Authority's Project Manager on 11" x 17" paper along with an electronic copy in PDF format for future reproduction.

1.3. TRAFFIC

1.3.1. Traffic Permit

A traffic permit must be issued by the Authority prior to any activity being performed by non-Authority employees that impacts vehicular traffic operations or requires heavy-equipment to perform invasive testing. Occupation of the Authority's roadways for any purpose other than travel is not authorized, unless a traffic permit has been issued. The Authority's website contains additional information.

Upon execution of an OPS, the selected Engineer is recommended to submit a completed Traffic Permit, including compliance with insurance requirements, to the Authority's Project Manager for further handling. A copy of the approved permit must be in the possession of those performing the field work.

1.3.2. Roadway, Lane, Shoulder Closing and Slowdowns

Approval from the Authority must be obtained for any traffic restrictions. Requests must be coordinated and submitted to the Authority's Project Manager by noon Monday of the week prior to the requested closing or slowdown. Failure to receive approval will result in appropriate action by the State Police. In addition, coordination is required with the Maintenance Department to determine if the Authority or Engineer is placing the necessary maintenance and protection devices.

1.4. MISCELLANEOUS

1.4.1. Turnpike Roadway Designations

Exhibit 1-1 shows the nomenclature to be used in describing the various roadways along the Turnpike. Designations shall be preceded by word "FROM".

Example: **NSO** = from North to South Outer

Exhibit 1-1 New Jersey Turnpike Roadway Identification

MAINLINE

NS	North to South
SN	South to North
SNO	South to North Outer
SNI	South to North Inner
SNW	South to North Westerly
SNE	South to North Easterly
NSO	North to South Outer
NSI	North to South Inner
NSW	North to South Westerly
NSE	North to South Easterly

SOUTHERN MIXING BOWL

SNO-E	South to North on Outer to Easterly
SNO-W	South to North on Outer to Westerly
SNI-E	South to North on Inner to Easterly
SNI-W	South to North on Inner to Easterly
NSE-O	North to South on Easterly to Outerly
NSW-O	North to South on Westerly to Outerly
NSE-I	North to South on Easterly to Inner
NSW-I	North to South on Westerly to Inner

NORTHERN MIXING BOWL

NS95	North to South Interstate 95
NS80	North to South Interstate 80
SN95	South to North Interstate 95
SN80	South to North Interstate 80
SNE-95	South to North on Easterly to Interstate 95
SNE-80	South to North on Easterly to Interstate 80
SNW-95	South to North on Westerly to Interstate 95
SNW-80	South to North on Westerly to Interstate 80
NS95-E	North to South on Interstate 95 to Easterly
NS80-E	North to South on Interstate 80 to Easterly
NS95-W	North to South on Interstate 95 to Westerly
NS80-W	North to South on Interstate 80 to Westerly

INTERCHANGES

NT	North to Toll
ST	South to Toll
TN	Toll to North
TS	Toll to South
TNO	Toll to North Outer
TNI	Toll to North Inner
TSO	Toll to South Outer
TSI	Toll to South Inner
TNE	Toll to North on Easterly
TSW	Toll to South on Westerly
TNW	Toll to North on Westerly
NIT	North Inner Toll
NOT	North Outer to Toll
NET	North on Easterly to Toll
NWT	North on Westerly to Toll
SOT	South Outer to Toll
SIT	South Inner to Toll
SET	South on Easterly to Toll
SWT	South on Westerly to Toll

ROUTE 95

NS95L	North to South Route 95 Local
NS95X	North to South Route 95 Express
SN95L	South to North Route 95 Local
SN95X	South to North Route 95 Express
NLW	North Local to West
NXW	North Express to West
WNL	West to North Local
WNX	West to North Express
CD	Collector/Distributor
WCD	West to Collector/Distributor
ES	East to South
NLW	North on Local to West
SLW	South on Local to West
SLE	South on Local to East
SLX	South on Local to Express
NLX	North on Local to Express
SLE	South on Local to East
ESL	East to South Local
CSL	Collector to South Local

SERVICE AREAS

SSA	South to Service Area
NSA	North to Service Area
SAN	Service Area to North
SAS	Service Area to South
SASO	Service Area to South Outer
SASI	Service Area to South Inner
SANO	Service Area to North Outer
SANI	Service Area to North Inner
SOSA	South Outer to Service Area
SISA	South Inner to Service Area
NOSA	North Outer to Service Area
NISA	North Inner to Service Area

EXTENSIONS

NH	North to Hudson
SOH	South Outer to Hudson
SIH	South Inner to Hudson
TE	Toll to East
TW	Toll to West
ET	East to Toll
WT	West to Toll
HLT	Hudson to Local and Toll
HXT	Hudson to Express and Toll
HEW	Hudson East to West
HWE	Hudson West to East
HS	Hudson to South
HN	Hudson to North
SH	South to Hudson
PEW	Pennsylvania East to West
PWE	Pennsylvania West to East

INTERCHANGE 11

PST	Parkway from the South to Tolls
PNT	Parkway from the North to Tolls

SPORTS COMPLEX

NWC	North on Westerly to Complex
CNW	Complex to North on Westerly
WC	Westerly to Complex
CW	Complex to Westerly
WX	Westerly to Xanadu
XW	Xanadu to Westerly

1.4.2. Parkway Roadway Designations

Nomenclature used in describing the various ramps along the Garden State Parkway shall include Exit number, direction (SB or NB), exit (X) or entrance (E).

Examples:

17SBX = Exit 17 Southbound Exit Ramp

17SBE = Exit 17 Southbound Entrance Ramp

17NBX = Exit 17 Northbound Exit Ramp

17NBE = Exit 17 Northbound Entrance Ramp

1.4.3. Owner Notification (Notice of Entry)

In advance of any field investigation or similar types of work, including but not limited to survey and borings, on private property, the Authority notifies each affected property

owner by letter, stating the need for entry onto their property. Exhibit 1-2 shows a sample letter that is to be modified for project specific needs. No field work of any kind may commence until the property owners are notified.

It is the Engineer's responsibility to furnish the Authority with a list of owners and their addresses for all properties which may be affected within the project. In some instances when instructed by the Authority, the Engineer will send a letter on behalf of the Authority.

If an owner takes exception to entry onto their property, the Authority will negotiate with the owner in an attempt to meet the needs of both parties prior to taking legal action. During this process, the Engineer shall not enter onto the property in dispute.

Exhibit 1-2 Sample Owner Notification (Notice of Entry)

(to be modified for project-specific needs)

(ON ENGINEER'S LETTERHEAD)

Date:

Owner
(address)

RE: NJ Turnpike Authority
Project Title
Township
County
Block ___, Lot ___

Dear _____:

This letter provides notice that the New Jersey Turnpike Authority through their Consulting Engineers, _____, intends to enter the above described property with drilling contractors at two separate times during the next six months for the purpose of drilling soil borings. During each time, the property will be occupied for a period not expected to exceed one week.

Borings involve drilling small diameter hole(s) with the use of a drilling rig. These borings will yield information regarding soil characteristics and strength and may also be used for the purpose of determining whether there exists soil or groundwater contamination, and if so, the level of such contamination. After drilling is completed, holes will be suitably backfilled to the original ground elevation.

In the event the activity causes permanent damage to your property the Authority will either promptly make suitable repairs or reimburse you for the cost of repairs.

Be advised that the Authority and its employees and agents have statutory authority to enter upon your property during reasonable business hours pursuant to N.J.S.A. 27:23-6. Personnel performing these activities will carry appropriate identification.

Should you have questions concerning this matter, you may contact _____, by letter at the above address or fax at _____.

Very truly yours,

Project Manager

Copy:

New Jersey Turnpike Authority Project Manager

Section 2 - Order for Professional Services Reporting

2.1. General

An Order for Professional Services (OPS) is the contract between the Authority and Engineers. OPS issued by the Authority require that invoices be submitted monthly and within 15 Calendar Days after the close of the report period. Invoices must be accompanied by Monthly Progress Reports, or they will not be processed for payment. If the Engineer neglects to submit an invoice for services in any given month, or over a period of months, the firm shall nevertheless be required to submit a Monthly Progress Report as described in this Section. Failure to do so creates a burden on the Authority's staff to properly track costs of services and schedules and it impairs their awareness of any circumstances which may arise that adversely affect both. Consequently, failure to submit Progress Reports each and every month that the assignment is in progress will be considered by the Authority as reflecting poorly on the quality of the Engineer's services and will be a factor in judging the merit of requests for additional compensation. As the nature of each project is different, any requirement identified may be waived at the discretion of the Authority's Project Manager.

2.2. Invoices

A complete invoice submission includes the following information and documents:

1. A roster identifying staff that provided services during the report period, and the product of their hourly wage rate and the number of hours charged
2. A list of all direct expenses (expenses for which the Engineer is allowed to be reimbursed are defined under the terms of the OPS, in the Compensation Section)
3. Copies of individual expense accounts
4. Copies of vendor and subcontractor invoices
5. Copies of subconsultant invoices along with the same substantiating documentation as for the Engineer including Monthly Progress Reports
6. SBE Certificate of Participation Form
7. Monthly Invoice Summary, as shown in Exhibits
8.
9. Exhibit 2-1
10. Monthly Narrative Progress Report, as shown in Exhibit 2-2
11. Monthly Project Staffing Status Report, as shown in Exhibit 2-3
12. Monthly Design Progress Schedule, as shown in Exhibit 2-4
13. Monthly Permit Status Summary, as shown in Exhibit 2-5

2.2.1. Monthly Progress Reports

It will be the responsibility of the Engineer to submit Monthly Progress Reports to the Authority's Project Manager on the first of every month if not included in an Invoice or as directed by the Authority's Project Manager. Exhibit 2-2 shows a sample Monthly Narrative Progress Report. The Progress Reports shall consist of a written text and a Design Progress Schedule in the format outlined below. The written text is to follow the items of work shown on the Design Progress Schedule. Every item shown on the Schedule is to be covered in the text, and the order is to be the same each month. In discussing the items of work, the Engineer is to address the progress made during the past month, problems which have been resolved, new or old problems that require answers, the percentage completed for each item of work and for the overall project, work anticipated for the coming month, whether or not the individual items and overall project is on schedule, and if not, what steps are being taken to rectify the situation, and the status of permits required.

2.2.2. Design Progress Schedule

Within two (2) weeks after the Notice to Proceed, the Engineer shall submit to the Authority's Project Manager for approval, the proposed breakdown of individual tasks to be completed during design. This breakdown shall reflect the different discipline types (e.g. Survey/Base Mapping, Utilities, Right of Way, Permits, Alignment, Drainage, Signing, Lighting, Structures, Toll Plaza, etc.), and the estimated duration for each phase. Exhibit 2-4 shows a sample Design Progress Schedule that is to be modified for project specific needs. The appropriate number of copies of the Design Progress Schedule, as directed the Authority's Project Manager, are to be submitted with each Monthly Progress Report.

2.2.3. Permit Status

Exhibit 2-5 shows a sample Permit Status Summary that is to be modified for project specific needs. The appropriate number of copies of the Permit Status Summary, as directed the Authority's Project Manager, are to be submitted with each Monthly Progress Report.

2.3. BILLINGS

All billings by the Engineer shall be made to the Authority's Project Manager on Engineer's letterhead in the prescribed Invoice format as shown in Exhibits

Exhibit 2-1. All billings from outside agencies such as utility companies, etc. must be signed and approved by the Engineer before submittal to the Authority's Project Manager.

2.4. REQUEST FOR SUPPLEMENTS

OPS contain a caveat concerning the performance of services not included in the scope of the project. It is incumbent upon the Engineer to inform the Authority's Project Manager whenever the firm believes it has been required to perform such 'extra' services and to first secure agreement with the Authority for scope and fee before performing these services. Failure to do so burdens the Engineer with the risk of non-payment for performing unauthorized services. Without an agreed upon scope and fee, the Authority has no means of tracking costs against an estimated maximum amount. In effect, without a ceiling to respect, the Engineer cannot expect to receive a 'blank check' with no accountability for the efficiency of their operations or the cost of services.

Justifying additional compensation for underestimating the effort to perform in-scope services is extremely difficult. If the actual percent complete of each task is accurately reported, the completion of the Monthly Project Status Report spreadsheet (Exhibit 2-3) which accompanies each invoice will forecast an overrun. When the total 'Direct Salaries Status' column reflects a negative quantity, then the budgeted direct salaries and perhaps the total authorized fee are expected to overrun. Here again, timely recognition of this condition is important and the key to avoiding overruns, because with early discovery, the Engineer may have the opportunity to adjust and maximize the efficiency of their operations. Generally, overruns in performing in-scope services can be justified only if it can be shown that the situation has evolved as a result of conditions beyond the control of the Engineer, such as but not limited to: third party actions (or non-actions) of regulatory agencies; unanticipated levels of community or public involvement that require additional coordination effort beyond the scope originally defined; and, the discovery of unanticipated site conditions. In any event, the Engineer cannot reasonably expect the Authority to compensate dollar for dollar for overruns after the fact (i.e., after the authorized fee is spent). As soon as the Project Status Report indicates a significant (>5 percent) overrun in direct salaries or unanticipated direct expenses, the Engineer must negotiate with the Authority and determine a course of corrective action to avoid an overrun, or alternatively, commit to a firm estimate well before the actual authorized fee is exceeded. In general, no supplement will be considered if the only legitimate reason is that the Engineer originally underestimated the effort required to complete a task.

2.5. CLOSEOUT PROCESS (FINAL INVOICE)

Upon completion of the services identified under the OPS which has been confirmed by the Engineer with the Authority's Project Manager, the last invoice submitted shall be identified as FINAL on both the letter of transmittal and invoice and on the SBE Certificate of Participation form if applicable. The FINAL invoice shall indicate that all work is completed, and no further invoicing of the specified OPS shall be submitted.

2.6. EXHIBITS

Exhibit 2-1 Sample Monthly Invoice Summary

SAMPLE MONTHLY INVOICE SUMMARY

(ON ENGINEER'S LETTERHEAD)

Date:

New Jersey Turnpike Authority
Engineering Department
P.O. Box 5042
Woodbridge, NJ 07095-5042
Attention: (Authority's Project Manager)

EngineeringOPSinvoices@njta.com

OPS No.
OPS Title
Task Number (if applicable)

Invoice Number: (numbered sequentially starting with "1")
Invoice Period: mm/dd/yyyy to mm/dd/yyyy

Total Percent Billed:
Percent of Work Complete: (from Monthly Project Status Report)

	Authorized Fee	**Total Invoiced Through** (invoice date)	**Previously Invoiced**	**Amount Due This Invoice**
Direct Salaries	x,xxx,xxx.xx	x,xxx,xxx.xx	x,xxx,xxx.xx	xx,xxx.xx
O & P (1.xx)	x,xxx,xxx.xx	x,xxx,xxx.xx	x,xxx,xxx.xx	xx,xxx.xx
Direct Expenses	x,xxx,xxx.xx	x,xxx,xxx.xx	x,xxx,xxx.xx	xx,xxx.xx
Sub-Total	x,xxx,xxx.xx	x,xxx,xxx.xx	x,xxx,xxx.xx	xx,xxx.xx
Subconsultants				
Sub A	x,xxx,xxx.xx	x,xxx,xxx.xx	x,xxx,xxx.xx	xx,xxx.xx
Sub B	x,xxx,xxx.xx	x,xxx,xxx.xx	x,xxx,xxx.xx	xx,xxx.xx
Sub C	x,xxx,xxx.xx	x,xxx,xxx.xx	x,xxx,xxx.xx	xx,xxx.xx
Sub-Total	x,xxx,xxx.xx	x,xxx,xxx.xx	x,xxx,xxx.xx	xx,xxx.xx
TOTALS	x,xxx,xxx.xx	x,xxx,xxx.xx	x,xxx,xxx.xx	xx,xxx.xx

Very truly yours,

Project Manager

Exhibit 2-2 Sample Monthly Narrative Progress Report

Date:
OPS No.
OPS Title
Task Number (if applicable)
Invoice Number: (numbered sequentially starting with "1")
Invoice Period: mm/dd/yyyy to mm/dd/yyyy

MONTHLY NARRATIVE PROGRESS REPORT

1. Services Performed During the Invoice Period

Describe services (activities) that were performed for each task comprising the OPS corresponding to the Monthly Progress Report spreadsheet, as for example,

a. Project Management
b. Field Surveys
c. Subsurface Exploration Contract
d. Phase A Plan Preparation

2. Services to be Performed Next Period

In sequence as above

3. Environmental Permits

Describe services (activities) that were performed specifically related to the permit process and identify the target date for completion and obtaining the permit(s). To be included is a list of the various permits (navigation, coast guard, etc.) and grants (tidelands, riparian, etc.) that are required, when the required forms will be submitted, estimated time for approvals from the responsible agencies, and how this is coordinated with the Schedule in order to meet the various phase submissions and more importantly, that delays from unapproved permits will not impair advertisement or construction progress. As the design progresses, the status of these permits is to be covered in the written text as noted above and included in the permit status table.

4. Decisions Required

Identify activities on which progress is affected by the decisions of others. If there has been a lapse in the progress of an activity, identify which department, agency, and person is responsible for not furnishing timely decisions that affect the conduct of the services. If there are no decisions required indicate, 'None Required at this Time'.

5. Schedule Issues

Describe the status of the project progress, identifying which activities, if any, are behind schedule. It is essential that with each invoice, a computer generated bar chart (P3, Surtrak or MS Project) update be

submitted, with the data date corresponding to the invoice date. Target bars should be included in the schedule in order to gauge planned and actual progress on an activity basis. If there is a reason to believe that the submission date of deliverables (a schedule milestone) will be delayed beyond the date originally committed, describe measures that can be taken to recover the original schedule. In the event that a deliverable submission date is likely to be late, the Engineer is responsible to apprise the Authority the moment such event is suspected to occur without waiting for the submission of an invoice progress report.

6. Budget Issues

Describe in detail issues which have arisen to cause or threaten to cause a budget overrun. The Progress Status Report spreadsheet will forecast this event by the display of a negative value for the 'Status' column. Be specific as to the date that the scope was increased or otherwise changed or alternatively, identify the factors beyond the Engineer's control that caused the firm to spend more time than was anticipated to perform in-scope activities. In this regard, it should be noted that the terms of the OPS require the Engineer to provide ample notice and authorization by the Authority before performing services of any type that are likely to result in a budget overrun. As a rule, the Engineer should not expect to be compensated for performing such services by the issuance of an OPS supplement unless the Authority agrees that an increase in authorized fee is warranted. Progress Reports accompanying monthly invoices do not constitute the proper means for first alerting the Authority to budget issues. Early discovery of such instances must be the subject of formal written correspondence between the Engineer and the Authority.

7. Out of Scope Work

Describe those activities which are deemed out of scope along with justification, anticipated schedule and anticipated costs.

Exhibit 2-3 Sample Monthly Project Staffing Status Report

MONTHLY PROJECT STAFFING STATUS REPORT

Date:
OPS No.:
OPS Title:
Invoice No.:
Invoice Period:

(A) No.	(B)TASK	PERSON-HOURS				DIRECT SALARIES				(K) Estimated Percent Complete	(L) Actual Percent Spent
		(C) Budget	(D) Spent	(E) Projected Total	(F) Status	(G) Budget	(H) Spent	(I) Projected Total	(J) Status		
1	Project Management	200	100	200	-	$10,050	$5,025	$10,050	$0	50.0	50.0
2	Field Surveys	800	920	920	(120)	$26,040	$29,946	$29,946	($3,906)	100.0	115.0
3	Subsurface Exploration Contract	650	600	600	50	$18,688	$17,250	$17,250	$1,438	100.0	92.3
4	Phase A Plan Preparation	1,800	600	1,500	300	$58,050	$19,350	$48,375	$9,675	40.0	33.3
	TOTALS	3,450	2,220	3,220	230	$112,828	$71,571	$105,621	$7,207	67.8	63.4

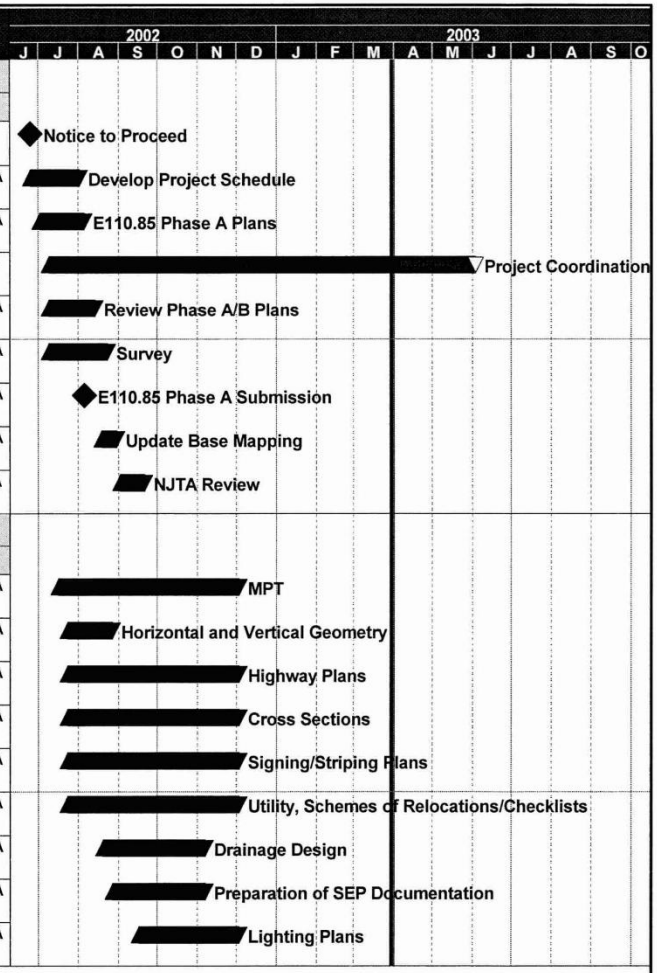
(Negative) status predicts budget overrun
Positive status predicts budget underrun

Note: In addition to a report summarizing the progress of all participants, a spreadsheet report must be submitted individually for the prime and all subconsultants

Notes: Column K is estimated from actual task accomplished
Columns C & G, D & H are actual hour and dollar amounts from cost control systems
Columns E & I = Column D/Column K & Column H/Column K
Columns F & J = Column C - Column E and Column G - Column I
Column L = Column H/Column G

Exhibit 2-4 Sample Design Progress Schedule

Activity ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish
Initial Work					
AA1000	Notice to Proceed	0	0	25JUN02A	
AA1005	Develop Project Schedule	10	0	25JUN02A	01AUG02A
AA1030	E110.85 Phase A Plans	33	0	03JUL02A	05AUG02A
AA1010	Project Coordination Meetings	260	46	10JUL02A	02JUN03
AA1020	Review Phase A/B Plans	20	0	10JUL02A	14AUG02A
AA1060	Survey	25	0	10JUL02A	23AUG02A
AA1040	E110.85 Phase A Submission	0	0		05AUG02A
AA1070	Update Base Mapping	10	0	19AUG02A	30AUG02A
AA1050	NJTA Review	10	0	02SEP02A	20SEP02A
Phase B					
Highway					
AA2025	MPT	40	0	17JUL02A	02DEC02A
AA2000	Horizontal and Vertical Geometry	15	0	24JUL02A	26AUG02A
AA2005	Highway Plans	65	0	24JUL02A	02DEC02A
AA2010	Cross Sections	20	0	24JUL02A	02DEC02A
AA2020	Signing/Striping Plans	30	0	24JUL02A	02DEC02A
AA2030	Utility, Schemes of Relocations/Checklists	80	0	24JUL02A	02DEC02A
AA2035	Drainage Design	25	0	20AUG02A	06NOV02A
AA2040	Preparation of SEP Documentation	29	0	27AUG02A	06NOV02A
AA2015	Lighting Plans	20	0	17SEP02A	02DEC02A



Start Date 05JUN02
Finish Date 19AUG03
Data Date 31MAR03
Run Date 07MAR07 10:12

Early Bar
Progress Bar
Critical Activity

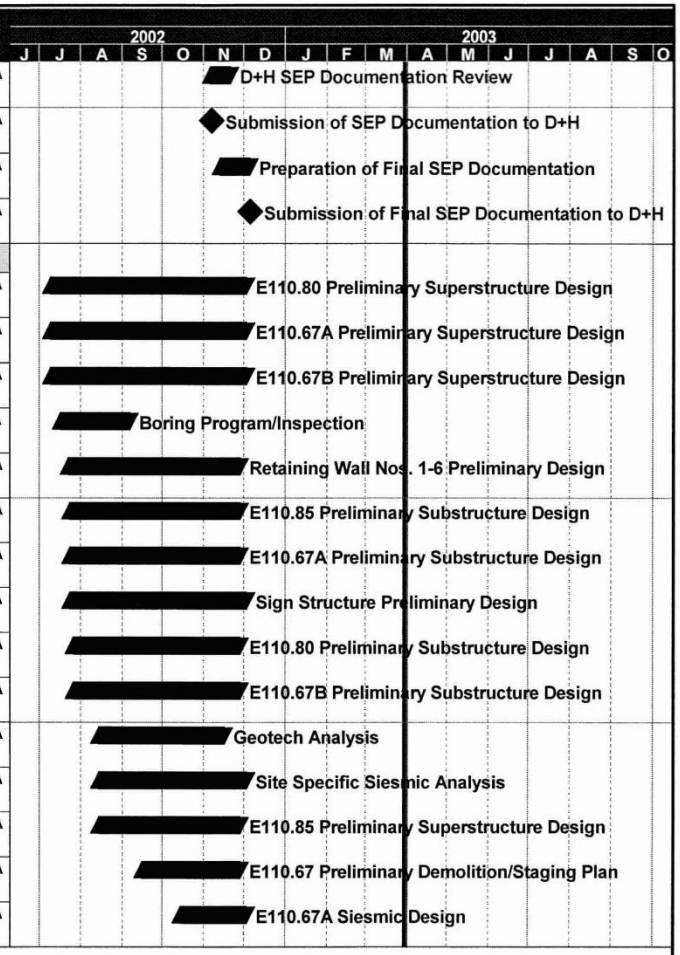
SI09 Sheet 1 of 4

OPS No.
Project Title

Final Design Schedule

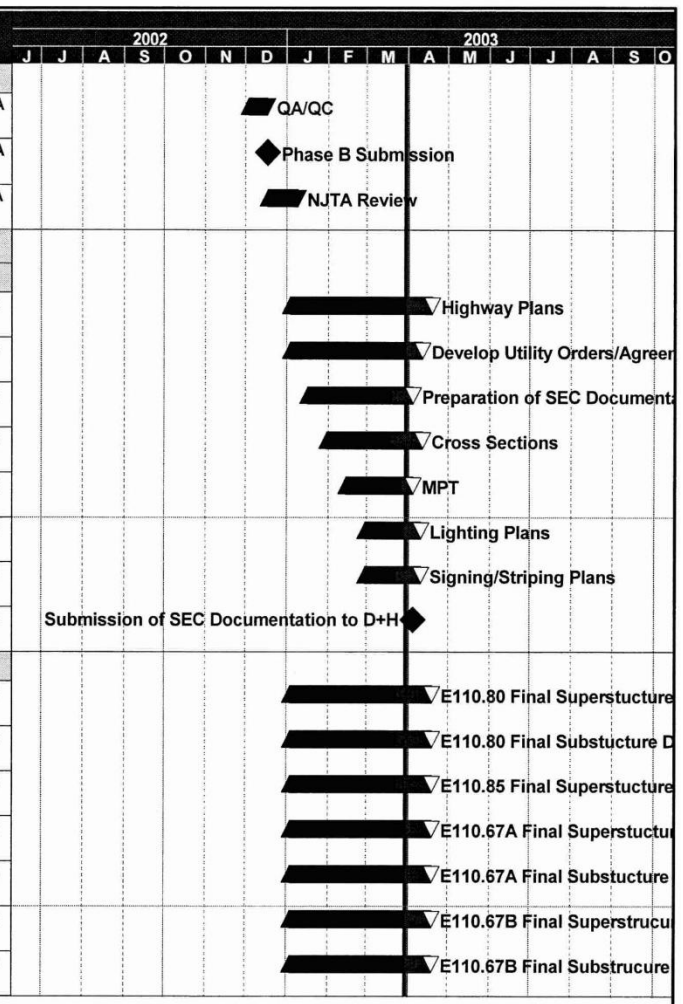
Engineering Firm
Update No. X
Month, Year

Activity ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish
AA2050	D+H SEP Documentation Review	10	0	06NOV02A	20NOV02A
AA2045	Submission of SEP Documentation to D+H	0	0		06NOV02A
AA2055	Preparation of Final SEP Documentation	10	0	13NOV02A	04DEC02A
AA2060	Submission of Final SEP Documentation to D+H	0	0		04DEC02A
Structures					
AA3020	E110.80 Preliminary Superstructure Design	80	0	10JUL02A	02DEC02A
AA3040	E110.67A Preliminary Superstructure Design	100	0	10JUL02A	02DEC02A
AA3055	E110.67B Preliminary Superstructure Design	100	0	10JUL02A	02DEC02A
AA3000	Boring Program/Inspection	20	0	17JUL02A	06SEP02A
AA3065	Retaining Wall Nos. 1-6 Preliminary Design	50	0	23JUL02A	27NOV02A
AA3035	E110.85 Preliminary Substructure Design	52	0	24JUL02A	27NOV02A
AA3045	E110.67A Preliminary Substructure Design	85	0	24JUL02A	27NOV02A
AA3070	Sign Structure Preliminary Design	50	0	24JUL02A	02DEC02A
AA3025	E110.80 Preliminary Substructure Design	65	0	26JUL02A	27NOV02A
AA3060	E110.67B Preliminary Substructure Design	85	0	26JUL02A	27NOV02A
AA3005	Geotech Analysis	25	0	14AUG02A	15NOV02A
AA3010	Site Specific Siesmic Analysis	40	0	14AUG02A	02DEC02A
AA3030	E110.85 Preliminary Superstructure Design	65	0	15AUG02A	27NOV02A
AA3015	E110.67 Preliminary Demolition/Staging Plan	50	0	16SEP02A	27NOV02A
AA3050	E110.67A Siesmic Design	20	0	14OCT02A	02DEC02A



Start Date 05JUN02 Finish Date 19AUG03 Data Date 31MAR03 Run Date 07MAR07 10:12	Early Bar Progress Bar Critical Activity	SI09 Sheet 2 of 4 **OPS No.** **Project Title** **Final Design Schedule**	Engineering Firm Update No. X Month, Year

Activity ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish
Submission					
AA4000	QA/QC	10	0	03DEC02A	16DEC02A
AA4005	Phase B Submission	0	0		16DEC02A
AA4010	NJTA Review	10	0	18DEC02A	08JAN03A
Phase C					
Highway					
AA5000	Highway Plans	80	15	03JAN03A	18APR03
AA5025	Develop Utility Orders/Agreements	80	10	03JAN03A	11APR03
AA5030	Preparation of SEC Documentation	25	5	16JAN03A	04APR03
AA5005	Cross Sections	30	10	31JAN03A	11APR03
AA5020	MPT	30	5	14FEB03A	04APR03
AA5010	Lighting Plans	30	9	28FEB03A	10APR03
AA5015	Signing/Striping Plans	20	9	28FEB03A	10APR03
AA5035	Submission of SEC Documentation to D+H	0	0		04APR03
Structures					
AA6005	E110.80 Final Superstucture Design	60	15	03JAN03A	18APR03
AA6010	E110.80 Final Substucture Design	60	15	03JAN03A	18APR03
AA6015	E110.85 Final Superstucture Design	60	15	03JAN03A	18APR03
AA6025	E110.67A Final Superstucture Design	83	15	03JAN03A	18APR03
AA6030	E110.67A Final Substucture Design	80	15	03JAN03A	18APR03
AA6035	E110.67B Final Superstrucure Design	80	15	03JAN03A	18APR03
AA6040	E110.67B Final Substrucure Design	80	15	03JAN03A	18APR03



Start Date	05JUN02
Finish Date	19AUG03
Data Date	31MAR03
Run Date	07MAR07 10:12

Early Bar
Progress Bar
Critical Activity

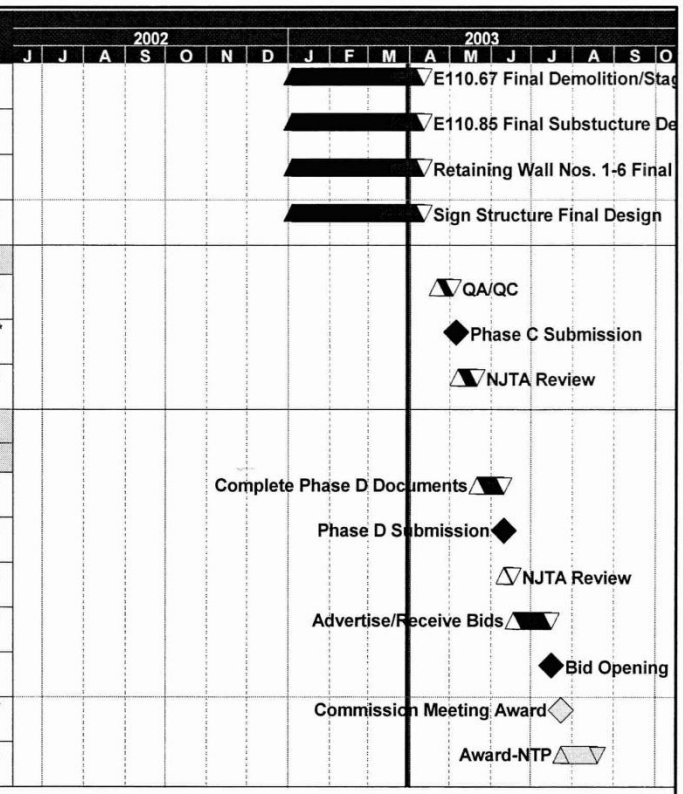
SI09 Sheet 3 of 4

OPS No.
Project Title

Final Design Schedule

Engineering Firm
Update No. X
Month, Year

Activity ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish
AA6000	E110.67 Final Demolition/Staging Plan	40	10	03JAN03A	11APR03
AA6020	E110.85 Final Substucture Design	40	10	03JAN03A	11APR03
AA6045	Retaining Wall Nos. 1-6 Final Design	40	10	03JAN03A	11APR03
AA6050	Sign Structure Final Design	30	10	03JAN03A	11APR03
Submission					
AA7000	QA/QC	10	10	21APR03	02MAY03
AA7005	Phase C Submission	0	0		05MAY03*
AA7010	NJTA Review	10	10	07MAY03	20MAY03
Phase D					
AA8000	Complete Phase D Documents	15	15	21MAY03	10JUN03
AA8005	Phase D Submission	0	0		10JUN03
AA8010	NJTA Review	5	5	11JUN03	17JUN03
AA8015	Advertise/Receive Bids	20	20	18JUN03	15JUL03
AA8020	Bid Opening	0	0		15JUL03
AA8025	Commission Meeting Award	0	0		22JUL03*
AA8030	Award-NTP	20	20	23JUL03	19AUG03



Start Date 05JUN02 Finish Date 19AUG03 Data Date 31MAR03 Run Date 07MAR07 10:12	Early Bar Progress Bar Critical Activity	SI09 Sheet 4 of 4 **OPS No.** **Project Title** **Final Design Schedule**	Engineering Firm Update No. X Month, Year

Exhibit 2-5 Sample Permit Status Summary

(to be modified for project specific needs)

STATUS OF PERMITS OPS NO. PROJECT TITLE	
USACE Section 404 Permit	Initial Permit 93-03440 & 93-03441 issued 12/97 and 1/99 respectively, **Permit (modification) Number 93-03441-1 issued 5/6/02**. The conservation easement was submitted to USACE on 1/31/02. USACE recommended revisions to the Preservation Area map. Additional information provided to the New Jersey Turnpike Authority regarding USACE recommendations in June 2003.
NJDEP Stream Encroachment Permit/WQZ/CZM EO215 EIS	All input needed by June 1, 2004 (concurrent with Phase B) SEP/WQC/CZM application to be submitted to the New Jersey Turnpike Authority on June 15, 2004. SEP/WQC/CZM application to be submitted to NJDEP on July 1, 2004. Permit issuance by November 1, 2004. EIS submitted to the New Jersey Turnpike Authority for review on April 8, 2004. Comments from the New Jersey Turnpike Authority by April 21, 2004. To be submitted to NJDEP for review on April 30, 2004. Conditional approval by June 30, 2004.

Section 3 - SUBMISSION REQUIREMENTS

3.1. GENERAL

The project lifecycle consists of Concept Development (CD), Preliminary Design (PD), Final Design (FD) and Post-Design Services/Construction Engineering Support. A project may be a single construction contract, or it may consist of multiple construction contracts. Unless otherwise noted in the project scope documents, a project will include all phases as described in this Section.

This Section defines the major tasks and deliverables for each project phase. The Engineer shall confirm with the Authority's Project Manager the method of delivery and number of copies required for each deliverable three weeks prior to each submission. Review timeframes will be determined on a case-by-case basis and coordinated with the Authority's Project Manager. Comment resolution summaries are to be submitted to the Authority's Project Manager two weeks after comments are received for concurrence. For Final Design deliverables, comment resolution summaries and original comments for the previous review shall also be submitted with the following deliverable.

For additional information on formatting and procedures for submittals, refer to: Guidance for Electronic and Hard Copy Submittals

3.1.1. Project Phases

Concept Development involves developing a well-defined and well-justified Purpose and Need Statement focusing on the primary needs to be addressed by the project. The major objectives of Concept Development are to identify and compare reasonable alternatives and strategies that address the Purpose and Need Statement and ultimately select a Preliminary Preferred Alternative (PPA). Concept Development will validate whether the project can be advanced to Preliminary Design and Final Design.

The primary activities in Concept Development include, but are not limited to, data collection, coordination with Authority subject matter experts and stakeholders (including NJDOT, other associated transportation agencies and local officials, when deemed appropriate), risk identification, development of a number of prudent and feasible conceptual alternatives, and alternatives analysis studies. The studies will consider environmental impacts, right-of-way impacts, access impacts, utility impacts, design, traffic impacts and related MPT/Staging, community involvement (as required), agency/local government input, initial and lifecycle costs, and constructability to a planning level effort.

3.1.1.1. Preliminary Design (Phase A)

Preliminary Design involves advancing the PPA through initial design, engineering, and environmental technical studies. The major objective of Preliminary Design is to develop and refine the PPA with the detail necessary

to secure the approval of the Environmental Document and Design Exceptions, as well as determine preliminary ROW impacts. The Phase A milestone submission is included in Preliminary Design. Risk management and constructability reviews continue in Preliminary Design.

3.1.1.2. Final Design (Phases B, C, D)

Final Design involves continuing design tasks started in Preliminary Design to develop final contract documents. The major objective of Final Design is to produce the project's contract documents (Final Plans, Specifications, Cost Estimate) for use in soliciting bids and moving the project to Construction.

The primary activities in Final Design include, but are not limited to, completing roadway design, bridge and structure design, right-of-way and access engineering, utility engineering, securing environmental permits and clearances, environmental investigation (if required), risk management, and community outreach (as required). The Phase B, Phase C, and Phase D milestone submissions are included in Final Design.

3.1.1.3. Post-Design/Construction Engineering Support Services

As a project moves into construction, the Engineer will provide Post-Design services and Construction Engineering Support including, but not limited to, bid analysis, preparation of Changes of Plans, Shop Drawing reviews and responding to Requests for Information.

3.1.2. Project Checklist

The Authority has developed Project Checklists that list submittals required for each phase. The Major Milestone Submission Checklists document the specific deliverables for each milestone submission. The appropriate Major Milestone Submission Checklist is to be included with each milestone submission.

The template Checklist for all phases can be found at: Project Checklist

3.1.3. Multi-Phase Tasks and Deliverables

The following tasks span multiple phases of the project lifecycle and require a submittal at the earliest project phase that will be updated and re-submitted in subsequent phases.

3.1.3.1. Design Decision Report

A Design Decision Report (DDR) will be prepared and updated throughout the project lifecycle. All significant design decisions will be documented in the DDR and submitted to the Authority's Project Manager. The DDR will be prepared in accordance with the Authority's DDR template.

Design Decision Report Template

3.1.3.2. Risk Management

The Risk Register will be updated throughout the project lifecycle. Project risks are to be assessed in areas including, but not limited to, utilities, right-of-way, access, drainage, stormwater management, environmental impacts, constructability, schedule, and cost. During each submission, the Engineer shall:

- Identify any new risks
- Review and implement risk response action plans, as necessary

Risk Register Template

3.1.3.3. Constructability

Throughout the project lifecycle, it will be necessary for the Engineer to perform a constructability review to verify the subject project is safely and logistically constructible. Constructability Reviews should begin in the earliest phase of the project and be documented in the Concept Development and Preliminary Design Reports. A standalone Constructability Review Report shall be prepared and submitted in Final Design, as noted in the Project Checklist. Requirements of the Constructability Review and Constructability Review Report are included in the "Constructability Review" section of the Procedures Manual.

3.1.3.4. Coordination With Stakeholders

Throughout the project lifecycle, it may be necessary for the Engineer to meet with stakeholders, including outside agencies, local officials, and the general public, as approved or as directed by the Authority's Project Manager. For each phase, a Stakeholder Outreach Plan shall be prepared by the Engineer and approved by the Authority's Project Manager to identify the anticipated stakeholder outreach for that phase. Recommended stakeholder outreach is described in each project phase in this Section, to be confirmed with the Authority's Project Manager based on project-specific needs.

The Engineer shall maintain a log of all communication with outside agencies. The log shall be updated throughout the project and submitted with every major milestone submittal.

The template outside agency coordination log can be found at: Outside Agency Coordination Log Template

Following each stakeholder meeting, the Engineer shall prepare and submit meeting minutes to the Authority's Project Manager including the following:

- Stakeholder and purpose for meeting
- Date and location of meeting

- List of attendees with contact information
- Topics discussed and decisions made
- Areas requiring Authority decisions
- Unresolved issues and action items with assigned responsibility, if needed
- Betterments requested and participation by outside stakeholders

3.2. CONCEPT DEVELOPMENT

3.2.1. General

During Concept Development, major tasks include Data Collection, Environmental Screening, Stakeholder Outreach, Data Analysis, Alternatives Analysis and Risk Identification, Selection of a PPA, Development of Cost Estimates, Preparation of Concept Development Report, and Development of Preliminary Design Scope.

For projects with a more limited scope, the project scope documents will indicate any Concept Development tasks and deliverables that will not be required and any Preliminary Design tasks and deliverables that will be included in Concept Development. Limited scope projects include, but are not limited to, annual maintenance contracts (bridge repairs and pavement resurfacing), emergency contracts, bridge deck and superstructure replacements within the same alignment, lighting and facility maintenance contracts, and guide rail replacement contracts.

3.2.2. Major Tasks

3.2.2.1. Data Collection

The Engineer will contact the Authority's Project Manager to obtain data necessary for the concept studies. This may include, but not be limited to, traffic counts, crash data, as-built/record plans, maintenance and jurisdictional maps/agreements, and management systems data (pavement, drainage, bridge, safety, etc.). The Engineer will evaluate this input and populate the initial Project Risk Register. The Engineer will complete an Environmental Screening, utility identification (Utility Contact Letters), assist in early coordination with State Historic Preservation Organization (SHPO), if applicable, and prepare an Environmental Justice Assessment. A Geotechnical Desk Study will be performed.

CD-level mapping will be prepared for use in project base maps. The Authority's Project Manager will confirm whether topographic or aerial mapping will be required for the Concept Development studies. If topographic mapping is not prepared during Concept Development, it may be required during Preliminary Design. Typically, CD-level mapping shall be sufficient for

1”=100’ or 1”=200’ scale plan development. A Survey Control Report shall be submitted in accordance with the requirements in the “Design Surveys” section of the Procedures Manual.

3.2.2.2. Data Analysis

Data collected shall be reviewed and compared with established design criteria and standards to identify existing substandard design elements. The Engineer shall review the crash records to determine if there are crash hot spot locations within the project limits or if there is an overrepresentation of crashes within or adjacent to a substandard design element. Crash diagrams are prepared as necessary to support the crash data analysis. An environmental constraints map shall be prepared.

3.2.2.3. Purpose and Need Statement

Following data collection and analysis, the Engineer and Authority’s Project Manager shall verify the Problem Statement and the Engineer shall prepare the Project Purpose and Need Statement. The Project Purpose defines the problem, and the Project Need describes the supporting data to justify the problem. The Project Purpose and Need Statement must be concise and comprehensible and not be so narrowly defined that it unreasonably points to a single solution. Avoid stating a solution as a purpose, such as “the purpose of the proposed project is to replace the bridge.” Goals and Objectives are often included in the Project Purpose and Need Statement to address secondary issues that should be included in the proposed project.

The Draft Project Purpose and Need Statement will be submitted to the Authority’s Project Manager following data collection and analysis. Input from Subject Matter Experts and project stakeholders will be provided to the Engineer for consideration in the Final Project Purpose and Need Statement.

3.2.2.4. Alternatives Analysis

Alternative studies will be explored with a goal of selecting the alternative providing the optimal solution meeting the Project Purpose and Need. Studies may consist of, but not be limited to, horizontal and vertical alignment shifts, channelization alternatives, alternative interchange configurations, bridge material types, retaining walls, preliminary span arrangements, and preliminary right-of-way impact comparisons. The underlying objective of each alternative should be to address the Project Purpose and Need; each alternative should consider avoiding or minimizing impacts to the community, the environment, traffic, and utilities.

Conceptual maintenance and protection of traffic schemes shall be initiated (if standard drawings are not comprehensive); initial constructability reviews will

be conducted to identify potential challenges, risks, and fatal flaws. Preliminary cost estimates and right-of-way impacts will be developed. Potential detours will be evaluated and assessed for cost and schedule savings. If identified detours include non-State highways not under Authority jurisdiction in excess of 48 hours, it is recommended to seek input from the local jurisdiction, as directed by the Authority's Project Manager.

An Alternatives Comparison Matrix will be prepared to document each alternative studied and its potential impact to right-of-way, utilities, access, drainage, stormwater management, construction cost, built and natural environment, etc. Alternatives may be eliminated if they are not feasible, are cost-prohibitive, or if impacts are significant.

3.2.2.5. Selection of Preliminary Preferred Alternative

Following consultation with the Authority's Project Manager, Authority subject matter experts, and project stakeholders, the Engineer will recommend an alternative that best meets the Project Purpose and Need as the PPA. A DDR entry shall be created and approved by the Authority's Project Manager to document selection of the PPA.

3.2.2.6. Preliminary Preferred Alternative Conceptual Plans

Conceptual Plans shall be developed for the PPA to establish preliminary horizontal and vertical alignment, stormwater management characteristics, interchange configurations and local road treatments. Conceptual Plans are to be developed accurately in CAD software at 1"=100' or 1"=200' scale, on topographic or aerial background, as directed by the Authority's Project Manager. The plans produced shall be in color, unless otherwise directed by the Authority's Project Manager, in accordance with the following legend:

- Wetlands, Water and Waterways .....aqua
- Authority Roadways (mainline, ramps, U-turns, etc.).....yellow
- Authority Shoulders.....brown
- Local Roads.....green
- Right-of-Way lines (existing and proposed) .....red
- Structure Outlines .....black
- Slope Lines.....dashed
- Cut Lines .....brown
- Fill Lines .....green
- Parks, Hatched.....green
- Mileposts, Outlined .....black

The Conceptual Plan set shall include plans, profiles, and typical sections showing, at a minimum, lane dimensions, local roadway widths, intersections,

access/driveways, grading criteria, median treatments, drainage features, and approximate locations of existing utilities with conflicts identified. For additional plan requirements, see "Preliminary Plans" in the "Roadway Plan Preparation" section of the Procedures Manual.

For projects involving structures, preliminary GP&E plans shall be included in the Conceptual Plan set. Preliminary maintenance and protection of traffic plans, including conceptual barrier layout in plan view to confirm feasibility of traffic shifts, and preliminary detour plans shall also be included in the Conceptual Plan set.

3.2.2.7. Geometric Review and Reasonable Assurance of Design Exception Approval

The Engineer will determine if Design Exceptions will be required for the PPA. To obtain reasonable assurance that the Authority will grant the Design Exceptions in the Design phases, the Engineer will prepare and submit a Geometric Review package. The Geometric Review package will include a summary of existing substandard design elements and an analysis of substandard elements to remain that will require Design Exceptions. The Geometric Review package will be submitted to the Authority for review and approval, as directed by the Authority's Project Manager. Documentation of Reasonable Assurance of Design Exception Approval, provided by the Authority, is to be included in the Concept Development Report and documented in the DDR.

For more information on Design Exceptions and requirements of the Geometric Review Package, see Design Exception Guidance Document

3.2.2.8. Concept Development Report

The CD Report documents all of the information used to develop the PPA. The report shall be prepared in accordance with the Authority's latest CD Report Template. The CD Report should include, at a minimum, a project description, Project Purpose and Need, design parameters, existing inventory and condition, traffic and crash summary, summary of alternatives studied, environmental concerns, schedule considerations, cost estimates, problem areas requiring further investigation in the next phase of design, summary of meetings held, proposed construction staging, anticipated ROW impacts, anticipated environmental permits and environmental mitigation considerations. The anticipated Environmental Document (to be obtained in Preliminary Design) should be described, as well as documentation of anticipated Design Exceptions and the Authority's concurrence.

The DDR log for Concept Development is to be included as an appendix to the CD Report to document all major design decisions for the project.

The Alternatives Comparison Matrix and Project Risk Register are to be included as appendices to the CD Report. Project risks, including any major utility risks, identified earlier in Concept Development will be assessed and updated if necessary and any newly identified risks will be added.

The Engineer will submit the Draft CD Report to the Authority for review, as directed by the Authority's Project Manager. Following the Authority's review, the Engineer will compile a Comment Resolution Summary, address comments, and submit the Final CD Report to the Authority along with a copy of the Comment Resolution Summary.

The sample Concept Development Report Table of Contents can be found at: Concept Development Report Template This template can be modified to meet project needs.

3.2.2.9. Preliminary Design Scope Statement

The Engineer will evaluate and prepare a suggested scope of work for Preliminary Design and submit to the Authority's Project Manager to assist in preparation of the project solicitation documents.

3.2.2.10. Stakeholder Outreach

The Engineer shall prepare a Stakeholder Outreach Plan to outline the anticipated stakeholder outreach during Concept Development. The Stakeholder Outreach Plan is to be submitted to the Authority's Project Manager for approval. Stakeholder Outreach in Concept Development should seek to introduce the project to the affected stakeholders and obtain their input to be used in development of the project alternatives. The Concept Development Stakeholder Outreach Plan should include the following:

- List of activities/meetings
- Purpose and objective for each meeting
- Target audience for each meeting
- Outreach methods
- Need for translation services

The level of stakeholder outreach and outside agencies to be consulted will depend on the scope of the project and its perceived impacts. For projects with impacts to non-Authority roadways, a Local Officials Briefing is recommended and a Public Information Center may be considered for larger projects to better understand how the project may impact the public.

Coordination with utility companies can also be included in the Stakeholder Outreach Plan.

3.2.3. Deliverables

- Concept Development Stakeholder Outreach Plan
- Project Risk Register
- Environmental Screening
- Utility Contact Letters
- Environmental Justice Assessment
- Geotechnical Desk Study
- Survey Control Report
- Crash Diagrams
- Project Purpose and Need Statement
- Alternatives Comparison Matrix
- Preliminary Preferred Alternative Conceptual Plans
- Preliminary ROW Impact Plan
- Preliminary Cost Estimate
- Geometric Review Package
- Concept Development Report
- Design Decision Report
- Preliminary Design Scope Statement
- Outside Agency Coordination Log

3.3. PRELIMINARY DESIGN (PHASE A)

3.3.1. General

During Preliminary Design, the PPA developed in Concept Development will be advanced through initial design, engineering, and technical studies to an approximate 30 percent completion level of design. Major tasks include Stakeholder Outreach, Approved Environmental Document, Approved Design Exception, Preliminary ROW Documents, Utility Identification, Risk Assessment, and Preparation of Preliminary Plans. If topographic mapping was not prepared during Concept Development, this mapping should be prepared at the start of Preliminary Design.

For projects with a more limited scope or those that did not have a Concept Development phase, the project scope documents will indicate any Preliminary Design tasks and deliverables that will not be required and any Concept Development or Final Design tasks and deliverables that are to be included in Preliminary Design. Limited scope projects include, but are not limited to, maintenance reserve contracts (deck and paving), emergency contracts, bridge deck and superstructure replacements within the same alignment, lighting and facility maintenance contracts, and guide rail replacement projects.

Some disciplines, such as Right of Way and Environmental/Drainage, will have milestones that do not align with Preliminary Design (Phase A Major Milestone Submission). Those submittals will also be captured on the Project Checklist.

3.3.2. Major Tasks

3.3.2.1. Project Plan

At the start of Preliminary Design, the PPA chosen in Concept Development shall be further developed and refined. This should be done in conjunction with additional stakeholder input, as needed, through the Stakeholder Outreach Plan. A focus should be placed on portions of the design that may result in additional ROW and access impacts, not identified during Concept Development. The PPA designs will be developed to a level of detail necessary to prepare and obtain approval of the Environmental Document and final approval of Design Exceptions.

Once the PPA is refined, the Engineer will submit the "Project Plan" to the Authority's Project Manager for review. Following the Authority's review, the Engineer will compile a Comment Resolution Summary, address comments, and submit the Final Project Plan to the Authority along with a copy of the Comment Resolution Summary. The Authority's Project Manager will provide approval that the Project Plan can be used to develop the Phase A plans. A copy of this approval shall be included in the Preliminary Design Report and documented in the DDR.

3.3.2.2. Environmental Document

The Environmental Screening Report prepared during Concept Development should be utilized in conjunction with the approved Project Plan to prepare the required Environmental Document. If the project did not have a Concept Development phase, an Environmental Screening should be prepared to identify the Areas of Concern for use in the development of the Environmental Document. Environmental Engineering guidance is outlined in the "Environmental Engineering" section of the Design Manual.

If the Environmental Screening Report identified the need for a noise analysis, the Engineer shall prepare the analysis in accordance with the Authority's Policy for Traffic Noise Analysis and Abatement, as well the "Traffic Noise Analysis and Abatement" section of the Procedures Manual. A Traffic Noise Analysis and Abatement Report shall be prepared and included as part of the Environmental Document.

The Engineer will prepare the required Environmental Document. For the majority of the Authority's projects, which are solely self-funded, with no Federal oversight, the required document will be prepared per EO 215

guidance (Exemption Letter, Environmental Assessment or Environmental Impact Statement, as applicable). Documentation following the National Environmental Policy Act (NEPA) process (Categorical Exclusion, Environmental Assessment or Environmental Impact Statement, as applicable) may be required for some projects. If a project includes a Federal Individual Permit such as a USCG Bridge Permit or USACE Section 404 or Section 10 and it cannot utilize a Nationwide permit, the NEPA process shall be followed, as required by the applicable Federal Lead Agency.

The Engineer shall submit the Environmental Document to the appropriate party(ies) for review and approval. Following the agency(ies) review, the Engineer will compile a Comment Resolution Summary, address comments, and resubmit the updated Environmental Document along with a copy of the Comment Resolution Summary for final approval. The approved Environmental Document shall be included in the Preliminary Design Report.

3.3.2.3. Design Exception Report

The Engineer shall review the Geometric Review Package and Assurance of Design Exceptions included in the CD Report to determine if there are any additional substandard elements to remain on the project as a result of the latest Project Plan. Controlling Design Elements that require Design Exceptions are defined in the Design Exception Guidance Document. For any other design element modifications, concurrence from the Authority Project Manager and/or Authority subject matter experts shall be documented in the Design Decision Report.

The Engineer shall prepare the Design Exception Report (DER) and submit to the Authority's Project Manager for review and approval. Following the Authority's review, the Engineer will compile a Comment Resolution Summary, address comments, and submit the Final DER for approval. Documentation of the Authority's approval of the DER shall be included in the Preliminary Design Report and in the DDR.

If additional Design Exceptions are identified in future phases of Design, the DER shall be amended and resubmitted for approval.

For more information on Design Exceptions and requirements of the DER, see Design Exception Guidance Document

3.3.2.4. Preliminary ROW Plans

The Engineer will review the preliminary ROW and access impacts identified in Concept Development, in conjunction with the Project Plan refined during Preliminary Design, to finalize the list of parcel acquisitions required for the project. In addition to ROW required due to roadway widening or

realignment, it is the responsibility of the Engineer to determine ROW needed for utility relocation, construction easements, drainage, traffic signal equipment, construction access, etc. ROW acquisition is a long duration process and often on the schedule critical path. The Engineer is responsible for completeness of the ROW acquisition needs in development of the preliminary ROW plans. For additional ROW Engineering guidance and deliverable requirements, see the "Right of Way" section of the Procedures Manual.

3.3.2.5. Utility Identification

The Engineer will review the utility conflicts identified in Concept Development, in conjunction with the Project Plan refined during Preliminary Design, to determine if there are any further utility conflicts. If the project did not have a Concept Development phase, the utility contact letters shall be sent out at the start of Preliminary Design. Utility base maps prepared from as-built information and information provided by the utility companies, during the contact letter process, will be sent to the utility companies for verification. The utility base maps will be updated based on the verification information received and should show the proposed conflicts. Test holes shall be performed in Preliminary Design for verification of underground utilities that potentially require relocation to avoid added costs, ROW, or schedule delays due to late discovery during Final Design. A Utility Status Schedule shall be maintained by the Engineer throughout Preliminary Design and documented in the Preliminary Design Report. The Engineer will prepare Utility Orders for utility company preliminary engineering efforts. For additional guidance on the utility process, see the "Utility Installations, Relocations and Adjustments" section of the Procedures Manual.

3.3.2.6. Preliminary Plans/Phase A Plan Submission

The Preliminary Plans are to be prepared graphically at 1"=50' or 1"=30' scale and are to be 30 percent complete. A single submission should cover an entire project or Design Section. Specific requirements for the Phase A Plan Submission, including number of copies of each plan type, are detailed in the "Major Milestone Submission Checklist – Preliminary Design (PD) (Phase A)." Unless otherwise noted, the Phase A Plan Submission is to include:

- Title Sheet
- Preliminary Roadway Plans showing horizontal geometry and ROW lines
- Profiles
- Typical Sections
- Boring Logs and Special Soils Treatment Recommendation

- Preliminary ROW Plans
- Conceptual Lighting Plans
- Conceptual ITS Plans
- Conceptual Drainage Plans
- Utility Conflict Plans
- Structure Sketches for New and Major Bridges
- Conceptual Structural Plans
- Toll Plaza Building Preliminary Plans
- Conceptual Signing and Striping Layouts
- Maintenance Building Layout and Recommendations
- Preliminary Environmental Plans
- Conceptual Noise Wall Locations
- Conceptual Construction Sequence
- Schematics for Maintenance and Protection of Traffic
- Conceptual Staging Plans

Details on how to perform Preliminary Design and prepare documents by discipline can be found in the other Sections of the Design and Procedures Manuals.

3.3.2.7. Preliminary Design Report

The PD Report is used to document all major tasks performed during Preliminary Design. The report shall be prepared in accordance with the Authority's latest PD Report Template. The PD Report should include, at a minimum, summary of the Preliminary Design scope statement, constructability constraints and considerations, summary of the Project Plan, schedule considerations, preliminary stormwater management design, preliminary ROW and construction cost estimates, as well as all design criteria and discussions highlighting critical issues to be further investigated during Final Design.

The DDR log for Preliminary Design is to be included as an appendix to the PD Report to document all major design decisions for the project.

The utility impact plans and status schedule, the Geotechnical Engineering Report, pavement recommendation (as needed), and summary of meetings with stakeholders (outside agency coordination log) are to be included as appendices to the PD Report. Project risks identified in Concept Development will be assessed and updated if necessary and any newly identified risks will be added to the Risk Register.

The Approved Project Plan, Environmental Document, and Design Exception Reports are to be included as appendices to the PD Report.

The Engineer will submit the PD Report to the Authority for review, as directed by the Authority's Project Manager. Following the Authority's review, the Engineer will compile a Comment Resolution Summary, address comments, and submit the Final PD Report to the Authority along with a copy of the Comment Resolution Summary.

The sample Preliminary Design Report Table of Contents for standard design projects and for annual maintenance projects can be found at: Preliminary Design Report Template and Preliminary Design Report Template (Maintenance Reserve) These templates can be modified to meet project needs.

3.3.2.8. Final Design Scope Statement

The Engineer will evaluate and prepare a suggested scope of work for Final Design to assist the Authority's Project Manager in preparation of the project solicitation documents. Major milestone phase submittals and additional pre-phases should be considered at this time.

3.3.2.9. Stakeholder Outreach

The Engineer shall prepare a Stakeholder Outreach Plan to outline the anticipated stakeholder outreach during Preliminary Design. Stakeholder outreach in Preliminary Design should seek to inform the affected stakeholders about the PPA that is advancing through design and obtain written concurrence from State, County, and Municipal agencies regarding the proposed impacts on all affected roadways in terms of construction, maintenance and protection of traffic or detours, and intent of participation in betterments. The Stakeholder Outreach Plan should include the following:

- List of project stakeholders
- Purpose and goals of stakeholder outreach
- List of activities/meetings
- Purpose and objective for each meeting
- Target audience for each meeting

The level of stakeholder outreach and outside agencies to be consulted will depend on the scope of the project and its perceived impacts. For projects with impacts to non-Authority roadways, a Local Officials Briefing is recommended and a Public Information Center may be considered for larger projects to better understand how the project may impact the public. If a Public Information Center was held during Concept Development, it may be forgone until Final Design at the discretion of the Authority's Project Manager. Coordination with utility companies can also be included in the Stakeholder Outreach Plan.

3.3.3. Deliverables

- Preliminary Design Stakeholder Outreach Plan
- Project Plan
- Traffic Noise Analysis and Abatement Report
- Environmental Document
- Design Exception Report
- Utility Base Maps with conflicts identified
- Utility Status Schedule
- Utility Orders
- Phase A Plan Submission
- Preliminary Design Report
- Preliminary Stormwater Management Report
- Design Decision Report
- Preliminary Lighting Report
- Geotechnical Engineering Report
- Pavement Recommendation (as needed)
- Final Design Scope Statement
- Initial ROW Estimate
- Preliminary Construction Cost Estimate
- Preliminary Construction Schedule
- Project Risk Register
- Outside Agency Coordination Log
- Preliminary ROW Plans (GPPMs, ETMs, sample IPPMs, ROW Impact Matrix, sample Jurisdictional Limit Map, Tax Maps and Records, CADD, and GIS files)
- QPL Pilot Form

3.4. FINAL DESIGN (PHASES B, C, D)

3.4.1. General

In Final Design, preliminary designs will be developed to final completion. The contract plans and documents will be developed to 100 percent completion suitable for construction advertisement and bidding for advancement to Construction.

For projects with a more limited scope, the project scope documents will indicate the Final Design tasks and deliverables that will not be required and any tasks and deliverables from previous phases that will be included in Final Design. Limited scope projects include, but are not limited to, annual maintenance contracts (bridge repairs and pavement resurfacing), emergency contracts, bridge deck and superstructure replacements within the same alignment, lighting and facility maintenance contracts, and guide rail replacement contracts.

During the preparation of final design documents, Major Milestone Submissions are to be made to the Authority's Project Manager. These submissions are required at various stages in development to allow for review (1) of the content; (2) for specifics; and (3) for completeness. Major Milestone Submissions for Phases B through D must be delivered as one per construction contract within a project or Design Section. These Major Milestone Submissions are defined as follows:

- Pre-Phase B Submission – Preliminary submission of bridge designs, utility checklists, and signing layouts, draft Constructability Review Report, may include preliminary MPT Coordination Report
- Phase B Submission – Contract documents are 70 percent complete
- Pre-Phase C Submission – Subset of full 95 percent complete contract documents for utilities, lighting, ITS, and Maintenance and Protection of Traffic
- Phase C Submission – Contract documents are 95 percent complete and subject to thorough review by the Authority
- Phase D Submission – Contract documents are 100 percent complete and ready for advertisement

Following project advertisement, additional submittals may be required during the bidding period; these are described below under Post-Phase D Services.

To address scalability of projects, other interim submissions such as Pre-Phase D may be added at the discretion of the Authority's Project Manager. Some disciplines, such as Right of Way and Environmental/Drainage will have milestones that do not align with the typical phase submissions; those submittals will be captured on the Project Checklist and delivery requirements and timing are to be confirmed with the Authority's Project Manager.

Review comments for each of the Final Design Major Milestone Submissions will be forwarded to the Engineer approximately three weeks after each submission. The Engineer shall provide a comment resolution summary two weeks after the comments are received, unless noted otherwise by the Authority's Project Manager.

3.4.2. Major Tasks

During Final Design, major tasks include Stakeholder Outreach, Preparation of Final Contract Documents and engineering support during bidding.

3.4.2.1. Risk Assessment

Prior to each Major Milestone Submission, the project risk register is to be reviewed. Previously identified risks will be assessed and updated if necessary and any newly identified risks will be added to the Risk Register.

3.4.2.2. Design Decision Report

All significant design decisions are to be documented in the DDR and submitted to the Authority's Project Manager. The DDR log shall be included with each Major Milestone Submission.

3.4.2.3. Design and Preparation of Contract Documents

Details on how to perform final design and prepare contract documents by discipline can be found within the Procedures and Design Manuals as follows:

- Design Surveys
  See the "Design Surveys" section of the Procedures Manual for design survey requirements and Survey Control Report requirements.
- Geotechnical Engineering
  See the "Geotechnical Engineering" sections of the Procedures Manual and Design Manual for Geotechnical Engineering tasks, submittals by Phase, and for guidance on geotechnical analysis and design tasks by Phase.
- Roadway Design and Plan Preparation
  See the "Roadway Plan Preparation" section of the Procedures Manual for guidance on preparation of Contract Plans. See the "New Jersey Turnpike Geometric Design," "Garden State Parkway Geometric Design," and "Guide Rail/Median Barrier/Attenuator Design" sections of the Design Manual for guidance on roadway design.
- Structures Plan Preparation
  See the "Structures Plan Preparation" and "Structures Design" sections of the Procedures Manual and Design Manual for guidance on preparation of Contract Plans for major reconstruction of bridges and other structures, bridge repair contracts, and architecture/buildings and guidance on structures design.
- Utilities
  See the "Utility Installations, Relocations and Adjustments" section of the Procedures Manual for guidance on utility installations, relocations, and adjustments and utility submittals.
- Right of Way
  See the "Right of Way" section of the Procedures Manual for details on the ROW Engineering process, submittals by Phase, and guidance on ROW plan preparation.
- Stormwater Management and Drainage Design
  See the "Drainage Design" section of the Design Manual for guidance on drainage and environmental design, plan preparation, submission criteria, and permits.

- Signing and Striping
  See the "Signing and Striping" section of the Design Manual for guidance on signing and striping design, plan preparation, and submittal requirements.
- Lighting and Power Distribution
  See the "Lighting and Power Distribution Systems" section of the Design Manual for guidance on Lighting and Power Distribution Systems design, plan preparation, and submittal requirements by Phase.
- ITS and Communications Systems
  Per the "ITS and Communication Systems" section of the Design Manual, contact the Authority Project Manager for project-specific ITS requirements.
- Traffic Control
  See the "Traffic Control During Construction" section of the Design Manual for guidance on Traffic Control plan preparation, Maintenance and Protection of Traffic Plans, Traffic Impact Report, and submittal requirements by Phase.
- Landscaping
  See the "Landscaping" section of the Design Manual for Landscaping design considerations and guidance for plan preparation.
- Facility Buildings/Toll Plazas
  See the "Facility Buildings/Toll Plazas" and "Structures Plan Preparation" sections of the Design Manual and Procedures Manual for guidance on design and plan preparation for various facility buildings and toll plazas.
- Environmental Engineering
  See the "Environmental Engineering" section of the Design Manual for guidance on conducting environmental investigations and submittal requirements by Phase.
- Constructability Review
  See the "Constructability Review" section of the Procedures Manual for guidance on conducting constructability reviews, report preparation, and submittal requirements by Phase.

3.4.2.4. Stakeholder Outreach

The Engineer shall prepare a Stakeholder Outreach Plan to outline the anticipated stakeholder outreach during Final Design. Stakeholder Outreach in Final Design should seek to update the affected stakeholders about the status of the project and inform stakeholders of anticipated impacts due to construction. The Stakeholder Outreach Plan should include the following:

- List of activities/meetings
- Purpose and objective for each meeting
- Target audience for each meeting

The level of stakeholder outreach and outside agencies to be consulted will depend on the scope of the project and its perceived impacts. For projects with impacts to non-Authority roadways, a Local Officials Briefing is recommended and a pre-construction Public Information Center is recommended for larger projects to inform the public about the construction schedule and anticipated impacts to traffic during construction. The Stakeholder Outreach Plan shall include any required public hearings to comply with regulatory agencies, permit requirements, and EO 172 requirements, as applicable to the project.

If detours will be required for the project, the Local Officials Briefing(s) will provide an opportunity to present the detour plan and request written approval from the local jurisdictions. Roadway closure of non-State highways not under Authority jurisdiction in excess of 48 hours require written approval from local jurisdictions. Certification reports shall be submitted to the State in accordance with N.J.A.C.16:27-4.2(f), copies of which shall be provided to the Authority.

Traffic Impact Notices should be prepared for the Pre-Phase C submission and finalized for the Phase C Submission. These notices will be utilized by the construction consultant and construction liaison to alert motorists of upcoming work via traffic bulletins on the radio, internet, local newspaper, and the SafeTrip NJ App.

3.4.2.5. Pre-Phase B Submission

When indicated in the project scope documents, or as directed by the Authority's Project Manager, a Pre-Phase B Submission will be required to provide an update on utility coordination, present preliminary signing layouts, present preliminary structures plans, or provide the preliminary MPT Coordination report.

For new bridge construction and major bridge reconstruction projects, the Pre-Phase B submission requirements are described in the "Structures Plan Preparation" section of the Procedures Manual. Utility submittals at Pre-Phase B are described in the "Utility Installations" section of the Procedures Manual. The preliminary signing layout submittal is described in the "Signing and Striping" section of the Design Manual.

Specific requirements for the Pre-Phase B submission, including number of copies of each plan type, are detailed in the "Major Milestone Submission

Checklist – Final Design (FD) - Pre-Phase B." The Pre-Phase B submission may include:

- Plans and report for each new structure and wall within the contract
- Condition Assessment Reports
- Utility Checklists
- Utility Scheme of Accommodation Plans
- Utility Owner Preliminary Cost Estimates
- Preliminary Signing Layout
- Preliminary MPT Coordination Report
- Draft Constructability Review Report

3.4.2.6. Phase B Submission

The Phase B submission occurs for each construction contract at the stage of plan development when the horizontal and vertical alignment have been computed but the work has not progressed to the point of computing detailed quantities (70 percent complete contract documents). Development of the supplementary specifications should begin during this phase of the project lifecycle but are not a required deliverable unless otherwise directed by the Authority's Project Manager.

For developing the Engineer's Estimate, refer to the Authority's Guidance for Creating an Engineer's Estimate and the CapEx & Specifications Guidelines.

If additional Design Exceptions have been identified since approval of the Design Exception Report in Preliminary Design, the Design Exception Report shall be amended and resubmitted for approval.

Specific requirements for the Phase B submission, including number of copies of each plan type, are detailed in the "Major Milestone Submission Checklist – Final Design (FD) - Phase B." Unless otherwise noted, the Phase B submission is to include:

- Plans
  - Maintenance and Protection of Traffic Schematics
  - Typical Sections
  - Construction Plans
  - Drainage and Grading Plans
  - Landscape Plans
  - Signing and Striping Plans
  - Lighting Plans
  - ITS Plans
  - Preliminary Construction Details
  - Cross Sections

  - Structural Plans
  - Detour Plans, including written approval from local jurisdictions
  - Fencing and Construction Access Details
  - List of Standard Drawings and Reference Drawings
  - Draft IPPMs, Draft Metes and Bounds Descriptions, Updated Impact Matrix, Draft Jurisdictional Limit Map
  - Updated GIS shape files, as requested
- Calculations
  - Stormwater Management and Drainage Calculations
  - Hydrologic and Hydraulic Calculations
  - Sign Lighting & Roadway Lighting Design Calculations
  - Computed Horizontal and Vertical Alignment data
  - Earthwork Quantities
- Reports
  - Preliminary Geotechnical Engineering Report, including design calculations
  - Traffic Impact Report
  - Constructability Review Report
  - Construction Sequence
  - Scour Report
  - Non-Standard Bearing Report
  - Updated Design Exception Report, if necessary
- Other
  - Engineer's Estimate
  - Phase B Request for Unit Codes
  - Construction Schedule
  - Approved Utility Checklists and Schemes with Preliminary Cost Estimates
  - Environmental Permit Applications
  - Pre-Phase B Comment Resolution Summary (if applicable)
  - Outside Agency Coordination Log
  - Risk Register
  - QPL Pilot Form (if not submitted at Phase A)

3.4.2.7. Pre-Phase C Submission

The Pre-Phase C submission is used as a milestone between the Phase B and Phase C submissions to keep the project on schedule regarding the utility orders, outside agency approvals, Jurisdictional Agreements, and lighting and ITS design elements. The Pre-Phase C submission requires 95 percent complete maintenance and protection of traffic (MPT) plans and supplementary specifications (MPT Sections only) to provide the Authority's

Operations Department an opportunity to review the MPT section of the contract documents prior to the Phase C submission. Once traffic shifts are known, the Engineer should commence the shoulder pavement evaluation study to be included with the Phase C submission.

Specific requirements for the Pre-Phase C submission, including number of copies of each plan type, are detailed in the "Major Milestone Submission Checklist – Final Design (FD) - Pre-Phase C." Unless otherwise noted, the Pre-Phase C submission is to include:

- Utility Orders
- Final approvals from State, County, Municipal agencies, as required
- Utility Service to Authority Facilities
- Jurisdiction and Maintenance Agreements
- Lighting and ITS Pre-Phase C Submission
- Initial submission to NJ Department of Community Affairs Division of Codes and Standards, if applicable
- 95 percent complete MPT Plans
- Supplementary Specifications (MPT Sections only)
- Draft Traffic Impact Notices
- Construction Schedule
- Constructability Review Report, updated as needed

3.4.2.8. Phase C Submission

The Phase C submission is 95 percent complete contract documents consisting of plans, supplementary specifications, quantity calculations, and engineer's estimate. All items required for construction, such as ROW, permits, and utility orders, are complete.

For Facility Buildings and Toll Plazas, a complete submission of all plans, specifications, design calculations, and fees to the Department of Community Affairs submission is required and should be completed during this phase of the project lifecycle. For more details regarding this submission, refer to the "Facility Buildings/Toll Plazas" section of the Design Manual.

Initial submittal of the Materials Acceptance Review Matrix is included with the Phase C Submission. Refer to the Shop Drawing Review Guidelines for additional information on preparation of this matrix.

Specific requirements for the Phase C submission, including number of copies of each plan type, are detailed in the "Major Milestone Submission Checklist – Final Design (FD) - Phase C". Unless otherwise noted, the Phase C submission is to include:

- Plans (complete plan set)
  - Construction Plans, including quantities, pay items, and final construction details
  - Cross Sections
  - Final MPT Plans
  - ROW Plans (Draft Final GPPMs/ETM Sheet Set, remaining Final IPPMs and Metes & Bounds Descriptions)
- Calculations
  - Roadway and Structure Quantity Calculations
  - Road User Cost Calculations
  - Liquidated Damages Calculations
  - Lighting and Electrical Calculations, if required
- Reports
  - Constructability Review Report, updated as needed
  - Final Geotechnical Engineering Report, including design calculations
  - Draft Load Rating Report
  - Shoulder Pavement Assessment Report
  - Lane Occupancy Charge Report
- Other
  - Phase C Request for Unit Codes
  - Supplementary Specifications (including Appendix Q and with track changes)
  - Supplementary Specifications for Comptroller approval (for Contracts over $12.5M)
  - Utility Service to Authority Facilities
  - Engineer's Estimate, without rounding or contingencies
  - Summary of Environmental Permit Status
  - Completed Highway Agency Stormwater General Permit Post-Construction Program Design Checklist for Individual Projects form (Authority form)
  - Construction Schedule
  - Outside Agency Coordination Log
  - Final Traffic Impact Notices
  - Materials Acceptance Review Matrix
  - Results of the Shoulder Pavement Evaluation Study
  - Phase B and Pre-Phase C (if applicable) Comment Resolution Summary
  - Risk Register
  - QPL Pilot Form

3.4.2.9. Phase D Submission

The Phase D submission is 100 percent complete contract documents consisting of plans, supplementary specifications, and engineer's estimate. This submission is a full package ready for bid. The Final ROW documents may be submitted in advance of the Phase D submission to begin the ROW acquisition process, as directed by the Authority's Project Manager.

Specific requirements for the Phase D submission, including number of copies of each plan type, are detailed in the "Major Milestone Submission Checklist – Final Design (FD) - Phase D." Unless otherwise noted, the Phase D submission is to include:

- Advertisement Packet (ZIP)
  - Final Plans, signed (PDF)
  - Final Supplementary Specifications (Word)
  - Engineer's Estimate, signed, without rounding or contingencies
  - Reference Drawings and/or Reference Material
- Construction Schedule
- Fiber Optic Cable Design Review Certification Form
- Outside Agency Coordination Log and written approval from local jurisdictions for roadway closures of non-State highways not under Authority jurisdiction in excess of 48 hours
- Phase C Comment Resolution Summary
- Final Constructability Review Report
- Boring Logs (included as part of the plans)
- Approved Environmental Permits
- Final ROW Plans (final submission all ROW documents, updated ROW Impact Matrix, updated Tax Maps and Records, updated CADD & GIS files), signed and sealed as directed
- Final Quantity Calculations
- Final Load Rating Report
- Updated Materials Acceptance Review Matrix
- Risk Register
- QPL Pilot Form

3.4.2.10. Post-Phase D Services

Following Phase D Submission, the Engineer will provide support to the Authority's Project Manager during the Bid phase. When required, the Engineer will assist the Authority's Project Manager with pre-bid meetings or presentations. Addenda will be prepared and submitted as necessary, per the "CapEx & Specifications Guidelines" and, if required, changes to the Engineer's Estimate can be made.

The final signed Engineer's Estimate shall be submitted to the Authority's Project Manager no later than three business days before the bid opening. The Estimate shall be of the format as provided in the Sample Engineer's Estimate. The Authority's Project Manager will send the Engineer's Estimate to the GCE for final signature.

One business day after bid opening, the Engineer shall review all results and check them for any irregularities, such as an unbalanced bid. The Engineer shall then transmit a formal letter of recommendation as to the award of the contract to the Authority's Project Manager. The Authority's Project Manager will send a copy to the GCE for review and the GCE will either approve or disagree with it.

Any changes to the plans made via addenda shall be documented in the conformed plans. The Engineer shall incorporate these changes to submit the following to the Authority a minimum of one week prior to the Construction Hand-Off Meeting:

- Half-size plan set, signed and sealed
- Conformed Plans CADD submission

The Authority will develop the conformed supplementary specifications, including addenda letters.

CapEx & Specifications Design Guidelines

Sample Engineer's Estimate

3.4.3. Deliverables

- Final Design Stakeholder Outreach Plan
- Project Risk Register
- Design Decision Report
- Outside Agency Coordination Log
- Pre-Phase B Submission
- Phase B Submission
- Pre-Phase C Submission
- Phase C Submission
- Phase D Submission
- Addenda
- Final Engineer's Estimate
- Bid Analysis & Recommendation Letter
- Conformed Plans CADD Submission

3.5. CONSTRUCTION ENGINEERING SUPPORT

3.5.1. General

During Construction, the Engineer will provide support to the Authority by preparing for and attending the pre-construction meeting, preparing Changes of Plan (as required), reviewing Shop Drawings, and responding to Requests for Information.

The Resident Engineer (RE) will also provide support to the Authority during the Construction Phase by preparing As-Built Plans.

3.5.2. Major Tasks

3.5.2.1. Construction Hand-off Meeting

Prior to the construction kick-off meeting with the Authority Construction Liaison, construction inspection team, and the Contractor; the Designer will hold a Construction Hand-off Meeting with the Authority Design and Construction Liaisons and the construction inspection team to discuss special items noted in the Constructability Report, review permits, and contract-specific requirements. Additionally, the Material Acceptance Review Matrix (Matrix) should be reviewed to understand responsibilities of the Designer and construction inspection team. Any changes made to the Matrix shall be updated by the Designer and a final version should be forwarded to the construction inspection team.

3.5.2.2. Changes of Plan

If, during the course of construction, the Resident Engineer (RE) determines that a formal Change of Plan (COP) is necessary, the Authority's Engineering Department will direct the Engineer to prepare it. The procedures for preparing a COP are located in the "CapEx & Specifications Design Guidelines." To prevent costly construction delays, the Engineer shall expeditiously prepare a COP, including cost estimate for changes, as directed by the Authority's Engineering Department.

CapEx & Specifications Design Guidelines

3.5.2.3. Shop Drawing Reviews

During the course of construction, the RE will forward to the Engineer shop drawings and working drawings for review and approval. The Engineer shall review and return all shop drawings and working drawings to the RE or the Authority, as appropriate, in accordance with Subsection 104.08 of the Specifications and the "Shop Drawing Review Guidelines."

Shop Drawing Review Guidelines

3.5.2.4. Requests for Information

During the course of construction, the RE may forward to the Engineer a Request for Information (RFI). To prevent costly construction delays, the Engineer shall expeditiously prepare a response to the RFI.

3.5.2.5. Lighting System Review

After lighting systems have been constructed, the Engineer shall perform a verification of the lighting installation to ensure it has been installed according to the approved design. This procedure is outlined in the "Lighting and Power Distribution Systems" section of the Design Manual and will be required before the Authority's Engineering Department issues final acceptance for any lighting system.

3.5.2.6. As-Built Plans

CADD files for all COPs shall be forwarded to the Authority's Project Manager for use in preparation of As-Built Plans. As-Built Plans will be prepared in accordance with the "As-Built Plan Preparation Guidelines."

As-Built Plan Preparation Guidelines

3.5.3. Deliverables

- Conformed Submission
- Changes of Plan
- Shop Drawing Reviews
- Request for Information Responses
- As-Built Plans

Exhibit 3-1 Design Element Modification Request

CONTRACT NO. _____

PHASE _____

DATE _____

DESIGN ELEMENT	DESIGN CRITERIA			APPROXIMATE COST	
	DESIRABLE	MINIMUM	PROPOSED	DESIRABLE	PROPOSED
RAMP RADIUS	235’	150’	180’	$1,250,000	$250,000

* PROVIDE GENERAL LAYOUT SKETCH(S) OR CORRESPONDENCE AS APPROPRIATE

IMPACTS/REASONS:

Providing the desirable radius requires the total acquisition of a small commercial property. Reducing the radius eliminates the total acquisition and only requires a slope easement.

Exhibit 3-2 Summary of Permit Requirements

CONTRACT NO. _____

PHASE _____

DATE _____

AGENCY	TYPE OF PERMIT	REASON FOR PERMIT	STATUS
NJDEP	GENERAL WETLANDS	BRIDGE PIER IMPACTS TRANSITION AREA	PREPARING INITIAL DRAFT FOR REVIEW

Exhibit 3-3 Environmental Permits

FEDERAL

U.S. Coast Guard (Bridge)

USCOE Section 404 (Individual/Nationwide) discharge of fill

USCOE Section 10 (Navigable Waters)

Section 7 (Endangered Species Consultation)

STATE

Coastal Area Facility Review Act

Hazardous Waste Site Investigation

NJDEP Tidal Wetlands

NJDEP Waterfront Development

NJDEP Tidal Conveyance

NJDEP Freshwater Wetlands

NJDEP Flood Hazard/Riparian

NJDEP Water Quality Certificate

OTHERS

Delaware Basin Commission

Meadowland Commission

Pineland Commission

Historic Sites Council

Green Acres/State House Commission

NJ No Net Loss Reforestation Act

State Agricultural Development Commission

Exhibit 3-4 Shop and Working Drawings

Stamp A

SHOP DRAWING REVIEW
CONSULTANT NAME

Review is for general compliance with contract documents. sole responsibility for correctness of dimensions, details, quantities, and safety during fabrication and erection shall remain with the Contractor.

- ☐ No Exceptions Taken
- ☐ Make Corrections Noted
- ☐ Amend and Resubmit
- ☐ Rejected

By _____

Date _____

Stamp B

The Engineer, in accordance with NJTA standards, has reviewed this submission, which the Contractor has developed as the final design of conceptual plans as shown or required in the Contract Documents, or temporary works required to perform the Work described or as required in the Contract Documents, for general compliance with the design concept and criteria.

RECOMMENDED FOR APPROVAL

Date _____

By _____

This does not relieve the Contractor from compliance with the requirements of the Contract Documents.

Stamp C

APPROVED

By _____

Date _____

Office of The
Chief Engineer

Exhibit 3-5 Material Acceptance Review Matrix

NJTA Procedures Manual
Exhibit 3-9 Material Acceptance Criteria Matrix

Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Historic District Sign	Each	Historic District Sign											CM
Construction Layout	LS	Control of Work											CM
Mobilization	LS	Control of Work											CM
Progress Schedule (This is a no Bid Item)	LS	Prosecution and Progress											CM
Fuel Price Adjustment (This is a NO BID, Lump Sum item for this contract. The Lump Sum price is $XXX,000. Enter a Unit Price of $XXX,000 as your bid item for this item.)	L.S.	Price Adjustment											CM
Clearing and Grubbing	ACRE	Clearing & Grubbing			x								CM
Sealing of Abandoned Well	Each	Sealing of Abandoned Well											CM
Monitoring Well	Each	Monitoring Well			x								CM
Basin and Swale Excavation	C.Y.	Basin and Swale Excavation											CM
Roadway Excavation, Earth	C.Y.	Roadway Excavation		x							x	x	CM
Roadway Excavation and Embankment	C.Y.	Roadway Excavation		x							x	x	CM
Roadway Excavation, Muck	C.Y.	Roadway Excavation		x							x	x	CM
Stripping Topsoil	C.Y.	Roadway Excavation									x	x	CM
Overload Removal	C.Y.	Roadway Excavation		x							x	x	CM
Deep Benchmarks	L.F.	Deep Benchmarks											CM
Open Standpipe Piezometers	Each	Piezometers											CM
Clay Liner	C.Y.	Embankment	x		x		x				x		CM
Vertical Wick Drain Obstruction Clearance	L.F.	Embankment	x		x		x						CM
Sand Blanket	C.Y.	Embankment	x		x		x				x		CM
#57 Stone Backfill	C.Y.	Embankment	x		x		x				x	x	CM
Geofoam Backfill	C.Y.	Embankment	x		x		x				x	x	CM
Geosynthetic Clay Liner	S.Y.	Embankment	x		x		x				x	x	CM
Embankment, Common	C.Y.	Embankment		x			x				x	x	CM
Embankment, Grade A	C.Y.	Embankment	x		x		x				x	x	CM
Embankment, Grade B	C.Y.	Embankment	x		x		x				x	x	CM
Porous Fill	C.Y.	Embankment	x	x	x						x	x	CM
Embankment, Grade C	C.Y.	Embankment	x		x		x				x	x	CM
Cofferdam	L.S.	Cofferdam					x						DE
Channel Excavation	C.Y.	Channel Excavation					x						CM
Coarse Aggregate Layer	C.Y.	Foundation Excavation	x		x								CM
Foundation Excavation	C.Y.	Foundation Excavation			x								CM
Trench Excavation, Extra Depth	C.Y.	Trench Excavation	x	x	x		x					x	CM
Trench Excavation, Electrical	L.F.	Trench Excavation	x	x	x		x					x	CM
Riprap and Scour Holes	Ton	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Slope Protection, 12" Thick, (D50=6")	Ton	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Aprons, 18" Thick, (D50=9")	Ton	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Ditch Protection, 18" Thick (D50=6")	Ton	Stone for Erosion Control	x	x	x							x	CM
Gabions	C.Y.	Stone for Erosion Control	x	x	x							x	CM
Gabion Mattress Slope Protection, 12" Thick	C.Y.	Stone for Erosion Control	x	x	x							x	CM
Gabion Mattress Ditch Protection, 12" Thick	C.Y.	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Slope Protection, 24" Thick (D50=12")	Ton	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Slope Protection, 24" Thick (D50=8")	Ton	Stone for Erosion Control	x	x	x							x	CM

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NJTA Procedures Manual
Exhibit 3-9 Material Acceptance Criteria Matrix

Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Riprap Stone Scour Hole, 12" Thick, D50=6"	Ton	Stone for Erosion Control	x	x	x							x	CM
Gabion Mattress Ditch Protection, 18" Thick	C.Y.	Stone for Erosion Control											CM
Riprap Stone Ditch Protection, 18" Thick, D50=9"	Ton	Stone for Erosion Control	x	x	x							x	CM
Sand Layer, 6" Thick	S.Y.	Stone for Erosion Control											CM
Riprap Stone Aprons, 36" Thick, D50=18"	Ton	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Aprons, 48" Thick, D50=24"	Ton	Stone for Erosion Control	x	x	x							x	CM
Gabion Mattress Ditch Protection, 24" Thick	C.Y.	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Ditch Protection, 24" Thick, D50=12"	Ton	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Slope Protection, 18" Thick, (D50=5")	Ton	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Scour Hole, 18" Thick, D50=9"	Ton	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Scour Hole, 24" Thick, D50=12"	Ton	Stone for Erosion Control	x	x	x							x	CM
Gabion Mattress Scour Hole, 24" Thick	C.Y.	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Scour Hole, 36" Thick, D50=18"	Ton	Stone for Erosion Control	x	x	x							x	CM
Gabion Mattress 9" x 6' x 9'	Ton	Stone for Erosion Control	x	x	x							x	CM
Stone, Grade B	Ton	Stone for Erosion Control	x	x	x							x	CM
Stone, Grade D	Ton	Stone for Erosion Control	x	x	x							x	CM
Filter Blanket	Ton	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Aprons, 12" Thick (D50=6")	Ton	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Aprons, 24" Thick (D50=12")	Ton	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Ditch Protection, 12" Thick, D50=6"	Ton	Stone for Erosion Control	x	x	x							x	CM
Riprap Stone Aprons, 16" Thick, D50=8"	Ton	Stone for Erosion Control	x	x	x							x	CM
Temporary Slope Drain	L.F.	Temp Soil Erosion & Dust Control	x				x					x	CM
15" Temporary Slope Drain	L.F.	Temp Soil Erosion & Dust Control	x				x					x	CM
18" Temporary Slope Drain	L.F.	Temp Soil Erosion & Dust Control	x				x					x	CM
Heavy Duty Silt Fence, Orange	LF	Temp Soil Erosion & Dust Control	x		x							x	CM
Heavy Duty Silt Fence, Black	LF	Temp Soil Erosion & Dust Control	x		x							x	CM
Storm Sewer Inlet Protection	Each	Temp Soil Erosion & Dust Control	x		x		x					x	CM
Sediment Containment Bags	Each	Temp Soil Erosion & Dust Control	x		x		x					x	CM
Concrete Driveway, 6" Thick	S.Y.	Temp Soil Erosion & Dust Control	x		x		x					x	CM
Turf Reinforcement Matting	S.Y.	Temp Soil Erosion & Dust Control	x		x		x					x	CM
Stone Deck Dam	C.Y.	Temp Soil Erosion & Dust Control	x		x		x					x	CM
Floating Sediment Risers	Each	Temp Soil Erosion & Dust Control	x		x		x					x	CM
Inlet Filter, Type 1	S.Y.	Temp Soil Erosion & Dust Control	x		x		x					x	CM
Inlet Filter, Type 2	Each	Temp Soil Erosion & Dust Control	x		x		x					x	CM
Sediment Control Bags	Each	Temp Soil Erosion & Dust Control	x		x		x					x	CM
Temporary Seeding	S.Y.	Temp Soil Erosion & Dust Control	x		x		x					x	CM
Watering	Thous	Temp Soil Erosion & Dust Control	x			x						x	CM
Temporary Stone, Grade B	Ton	Temp Soil Erosion & Dust Control	x		x							x	CM
Hay Bales	C.Y.	Temp Soil Erosion & Dust Control	x		x							x	CM
Silt Fence	L.F.	Temp Soil Erosion & Dust Control	x		x							x	CM
Floating Turbidity Barriers	LF	Temp Soil Erosion & Dust Control	x		x							x	CM
Inlet Filters	Each	Temp Soil Erosion & Dust Control	x		x							x	CM
Construction Driveway	Ton	Temp Soil Erosion & Dust Control	x		x							x	CM
Demolition of Existing Structures	LS	Demolition of Existing Structures					x						DE
Demolition of Existing Toll Plaza	L.S.	Demolition of Existing Structures					x						DE

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NJTA Procedures Manual
Exhibit 3-9 Material Acceptance Criteria Matrix

Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Temporary Orange Plastic Fence	L.F.	Tem.Orange Plastic Fence			x						x		CM
Subbase	CY	Subbase	x	x	x							x	CM
Sawcutting	LF	Sawcutting	x	x	x							x	CM
Stone Columns	LF	Stone Columns				x	x		x			x	DE
Pre-Drilling	LF	Pre-Drilling				x	x		x			x	CM/DE
Vibration and Movement Monitoring	L.S.	Vibration and Movement Monitoring				x	x		x			x	DE/CM
Reno Mattress (Gabion Basket)	C.Y.	Reno Mattress (Gabion Basket)				x	x		x			x	CM
Excavation, Acid Producing Soil	CY	Excavation, Acid Producing Soil				x	x		x			x	CM
Acid-Producing Soils Remediation	SY	Acid-Producing Soils Remediation				x	x		x			x	CM
Disposal of Acid Producing Soil	Ton	Disposal of Acid Producing Soil				x	x		x			x	CM
Testing for Acid Producing Soil Deposits	Each	Testing for Acid Producing Soil Deposits				x	x		x			x	CM
Foundation Excavation for Acid Producing Soils	C.Y.	Foundation Excavation for Acid Producing Soils				x	x		x			x	CM
Testing of Soils for Waste Classification	Each	Testing of Soils for Waste Classification				x	x		x			x	CM
Geotechnical Instrumentation Monitoring	Week	Geotechnical Instrumentation Monitoring				x			x				CM
Vibrating Wire Piezometers	Each	Piezometers				x			x				CM
Trench Excavation, Cut-Off Wall	S.F.	Trench Excavation, Cut-Off Wall				x			x				CM
Exploratory Test Pits	Each	Exploratory Test Pits				x			x				CM
Tile Drain Plugging	Each	Tile Drain Plugging				x			x				CM
Tile Drain Exploration	L.F.	Tile Drain Exploration				x			x				CM
Demolition of Building Lot # X	LS	Demolition of Buildings					x		x				DE
Asbestos Abatement# X	LS	Asbestos Abatement					x		x				DE
Demolition of Building Lot # X	LS	Demolition of Buildings					x		x				DE
Aggregate Base Course, 7" Thick	SY	Aggregate Base Course	x	x	x							x	CM
Asphaltic Base Course 25H64	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
Asphaltic Intermediate Course 19H76	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
Asphaltic Surface Course 12.5H76	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
HMA Surface Course, Mix I-5	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
Hot Mix Asphalt Driveway, 6" Thick	S.Y.	HMA Pavements	x	x	x			x	x		x	x	CM
Hot Mix Asphalt, Driveway, 4" Thick	S.Y.	HMA Pavements	x	x	x			x	x		x	x	CM
Hot Mix Asphalt, Driveway, 12" Thick	S.Y.	HMA Pavements	x	x	x			x	x		x	x	CM
HMA Base Course, Mix I-2	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
Superpave Hot Mix Asphalt 25H 64 Base Course	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
Superpave Hot Mix Asphalt 19M 64 Base Course	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
Superpave Hot Mix Asphalt 19H 76 Intermediate Course	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
Asphalt Price Adjustment. (This is a NO-BID, Lump Sum item for this contract. The	Ton	Asphalt Price Adjustment (This is a No-Bid Item)											CM
Superpave Hot Mix Asphalt 12.5H 76 Surface Course	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
Tack Coat	Gallon	HMA Pavements	x		x						x	x	CM
Superpave Hot Mix Asphalt 12.5M64 Surface Course	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
Clean Outside Shoulders	L.F.	Clean Outside Shoulders	x		x						x	x	CM
Superpave Hot Mix Asphalt 19H 64 Intermediate Course	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
Superpave Hot Mix Asphalt 25H 64 Base Course	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
Superpave Hot Mix Asphalt 9.5M 64 Surface Course	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
Superpave Hot Mix Asphalt 19M76 Base Course	Ton	HMA Pavements	x	x	x			x	x		x	x	CM
HMA Bridge Surfacing	Ton	HMA Pavements	x	x	x			x	x		x	x	CM

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NJTA Procedures Manual
Exhibit 3-9 Material Acceptance Criteria Matrix

Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Membrane Waterproofing	SY	HMA Pavements	x		x						x	x	CM
Asphalt Price Adjustment (This is a NO-BID, Lump Sum item for this contract. The	L.S.	HMA Pavements	x		x						x	x	CM
Berm Surfacing, 3 inches Thick	SY	Shoulder & Berm Surfacing	x		x							x	CM
Berm Surfacing, Crushed Stone, 6" Thick	SY	Shoulder & Berm Surfacing	x		x							x	CM
Concrete Base Course, 8" Thick	S.Y.	Portland Cement Conc Pavement	x	x	x		x	x	x	x		x	CM
Underlayer Preparation	S.Y.		x	x	x		x	x	x	x		x	CM
Bridge Approach Slab	S.Y.	Portland Cement Conc Pavement	x	x	x		x	x	x	x		x	CM
Pavement Removal, 2" Depth	S.Y.	Pavement Removal & Surface Milling				x							CM
Pavement Removal, 3" Depth	S.Y.	Pavement Removal & Surface Milling				x							CM
Pavement Removal, 5" Depth	S.Y.	Pavement Removal & Surface Milling				x							CM
Pavement Removal, 4" Depth	S.Y.	Pavement Removal & Surface Milling				x							CM
Pavement Removal, Varible Depth	S.Y.	Pavement Removal & Surface Milling				x							CM
Surface Milling	S.Y.	Pavement Removal & Surface Milling				x							CM
Surface Milling, 2" Average Depth	S.Y.	Pavement Removal & Surface Milling				x							CM
Surface Milling, 3" Average Depth	SY	Pavement Removal & Surface Milling				x							CM
Milled Rumble Strip	LF	Milled Rumble Strip				x							CM
Concrete Collar	Each	Concrete Structures	x	x	x		x	x	x			x	CM
Concrete In Culvert	CY	Concrete Structures	x	x	x		x	x	x			x	CM
Precast Reinforced Concrete 3-Sided Box Culvert	LF	Concrete Structures	x		x		x	x	x	x		x	DE
Pier Protection Barrier	LF	Concrete Structures	x	x	x		x	x	x			x	CM
Concrete In Pylon Wall	C.Y.	Concrete Structures	x	x	x		x	x	x			x	CM
Concrete In Pile Cap	C.Y.	Concrete Structures	x	x	x		x	x	x			x	CM
Concrete In Wingwalls	C.Y.	Concrete Structures	x	x	x		x	x	x			x	CM
Modular Expansion Joint, 6" Movement	L.F.	Concrete Structures		x		x						x	DE
Strip Seal Expansion Joints, 2" Movement	L.F.	Concrete Structures		x		x						x	CM
Neoprene Strip Seal	L.F.	Concrete Structures		x		x						x	CM
Jeene Seal Expansion Joints, 2" Movement	L.F.	Concrete Structures		x		x						x	CM
Concrete In Wall Facing	C.Y.	Concrete Structures	x	x	x		x	x	x			x	CM
Concrete In Barriers	C.Y.	Concrete Structures	x	x	x		x	x	x			x	CM
Concrete in CIP Collar	C.Y.	Concrete Structures	x	x	x		x	x	x			x	CM
Concrete Core Sampling	Each	Concrete Structures		x		x						x	CM
Concrete in Structure, Headwalls	C.Y.	Concrete Structures	x	x	x		x	x	x			x	CM
Strip Seal Expansion Joint	L.F.	Concrete Structures											CM
Concrete In Substructure Above Footings	CY	Concrete Structures	x	x	x		x	x	x			x	CM
Concrete In Footings	CY	Concrete Structures	x	x	x		x	x	x			x	CM
Concrete in Backwall	C.Y.	Concrete Structures	x	x	x		x	x	x			x	CM
Concrete in Abutment Above Footings	C.Y.	Concrete Structures											CM
Concrete in Coping	C.Y.	Concrete Structures	x	x	x		x	x	x			x	CM
Concrete in Pier Above Footings	C.Y.	Concrete Structures											CM
Reinforcement Steel	Pound	Concrete Structures	x		x		x	x	x	x		x	DE
Concrete in Retaining Walls Above Footings	C.Y.	Concrete Structures											CM/DE
Concrete In Bridge Parapet	CY	Concrete Structures	x	x	x		x	x	x			x	CM/DE
Concrete In Deck Slabs	C.Y.	Concrete Structures											CM
Reinforcement Steel, Epoxy Coated	Pound	Concrete Structures	x		x		x	x	x	x		x	DE
Reinforcement Bar Coupler	Each	Concrete Structures	x		x		x	x	x	x		x	CM

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Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Drill and Grout Reinforcement Bar	Each	Concrete Structures	x		x		x	x	x	x		x	CM
Mechanical Coupler	Each	Concrete Structures	x		x		x					x	CM
Concrete Penetrating Sealer Treatment	SF	Concrete Structures	x	x	x							x	CM
Presstressed Concrete Beams, Type VI	L.F.	Presstressed Concrete Beams, Type VI			x							x	DE
Prestressed Concrete Bulb Tee Beams, 55 Inches Deep	L.F.	Prestressed Concrete Bulb Tee Beams, 55 Inches			x							x	DE
Prestressed Concrete Adjacent Box Beams, 27" X 48"	L.F.	Prestressed Concrete Adjacent Box Beams, 27" X			x							x	DE
HLMR Bearings, 200 Kips to 450 Kips, Type E	Each	Steel Structures			x		x		x	x		x	DE
Shear Connectors	Each	Steel Structures			x		x		x	x		x	DE
Structural Steel	L.S.	Steel Structures			x		x		x	x		x	DE
Structural Steel Deck Joints	L.S.	Steel Structures			x		x		x	x		x	DE
Treated Timber Structures	MFBM	Timber Structures			x		x					x	DE
HP 12 X 53 Test Piles	L.F.	Piles	x	x	x	x	x		x			x	DE
Driving HP 14 X 89 Piles	L.F.	Piles		x			x		x		x		DE
Steel HP 14 X 89 Test Piles	L.F.	Piles	x	x	x	x	x		x			x	DE
Splices For Steel Hp 14 X 89 Piles	Each	Piles	x		x	x	x				x	x	DE
Furnishing HP 14 X 89 Piles	L.F.	Piles	x		x	x	x		x			x	DE
14 Inch Diameter Steel Pipe Test Piles	LF	Piles	x		x	x	x		x			x	DE
Point Reinforcement For 14 Inch Diameter Steel Pipe Piles	Each	Piles	x		x	x	x		x			x	DE
Splices For 14 Inch Diameter Steel Pipe Piles	Each	Piles	x		x	x	x		x			x	DE
Splices For Steel Hp 12 X 53 Piles	Each	Piles	x		x	x	x				x	x	DE
Furnishing 14" Diameter Steel Pipe Piles	LF	Piles			x	x	x		x			x	DE
Driving 14" Diameter Steel Pipe Piles	LF	Piles		x			x		x		x		DE
Driving 16" Cast-In-Place Concrete Piles	L.F.	Piles		x			x		x		x		DE
Splices for 16" Cast-In-Place Concrete Piles	Each	Piles	x		x	x	x				x	x	DE
Furnishing 16" Cast-In-Place Concrete Piles	L.F.	Piles	x		x	x	x		x			x	DE
16" Cast-in-Place Concrete Test Piles	L.F.	Piles	x	x	x	x	x		x			x	DE
Furnishing Equipment for Driving Piles	LS	Piles	x			x	x		x			x	DE
Furnishing and Installing W18 x 86 Piles	LS	Piles	x		x	x	x		x			x	DE
Dynamic Pile Load Tests	Each	Piles				x	x						DE
Protective Pile Coating	L.F.	Piles	x		x						x	x	DE
30" Diameter Steel Pipe Casing	L.F.	Piles	x	x	x	x	x		x			x	DE
Remove Existing Span Sign Structure No.	LS	Sign Support Structures		x			x		x				CM/DE
Fabrication and Delivery of Overhead Butterfly/Cantilever Sign Support Structure Post	Pound	Sign Support Structures	x	x	x		x		x	x			DE
Fabrication and Delivery of Overhead Butterfly/Cantilever Sign Support Structure Truss	Pound	Sign Support Structures	x	x	x		x		x	x			DE
Fabrication and Delivery of Overhead Span Sign Support Structure End Frame	Pound	Sign Support Structures	x	x	x		x		x	x			DE
Fabrication and Delivery of Overhead Span Sign Support Structure Truss	Pound	Sign Support Structures	x	x	x		x		x	x			DE
Concrete Cloumn for Sign Structures	C.Y.	Sign Support Structures	x	x	x		x		x	x			DE
Aluminum Posts for Ground Mounted Signs	Pound	Sign Support Structures	x	x	x		x		x	x			DE
Concrete Foundations for Ground Mounted Signs	C.Y.	Sign Support Structures	x	x	x		x		x	x			DE
Concrete Foundations for Overhead Sign Structures	CY	Sign Support Structures	x	x	x		x	x				x	DE
Concrete in Structures, Pedestals	C.Y.	Sign Support Structures	x	x	x		x		x	x			DE
Install Overhead Butterfly Sign Structure No. X	L.S.	Sign Support Structures				x	x					x	DE

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Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Install Overhead Cantilever Sign Structure No. X	L.S.	Sign Support Structures				x	x					x	DE
Install Overhead Span Sign Structure No. X	L.S.	Sign Support Structures	x	x	x		x			x			DE
Remove Existing Span Sign Structure No. X	L.S.	Sign Support Structures	x	x	x		x			x			DE
Remove Existing Cantilever Sign Structure No. X	L.S.	Sign Support Structures	x	x	x		x			x			DE
TFE Expansion Bearing, x" X x", Type xx	Each	TFE Expansion Bearing, Type EG	x		x		x		x	x	x	x	DE
Plain Elastomeric Bearing Pad, x" x x"	Each	TFE Expansion Bearings	x		x		x		x	x	x	x	DE
Laminated Elastomeric Bearing Pad, x" x x"	Each	TFE Expansion Bearings	x		x		x		x	x	x	x	DE
Damp-proofing	S.Y.	Miscellaneous			x							x	CM
Waterproofing	S.Y.	Miscellaneous			x							x	CM
Preformed Sheet Membrane Waterproofing	S.Y.	Miscellaneous			x							x	CM
8" Drainage Pipe, (Fiberglass)	L.F.	8" Drainage Pipe, (Fiberglass)			x				x				CM
Inlet Frames and Grates	Each	Inlet Frames and Grates			x				x				CM
Scuppers	Each	Scuppers			x				x				CM
Articulated Concrete Block Mattress	S.Y.	Underbridge Slope Protection	x	x	x		x			x		x	CM
Concrete Slope Protection	SF	Underbridge Slope Protection	x	x	x		x			x		x	CM
Stone Slope Protection	S.Y.	Underbridge Slope Protection	x	x	x		x			x		x	CM
Cut-Off Sheeting	SF	Temporary Sheeting											
Temporary Sheeting	SF	Temporary Sheeting	x		x		x						DE
Temporary Sheeting to Remain in Place	SF	Temporary Sheeting	x		x		x						DE
Protective Coating	S.F.	Permanent Sheeting		x	x	x	x			x		x	CM
Catches	SY	Bridge Deck Rehabilitation			x		x		x		x		DE
Backwall Reconstruction	LF	Bridge Deck Rehabilitation			x		x				x	x	CM
Asphaltic Plug Joint	SF	Bridge Deck Rehabilitation	x		x		x				x	x	CM
Removal of Asphalt Surfacing and Scarify Concrete	S.Y.	Bridge Deck Rehabilitation	x		x		x				x	x	CM
Removal of Existing Surfacing	SY	Bridge Deck Rehabilitation					x		x				CM
Reinforcement Steel, Field Anti - Corrosion Coating	SF	Bridge Deck Rehabilitation	x		x		x		x		x	x	CM
Spall Repair, Type 1	SF	Bridge Deck Rehabilitation					x						CM
Joint Seal Replacement, Type 1	LF	Bridge Deck Rehabilitation	x		x		x				x	x	CM
Parapet Reconstruction Location No. 1	L.F.	Bridge Structural Repair	x		x				x		x	x	CM/DE
Repair Spalled Concrete, Type 1 - Abutment	SF	Bridge Structural Repair										x	CM
Repair Spalled Concrete, Type 1 - Pier	SF	Bridge Structural Repair										x	CM
Substructure Membrane Waterproofing	SF	Bridge Structural Repair	x		x				x		x	x	CM
Reconstruct Bearing Area	Each	Bridge Structural Repair	x		x				x		x	x	CM
Anti-Graffiti Protective Coating	S.F.	Bridge Structural Repair	x		x				x		x	x	CM
Ground Mounted Post, Type A	L.F.	Bridge Structural Repair	x		x				x		x	x	DE
Noise Barrier Foundation	L.F.	Bridge Structural Repair	x		x				x		x	x	DE
Ground Mounted Noise Barrier Panel	S.F.	Bridge Structural Repair	x		x				x		x	x	DE
Remove Existing Ground Mounted Noise Barrier	L.S.	Bridge Structural Repair	x		x				x		x	x	DE
Concrete Penetrating Stain	S.F.	Bridge Structural Repair	x		x				x		x	x	CM
Additional Crushed Stone	C.Y.	Bridge Structural Repair	x		x				x		x	x	CM
MSE Abutment Wall No. X	SF	MSE Walls	x		x	x	x	x	x	x	x	x	DE
MSE Wing Wall No. X	S.F.	MSE Walls	x		x	x	x	x	x	x	x	x	DE
MSE North Abutment	S.F.	MSE Walls	x		x	x	x	x	x	x	x	x	DE
Retaining Wall No. X	CY	MSE Walls	x		x	x	x	x	x	x	x	x	DE
Prefabricated Modular Wall No. X	S.F.	MSE Walls	x		x	x	x	x	x	x	x	x	DE

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Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Temporary Retaining System	S.F.	MSE Walls	x		x	x	x	x	x	x	x	x	DE
30" Diameter Drilled Shaft	LF	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
Demonstration Drilled Shaft, 96-Inch Diameter	Each	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
Osterberg Cell Load Test, 96-Inch Diameter Shaft	Each	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
Obstructions	L.F.	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
Crosshole Sonic Logging (CSL) of Drilled Shaft	Each	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
Crosshole Tomography, If and Where Directed	Each	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
Concrete Coring at Drilled Shaft, If and Where Directed	L.F.	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
Shaft Inspection Device (Mini-SID)	Each	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
Drilled Shaft for Sign Structures	L.F.	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
54" Drilled Shaft for Sign Structures	LF	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
30" Diameter Drilled Shafts for Sign Structure	L.F.	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
Sonic Caliper Test	Each	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
Furnishing Drilled Shaft Drilling Equipment	L.S.	Drilled Shafts for Sign Structure Foundations	x		x		x			x		x	DE
Concrete in Deck Slabs, HPC	C.Y.	High Performance Concrete (HPC)	x	x	x		x	x		x		x	CM/DE
Concrete in Headblock, HPC	CY	High Performance Concrete (HPC)	x	x	x		x	x		x		x	CM
Concrete in Parapet, HPC	CY	High Performance Concrete (HPC)	x	x	x		x	x		x		x	CM/DE
Bridge Approach Slab, HPC	S.Y.	High Performance Concrete (HPC)	x	x	x		x	x		x		x	CM
Relief Slab, 18" Thick, HPC	S.Y.	High Performance Concrete (HPC)	x	x	x		x	x		x		x	CM
Concrete In Sidewalk, HPC	C.Y.	High Performance Concrete (HPC)	x	x	x		x	x		x		x	CM
Sleeper Slab, HPC	C.Y.	High Performance Concrete (HPC)	x	x	x		x	x		x		x	CM
Concrete In Median Barrier, HPC	C.Y.	High Performance Concrete (HPC)	x	x	x		x	x		x		x	CM
Bitumen Coating	LF	Bitumen Coating For Steel Piles	x			x	x					x	CM
Salt Storage Structure	L.S.	Salt Storage Structure	x			x	x						CM
Install Overhead Span Variable Message Sign and Variable Speed Limit Sign Support Structure No. X	LS	Overhead Span VMS & VSLS Supports	x		x		x			x		x	CM/DE
Fabrication and Delivery of overhead Span Sign Support Structure, xx'-x" Length	Each	Overhead Span VMS & VSLS Supports	x		x		x			x		x	DE/CM
Timber Lagging	S.Y.	Overhead Span VMS & VSLS Supports	x		x		x			x		x	DE
Precast Concrete Lagging	S.Y.	Overhead Span VMS & VSLS Supports	x		x		x			x		x	DE
Removal of Existing VMS Signs and Structures	L.S.	Overhead Span VMS & VSLS Supports	x		x		x			x		x	CM/DE
Steel Soldier Piles	L.F.	Overhead Span VMS & VSLS Supports	x		x		x			x		x	DE
8-Inch Combination Underdrain	L.F.	Underdrains	x	x	x							x	CM
8" Outlet Pipe	LF	Underdrains	x	x	x							x	CM
10" Pipe Underdrain	L.F.	Underdrains	x	x	x							x	CM
12" High Density Polyethylene Pipe	L.F.	Underdrains	x	x	x							x	CM
12" High Density Polyethylene Elbows	Each	Underdrains	x	x	x							x	CM
12" High Density Polyethylene End Section	Each	Underdrains	x	x	x							x	CM
12" Trench Drain	L.F.	Underdrains	x	x	x							x	CM
Bio-Retention System	S.Y.	Underdrains	x	x	x							x	CM
18 Inch Half Section Corrugated Metal Pipe	L.F.	Underdrains	x	x	x							x	CM
Underdrain, Type X	L.F.	Underdrains	x	x	x							x	CM
12" Bleeder Drain	LF	Storm Drains	x		x						x	x	CM
36" Reinforced Concrete Flared End Section	Each	Storm Drains	x		x						x	x	CM
14"x23" Reinforced Concrete End Sections	Each	Storm Drains	x		x						x	x	CM

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Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
42" Reinforced Concrete Culvert Pipe	L.F.	Storm Drains	x		x						x	x	CM
8" Corregated Metal Pipe	L.F.	Storm Drains	x		x						x	x	CM
19" x 30" Horizontal Elliptical Reinforced Concrete Pipe	L.F.	Storm Drains	x		x						x	x	CM
38"X60" Reinforced Concrete Elliptical Pipe	L.F.	Storm Drains	x		x						x	x	CM
48" Corrugated Aluminum Alloy Pipe, Gauge 12	L.F.	Storm Drains	x		x						x	x	CM
29"x45" Reinforced Concrete Elliptical Flared End Sections	Each	Storm Drains	x		x						x	x	CM
36" Corrugated Aluminum Alloy Pipe, Gauge 14	L.F.	Storm Drains	x		x						x	x	CM
Precast Concrete Arch Culvert, 21' Diameter	L.F.	Storm Drains	x		x						x	x	CM
Precast Concrete Culvert, 8' x 11'	L.F.	Storm Drains	x		x						x	x	CM
29"x45" Reinforced Concrete Elliptical Pipe	L.F.	Storm Drains	x		x						x	x	CM
19" x 30" Reinforced Concrete Elliptical Pipe, Class V	L.F.	Storm Drains	x		x						x	x	CM
3" Ductile Iron Pipe	L.F.	Storm Drains	x		x						x	x	CM
43" x 68" Reinforced Concrete Elliptical Pipe, Class V	L.F.	Storm Drains	x		x						x	x	CM
18 Inch Half Section Corrugated Metal Pipe	L.F.	Storm Drains	x		x						x	x	CM
Vertical Drain System	S.Y.	Storm Drains	x		x						x	x	CM
Cleaning Existing Storm Drains	L.F.	Storm Drains				x			x				CM
8" PVC Schedule 80	L.F.	Storm Drains	x		x						x	x	CM
12" Corrugated Metal Flared End Section	Each	Storm Drains	x		x						x	x	CM
12" Ductile Iron Pipe	L.F.	Storm Drains	x		x						x	x	CM
12" Reinforced Concrete Flared End Section	Each	Storm Drains	x		x						x	x	CM
12" High Density Polyethylene Flared End Section	Each	Storm Drains	x		x						x	x	CM
12" Reinforced Concrete Pipe	L.F.	Storm Drains	x		x						x	x	CM
12" Reinforced Concrete Pipe, Class V	L.F.	Storm Drains	x		x						x	x	CM
Cleaning Existing Drainage Structures	Each	Storm Drains				x			x				CM
Clean Existing Drainage System	LF	Storm Drains				x			x				CM
Inlet, Type D1 Modified	Each	Manholes & Inlets	x		x		x			x		x	CM
Outlet Control Structure	Each	Manholes & Inlets			x		x				x	x	CM
Temporary Pipe Plug	Each	Manholes & Inlets	x		x		x					x	CM
Inlet, Type Double D1	Each	Manholes & Inlets	x		x		x			x		x	CM
Inlet, Type D1 (NJDOT)	Unit	Manholes & Inlets	s		s		s			s		s	CM
Manhole, Type MHX	Each	Manholes & Inlets	x		x		x			x		x	CM
Inlet, Type D2-1	Each	Manholes & Inlets	x		x		x			x		x	CM
Reset Existing Casting	Each	Manholes & Inlets	x			x	x						CM
Flow Control Structure	Each	Manholes & Inlets	x		x		x		x	x		x	DE
Drainage Chamber	Each	Manholes & Inlets	x		x		x			x		x	DE
Manhole, Type SP-1	Each	Manholes & Inlets	x		x		x			x		x	CM
Manhole, Type SP-2	Each	Manholes & Inlets	x		x		x			x		x	CM
Reset Frame, Type E with Extension	Each	Manholes & Inlets	x		x	x	x			x		x	CM
Outlet Structure	Each	Manholes & Inlets	x		x		x			x		x	CM
New Inlet Frame & Grate, Type B	Each	Manholes & Inlets	x		x		x			x		x	CM
New Inlet Frame & Grate, Type G-1	Each	Manholes & Inlets	x		x		x		x	x		x	CM
Reconstructed Inlet, Type D2, Using Existing Grate and Frame	Each	Manholes & Inlets	x		x		x			x		x	CM
Incidental Concrete	Each	Manholes & Inlets	x		x		x			x		x	CM
Inlet Converted to Manhole	Each	Manholes & Inlets	x		x		x			x		x	CM
Reconstructed Inlet, Type B1-X1, Using New Grate and Frame	Each	Manholes & Inlets	x		x		x			x		x	CM

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Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
New Manhole Frame and Cover	Each	Manholes & Inlets	x		x		x		x	x		x	CM
Repair Inlets	SF	Manholes & Inlets	x		x	x	x		x	x		x	CM
Reset Frame	Each	Manholes & Inlets	x		x	x	x		x	x		x	CM
Temporary Inlet Cap	Each	Manholes & Inlets	x		x		x		x	x		x	CM
Clean Existing Drainage System	LF	Manholes & Inlets				x			x				CM
Fill Abandoned Pipe	CY	Minor Conc Structures & Incidental Conc	x	x	x			x				x	CM
precast Concrete Splash Pad	Each	precast Concrete Splash Pad	x	x	x			x				x	CM
Pipe Support Bridge	L.S.	Pipe Support Bridge	x	x	x			x				x	DE
Mitered Headwall	Each	Mitered Headwall	x	x	x			x				x	CM
Concrete Gutter, 4" Thick	S.Y.	Concrete Gutter, 4" Thick	x	x	x			x				x	CM
Asphalt Concrete Lip Curb	L.F.	Asphalt Conc. Lip Curb and Lip Curb inlets	x	x	x			x				x	CM
Asphalt Concrete lip Curb Inlet	Each	Asphalt Conc. Lip Curb and Lip Curb inlets	x	x	x			x				x	CM
9" x 16" Concrete Verticle Curb (NJDOT)	LF	Concrete Curb	x	x	x			x				x	CM
Concrete Island, 4" Thick	SY	Concrete Curb	x	x	x			x				x	CM
Belgian Block Curb	LF	Concrete Curb	x	x	x			x				x	CM
Concrete Lip Curb	L.F.	Concrete Curb	x	x	x			x				x	CM
Concrete Median Barrier, Protection, Variable Height	LF	Concrete Median Barrier		x	x		x	x		x		x	CM
VMS Equipment Median	Each	Concrete Median Barrier		x	x		x	x		x		x	DE
Concrete Median Barrier Roadway	LF	Concrete Median Barrier		x	x		x	x		x		x	CM
15"x41" Concrete Barrier Curb	L.F.	Concrete Median Barrier		x	x		x	x		x		x	CM
Concrete Median Barrier, Protection	LF	Concrete Median Barrier		x	x		x	x		x		x	CM
Concrete Median Barrier, Type 1	LF	Concrete Median Barrier		x	x		x	x		x		x	CM
Concrete Roadway Barrier With Moment Slab	LF	Concrete Median Barrier		x	x		x	x		x		x	DE/CM
4" Aluminum Tube, Concrete Mounted	LF	Sign Support Structures	x		x		x			x		x	CM
Relocate Existing Ground-Mounted Sign	Each	Sign Panels			x		x				x	x	CM
Removal of Existing Ground-Mounted Sign	Each	Sign Panels			x		x				x	x	CM
Sign Panels	SF	Sign Panels			x		x				x	x	DE
U-Channel Post	LF	Sign Panels			x		x				x	x	CM
Remove Signs	Each	Sign Panels			x		x				x	x	CM
Relocate Sign Panels	Each	Sign Panels			x		x				x	x	CM
Telescoping Guide Rail End Terminal	Each	Guard Rail	x		x		x				x	x	CM
Flared Guide Rail Terminal	Each	Guard Rail	x		x		x				x	x	CM
Offset Bracket	Each	Guard Rail	x		x		x				x	x	CM
Parapet Connection, Type A	Each	Guard Rail	x		x		x				x	x	CM
Parapet Connection, Type B	Each	Guard Rail	x		x		x				x	x	CM
Removal of Beam Guide Rail	LF	Guard Rail	x		x		x				x	x	CM
Beam Guide Rail Post Weldment	Each	Guard Rail	x		x		x				x	x	CM
Safety Walk Connection, Type A	Each	Guard Rail	x		x		x				x	x	CM
Safety Walk Connection, Type B	Each	Guard Rail	x		x		x				x	x	CM
Beam Guide Rail Element	L.F.	Guard Rail	x		x		x				x	x	CM
Tangent Guide Rail Terminal	Each	Guard Rail	x		x		x				x	x	CM
Beam Guide Rail Anchorage	Each	Guard Rail	x		x		x				x	x	CM
Beam Guide Rail Buried End Terminal	Each	Guard Rail	x		x		x				x	x	CM
Beam Guide Rail, Dual-Faced	LF	Guard Rail	x		x		x				x	x	CM

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Exhibit 3-9 Material Acceptance Criteria Matrix

Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Beam Guide Rail	LF	Guard Rail	x		x		x				x	x	CM
Beam Guide Rail, Dual-Faced, Bridge	LF	Guard Rail	x		x		x				x	x	CM
Rub Rail	LF	Guard Rail	x		x		x				x	x	CM
Beam Guide Rail Post	Each	Guard Rail	x		x		x				x	x	CM
Reset Beam Guide Rail with New Post	L.F.	Guard Rail	x		x		x				x	x	CM
Beam Guide Rail Post, 8' Long	Each	Guard Rail	x		x		x				x	x	CM
Reset Beam Guide Rail, Type A	L.F.	Guard Rail	x		x		x				x	x	CM
Chain Link Fence, Type II, 84" High	LF	Fencing	x		x		x				x	x	CM
Vehicular Gate, Type II, 84" High, 12' Wide	Each	Fencing	x		x		x				x	x	CM
Chain Link Fence Gate	Each	Fencing	x		x		x				x	x	CM
Bridge Fencing, Curved Top, 75" High	L.F.	Fencing	x		x		x				x	x	CM
Chain-Link Fence, Aluminum Coated Steel, Bridge, 6'-3" High (NJDOT)	L.F.	Fencing	x		x		x				x	x	CM
Reset Fence	L.F.	Fencing	x		x		x				x	x	CM
Chain Link Fence, Type II, 48" High	L.F.	Fencing	x		x		x				x	x	CM
Vehicular Gate, Type II, 48" High, 12' Wide	Each	Fencing	x		x		x				x	x	CM
Temporary Fencing, 96" High	L.F.	Fencing	x		x		x				x	x	CM
Fence Screening Slats	L.F.	Fencing	x		x		x				x	x	CM
Vehicular Gate, Type II, 84" High, 30' Wide	Each	Fencing	x		x		x				x	x	CM
Pedestrian Gate, Type II, 84" High, 4' Wide	Each	Fencing	x		x		x				x	x	CM
Chain Link Fence, 7' High	L.F.	Fencing	x		x		x				x	x	CM
Median Fencing	L.F.	Fencing	x		x		x				x	x	CM
Temporary Chain Link Fence, Type II, 84" High	L.F.	Fencing	x		x		x				x	x	CM
Concrete Monuments	Each	Concrete Monuments	x		x						x	x	CM
Concrete Driveway Apron, 6" Thick	S.Y.	Sidewalk	x	x	x		x					x	CM
Detectable Warning Surface	S.Y.	Sidewalk	x		x		x					x	CM
Asphalt Concrete Sidewalk, 4" Thick	SY	Sidewalk	x		x		x					x	CM
Concrete Sidewalk, 4" Thick	S.Y.	Sidewalk	x	x	x		x					x	CM
Reconstruct Safetywalk	S.F.	Sidewalk	x		x		x					x	CM
Delineator, Type BA-R	Each	Delineators			x						x	x	CM
Delineator, Type CAS-Y	Each	Delineators			x						x	x	CM
Pavement Striping, White, 12" Wide	L.F.	Pavement Strips & Markings	x		x		x				x	x	CM
Preformed Contrast Marking Tape	L.F.	Pavement Strips & Markings	x		x		x				x	x	CM
Diamond Grinding	L.F.	Pavement Strips & Markings	x		x		x				x	x	CM
Striping and Marking Removal	L.S.	Pavement Strips & Markings	x		x	x	x				x	x	CM
Removal of Pavement Stripes (Hydromilling)	L.F.	Pavement Strips & Markings	x		x						x	x	CM
Horizontal Ramp Gate	Each	Pavement Strips & Markings	x		x		x				x	x	CM
Temporary Pavement Striping	LF	Pavement Strips & Markings	x		x		x				x	x	CM
Traffic Stripes, Long - Life, Epoxy Resin	L.F.	Pavement Strips & Markings	x		x		x				x	x	CM
Traffic Markings, Lines, long - Life, Epoxy Resin	L.F.	Pavement Strips & Markings	x		x		x				x	x	CM
Traffic Markings, Lines, Long - Life, Thermoplastic	L.F.	Pavement Strips & Markings	x		x						x	x	CM
Furnish Field Office, Type A	Unit	Maintain Field Office				x							CM
Maintain Field Office, Type A	Month	Maintain Field Office				x							CM
Remove Field Office Complex	L.S.	Maintain Field Office				x							CM
Maintain Field Office Complex	Month	Maintain Field Office				x							CM
Horizontal Ramp Gate	Each	Horizontal Ramp Gate										x	CM

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Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Test Pits	Each	Test Pits										x	CM
Test Pit Extra Depth	L.F.	Test Pits										x	CM
Cleaning Existing Storm Drain, 12" to 48" Diameter	LF	Miscellaneous Drainage				x						x	CM
Clean Existing Storm Drains, 15" to 24" Diameter	L.F.	Miscellaneous Drainage				x						x	CM
Quadguard Impact Attenuator, 9 Bays, 36" Wide	Each	Impact Attenuator				x	x					x	CM
Pressure Grout Approach Slab	Each	Impact Attenuator				x	x					x	CM
Z-Turn Attrnuator	Each	Impact Attenuator				x	x					x	CM
Mile Marker, Type RP	Each	Mile Marker	x		x		x					x	CM
Utility Support Hangers	Each	Utility Support Hangers	x		x		x					x	CM/DE
Raised Pavement Markers	Each	Raised Pavement Markers	x		x		x					x	CM
Raised Pavement Markers, Bi-Directional, Amber Lens	Each	Raised Pavement Markers	x		x		x					x	CM
48 Inch Reinforced Concrete Pipe, Class V Pipe Jacking	LF	Pipe Jacking	x		x		x						CM/DE
30 Inch Steel Pipe Jacking	L.F.	Pipe Jacking	x		x		x						CM/DE
Thermoplastic Rumble Strips	L.F.	Rumble Strips	x		x		x						CM
Stormwater Diversion Chamber	Each	Stormwater Diversion Chamber	x		x		x						CM/DE
Stormwater Treatment Units	Each	Manholes and Inlets	x		x	x	x				x		CM/DE
Temporary Water Facilities	L.S.	Temporary Water Facilities	x		x		x			x		x	CM/DE
2-6" Electric Riser Conduit, Concrete Encased	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Electric Manhole	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
6-4" Telephone Conduit Bank	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
6-4" Telephone Conduit Bank, Bridge Mounted	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
9-5" Duct, Concrete Encased Ductbank	LF	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
36" Split Steel Casing	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Water Service Connection	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
6" Ductile Iron Pipe Sewer Main	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Manufactured Treatment Devices, Type 1	Each	PS&G Electric Manholes and Conduits	x		x	x	x				x		CM
2-5" Duct, Sand Encased Ductbank	LF	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Reset Water Valve Boxes	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
48" Steel Casing Pipe, Jacking And Tunneling Method	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
26" Steel Casing Pipe	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
6" Polyvinyl Chloride Sewer Pipe	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
8" Ductile Iron Sanitary Sewer Force Main	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
12" Plastic Gas Main	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
12" Steel Gas Main	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Electrical Conduit, 3" Steel	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Concrete Encased 4" Duct Bank	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
12"X12"X6" C.I. Junction Box	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
8" Polyvinyl Chloride Sewer Pipe	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Water Main Blow Off Assemblies	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
12" Tapping Sleeve and Valve	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
12" Line Valve	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
12" Line Stop	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Manhole, Sanitary Sewer, 5' Diameter	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Sanitary Sewer Air Release And Vacuum Valve Assemblies	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Sanitary Sewer Sampling Valve Assemblies	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM

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Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Sanitary Sewer Blow Off Valve Assemblies	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Cable Hand Hole	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Utility Relocation, Telephone	L.S.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM/DE
6" Line Stop	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
2-4" Telephone Riser Conduit	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
2-4" Telephone Riser Conduit, Concrete Encased	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
1-4" Cable Riser Conduit, Concrete Encased	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Manhole, PSE&G 3-WAY	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
8" PVC Sanitary Pipe	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Reset Gas Valve	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Relocation of JCP&L Electrical Facilities	L.S.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM/DE
6-4" Telephone PVC Conduits	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
2-4" Electrical (PSE&G) PVC Conduits	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
4-4" Cable TV PVC Conduits (Encased in Concrete)	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
4-4" Cable Conduit Bank, Bridge Mounted	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM/DE
9-5" Duct, On Structures	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM/DE
2-5" Duct, Concrete Encased Ductbank, with Risers	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
4" Ductile Iron Pipe Sewer Main	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
6" Sanitary Sewer Valve	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
16" Steel Casing	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Removal of Sewer Pipe	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Sanitary Wastewater Transport and Disposal	L.S.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
6" Ductile Iron Water Pipe	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
10" Water Valve	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
10" Ductile Iron Water Cap	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Water Service Cap	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Water Hydrant	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Removal of Water Pipe	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
12" Gas Valve	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Reset Gas Valve Box	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Gas Service Cap	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Linestop and Tie-In Assistance	Crew	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Fabricate Gas Tie-In Piece	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Removal of Gas Pipe	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Relocate JCP&L Electric Distribution - CHAR	L.S.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM/DE
4" Telephone PVC	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
2-4" Telephone Duct Bank, PVC	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
24"x36" Telephone Junction Box	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Removal and Reinstallation of Existing Fiber Cables	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Dry Standpipe	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Relocation of JCP&L Electrical Facilities - Distribution Only	LS	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM/DE
Relocation of JCP&L Electrical Facilities - 34.5 KV Transmission Only	LS	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM/DE
Relocation of Temporary Verizon Facilities	LS	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM/DE
8" Plastic Gas Line (Under Roadway)	LF	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
8" Temporary Gas Line, On Structure, 8" Temporary Steel Gas Line (On and Off	LF	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM

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Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
8" Temporary Plastic Gas Line (Under Roadway)	LF	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Water Air Release Assembly	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
2" Water Valve and Blow-Off	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
4" Water Valve and Blow-Off	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
13-4" Telephone Duct Bank, PVC	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
6'x12' Telephone Manhole, Rebuild	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
4" Telephone, Swing Conduit	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Manhole, Sanitary Sewer Air Release	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
12" Ductile Iron Water Cap	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Gas Expansion Joint Vault	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Manhole, Sanitary Sewer (4' Diameter)	Unit	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
3-4" Telephone Riser Conduit	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
8" Steel Gas Main	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Temporary Sanitary Facilities	L.S.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Fire Hydrant Assemblies	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
4" Plastic Gas Main	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Gas Service Connection	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
4" Ductile Iron Water Pipe Class 54 Water Main	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Reset Fire Hydrant	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
4" Ductile Iron Water Pipe Class 52 Force Main	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
4" Water Valve	Each	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
6" Steel Gas Main, On Structures	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
8" Ductile Iron Sanitary Sewer Main	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
12" Ductile Iron Water Pipe, Class 52	L.F.	PS&G Electric Manholes and Conduits	x		x		x			x		x	CM
Lead and Asbestos Survey, Report and Monitoring	Each	Non-Hazardous Material Handling											CM/DE
Sluice gate	Each	Non-Hazardous Material Handling	x		x		x				x	x	CM/DE
Demolition of Buildings (1)	L.S.	Non-Hazardous Material Handling	x		x		x					x	DE/CM
Removal of Asbestos (This is a NO-BID, Lump Sum item for this contract. The Lump Sum price is $100,000. Enter a Unit Price of $100,000 as your bid for this item.)	Each	Non-Hazardous Material Handling	x		x		x					x	CM/DE
Off-Site Disposal of ID-27 Waste	Ton	Non-Hazardous Material Handling					x		x			x	CM
Environmental Health and Safety Plans	Ton	Environmental Health and Safety Plans			x		x						CM
Removal of Underground Storage Tanks	Each	Removal of Underground Storage Tanks	x		x		x					x	CM/DE
5" Fiberglass Conduit	L.F.	PUBLIC UTILITIES IN STRUCTURES	x		x		x						CM
As-Built Plans	L.S.	Utilities					x						CM
Oil Water Separato	L.S.	Oil Water Separato	x		x		x					x	
Removal of Aboveground Storage Tanks	L.S.	Non-Hazardous Material Handling					x		x			x	CM/DE
4" Fiberglass Conduit, On Structures	L.F.	PUBLIC UTILITIES IN STRUCTURES	x		x		x						CM
Removal of Asbestos (This is a NO-BID, Lump Sum item for this contract. The Lump Sum price is $20,000. Enter a Unit Price of $20,000 as your bid for this item.)	L.S.	Non-Hazardous Material Handling					x		x			x	CM
Installation of 4" Telephone Conduit, On Structures	L.F.	PUBLIC UTILITIES IN STRUCTURES	x		x		x						CM
Track Removal, Storage, and Tie disposal, Siding (Excluding Grade Crossing)	T.F.	Track Removal, Storage, and Tie disposal, Siding (Excluding Grade Crossing)	x		x		x						CM

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Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Track Removal, Storage, and Tie disposal, Main Track (Excluding Turnout)	T.F.	Track Removal, Storage, and Tie disposal, Main Track (Excluding Turnout)	x		x		x						CM
Remove and Store Existing No. 10 Turnout	Each	Remove and Store Existing No. 10 Turnout	x		x		x						CM
Remove and Replace Designated Switch Timbers	L.F.	Remove and Replace Designated Switch Timbers	x		x		x						CM
Remove Grade Crossing, Salvage Rail & Tie Plates, Dispose of Ties and Chairrail, Restore Pavement	T.F.	Plates, Dispose of Ties and Chairrail, Restore Pavement	x		x		x						CM
Rebuild Track; Subballast, Ballast, New Ties, Fit Tie Plates, Dispose , Fit Rail, Line and Surface	T.F.	Rebuild Track; Subballast, Ballast, New Ties, Fit Tie Plates, Dispose , Fit Rail, Line and Surface	x		x		x						CM
Reinstall No. 10 Turnout, Subballast, Ballast	Each	Reinstall No. 10 Turnout, Subballast, Ballast	x		x		x						CM
Supply and Install New Grade Crossing, Rail, Ties, Subballast, Ballast, Pavement, Rubber Flangeway	T.F.	Supply and Install New Grade Crossing, Rail, Ties, Subballast, Ballast, Pavement, Rubber Flangeway	x		x		x						CM
Environmental Health and Safety Plans	LS	Environmental Health and Safety					x		x				DE
Lead and Asbestos Survey, Report and Monitoring	L.S.	Underground Storage Tank Removal					x		x				DE
Demolition of Buildings (1)	L.S.	Underground Storage Tank Removal					x		x				DE
Off-Site Disposal of ID-27 Waste	Ton	Underground Storage Tank Removal					x		x			x	DE
Environmental Health and Safety Plans	L.S.	Underground Storage Tank Removal					x		x				DE
Removal of Underground Storage Tank	Each	Underground Storage Tank Removal					x		x				DE
Transite Duct Bank Removal	L.F.	Underground Storage Tank Removal					x		x				DE
Filter Diaphragm	C.Y.	Underground Storage Tank Removal					x		x				CM
Temporary Subgrade Stabilization for Haul Roads, Type 1	S.Y.	Underground Storage Tank Removal					x		x				CM
Temporary Subgrade Stabilization for Haul Roads, Type 2	S.Y.	Underground Storage Tank Removal					x		x				CM
Highway Advisory Radio Sign	Each	Highway Advisory Radio Sign					x		x				CM
Access Gate	L.S.	Access Gate					x		x				CM
Lead and Asbestos Survey, Report and Monitoring (This is a NO-BID, Lump Sum item for this contract. The Lump Sum price is $XX,000. Enter a Unit Price of $50,000 as your bid for this item.)	L.S.	Lead and Asbestos Survey, Report and Monitoring (This is a NO-BID, Lump Sum item for this contract. The Lump Sum price is $XX,000. Enter a Unit Price of $XX,000 as your bid for this item.)					x		x				CM
Furnish Track	T.F.	Furnish Track					x		x				CM
Tank Cleaning	Month	Tank Cleaning					x		x				CM
Tank Decontamination	Each	Tank Decontamination					x		x				CM
Tank Draining - Storm System	Each	Tank Draining - Storm System					x		x				CM
Tank Draining - Treatment Facility	Gallon	Tank Draining - Treatment Facility					x		x				CM
Tank Rental	Month	Tank Rental					x		x				CM
Controlled Release Terminals	L.F.	Underground Storage Tank Removal					x		x				DE
Controlled Release Terminal Anchorages	Each	Controlled Release Terminal Anchorages					x		x				CM
Concrete Foundation For Lighting Distribution and Control Panel	Each	Common Electrical Provisions	x		x		x				x	x	DE/CM
Foundation, Type MC	Each	Common Electrical Provisions	x		x		x				x	x	DE/CM
Transformer, Type 45KVA	Each	Common Electrical Provisions	x		x		x				x	x	DE
Enclosed Circuit Breaker	Each	Common Electrical Provisions	x		x		x				x	x	CM

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Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Meter and Disconnect Mount	Each	Common Electrical Provisions	x		x		x				x	x	CM
Service Cable Replacement in Kind	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
Temporary Electrical and Lighting Facilities	L.S.	Common Electrical Provisions	x		x		x				x	x	DE/CM
#1/0 A.W.G Ground Wire	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
3" Rigid Metallic Conduit, on Structures	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
3" Rigid Metallic Conduit, Underground	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
3" Rigid Nonmetallic Conduit, PVC-(Schedule 40)	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
#6 A.W.G. Ground Wire	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
#6 A.W.G. Multiple Lighting Cable	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
#6 A.W.G. Service Cable (600V)	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
Remove and Salvage Existing Facilities	LF	Common Electrical Provisions	x		x		x				x	x	CM
Underbridge Lighting Fixture	Each	Roadway Lighting	x		x		x				x		DE
Tunnel Lighting Fixture	Each	Roadway Lighting	x		x		x				x		DE
Load Center Cabinet '206TPK'	Each	Roadway Lighting	x		x		x				x		DE
Lighting Standard Base, Type I	Each	Roadway Lighting	x		x		x				x		DE
Meter Cabinet, Type H, Voltage 240/480V, 200 AMP	Each	Roadway Lighting	x		x		x				x		DE
Tunnel Lighting	L.S.	Roadway Lighting	x		x		x				x		DE
Temporary Lighting Systems	L.S.	Roadway Lighting	x		x		x				x		CM
Current Transformer Cabinet	Each	Roadway Lighting	x		x		x				x		DE
Load Center Cabinet, Type F Modified	Each	Roadway Lighting	x		x		x				x		DE
Load Center, Type J1	Each	Roadway Lighting	x		x		x				x		DE
Concrete Base, Type M	Each	Roadway Lighting	x		x		x				x		DE
Load Center, Type T	Each	Roadway Lighting	x		x		x				x		DE
Meter Cabinet, Type Nonstandard, Voltage 277/480V	Each	Roadway Lighting											DE
Remove And Salvage Existing Facilities	L.S.	Roadway Lighting	x		x	x					x	x	CM
Roadway Lighting Distribution and Control Panel	Each	Roadway Lighting	x		x						x	x	DE
RELOCATE JUNCTION BOX FOUNDATION, TYPE JBF	Each	Roadway Lighting	x		x	x	x				x	x	CM
RELOCATE LIGHTING STANDARD	Each	Roadway Lighting	x		x	x	x				x	x	CM
Lighting Standard, Type L-MG-26	Each	Roadway Lighting	x		x						x	x	DE
Type P4 Luminaire, 400W	Each	Roadway Lighting	x		x		x				x		DE
Illumination For Sign Structure No. XX.XX	L.S.	Roadway Lighting	x		x		x				x		DE
Removal of Emergency Speed Warning and Speed Limit Signs	L.S.	Emergency Speed Warning and Speed Limit Signs				x	x						CM
System Manufacturer Installation and Testing (This is a NO-BID, Lump Sum item for this contract. The Lump Sum price is $20,000. Enter a Unit Price of $20,000 as your bid for this item.)	L.S.	System Manufacturer Installation and Testing (This is a NO-BID, Lump Sum item for this contract. The Lump Sum price is $20,000. Enter a Unit Price of $20,000 as your bid for this item.)				x							CM
In-Pavement Wireless Sensor	Each	Wireless Vehicle Detection System				x	x						DE
Wireless Access Point, Pole Mounted	Each	Wireless Vehicle Detection System											DE
Spare Parts	L.S.	Spare Parts				x	x						DE
JCP&L Electrical Service Contract	L.S.	JCP&L Electrical Service Contract				x	x						CM
Varible Message Sign Installation	Each	Varible Messaage Sign Installation				x	x						DM
Varible Speed Limit Sign Installation	Each	Varible Messaage Sign Installation				x	x						DM
System Control Cabinet Installation	Each	Varible Messaage Sign Installation				x	x						DE

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Electric Service Meter Cabinet	Each	Roadway Lighting	x		x		x				x		CM
Power Equipment on ITSS	Each	Roadway Lighting	x		x		x						DE
Transformer, Type 37.5kVA	Each	Varible Messaage Sign Installation					x						DE
CCTV Camera, ITSS Mounted	Each	CCTV Camera Installation	x		x		x						DE
CCTV Camera, Pole Mounted With Lowering Device	Each	CCTV Camera Installation	x		x		x						DE
Relocation of Highway Advisory Road Sign	L.S.	Common Electrical Provisions	x		x		x				x	x	CM
Wireless Access Point, ITSS Mounted	Each	Wireless Vehicle Detection System					x						DE
2-Way Duct Bank, 4" HDPE Conduits Directional Drilled	L.F.	Common Electrical Provisions	x		x		x				x	x	DE
2-Way Comm Duct Bank, Soil Encased	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
4" HDPE Conduit with Pull Cords	LF	Common Electrical Provisions	x		x		x				x	x	CM
4-Way Duct Bank, 4" HDPE Conduits Directional Drilled	L.F.	Common Electrical Provisions	x		x		x				x	x	DE
Concrete Foundations For Aluminum Light Assemblies	Each	Concrete Foundations For Aluminum Light											CM
2-Way Comm Duct Bank, Concrete Encased	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
4-Way Power/Comm Duct Bank, On Structure	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
Reestablish/Relocate Underground Customer Electric Service	L.S.	Common Electrical Provisions	x		x		x				x	x	CM
Multi-Mode Fiber Optic Cable, 6-Fibers	L.F.	Common Electrical Provisions	x		x		x				x	x	DE
Lighting Standard, Type L-ITS-40	Each	Common Electrical Provisions	x		x		x				x	x	DE
ITS Power Equipment, Pedestal Mounted	Each	Common Electrical Provisions	x		x		x				x	x	DE
ITS Equipment Platform, Type 2	Each	Common Electrical Provisions	x		x		x				x	x	DE
Removal Of Highway Advisory Radio Sign System, Ground Mounted	Each	Common Electrical Provisions	x		x		x				x	x	CM
Radio Antenna Mount	Each	Common Electrical Provisions	x		x		x				x	x	DE
Temporary Electric Facilities, Buried	L.S.	Common Electrical Provisions	x		x		x				x	x	CM
Customer Owned Underground Service - Electric	L.S.	Common Electrical Provisions	x		x		x				x	x	CM
Customer Owned Underground Service - Telephone	L.S.	Common Electrical Provisions	x		x		x				x	x	CM
Hybrid Changeable Message Sign (This is a NO-BID, Lump Sum item for this contract. The unit price is $65,000. Enter a Unit Price of $65,000 as your bid for this item).	L.S.	Common Electrical Provisions	x		x		x				x	x	DE
Hybrid Changeable Message Sign Installation	Each	Common Electrical Provisions	x		x		x				x	x	DE
Image Detection System	L.S.	Common Electrical Provisions	x		x		x				x	x	DE
Advanced Radar Detection	L.S.	Common Electrical Provisions	x		x		x				x	x	DE
End Node Radio Installation	Each	Common Electrical Provisions	x		x		x				x	x	DE
Software Implementation	L.S.	Common Electrical Provisions	x		x		x				x	x	DE
Central Software Hosting / Maintenance	Day	Common Electrical Provisions	x		x		x				x	x	DE
Portable Variable Message Sign	Day	Common Electrical Provisions	x		x		x				x	x	DE
Portable Traffic Detection Sensor	Day	Common Electrical Provisions	x		x		x				x	x	DE
Training and Documentation	L.S.	Common Electrical Provisions	x		x		x				x	x	DE
5-Way Duct Bank, 4" HDPE Conduits, Directional Drilled	L.F.	Common Electrical Provisions	x		x		x				x	x	DE
Transformer, Type 50 kVA	Each	Common Electrical Provisions	x		x		x				x	x	DE
Fiber Optic Duct Bank	L.S.	Common Electrical Provisions	x		x		x				x	x	CM
HAR Sign Beacon Control Equipment	Each	Common Electrical Provisions	x		x		x				x	x	CM
8-5" Electric Duct Bank, PVC	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
Illuminated Sign Relocation	Each	Common Electrical Provisions	x		x		x				x	x	CM
2-4" Telephone Duct Bank, PVC with Risers	L.F.	Common Electrical Provisions	x		x		x				x	x	CM

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Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
30"x60" Temporary Telephone Handhole	Each	Common Electrical Provisions	x		x		x				x	x	CM
8-6" Electric Duct Bank on Structure, Fiberglass	L.F.	Common Electrical Provisions	x		x		x				x	x	CM
Landscape Wall	S.F.	TREE WELLS AND TREE WALLS	x		x		x				x	x	CM/DE
Topsoil	SY	Topsoiling	x				x					x	CM
Seeding, Type A	SY	Seeding & Sodding	x		x		x				x	x	CM
Seeding Type W	SY	Restoration of Temporary Wetland Disturbances					x						CM
Mowing	Acre	Seeding & Sodding					x					x	CM
Straw Mulching	S.Y.	Temp Soil Erosion & Dust Control	x		x							x	CM
Watering	MG	Seeding & Sodding					x					x	CM
Planting, Atlantic White Cedar (Chamaecyparis Thyoides)	Each	Planting, Atlantic White Cedar (Chamaecyparis Thyoides)	x	x									CM
Wood Chip Mulching	S.Y.	Wood Chip Mulching	x	x									CM
Abandoned Plant Pits	C.F.	Abandoned Plant Pits	x	x									CM
Soil Stablization Matting	S.Y.	Soil Stablization Matting					x					x	CM
Block Paving	S.Y.	Block Paving					x					x	CM
Gravel Paving	S.Y.	Gravel Paving					x					x	CM
Nonvegetative Surface, Hot Mix Asphalt	S.Y.	Nonvegetative Surfaces	x		x	x					x	x	CM
Herbaceous Wetland Planting, Carex Stricta	Each	Seeding & Sodding	x		x							x	CM
Bedding for Reforestation	S.Y.	Seeding & Sodding	x		x							x	CM
Tree Snags	Each	Seeding & Sodding	x		x							x	CM
Invasive Vegetation Removal	Acre	Seeding & Sodding	x		x							x	CM
Topsoil Amendment	S.Y.	Seeding & Sodding	x		x							x	CM
Leaf Litter	C.Y.	Seeding & Sodding	x		x							x	CM
Concrete Modular Unit Wall	C.Y.	Seeding & Sodding	x		x							x	CM
Block Wall	S.F.	Block Wall	x		x							x	CM/DE
Uniform Traffic Directors (This is a NO-BID, Lump Sum item for this contract. The Lump Sum price is $50,000. Enter a Unit Price of $50,000 as your bid for this item.)	L.S.	Traffic Control Devices		x	x		x	x		x		x	CM
Precast Concrete Curb Construction Barrier	L.F.	Traffic Control Devices		x	x		x	x		x		x	CM
Repair Temporary Impact Attenuators	Barrel	Traffic Control Devices				x			x				CM
Repair Truck Mounted Impact Attenuators	Each	Traffic Control Devices				x			x				CM
Furnishing Temporary Concrete Barrier, Type 4	L.F.	Traffic Control Devices		x	x		x	x		x		x	CM
Flashing Arrow Boards, 4' x 8'	Each	Lane & Shoulder Closings		x	x		x	x		x		x	CM
Placing And Removing Temporary Impact Attenuator, Frangible Module Type A	Each	Lane & Shoulder Closings		x	x		x	x		x		x	CM
Furnishing Sign Stands	Each	Lane & Shoulder Closings	x		x	x							CM
Furnishing Sign PaneL.S.	Each	Lane & Shoulder Closings	x		x	x							CM
Furnishing Overlay PaneL.S.	Each	Lane & Shoulder Closings	x		x	x							CM
Furnishing Traffic Cones	Each	Lane & Shoulder Closings	x		x	x							CM
Furnishing Flashing Lights	Each	Lane & Shoulder Closings	x		x	x							CM
Furnishing Batteries	Each	Lane & Shoulder Closings	x		x	x							CM
Placing and Removing Concrete Barrier	L.F.	Lane & Shoulder Closings				x	x		x			x	CM
Temporary Striping	L.F.	Lane & Shoulder Closings				x	x		x			x	CM
Traffic Protection Patrol	M.H.	Lane & Shoulder Closings				x							CM

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Pay Item Description	Pay Unit	Standard Specification Description	Source	Testing	Division 900 - Conformance	Other Conformance	Shop Drawings	Mix Design	QC Plan	Mill Certifications	Certifications of Compliance	Receiving Tickets	Reviewer (CM or DE)
Uniformed Flagman	M.H.	Lane & Shoulder Closings				x							CM
Furnishing Truck with Mounted Attenuator	Each	Lane & Shoulder Closings	x		x	x							CM
Furnishing Temporary Impact Attenuator	Each	Lane & Shoulder Closings	x		x	x							CM
Furnishing Truck with Mounted Attenuator for Engineer's Use	M.H.	Lane & Shoulder Closings	x		x	x							CM
Placing and Removing Temporary Impact Attenuator	Each	Lane & Shoulder Closings				x	x						CM
Shoulder Closing for Engineer's Use	Each	Lane & Shoulder Closings				x							CM
Modular Guidance System	L.F.	Lane & Shoulder Closings	x		x	x	x					x	CM
Furnishing Traffic protection Devices	L.S.	Lane & Shoulder Closings	x		x	x							CM
Furnish Varible Message Sign	Each	Lane & Shoulder Closings	x		x	x	x					x	CM
Installation, Maintenance and Removal of Breakaway Barricades	Each	Lane & Shoulder Closings	x		x	x	x					x	CM
Maintenance and Protection of Traffic	L.S.	Lane & Shoulder Closings				x	x						CM
Emergency Lane Closure	Each	Lane & Shoulder Closings				x	x						CM
Maintenance and Protection of Traffic on Location No. 1	L.S.	State, County and Local Highways				x	x						CM
Building Architectural Work	L.S.	Building Architectural Work	x		x	x	x					x	DE/CM
Building Plumbing Work	L.S.	Building Plumbing Work	x		x	x	x					x	DE/CM
Building Electric Work	L.S.	Building Electric Work	x		x	x	x					x	DE/CM
Building Mechanical Work	L.S.	Building Mechanical Work	x		x	x	x					x	DE/CM
Building Structural Work	L.S.	Building Structural Work	x		x	x	x					x	DE/CM
I-11 Soil Aggregate	C.Y.	I-11 Soil Aggregate	x		x	x	x					x	CM
Dense-Graded Aggregate Base Course, 6" Thick	S.Y.	Aggregate Base Course	x	x	x							x	CM
Prime Coat	Gallon	HMA Pavements	x		x			x			x	x	CM
Hot Mix Asphalt 9.5H 64 Surface Course	Ton	HMA Pavements	x		x			x			x	x	CM
Hot Mix Asphalt 12.5H 76 Surface Course	Ton	HMA Pavements	x		x			x			x	x	CM
Hot Mix Asphalt 25H 64 Base Course	Ton	HMA Pavements	x		x			x			x	x	CM
Controlled Release Terminal	Unit	Beam Guide Rail	x		x		x					x	CM
Controlled Release Terminal Anchorage	Unit	Beam Guide Rail	x		x		x					x	CM
RPM, Mono-Directional, White Lens	Each	Traffic Stripes	x		x		x				x		CM
Flexible Delineator, Ground Mounted	Unit	Traffic Stripes	x		x		x				x		CM
Guide Sign, Type GA, Breakaway Supports	S.F.	Traffic Stripes	x		x		x				x		CM
Fire Hydrant	Unit	Utilities	x		x		x				x		CM
Reset Fire Hydrant	Unit	Utilities	x		x		x				x		CM
Reset Water Valve Box	Unit	Utilities	x		x		x				x		CM
Reset Gas Valve Box	Unit	Utilities	x		x		x				x		CM
3" Rigid Metallic Conduit	L.F.	Roadway Lighting	x		x		x				x		CM
18" x 36" Junction Boxes	Unit	Roadway Lighting	x		x		x				x		CM
Junction Box Foundation	Each	Roadway Lighting	x		x		x				x		DE
Foundation, Type SFT	Unit	Roadway Lighting	x		x		x				x		DE
Meter Cabinet, Type T	Each	Roadway Lighting	x		x		x				x		CM
Controller, 8 Phase	Unit	Roadway Lighting	x		x		x				x		CM
Traffic Signal Mast Arm, Aluminum	Unit	Roadway Lighting	x		x		x				x		CM
Traffic Signal Mast Arm, Steel	Unit	Roadway Lighting	x		x		x				x		CM
Traffic Signal Cable, 2 Conductor	L.F.	Roadway Lighting	x		x		x				x		CM
Traffic Signal Head	Unit	Roadway Lighting	x		x		x				x		CM
Pedestrian Signal Head	Unit	Roadway Lighting	x		x		x				x		CM
Push Button	Unit	Roadway Lighting	x		x		x				x		CM

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Image Detector	Unit	Roadway Lighting	x		x		x				x		CM
Temporary Traffic Signal System, Location No. 1	L.S.	Roadway Lighting	x		x		x				x		CM
Controller Turn-On	Unit	Roadway Lighting	x		x		x				x		CM
Uninterruptible Power Source Unit with Controller Cabinet Revisions	Each	Roadway Lighting	x		x		x				x		CM
Lighting Standard Aluminum	Each	Roadway Lighting	x		x		x				x		DE
Luminaire	Unit	Roadway Lighting	x		x	x	x				x		DE
Temporary Highway Lighting System	L.S.	Roadway Lighting	x		x	x	x				x		DE
ITS Conduit, Type A	L.F.	Roadway Lighting	x		x	x	x				x		CM
Junction Box ITS Type A	Each	Roadway Lighting	x		x	x	x				x		CM
Control Center System, Location No.1	L.S.	Roadway Lighting	x		x	x	x				x		DE
Foundation, CSS Type A	Each	Roadway Lighting	x		x	x	x				x		DE
Camera Standard, Type A	Each	Roadway Lighting	x		x	x	x				x		DE
Camera	Each	Roadway Lighting	x		x	x	x				x		DE
Controller, Camera	Each	Roadway Lighting	x		x	x	x				x		DE
Fiber Optic Cable, Type A	L.F.	Roadway Lighting	x		x	x	x				x		DE
Controller CTSS	Unit	Roadway Lighting	x		x	x	x				x		CM
Sign Lighting, Structure No. XX	L.S.	Sign Structures	x		x	x	x				x		DE
Standby Wrecker Service	Hour	Lane & Shoulder Closings	x		x	x							CM

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Section 4 - DESIGN SURVEYS

4.1. AERIAL PHOTOGRAPHY CRITERIA

4.1.1. Scale of Negatives

The flight height above the average ground elevation or set datum shall be such that the negatives will yield photographic prints on paper or on dimensionally stable polyester-type plastic or scanned images to the scale specified by the Authority's Project Manager. Negatives departing from the intended scale by more than five percent (5%) shall be rejected.

Unless specified otherwise by the Authority's Project Manager, the flight height shall be no more than eight times the value of the intended photography scale. Accordingly, the photography scales and flight heights, together with the corresponding contour intervals, are shown in Exhibit 4-1.

Exhibit 4-1 Photography Scale and Flight Height Guidelines

MAPPING SCALE	CONTOUR INTERVALS	PHOTOGRAPHY SCALE	FLIGHT HEIGHT
1" = 30'	1.0'	1" = 250'	1,500'
1" = 50'	1.0'	1" = 400'	1,800'
1" = 100'	2.0'	1" = 700'	4,200'
1" = 200'	5.0'	1" = 1,600' (max)	9,600' (max)
Nominal focal length of 6".			
Use of digital cameras is permissible, however since digital cameras have various focal lengths, the photography scale shall be maintained.			

4.1.2. Photogrammetric Ground Control

By definition, the horizontal datum is a rectangular plane coordinate system. Unless approved otherwise by the Authority's Project Manager, all horizontal control shall reference the New Jersey State Plane Coordinate System referenced to the North American Datum of 1983 (NAD83) plus the Adjustment Date Tag (1996) (NAD83/96). All horizontal control shall begin and terminate on monuments that are in the National Geodetic Reference Database System (NGRDS). Monuments consist of a numbered point set within the project limits, flush with the ground in areas where they will not be disturbed by normal daily activity. These points can be a 36" x 5/8" re-bar with a bronze or aluminum cap driven in to the ground or precast concrete monuments minimum 36" long 4" square on the top and 5" square on the bottom.

The vertical datum is normal to gravity. Unless approved otherwise by the Authority's Project Manager, all vertical control shall reference the North American Vertical Datum

of 1988 (NAVD 88). All vertical control shall begin and terminate on existing bench marks that are in the National Geodetic Reference Database System (NGRDS). Bench marks are simply a point with a known elevation, typically referenced to a specified National Datum, such as the North American Vertical Datum 1988 (NAVD88) or National Geodetic Vertical Datum (NGVD1929) for older bench marks.

Horizontal control points shall be set up as station points in a closed traverse whenever practicable. If field conditions dictate otherwise, control points shall either be tied to the traverse from two different stations or have the angles and distances for single ties measured at least twice. Each aerial control photograph shall be examined carefully in the field to ensure that the object described in the photograph is indeed the corresponding object in the field. Aerial Photography shall be submitted to the Authority's Engineering Department with the Phase A submission.

Vertical control points shall be set up as turning points on differential level runs. Side shots used for photo control points are not acceptable. Global Positioning System (GPS) and trigonometric leveling is acceptable in lieu of differential leveling if field conditions so dictate and approval is received from the Authority's Project Manager. However, all distances shall be measured using electronic distance measuring devices in order to ensure that the accuracies listed in Exhibit 4-2 can be obtained.

When GPS technology is used, in either the Rapid Static Method or Real Time Kinematic (RTK), multiple sessions must be completed on each point using a different constellation configuration, so the mean values of the coordinates and elevations meet the accuracies shown in the attached table.

Exhibit 4-2 Recommended Control Accuracies

MAPPING SCALE	HORIZONTAL	VERTICAL
1" = 30'	0.20'	0.05'
1" = 50'	0.30'	0.05'
1" = 100'	0.50'	0.10'
1" = 200'	1.00'	0.30'
Note:	Standard error, defined as the square root of the sum of the squares of the errors from "n" measurements divided by "n", in position and elevation of each control point shall not exceed the recommended accuracies shown.	

A target is defined as a point painted on the road surface or a cloth placed over an existing monument in the field which can be easily seen on the photo image and located in the field by a survey crew. Its shape shall be in the form of a symmetrical cross with the recommended sizes as shown in Exhibit 4-3.

Targets shall be prepared by painting or printing them on cardboard, muslin or similar cloth, or they shall be constructed of lime placed on the ground, or they shall be painted on the roadway surface. In all cases the cross template shall be used as a guide.

Control points are specific points visible in the photo image having coordinates and elevations to be used for the proper spatial orientation of the photography. These points and can be either pre-targeted (prior to flight) or photo-identifiable points can be selected for use upon viewing existing aerial photographs. Unless otherwise approved by the Authority's Project Manager, targets shall be established in the field so that they are visible in the aerial photography resulting in a permanent photographic record.

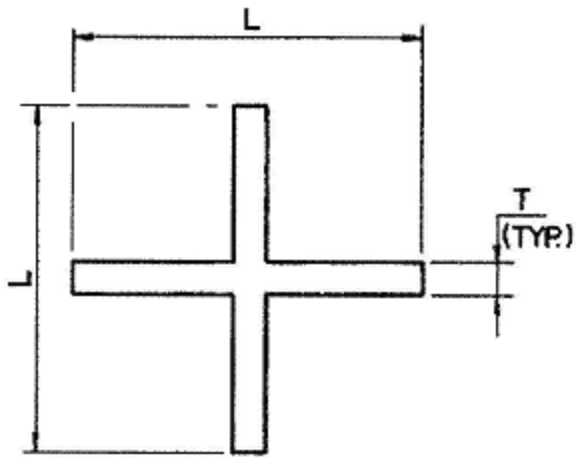
Targets serve to make evident the locations of control points so that the existence and position of each point is easily and accurately discernible when its corresponding image is viewed in an aerial photograph. Targets also pinpoint supplemental control points which enable aerial photographs to be oriented within photogrammetric instruments for use in the stereoscopic compilation of map manuscripts. Additional targets will be provided over existing baseline and right of way monuments or control points. This will permit orienting the maps to plan stationing and plan right of way lines.

Targets shall be placed in the median and shoulder zones of the roadway in question and on flat ground whenever practicable. Steep slopes, sharp ridges and ditches should be avoided. All targets shall be placed on contrasting background so as to be readily distinguishable in aerial photographs.

Each target shall be placed with its center directly over and at the exact elevation of the steel rod or other appropriate manifestation of the control point in question. The target legs should not slope appreciably from the center.

Normally, target spacing shall be at an interval equal to 1.2X the flight height. However, for those Projects where the required flight height is 1200' or less, targets shall be placed so that at least two (2) will appear in the overlap between adjacent photographs. Accordingly, unless otherwise approved by the Authority's Project Manager and as noted above, the guidelines for sizes and center-to-center intervals of targets shown in Exhibit 4-3 are recommended. Black targets are used instead of white targets on concrete road surfaces, sandy soils, etc. where the background of the photo image is lighter, and the darker target will stand out in the image.

Exhibit 4-3 Design Guidelines for Targets



MAPPING SCALE	FLIGHT HEIGHT	MAXIMUM INTERVAL	TARGET LEG WIDTH (WHITE/BLACK)	TARGET LEG LENGTH (WHITE/BLACK)
1” = 30’	1,500’	1,800’	6”/18”	2’/6’
1” = 50’	1,800’	2,100’	6”/18”	3’/9’
1” = 100’	4,200’	5,040’	8”/24”	5’/15’
1” = 200’	9,600’ (max)	11,520’	18”/36”	10’/30’

Upon approval by the Authority’s Project Manager, photo-identifiable control points may be used in lieu of targeting control points. The use of photo-identifiable control points may be authorized if existing aerial photographs are readily available and if the Project area is urban or suburban in character where such points would exist in abundance.

Photo-identifiable control points shall be established on permanently fixed objects and shall be of sufficient clarity and definition as to provide the same quality and reliability in aerial photographs as targeted control points. Points that are indefinite or not permanent (e.g. bushes, logs; intersections, roadway centerlines or building corners at a large scale; etc.) are not acceptable.

Photo-identifiable control points shall be maintained at the maximum intervals as specified for the placement of new targets with respect to their corresponding flight heights. Such points shall be established in the central zone of the roadway in question and on flat ground whenever practicable. In all other respects, requirements for these points shall correspond to the specifications affecting the layout of targeted control points.

4.1.3. Low Altitude Mapping & Photogrammetry (LAMP)

Use of low altitude techniques to obtain ground elevations is permissible when roadway or lane closings are infeasible. The mapping accuracy shall be 0.1 feet horizontal and 0.04 feet vertical.

4.2. SURVEY CONTROL REPORT REQUIREMENTS

The Survey Control Report shall be submitted to the Authority's Engineering Department in advance of any survey work. The Report shall include the following at a minimum:

1. Introduction
   a. Purpose – Describe the purpose for which the survey was conducted.
   b. Point of Contact – Supply the name, phone number, and mailing address of the contact within the submitting organization. Supply the same information for all organizations that participated in the survey.
   c. Accuracy Standards – Provide the accuracy standards (vertical and horizontal) specified for the project.
   d. Endorsement – Signed and sealed by the Professional Land Surveyor in responsible charge of the project.
2. Location – Indicate the geographic location and scope of the work in general terms.
3. Field Work
   a. Chronology – Give a brief description of the progression of the survey work.
   b. Instrumentation – Describe the make, model and serial number of each instrument used on the project. Provide the most current calibration records of the instruments used on the project.
   c. Deviation from Instructions – Describe any deviation from the procedures and specifications stated in the project instructions.
4. Data Processing Performed – Describe the data processing that was performed. Include tasks such as transferring of data to different storage media, data quality checking, station descriptions, baseline determinations, closure computations, and the following information (if appropriate):
   a. Software Used – Specify all software by program name and version number that was used to acquire, manage, reduce, adjust, and submit field data. If the data was reduced or acquired with different versions of a program, specify which version was used with which block of data.
   b. Rejected Data – Specify any data that was rejected and re-surveyed. This should include the reasons why the data from a particular field session was rejected.
   c. Adjustment – Discuss in detail the type of adjustments performed. Indicate the weighting technique used and stations constrained. Include a list of the adjusted coordinates of all horizontal points and a list of all adjusted bench mark elevations.

d. Closures – Tabulate the results of all loop mis-closure computations performed. Include the baselines used, baseline length, maximum closure in each component, and average closure error in each component. Tabulate closure component error in terms of Cartesian coordinates and in terms of the local terrestrial system. Also, tabulate comparisons of repeat baselines observed indicating baseline length and maximum and average closure for each baseline component. Closures shall be stated in both meters and parts per million.

5. Attachments of Enclosures

6. Cutting or clearing in other areas according to accepted Authority horticultural methods, which are:

   a. Station List – Include a table that lists the station name, coordinates, elevation and station type for all stations surveyed.

   b. Field Sketch – Attach a copy of the project sketch. If there are multiple copies of the sketch showing different data, attach a copy of each. The project sketch shall include all stations occupied during the survey and a border drawn around the edge with grid ticks for latitude and longitude. The sketch will show other stations of the existing network located within or near the work area. Indicate whether any attempt was made to recover these stations. The report and/or recovery notes will indicate why the recovered stations were not surveyed. To indicate a station that was not recovered, use "NR" next to that station's symbol. Survey points will be shown in an inset sketch when they are too closely together to be depicted clearly on the network sketch.

   c. Instructions – Attach a copy of the instructions and/or contract under which this work was performed. Also include any revisions or changes to the instructions or specifications.

   d. Field Logs – Provide original field survey notes and record books.

   e. QA/QC Program Project Task Order Form / Checklists

   f. Paper prints showing all control points (control diagram).

4.3. FIELD SURVEY REQUIREMENTS

In advance of any survey work, the Engineer shall prepare a list of property owners in the corridor together with their addresses. An owner notification letter (notice of entry) will be sent to these property owners by the Engineer. Refer to Subsection 1.4.3 of this Manual for more information. No field work of any kind shall be undertaken until the owners are so notified.

In advance of any survey work on other than private property or Authority property, the Engineer shall advise the owner or agency involved (e.g. Municipality, Utility Company, Railroad, etc.) by letter, explaining the work to be performed, the approximate time period during which it is to be accomplished and the personnel and equipment which are to be used. For letters to Municipalities, a copy shall also be sent to the local police department.

In some cases, a railroad may require telephone verification 24 hours before actually commencing work on their property, the execution of a "right of entry" and payment to cover the expenses of railroad employees (e.g. Flagmen) assigned to accompany the survey work.

The legal "right of entry" to make surveys is specified in certain proceedings in N.J. Statutes 46:11, Sec. 1. Also, on December 21, 1971 a new Condemnation Act (N.J. Statutes 27:23 - 6 & 20:3 - 16), became law, thus enabling agents of the Authority to enter upon private property after giving proper notice as defined in the Act. Although the Authority would thus have the legal right to enter upon private property for the purpose of making surveys, the Authority does not wish to impose this law against the will of property owners if such can be avoided. Therefore, the Engineer, in coordination with the Authority's Project Manager, is to make every effort to avoid performing survey work over the objection of a property owner, by rearranging his work accordingly. Should such a rearrangement not be possible, the Engineer is to immediately notify the Authority's Project Manager by letter describing the problem, the alternatives available, and the Engineer's recommended solution. The Authority's Project Manager will then contact the property owner and attempt to resolve the problem.

Before starting any work on Authority property, the Engineer shall submit to the Authority's Operations Department a "Traffic Permit" application, describing in detail the nature and extent of the work to be performed, as well as furnishing the other data required on the Application. The Authority's Operations Department will then issue a "Traffic Permit" authorizing the work and setting forth the conditions under which the work is to be performed. This permit shall be carried by the personnel engaged in the work at all times and shall be shown to State Police and Authority personnel upon request with the provisions of the permit strictly obeyed. Refer to Subsection 1.3.1 of this Manual for more information.

It is essential that all engineering and survey personnel, prior to being assigned to the work, acquire a thorough understanding of the policies, procedures and intent of the Authority with respect to activities involving the general public. The best interests of the Authority must always be given prime consideration, and these are best served when the personnel exhibit a courteous, respectful and cooperative attitude towards the public. Personnel are to be cautioned to exercise discretion in discussing the details of the Project with the public, and they shall be thoroughly briefed in advance as to the extent of the information they can disclose. Should there be any doubt or should questions by the public be beyond those to which personnel are permitted to respond, the person asking should be politely told to refer their question to the Authority's Project Manager.

Before beginning work, all personnel shall be cautioned against causing any damage to public or private property. Should any such damage occur while performing the field survey work, the Engineer shall be considered solely and entirely responsible therefore. In the event any of the Engineer's personnel or vehicles become involved in an accident of any nature during the performance of the work, the Engineer shall fulfill all established requirements related thereto, and in addition shall also promptly advise the Authority's Project Manager in writing of the nature and details of the accident and the subsequent actions taken.

4.4. EXECUTION OF THE SURVEYS

It will be the responsibility of the Engineer to determine the type and detailed extent of survey information that will be required for the Project. Particular attention shall be given to obtaining data for existing structures, drainage, utilities and property corners which may be removed or destroyed during construction and therefore never available again.

All field notes will become part of the permanent record of the work and must be clearly and accurately recorded in such a manner as to be readily interpreted in the future by those not

intimately familiar with the original work. Field information obtained from data collectors shall not be disposed of without the written permission of the Authority's Project Manager. Copies of all field notes shall be furnished to the Authority's Project Manager upon request, together with any supplementary legend or other information required making the data completely self-explanatory.

Reproducible small scale (e.g. 1" = 200') Survey Control Maps of the Project area, showing existing monuments, the preliminary alignment of the Project, the proposed control traverse and bench level network and required cutting limits and methods (if applicable) shall be prepared and submitted to the Authority's Engineering Department prior to beginning any survey work.

The Authority cannot stress too strongly the fact that they prefer no cutting of trees, shrubs, bushes, etc. whatsoever. If, however, cutting is absolutely required, then it shall be held to an absolute minimum and good judgment shall be used in selecting the areas to be cut. Preferably any areas where cutting is required, the cutting will be done in areas that will later be cleared for construction; hence, no survey work will be authorized until Survey Control Maps are submitted and approved.

When taking into account the environmental impact factors related to surveying, the Engineer shall consider using one of the three schemes (listed in the order of preference):

1. No cutting or clearing. Provide survey runs along existing roads and/or across already clear areas.
2. Cutting or clearing within proposed construction limits only.
3. Cutting or clearing in other areas according to accepted Authority horticultural methods, which are:
    a. Not to remove or cut trees with a caliper of 3 inches or more measured 1 foot from the ground.
    b. Limbs requiring removal will be cut with either pruning loppers or pruning saw.
    c. Limbs removed that have a diameter of 1 inch or greater, will be painted with an approved tree wound compound.
    d. All cuts are to be cut flush with the bark of the tree.
    e. When removing limbs having a diameter of 2 inches or greater, care should be exercised to prevent tearing the bark from the tree trunk.

After the proposed survey network and Survey Control Maps have been approved by the Authority's Engineering Department, the horizontal and vertical survey control shall be performed. The actual data shall be shown on the Survey Control Maps, in project plan format, and submitted to the Authority's Engineering Department within ten (10) Working Days after completion.

The Engineer shall locate all existing horizontal and vertical control monuments within or nearest to the Project area and shall verify, as necessary, the accuracy of these monuments for their purposes. In case of discrepancies between existing monuments, those with the original highest order of accuracy and showing no apparent disturbance shall govern. Coordinates used to establish beginning point and initial bearing should be noted in the Survey Control Report, together with coordinates for existing monuments found. Also identify the basic elevation used

to establish bench marks, together with elevations of existing bench marks found. Errors of closures for horizontal and vertical control resulting from the Engineer's own work shall be given. If necessary, new ties and descriptions shall be made for existing monuments.

Additional new horizontal and vertical control monuments shall be established as necessary to serve the Project area and shall be situated outside of the construction areas so that they will not be damaged or destroyed by the construction activities. Horizontal control monuments shall be assigned values in the New Jersey State Plane Coordinate System referenced to the North American Datum of 1983 (NAD83) plus the Adjustment Date Tag (1996) (NAD83/96), and vertical control monuments shall be referenced to the North American Vertical Datum of 1988 (NAVD88).

Control point values established by others shall be clearly identified so as not to be accidentally intermixed with the Engineer's newly established values. Comparisons of horizontal and vertical data shall be tabulated showing both newly established and previously existing values.

In the event that the work includes more than one Project, horizontal and vertical control monuments shall be established at or near the Project boundaries and the coordinates and elevations of these common monuments shall be jointly agreed upon between the adjoining Engineers. The Engineer shall advise the Authority's Project Manager of meetings scheduled for this purpose between adjoining Engineers so that a representative of the Authority's Engineering Department can attend.

A primary closed traverse shall be run throughout the general area of the Project and shall incorporate existing and new monuments, as well as adjacent control points on adjoining Projects, if any, into the run. Intermediate traverse points shall be at least semi-permanent, iron pins, and shall be accessible, clearly referenced and designated in the field and properly described on the Survey Control Maps. At least three reference ties to permanent objects shall be made and recorded for each monument and principal traverse point. Horizontal traverse points shall be spaced a maximum of 1,200 feet.

Closed bench level circuits shall be run throughout the entire Project area and shall also be tied into vertical control monuments in adjoining Projects, if any. The bench marks should be set where they will not be disturbed by daily normal activity and at intervals of 600 feet or less in the vicinity of a construction area. These points can be driven monuments or re-bar (3-feet long minimum), plugs or cuts in bridge abutments, brick or concrete walls, solid rock out crops or similar objects that are permanent in character.

All traverses for horizontal control and all bench level circuits for vertical control shall be run to second order accuracy.

The use of GPS to establish ground control is permissible and shall be to second order accuracy (1.5 cm). Calculations sheets shall be included in the Survey Control Report.

In general, horizontal and vertical control points shall be located at positions which will afford the greatest accuracy and access for layout of construction baselines and bench marks and for right of way monuments, but shall be situated in permanent locations, i.e., outside of the limits of construction.

For secondary traverses for construction surveys, closed traverses are generally to be used to locate photogrammetric control points, points in the vicinity of project baselines, right of way monuments, property corners, and control points for existing roads, utilities, railroads, streams, etc.

4.5. TOPOGRAPHIC MAPPING

4.5.1. Infrastructure Items

During the digital mapping process, the features that have been identified in the specifications and are visible or interpretable in the photography will be digitized on their appropriate layer when possible.

4.5.2. Topographic Detail

Using Digital Terrain Modeling Procedures (DTM), breaklines will be collected in 3D when the stereo model is set in any one of our plotting systems. These breaklines will include pavement edges for roads and runways, edge of paved shoulders, curb lines, concrete center lines, tops and toe of slopes, tops and bottoms of ditches, water lines and other features that depict the shape of the ground. Within accuracy requirements, the DTM used to develop the contours shall be generated to represent true elevation above mean sea level and the exact shape of the ground. The contour lines will be shown as solid lines. Contour labels will be provided at (X) intervals in areas of moderate relief and provide labels as necessary for map clarity. Spot elevations will be provided at key points throughout the project limits in areas where the contours are more than 1 inch apart at map scale. These key points will include roadway intersections, along railroads, bridges, ramps, etc. This information will be placed on separate layers within the graphic file for ease of future file management and with the DTM.

4.5.3. Planimetric Detail

The digital file will contain all land use features within the project limits, such as buildings, roads, shoulders, ramps, highway striping, drives, fences, docks, hydrants, poles, parking lots, railroads, rivers, sidewalks, signs, catch basins, trees, etc., visible on or interpretable from the aerial photography. Any feature larger than 20 feet will be outlined to scale. The features shown will be consistent with the detail mapping requirements. These features will all be digitized on a separate CAD layer with the appropriate symbol and line type. Features stored in a CAD file in this manner, will be displayed and interactively edited on color high-resolution monitors and then plotted in various combinations of detail required. Hard copy plots will be prepared showing the planimetric features and submitted to the Authority upon request.

Section 5 - GEOTECHNICAL ENGINEERING

5.1. INTRODUCTION

5.1.1. General

This Section provides Engineers with an outline of their minimum responsibility for work and deliverables as required by the Authority. The primary intent is to dictate a uniform approach to geotechnical design aspects for Authority projects and stipulate minimum presentation standards for Reports, Contract Plans, and Specifications. This Procedures Manual should be used in coordination with the Design Manual, which provides additional details for the requirements and documentation of foundation design and related decisions

5.1.2. Geotechnical Engineering Phases

The Geotechnical work shall be conducted in Preliminary and Final Design:

- Preliminary Design – Perform Desk Study
- Phase A – Prepare and submit Phase A Geotechnical Engineering Report, Desk Study and Geotechnical Exploration Plan (GEP)
- Phase B – Perform the Geotechnical Exploration, preliminary design recommendations, and preliminary Phase B Geotechnical Engineering Report.
- Phase C – Finalize design recommendations, plans and specifications, finalize Geotechnical Engineering Reports
- Phase D – Finalizing plans and specifications.

These phases are discussed in detail in subsequent sections.

5.1.3. Hold Points

Hold Points are defined as points in the project development where concurrence must be provided by the Authority for work to date and plans for upcoming work. The end of each phase specified in Section 5.1.2 shall be considered as a Hold Point. The Engineer of Record (EOR) and Geotechnical Engineer (GE) shall be required to address and resolve Authority comments and concerns as they pertain to the phase submissions in order to advance from each Hold Point. Work advanced beyond a Hold Point without Authority permission is performed at the sole risk of the EOR.

5.1.4. Work Plans

Work Plans shall be prepared by the EOR and approved by the Authority before any work begins. The Work Plans shall clearly state the objective of the work, list any project

specific assumptions for design, and provide a simple schedule for the completion of the work.

5.1.5. Meetings

Meetings shall be held to discuss geotechnical issues, determine which issues warrant design memoranda, review design memoranda, resolve comments, or provide other geotechnical recommendations, and coordinate with the other disciplines on the Design Team.

The need for meetings shall be made by mutual agreement between the EOR, GE, the General Consulting Engineer and the Authority on an as needed basis. For the purposes of estimating, the EOR and the GE should assume attendance at the Kick-off, Preliminary Design, Phase A, B, and C review meetings.

5.2. PRELIMINARY DESIGN

A Desk Study shall be performed during Preliminary Design as per the requirements specified in Section 6.3 of the Design Manual. Generally, the GE's contribution to the Preliminary Design Submission shall consist of gathering existing subsurface information, applying a basic geologic understanding to the project, identifying geological hazards and environmental constrains, gathering existing foundation details for reuse options, and determining the suitable foundation options for the alternates being evaluated. The Desk Study shall include discussions as detailed in Section 6 of the Design Manual. The information gathered during the Preliminary Design phase shall serve as the basis to inform the GEP development and other design phases.

5.3. PHASE A

Requirements for the Phase A deliverables are provided in Section 6.3 of the Design Manual.

5.3.1. Desk Study

The part of the Desk Study performed during Preliminary Design shall be finalized. Additional or more detailed information shall be collected and incorporated into the Preliminary Design work as outlined in Section 6.3.1 of the Design Manual.

5.3.2. Geotechnical Exploration Plan

Geotechnical Exploration Plan (GEP) shall be developed in accordance with Sections 6.3.2 and 6.4 of the Design Manual.

5.3.3. Existing Foundation Investigation Plan

An Existing Foundation Investigation Plan shall be developed for rehabilitation and reconstruction projects where reuse of existing foundations is considered. The plan shall include exploration methods, in-situ tests, geophysical tests, and laboratory

tests required to verify the integrity and load carrying capacity of the existing foundations in accordance with Section 6.4 of the Design Manual.

5.3.4. Geotechnical Engineering Report

The Phase A Geotechnical Engineering Report shall include the Desk Study, GEP, and Existing Foundation Investigation Plan discussed above. The sample table of contents included in Appendix E of the Design Manual shall be utilized for developing this report.

5.4. PHASE B

Requirements for geotechnical design, drawings, and Phase B Geotechnical Engineering Report is provided in Sections 6.4 through 6.10 of the Design Manual.

5.4.1. Geotechnical Exploration and Existing Foundation Investigation

The geotechnical exploration and existing foundation investigation including the field work and laboratory testing shall be completed in Phase B unless a multi-phase approach is proposed as per Section 6.3.2 of the Design Manual. Field logs shall be finalized, and typed logs shall be prepared in accordance with the templates provided in Section 6 of the Design Manual. Subsurface profiles and cross sections shall be developed. If additional conditions arise during the Phase A subsurface investigation due to site variability, change in design, or unexpected conditions, the GE shall request, via the EOR, the Authority's approval of a supplemental exploration or investigation.

5.4.2. Preliminary Geotechnical Engineering and Foundation Design

Geotechnical engineering and foundation design shall be performed in accordance with Section 6 of the Design Manual. This work shall include developing design parameters, performing necessary calculations to develop the design recommendations, and providing design recommendations.

5.4.3. Geotechnical Engineering Report

The Phase B Geotechnical Engineering Report shall include the necessary information collected for the Phase A Report and the topics included in Appendix E of Section 6 the Design Manual. The necessary information to be included in the report is specified in the Design Manual under each subsection. Design calculations shall be submitted as a separate volume.

5.4.4. Contract Drawings

The geotechnical- and foundation-related information required for construction shall be included in the Contract Drawings. The necessary information to be

included in the Contract Drawings is specified in the Design Manual under each subsection.

5.5. PHASE C

Requirements for finalizing geotechnical designs, drawings, specifications, and the Final Geotechnical Engineering Report are provided in Sections 6.4 through 6.10 of the Design Manual.

5.5.1. Geotechnical Engineering and Foundation Design

Geotechnical engineering and foundation design performed during Phase B shall be finalized in accordance with Section 6 of the Design Manual.

5.5.2. Geotechnical Engineering Report

The Geotechnical Engineering Report submitted during Phase B shall be finalized as per the design revisions and the Phase B comments from the Authority. The necessary information to be included in the report is specified in the Design Manual under each subsection. Design calculations shall be submitted as a separate volume.

5.5.3. Contract Drawings

The Contract Drawings prepared during Phase B shall be revised to include updated design information and incorporate the Phase B comments from the Authority. The necessary information to be included in the Contract Drawings is specified in the Design Manual under each subsection.

5.5.4. Contract Specifications

The Contract Specifications shall be prepared for any items that deviate from or are not available from the Authority's Standard Specifications.

5.6. PHASE D

Requirements for finalizing the Contract Documents are provided in Sections 6.4 through 6.10 of the Design Manual. Generally, the GE's contribution to the Phase D Submission will consist of the following items:

5.6.1. Contract Drawings

The Contract Drawings prepared during Phase C shall be revised to include updated design information and incorporate the Phase C comments from the Authority. The necessary information to be included in the Contract Drawings is specified in the Design Manual under each subsection.

5.6.2. Contract Specifications

The Contract Specifications prepared during Phase C shall be revised to include updated design information and incorporate the Phase C comments from the Authority.

5.6.3. Submission

Drawings, Specifications, and any additional information required under the Consultant's OPS shall be submitted to the Authority as "bid ready" documents. Please note that the Boring Logs shall be included as part of the Contract Drawings.

5.7. CONTRACT DOCUMENTS FOR BIDS AND POST DESIGN SERVICES

Final Contract Documents shall be prepared and submitted to the Authority, which incorporate the Authority's Phase D comments (if any). The EOR and GE shall be responsible for reviewing Contractor Submittals, Site Specific Work Plans, Requests for Information (RFIs), Changes of Plan, and other issues arising during construction. Geotechnical engineering-related post design services are specified in Section 6.11 of the Design Manual. This work shall be performed in accordance with Section 3.4.6 of the Procedures Manual.

Section 6 - ROADWAY PLAN PREPARATION

6.1. GENERAL

The following are guidelines for the preparation of contract plans. These instructions are intended to insure that uniform level of engineering (design) information is presented and arranged in a consistent format. Plans will be reviewed by the Authority at various interim stages of completion as discussed below.

Plans shall contain all essential and other required data presented in a manner consistent with good engineering practice. The amount of detail included shall be that necessary and sufficient to allow a bidder to quickly and properly assess and evaluate the work to be done.

The overall sheet size, of all final contract plans edge-to-edge, shall be 22 inches x 36 inches and shall be 21 inches x 33 ½ inches inside of borders as detailed in Exhibit 6-1.

The title box shall be in the lower right-hand corner of the sheet and shall be of the size shown in Exhibit 6-1. The wording in the title box shall be as shown in Exhibit 6-2 depending upon the particular project involved. The name of the roadway shall be the road on which the work is being performed.

On all plan sheets, except where noted otherwise in this Manual, the minimum size lettering to be used shall have a base height of equal to 0.12 feet. As the plans may be reduced to half size, this is the minimum size lettering which will produce a clear, legible text after reduction. Similarly, a bar scale should appear on all sheets where a reduction in sheet size will affect the scale of the drawing.

Symbols and line weights shall be as shown in the Standard Legend in the Sample Plans. In the preparation of plans, the use of drafting aides, such as tape or rub-ons, will not be allowed. The Authority will not accept as an original tracing any sheet with aids attached to it. Nor will the Authority accept any sheet that is poorly reproduced.

Reference is made to the Sample Plans as a supplement to contract plan sheet content and format that is described in this Manual.

Exhibit 6-1 Typical Sheet Layout

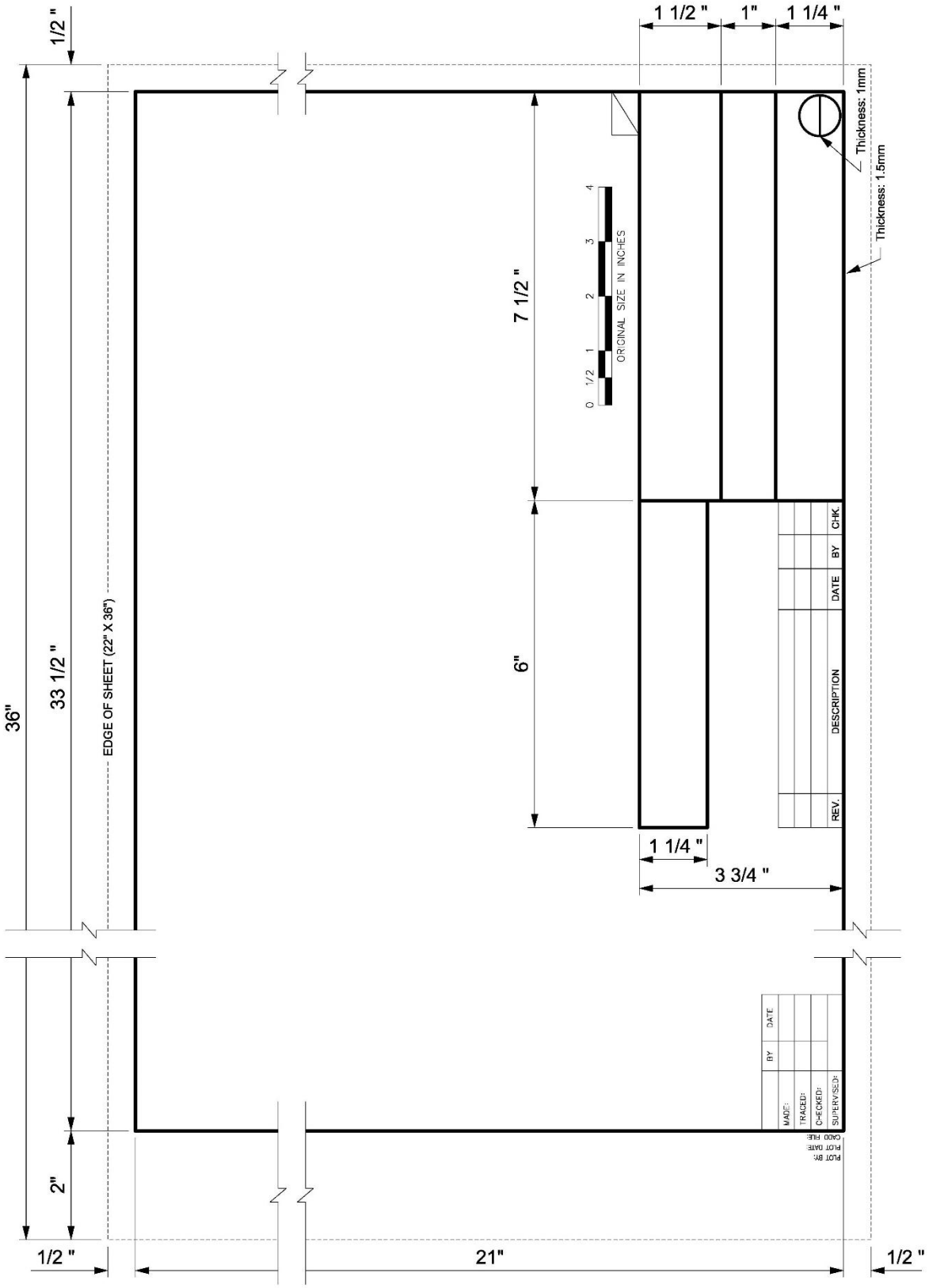
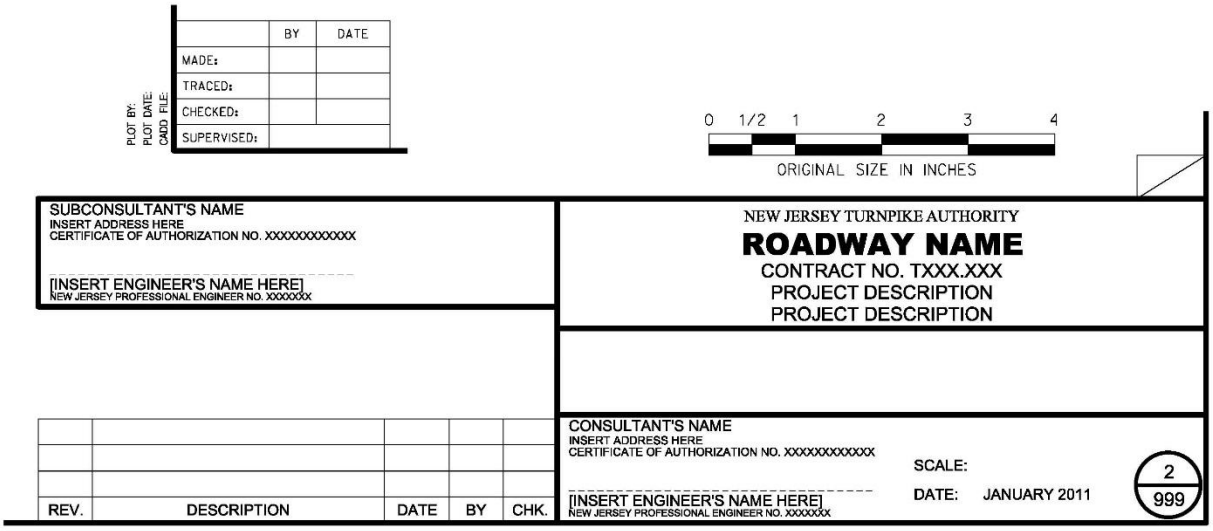


Exhibit 6-2 Typical Title Box



6.2. PRELIMINARY PLANS

Preliminary plans are to be drawn at a scale of either 1” = 100’ or 1” = 200’. The plans are to be presented on maps showing all topography or aerial photomosaics as directed by the Authority’s Engineering Department. The work shall be prepared on bond material.

Profiles are to be drawn at a 10 to 1 ratio with the horizontal scale the same as the plan scale. The sizes of the sheets are to be 2 feet wide and are to be between 3 and 6 feet long.

The following information is to be shown:

6.2.1. Preliminary Plan Sheets

1. Title box
2. Roadway designations and outside roadway widths
3. Radii with PC, PT and PCC locations
4. Stationing at 100-foot intervals and mileposts
5. Approximate proposed right of way and existing property lines
6. Slope lines
7. Local street names
8. Municipal boundaries and names
9. Horizontal limits of work
10. Typical sections
11. Structure outlines

12. Approximate retaining wall locations
13. Limits of local road relocations
14. Major stream relocations
15. Major utility relocations
16. Major bodies of water
17. Parks

6.2.2. Preliminary Profile Sheets

1. Title box
2. Roadway designations
3. Existing ground using a dashed line
4. Datum, horizontal and vertical scales and stationing
5. Gradients to nearest 0.1 percent using a solid line
6. Existing and proposed structure locations and major waterway openings
7. Existing subsurface utilities to the extent known
8. Minimum vertical clearances at structures
9. Vertical Curve data including PVI, PVC, PVT, curve length, low/high points, e and K values
10. Location and size of horizontal radii
11. Superelevation and transition locations
12. Superimposed profiles from adjacent ramps or roadways at noses or concentric areas
13. Nose locations

6.3. PHASE "A" PLANS

Phase "A" plans are to be either 1"=30' or 1"= 50' scale showing existing topography and depicting the entire project, plus 500 feet beyond the proposed longitudinal limit of work.

The following information shall be included with Phase "A" Submission documents:

6.3.1. Phase "A" Plan Sheets

1. Title box.
2. Base maps to be topographic maps showing as much of the surrounding area as possible.
3. Proposed roadway designations.

4. Typical roadway widths and transition widths.
5. Stationing, station equations, baseline and profile line designations
6. Radii with PC, PT and PCC callouts.
7. Pavement cross slopes, maximum superelevation and location.
8. Slope lines, dashed.
9. Proposed right of way with set dimensions and existing property lines, as well as all easements required for construction, drainage, utilities and slopes.
10. Typical sections showing horizontal dimensions, pavement make-up, curb and sidewalk types, guard rail treatment, pavement cross slopes, right of way dimensions where applicable, grading criteria, superelevation treatment, and profile line for all roadways in contract.
11. Environmental considerations such as earth berms, walls, detention basins, etc.
12. Horizontal limits of work.
13. Approximate location of all utilities and their proposed treatment.
14. Alternatives considered and presented in detail similar to recommended alignment.
15. Construction Sequence at either 1" = 100' or 1" = 200' scale showing existing roadways, proposed roadways and brief explanation of construction sequence, including detours.
16. Temporary and permanent access roads.

6.3.2. Phase "A" Profile Sheets

1. Title box.
2. Base shall be paper material with a 2-foot width and between 3 and 6 feet long as necessary.
3. Scale to be 1" = 50' horizontal and 1" = 5' vertical, showing datum, stationing and roadway designations.
4. Existing ground dashed and profile line solid with gradients to nearest 0.1 percent
5. Vertical curve data including PVI, PVC, PVT, curve length, low/high points, e and K values
6. Location and size of horizontal radii
7. Superelevation, superelevation transitions and design speed
8. Nose locations
9. Superimposed adjacent or concentric roadways and at noses of ramps

10. Existing and proposed utilities
11. Existing and proposed drainage facilities
12. Structures with minimum critical clearance locations

6.4. CONTRACT PLAN FORMAT (PHASES "B" THROUGH "D")

Contract drawings shall be numbered consecutively and in the following order:

1. Title Sheet
2. General Legend Sheet
3. Table of Quantities
4. Plan Reference & Boring Location Sheet
5. Tie Sheet
6. Alignment Data Sheet
7. Maintenance and Protection of Traffic Plans
8. Detour Plans
9. Jurisdictional Limit Map
10. Typical Sections
11. Construction Plans
12. Utility Construction Plans
13. Drainage and Grading Plans
14. Drainage Tabulation Sheets
15. Soil Erosion and Sediment Control Plans
16. Landscape Plans
17. Profiles
18. Signing and Striping Plans
19. Lighting Plans (see Design Manual Section "Lighting and Power Distribution Systems")
20. ITS Plans (see Design Manual Section "ITS and Communication Systems")
21. Construction Details
22. Key to Cross Sections & Earthwork Summary
23. Cross Sections
24. Structural Plans
25. Standard Drawings
26. Reference Drawings

6.5. CONTRACT PLAN CONTENT (PHASES "B" THROUGH "D")

The following is a brief description of the information to be shown on the finalized contract drawings:

6.5.1. Title Sheet

1. Title of Project, Contract Number, Authority Commissioners, Location.
2. Location Plan at suitable scale to adequately locate the project.
3. Index of Sheets in upper right-hand corner. Nomenclature on Index of Sheets shall match the nomenclature on Title Box of the drawings.
4. Signature lines in lower right-hand corner; all final Title Sheets must be signed by the Engineer's project manager or a principal officer. In some instances, as directed by the Authority's project manager, the final Title Sheet may also be signed by the Authority's project manager.
5. Standard Drawings used in this contract in upper left-hand corner. If necessary, the list of Standard Drawings can be put on a separate sheet.
6. Reference Drawings from other contracts which are applicable to this contract along the left sheet edge. If necessary, the list of Reference Drawings can be put on a separate sheet.
7. Utility companies associated with this contract in the lower left-hand corner.

6.5.2. General Legend Sheet

1. Title box.
2. Standard Authority legend with special symbols for this contract - left side of sheet.
3. General Notes - right side of sheet.
4. Earthwork Summary either here or on first Grading Plan. If cross-sections are used, Summary to be on Key to Cross Sections. See Key to Cross Section description for Summary content and format.

6.5.3. Table of Quantities

1. Title box.
2. Column headings of Item Number, Authority Standard Item Number, Item Description, unit of measurement, Estimated Quantity from The Plans, If and Where Directed Quantity, Total Contract Quantity and As-Built Quantity.
3. Item descriptions to be completely spelled out, no abbreviations.
4. Items to be consecutively numbered and in the same order as they appear in the Specifications.

6.5.4. Plan Reference & Boring Location Sheet

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. 1"=100' or 1"=200' scale plans showing existing and proposed roadways with designations.
4. Baselines with stationing every 100 feet and labeling at every 500-foot station.
5. Plan sheet outlines with separate plan sheet numbers shown, starting with Sheet 1. These will not be drawing numbers in the contract set but will reference to the plan sheets within separate groups of plans.
6. Borings with identification.
7. Show project limits and contract limits.
8. If used as baseline tie sheet also, give traverse bearings and distances from PI to PI; offset from traverse to proposed baseline, if 90 degrees give distance from PI to offset point; if not, give bearing and distance. Clearly identify baseline point being tied down.

6.5.5. Tie Sheet

1. Title box.
2. Field ties of traverse points shown on Plan Reference Sheet.
3. Label all points, including a description, such as rebar, stake, nail, etc.
4. Tie to be of size to be easily read and located. Need not be to scale.
5. Coordinates of all points and bearings and distances between points if these cannot be clearly shown on Plan Reference Sheet.
6. Sketches orientated to north arrow to aid in locating points.
7. Bench Mark elevations and descriptions.
8. State Plane Coordinate System.

6.5.6. Alignment Data Sheet

Tabulation to show the following information for all survey baseline data, alignment data and alignment curves in the contract.

1. Title box.
2. Survey Baseline Data including point number; bearing, to nearest 0.1 second; station, to nearest 0.01 foot; coordinates, to nearest 0.001 foot; and elevations, to nearest 0.01 foot.

3. Alignment Data including point type and station, to nearest 0.01 foot; station and offset to survey baseline, to nearest 0.01 foot; and coordinates, to the nearest 0.001 foot.
4. Curve Data including curve number (assign letter prefix to appropriate baseline if necessary), delta angle (Δ), to nearest 0.1-foot, radius (R), tangent (T) and arc (L) lengths, to nearest 0.01 foot; Center of Curve and PI coordinates, to the nearest 0.001 foot; and Plan Sheet number(s) on which the curve is found.

6.5.7. Maintenance and Protection of Traffic Plans

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. 1"=100' or 1"=200' scale plans showing existing and proposed roadways with designations.
4. Clearly show work to be performed in each Stage. Work may be subdivided into more detailed Phases for clarity, for maintenance of traffic, or for reasons particular to the contract (such as earthwork balance or other special situations).
5. If more than one Stage is used, succeeding Stages shall show work constructed under previous Stage. Shading can be used to indicate various stages of construction.
6. Show traffic pattern during the various Stages and Phases, including construction signing.
7. Written description of work to be performed including when and how traffic patterns are changed. Include notes indicating duration limits if critical to the project.
8. Contract limits and adjacent or overlapping contracts.
9. Identify areas where contract coordination is required, if applicable.

6.5.8. Detour Plans

Detour Plans are required when traffic is routed over temporary roadways or existing roadways temporarily. Detours that involve Authority roadways and ramps must be reviewed and approved by the appropriate Authority Operations Department. Detours that involve local roads must be reviewed and approved by the appropriate agency(s) with jurisdiction. For detours involving roadway closures of non-State highways not under Authority jurisdiction in excess of 48 hours, formal State approval with local county and/or municipality resolution is required. The following information is to be shown:

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.

3. Complete computed horizontal and vertical alignment. The vertical alignment may be shown either as described in Subsection 6.5.17 or by showing spot elevations at 25-foot station intervals.
4. The highway or grading plan sheets can be used as a base. Show existing and proposed roadways in the area and clearly show what roadways the detour will connect. Existing regulatory signs and traffic signals shall be shown.
5. Scale to be appropriate to show detail necessary for construction.
6. Typical section and pavement if not shown on Typical Section Sheets.
7. Curve data coordinates, bearings and pavement widths.
8. Temporary drainage required.
9. Notes concerning staging.
10. Locations of traffic control devices.
11. Construction, access and/or detour roads will not cross any waterways without prior approval of the agency having jurisdiction. Provision for protecting waterways is to be covered either in the plans with details or by requiring the contractor to provide details.
12. Traffic stripes.
13. If necessary, state that Uniformed Police Directors will be required.

6.5.9. Jurisdictional Limit Map

Jurisdictional Limit Maps may be necessary if a project overlaps an area outside of the Authority’s Right-of-Way, such as at an interchange, and future maintenance responsibilities must be specified and agreed upon. While sometimes Jurisdictional Limit Maps are included in a set of bidding plans, they are typically a separate document, and they are only to be prepared at the express direction of the Authority.

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and / or right side of the sheet.
3. 1” = 100’ (or 1” = 200’ if approved by the Authority’s Engineering Department) scale plans showing the completed construction in accordance with the symbols shown in Standard Legend. No contours are to be shown on Jurisdictional Limit Maps.
4. Names of roadways.
5. Show proposed baselines and indicate and label 100-foot Stations.
6. Show final Right-of-Way and property lines.
7. Include a legend of shading to indicate under whose jurisdiction various areas and appurtenances will be maintained by.

8. Shade in the appropriate areas to indicate under whose jurisdiction various areas and appurtenances will be maintained by.
9. In addition to shading, it may be necessary to include notes to clarify jurisdictional issues, such as snow plowing.
10. Label match lines by station and matching plan sheet number.

6.5.10. Typical Sections

1. Title box.
2. Scale shall adequately show all typical section details.
3. Detail various existing and proposed pavement sections and details.
4. Show existing and proposed typical lane, shoulder and berm dimensions and cross slopes for all roadways.
5. Show typical grading criteria and median grading treatments.
6. For mainline roadways and ramps, show normal and superelevated sections.
7. Show special sections such as pavement widening details.
8. Show special earthwork details such as method of determining lateral limits of muck excavation - designate pay limits.
9. Show topsoil, seeding, berm surfacing and guide rail locations.
10. Show pavement details for access roads, parking lots, etc.
11. Show rock cut details and pay limits, if applicable.
12. Show typical locations for curb, lip curb, barrier curb, medians, underdrains, inlets and manholes, if applicable.
13. Show acceleration and deceleration lane treatments.
14. For mainline roadways and ramps, show existing and proposed right of way lines.
15. For all local roads, show overall right of way dimensions.

6.5.11. Construction Plans

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. 1”=30’ (or 1”=50’ if approved by the Authority’s Engineering Department) scale plans showing existing planimetry in accordance with symbols shown in Standard Legend. No contours are to be shown on Construction Plans.

4. Show 500 feet of planimetric coverage beyond the beginning and end of the contract.
5. Existing drainage shall be indicated including inverts and types of drains. Existing streams, brooks, ditches, etc. are to be indicated including direction of flow and name of waterway (local name in parenthesis if applicable).
6. Existing roadways showing name and type of pavement and dimensions.
7. Horizontal alignment showing typical roadway dimensions at each edge of the sheet for each roadway shown, including dimensions needed to define transition areas.
8. Curve numbers shown, PC, PT, FCC stations shown, ties (station and offset) at beginning and end of variable pavement sections. Station in direction of traffic on single direction roadways.
9. Show baseline (existing and proposed), proposed right of way lines, bearings and station equations, indicate and label 100-foot stations.
10. Show all proposed and existing right of way lines, existing property lines, easements, etc. outside proposed right of way.
11. Pavement, curb, sidewalk, guide rail and approach slabs. Give limits of various pavement types.
12. Show borings by symbol and boring number.
13. Using Standard Legend, show existing and proposed utilities, treatment of existing utilities, if utility work by others, indicate by whom (Public Service, NJ American Water, etc.) and show Utility Work Order Number.
14. Show both existing and proposed overhead and underground power, telephone and communication wires.
15. Show baseline and ROW monuments by using Standard Legend symbols. Baseline monuments are to be placed at all PC, PCC’s, PT’s, etc. and at other locations to provide a maximum spacing of 500 feet. Right of way monuments are to be placed every 1,000 feet and at angle points in the proposed right of way line that do not coincide with existing property lines. Stations and offsets to right of way monuments to nearest 0.01 foot clearly showing the baseline to which monuments are referenced. Each baseline monument to have coordinates to nearest 0.01 foot.
16. Show type and location of proposed fence and type and location of vehicular gates, if applicable.
17. Label match lines by station and matching Plan sheet number.
18. If detours are involved, reference to detour sheet to be shown on appropriate plan sheet.
19. For special treatments, make cross reference to appropriate sheets.

20. If applicable, show horizontal limits of muck excavation, overload, sand drains, etc.

6.5.12. Utility Construction Plans

Utility Construction Plans are to be introduced into a contract where complex and/or extensive utility work is to be done within the contract limits and the work cannot be adequately shown on the Plans.

Generally, this condition will most usually occur in the Toll Plaza areas, but the use of these sheets is not restricted to those areas.

Profiles will be required for complicated or unusual utility installations such as extra depth water mains, sanitary sewers with tight clearances, etc. The format is to be similar to that of the roadway profiles described under Subsection 6.5.17.

If this work is to be done by the Contractor, clearly specify if the materials will be furnished by the Contractor or the utility. If inspections are to be performed by the utility, specify the lead time required to schedule said inspection, and the appropriate contact person information.

The Utility Construction Plans shall show all utility work to be performed, whether by the Contractor or by various utility companies. The following information is to be shown:

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. Scale to be no smaller than 1” = 30’.
4. Existing topography and proposed items of construction.
5. Existing and proposed utilities, both underground and aerial, including main lines and service connections. All utilities shown in accordance with the Standard Legend.
6. Work to be performed by a Utility Company is to be noted by Utility Work Order Number and the name of the Company.
7. Show schedule of conduits as to size, location, use, when to be installed, and who does the work.
8. Utility installation details.
9. List of Utility Companies and their responsibility, e.g. “Primary Electric Service - Public Service Electric and Gas Co.”
10. Coordination required with other contracts, or responsibility clearly defined if contract limits overlap.

6.5.13. Drainage and Grading Plans

Although cross sections are required, contouring may still be required to show intent for areas such as interchange infield grading, grading at ramp merges, water quality basins, etc.

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. Drainage and Grading Plans shall be to the same scale (1”=30’ or 1”=50’) and cover the same area as the Construction Plans.
4. The title of the sheet shall contain a number that is to be the same as the Plan sheet number, i.e. Construction Plan No. 10 covers the same area as Drainage and Grading Plan 10.
5. Same planimetry as shown on the Construction Plan sheets with the addition of 1-foot existing contour lines.
6. Existing and proposed utilities in accordance with Standard Legend.
7. Proposed and existing roadways with proper designations.
8. Stationing, bearings, PC, PT and PCC’s labeled, 100-foot stations labeled, right of way shown and labeled.
9. All existing and proposed drainage with flow arrows. Drafting to differentiate features by using Standard Legend symbols for inlets, manholes, etc. Show all inverts, grate elevations, pipe sizes and lengths for existing and proposed, ditches (type), rip—rap, type of existing and proposed pipe and length of proposed pipe between structures (inlets, manholes, etc.), underdrains.
10. All roadway and shoulder cross slopes.
11. Spot elevations at 25-foot intervals in areas where grades deviate from typical sections.
12. In areas involving complicated drainage patterns or grading, where showing pipe sizes, lengths and elevations would tend to clutter the plans, Drainage and Grading Plans may be separated or Drainage Tabulation Sheets may be used, but only with Authority’s Engineering Department approval. With the use of Drainage Tabulation Sheets, all drainage structures, flared end sections, headwalls, etc. are to be assigned structure numbers for cross-referencing the Drainage and Grading Plans and Drainage Tabulation Sheets.
13. Generally, if cross sections are not included in the contract plans, one-foot contours are to be shown for all pavement and slope areas. However, for relatively flat pavement areas, contours at 0.1, 0.2 or 0.5-foot intervals may be required to

adequately define the pavement surface. For uniformly graded slopes, only the 5-foot contours need be shown. One-foot contours are required in variable areas, flat areas and for meeting existing contours.

14. Muck Excavation, overload, sand drain, etc. limits shown with appropriate symbols and labeled.
15. Earthwork Summary on first Grading Plan if not shown on Key to Cross Sections sheet. For contracts with cross sections, Summary to be on Key to Cross Sections - See Key to Cross Sections description for Summary content.

In an effort to keep the pavements properly drained, the Authority prefers to provide a swale at pavement gore areas. This swale is graded to intercept sheet flow across the pavement gore areas, either ramp or mainline, and direct the water towards the physical nose. Inlets are installed at the physical nose to collect this water.

The following should be shown when pavement gores areas are included:

1. Spot elevations at 25-foot intervals for edges of thru pavement adjacent to gore areas.
2. Spot elevations and horizontal location of swale.

6.5.14. Drainage Tabulation Sheets

Drainage Tabulation Sheets are to be used only when the showing of inverts, pipe sizes and lengths, inlet types, etc. on the Drainage and Grading Plans would produce a cluttered and illegible sheet and then only with Authority's Engineering Department approval. If used, Drainage Tabulation Sheets are to be prepared for each Drainage and Grading Plan. The Tabulation is to show the following:

1. Title box.
2. Drainage structure number conforming to number shown on the Grading Plans.
3. Baseline station and offset.
4. Invert and top of grate elevations.
5. Type of structure i.e., Inlet Type D-1, Manhole Type M-1, etc.
6. Flared end sections with size and number of each.
7. Size, length and type of pipe between drainage structures.
8. A column for remarks.
9. The above are to be the column headings on the sheet, which will then allow the various entries to be tabulated in the appropriate columns.

10. The bottom line is to be headed “Sheet Totals” for totaling the various items of work. The final Tabulation sheet shall have a “Contract Totals” line for summarizing the item totals for the contract.

6.5.15. Soil Erosion and Sediment Control Plans

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. Erosion control devices

6.5.16. Landscape Plans

For Landscape Plans format and content, see Design Manual Section “Landscaping".

6.5.17. Profiles

Profiles are required for all roadways and are required for major underground utility relocations. Profile coverage shall extend 500 feet beyond the contract limits.

1. Title box.
2. Existing ground shown in dashed line and labeled.
3. Proposed profile grade shown in solid line and labeled, e.g. “P.G.L. Ramp ST”. Gradients shown to nearest 0.01 percent with a + or - to indicate rising or falling grade with respect to direction of increasing stationing.
4. 50-foot horizontal and five-foot vertical scales. Show 100-foot stations and datum elevation.
5. At every 50 feet of stationing, show vertical risers to stop, at either existing ground or profile line, whichever is higher.
6. Give proposed pavement elevations to nearest 0.01 foot and existing pavement elevations to nearest 0.1 foot at 50-foot intervals. In transition areas, give all variable edge elevations. Elevations to be written parallel to vertical risers with proposed to the right and existing to the left.
7. Clearly label profile with roadway designation.
8. Show PVI, PVC, PVT, curve length, low/high points, e and K values
9. Show structure either on profile or graphically above PGL. If on profile show footings.
10. If applicable, show pay limits of muck excavation and approximate elevation of firm bottom. Show upper limit of muck excavation backfill.

11. Show all drainage and utilities greater than 36” in diameter crossing the profile line by graphical plot and identify utility and label size of pipe. Show major drainage parallel to roadway if critical.
12. Show station equations.
13. Across the top of the of the plan sheet, indicate the horizontal geometry as to whether the alignment is tangent, curved right, curved left, the PC, PCC and PT locations, and the curve radius.
14. Across the top of the plan sheet, indicate if the profile has a normal crown, or if it is superelevated right or left. Show the stations where superelevation transitions occur.

6.5.18. Signing and Striping Plans

For Signing and Striping Plans format and content, see Design Manual Section “Signing and Striping”.

6.5.19. Lighting Plans

For Lighting Plans format and content, see Design Manual Section “Lighting and Power Distribution Systems”.

6.5.20. ITS Plans

For ITS Plans format and content, see Design Manual Section “ITS and Communications Systems”.

6.5.21. Construction Details

The construction details are to cover any items of construction not covered in the Standard Drawings. The drawings may have several scales and the scale for a particular detail shall be chosen so that the work can be clearly shown. Details are to include the following:

1. Title box.
2. Clearly defined pay limits and the work covered in the pay item.
3. Type of materials to be used and their location.
4. Typical, plan, elevation and section details as required.
5. Designations conforming to pay items in the proposal.
6. Appropriate notes concerning details, methods of construction, and location.

6.5.22. Key to Cross Sections & Earthwork Summary

The purpose of the Key to Cross Section sheet(s) is to show where the cross sections were taken, what baselines were used and the location of cross section match lines. The following should be shown:

1. Title box.
2. Scale either 1"=100' or 1"=200'.
3. Existing and proposed roadways with right of way lines and roadway designations.
4. Baselines used for cross sections with stations labeled every 500 feet.
5. Location of individual Cross Section sheet limits shown.
6. Cross Section match lines clearly shown and labeled.
7. Legend for cross sections as follows:

C = Excavation ..... Sq. Ft.

F = Embankment ..... Sq. Ft.

SF = Stripping in Fill ..... Lin. Ft.

SC = Stripping in Cut ..... Lin. Ft.

CE = Channel Excavation ..... Sq. Ft.

ME = Unsuitable or muck excavation ..... Sq. Ft.

P = Porous Fill ..... Sq. Ft.

TS = Topsoil ..... Lin. Ft.

8. Earthwork Summary

On contracts involving earthwork, an Earthwork Summary is to be shown in the plans. For contracts with only Grading Plans, the Summary is to be shown on the first Grading Plan. For contracts with cross sections, the Summary shall be shown on the first Key to Cross Section sheet. The Summary shall contain at least the following:

Excavation

a. Roadway Excavation from cross sections and/or grading plans.
b. Deductions for stripping, pavement excavation, etc.
c. Additional quantities for topsoiling.
d. Show total volume Roadway Excavation Earth.
e. List other excavation quantities, such as channel excavation, muck excavation, rock excavation, etc.

Embankment

a. Embankment from cross sections and/or grading plans.

b. Deduct volumes for topsoil.

c. Add volumes for stripping, pavement excavation in fill areas, etc.

d. Show embankment required.

e. List other embankment quantities, such as Grade A, Grade B, porous fill, etc.

Summary

a. Show mathematical difference between the excavation and embankment.

b. Indicate whether the contract is a surplus or borrow job.

6.5.23. Cross Sections

Cross sections are to be included in the contract plans unless otherwise directed by the Authority’s Engineering Department. The format and data required for cross sections is to be as follows:

1. Title box.
2. Sheets to be same size as Plan Sheets with a 1” base grid and 10 divisions per inch. Sheets are to have the same border dimensions as the plan sheets.
3. The title and revision boxes are to be in the lower right-hand corner, with no grid in this area.
4. The horizontal and vertical scales are to be 1”=10’.
5. The title box is to give the roadway designation and station to station limits for the sections that appear on the individual sheets.
6. All earthwork from original ground to final grading or template lines.
7. All structures and retaining walls, including their footings.
8. At profile line, show existing and proposed elevations.
9. Limits of muck excavation and limits of Special Subgrade Material, Grade B backfill.
10. Limits of channel excavation for channels or ditches, which may be parallel to the roadway, but far enough removed from the normal roadway work area not to be considered as roadway excavation.
11. Separate sections for major drainage channels, which would not ordinarily be shown on Roadway Cross Sections.
12. Stripping limits for cut and fill conditions.
13. Continuous Cross Section baseline for each sheet, i.e. no offsets or jogs. Station for each section.

14. Section quantities tabulation, preferably on right side of sheet next to the section.
15. Section match lines indicated.
16. Cross sections are to be shown at 50-foot intervals.

6.5.24. Structural Plans

For Structural Plans and Details format and content, see Section 7 - Structures Plan Preparation of this Manual.

6.5.25. Standard Drawings

The Authority's Standard Drawings required for each contract will be furnished by the Authority's Engineering Department. Absolutely no changes or additions of any kind are to be made to the Standard Drawings.

Any New Jersey Department of Transportation Standard Drawings needed for a project must be both obtained and numbered by the Engineer.

Each Standard Drawing which is to be included in the plans will be given a number, and an individual original copy of each Standard Drawing will be included in each original set of contract drawings. The Standard Drawings will be numbered starting with the first number after the last construction contract drawing. They are to be listed alphabetically, according to Standard Drawing title, when arranged for assignment of sheet number.

In the margin directly under the Standard Drawing title box, space is provided to fill in the contract number, the individual sheet number and the total number of sheets in the contract. It will be the Engineer's responsibility to give the Authority's Engineering Department ample notification of which Standard Drawings will be required for each contract, so that the Authority's Engineering Department will have time to prepare original copies of the necessary drawings.

6.5.26. Reference Drawings

Reference Drawings are any sheets, which will aid the Contractor, whether they are from a previous contract, a concurrent contract or from a future contract. Absolutely no changes are to be made to any reference drawings.

Following the list of Standard Drawings, a separate listing is to be shown on the title sheet of Reference Drawings. These Reference Drawings will also receive a sheet number and become part of the contract. They will receive sheet numbers after the last Standard Drawing number has been assigned. All boring logs are to be included as Reference Drawings and are to appear in the contract at the very end of the "Reference Drawings". All reference drawings are to have the words "Reference Drawing" inked immediately adjacent to the title box with lettering to have a base height of equal to

0.35 feet. In the margin below the title box, the contract number, individual sheet number and total number of sheets in the contract are to be added.

If Reference Drawings are required from another contract prepared by the same Engineer, it will be their responsibility to furnish reproduced original copies of such drawings for all contracts to which they apply.

Should the Reference Drawings be from a contract prepared by another Engineer, the Authority's Engineering Department will furnish reproduced original copies of such drawings, provided the Engineer has advised the contract number(s) and sheet description(s) that are required. It will be the Engineer's responsibility to give the Authority's Engineering Department ample notification of which Reference Drawings will be required for each contract so that the Authority's Engineering Department will have time to prepare copies of such sheets.

Thus, there will be three basic divisions to any set of construction contract drawings. The first division will be the construction drawings prepared for the individual contract. The second division will include all of the Standard Drawings applicable to that particular contract, arranged in alphabetical sequence and given sheet numbers. The third division will include all Reference Drawings, including the boring logs. All of the sheets of the various divisions will be given sheet numbers in numerical order starting with Sheet No. 1 of the construction plans and ending with that number which constitutes the last of the Reference Drawings. There shall be a complete set of original or reproduced original drawings for each construction contract.

6.6. LOCAL ROAD SIGNING AND PAVEMENT MARKING

These drawings should apply only to signing and pavement marking for local roads, which are relocated, widened, extended or affected as part of an Authority contract and shall be included in the Contract Signing and Striping Plans. For signing and striping, see Design Manual Section "Signing and Striping".

1. Maintenance and Protection of Local Road Traffic:

Maintenance and protection of local road traffic shall be provided in accordance with the procedures set forth in the "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD) as published by the Federal Highway Administration. The details for this maintenance and protection of local road traffic need not be shown on the plans if the contract documents can refer to the MUTCD for the pertinent requirements. If not, then appropriate details shall be included in the plans. If necessary, state that Uniformed Police Directors will be required. The Supplementary Specifications shall describe the work required and a lump sum item shall be provided in the Proposal to cover the cost of this work.

2. Permanent Construction of Traffic Control Devices on Local Roads:

Where local roads are relocated and/or reconstructed, it will generally become necessary to replace the existing traffic control devices and perhaps install new devices, including pavement striping where applicable.

The New Jersey Department of Transportation, Bureau of Traffic Engineering, exercises significant control over signing and pavement marking on both county and local roads; that intersect or are operationally influenced by a State highway; and related items installed under Authority contracts will require Department approval. Such Department approval, together with their subsequent inspection after installation, legalizes the signing and pavement marking. This legalization is essential for the protection of the Authority. For traffic control devices on a local road that impacts State highways, procedures pursuant to the provisions of N.J.A.C.16:27-4.2(c) shall be followed.

For each instance involving local road traffic control devices, the Engineer is to contact the municipal and county engineers to determine who is responsible for such installations and who submits them for approval by the Department. In most cases, it will be found that local municipality and/or county resolutions are a necessary part of the submittal.

Submittals to the Department for approval are always made by either the municipality or county.

Following the Engineer's design of the traffic control devices, the layouts are to be submitted to the local agency having jurisdiction for review and comments. The agency should be asked at that time about the legal status of all existing traffic control devices, which are proposed for replacement. If it cannot be absolutely determined that an existing device has been previously legalized by the Department, it is to be assumed that it is not legal, and that traffic control device shall be included with those being submitted to the Department for approval. In some cases, it may be more convenient to seek approval of all traffic control devices for a particular area, whether previously approved or not, especially if they are all shown on the same layout. Under no circumstances can existing illegal traffic control devices be reinstalled by the Authority's Engineering Department without prior approval by the Department.

Care should be taken during design to avoid including control devices which are not needed, and which would not ordinarily be installed by a local agency, since approval of all devices involves a perpetual responsibility for maintenance of these facilities, including regular repainting of pavement markings.

Every effort should be made to combine as many traffic control installations within a common jurisdiction agency as possible in order to minimize the required number of resolutions and submittals to the Department.

After the local agency has agreed to the proposed layout, the Engineer is responsible for assisting the local agency in the preparation of the submittal wherever possible by providing necessary plans, reports, etc.

Department approval and an adopted resolution must be obtained before the Authority can finalize the contract.

Section 7 - STRUCTURES PLAN PREPARATION

7.1. GENERAL

The following are guidelines for the preparation of contract plans for new construction and major reconstruction of bridges and other structures (not including sign bridges). These instructions are intended to insure that uniform level of engineering (design) information is presented and arranged in a consistent format. Plans will be reviewed by the Authority's Engineering Department at various interim stages of completion as discussed below.

7.2. BRIDGE IDENTIFICATION

Structure Numbers for bridges, sign structures, and culverts shall be assigned by the Authority's Engineering Department to the Engineer.

7.3. CONTENT AND FORMAT

Plans shall contain all essential and other required data presented in a manner consistent with good engineering practice. The amount of detail included shall be that necessary and sufficient to allow a bidder to quickly and properly assess and evaluate the work to be done and the Contractor to interpret the Plans with facility and correctly prepare shop details and/or construct each structural component. Specifications require the Contractor to prepare and submit complete shop details of reinforcement bars and structural steelwork for review before proceeding with fabrication. Other working drawings are required from the Contractor for temporary constructions and facilities, which are his responsibility to design (jacking operations, cofferdams, bracing for excavations, forms, etc.) and submit for review. As these drawings and designs will be based on information presented in the Plans, incomplete or vague details will only hinder progress by requiring a multitude of submittals.

The typical arrangement of drawings comprising the set of structural plans within a Contract which may or may not include related roadway design is given below along with a description of information to be furnished (but not necessarily limited to) on each.

7.3.1. Key Plan to Structures

A key plan is required upon which each structure site is identified within the Section limits. Ordinarily drawn to a scale of 1"=200', this plan is similar to the Plan Reference drawing given in roadway design plans. Information shown shall include all existing and new construction, stationing at intervals of 500 feet, and grid references. If space permits, the index of drawings for all included structures should be given on this sheet.

7.3.2. General Plan and Elevation

This drawing should be prepared using the approved Preliminary Design Plan as a base. (See Sample Plans) The scale shall preferably be not less than 1"=16', but in no case less than 1"=30'. Where applicable, the following data is to be furnished:

1. Computed stations of abutment bearing lines and pier centerlines; other mathematics and stations to define the computed geometry of roadways in the area of the bridge.
2. Vertical alignment of the supported roadway covering the length of the bridge; profiles of transitioning edges are to be included.
3. Location and dimension of minimum clearances.
4. Existing and proposed ground lines (in elevation).
5. Toes and tops of embankment slopes (in plan).
6. Bottom of footing and berm elevations.
7. Location of proposed and future (by other contracts) electrical and lighting facilities.
8. Proposed bridge and adjacent roadway drainage facilities.
9. Bearing types (General types; specific types are to be shown on Framing Plans).
10. Approach slab limits.
11. Temporary facilities, such as sheeting, and detour structures, which are required and are therefore pay items.
12. Permanent sheeting limits.
13. Pertinent existing planimetric features including the location of underground facilities and utilities, and proposed and future improvements, all of which may have affected the planning and location of the structure.
14. Existing and proposed utilities identified as to type and size.
15. Boring locations identified and shown on the plan by symbols and numbers.
16. Deck joint types and sizes.
17. General Notes.
18. Table of Estimated Quantities.

If nowhere else provided for in the Plans, an index of drawings should be included on the sheet.

7.3.3. Substructure Details

Typically, these plans are arranged as follows:

1. Plans and Elevations of Abutments
2. Special views and sections of abutments
3. Plans and Elevations of Piers
4. Special views and sections of Piers

Since bar lists are not given, it is generally sufficient to show bar patterns in elevation views and shapes in sectional views. However, special supplementary sections are often necessary to clearly indicate bar shape and placement in corners and other obscure areas. These views are required when detailing abutments. Dimensions for positioning bars beneath bearing areas are to be given in the plans to avoid conflicts with anchor bolt placement.

Where necessary, bearing pedestal reinforcement details must be shown.

Plan and Elevation views should generally be drawn to a 1/4-inch scale; preferably, the scale should not be less than 3/16 inch. The scale of sectional views shall be large enough to show a scaled representation of bar placement and shape. These views are commonly drawn to 1/2 inch or 3/4-inch scale.

7.3.4. Superstructure Details

Generally, these plans are arranged as follows:

1. Framing Plans and Stringer (Girder) Details
2. Cross Sections
3. Miscellaneous Details, as required

No hard and fast rule can be set for determining the amount of information, which can be presented on any one sheet, since this depends somewhat on the complexity of the structure's framing.

The required information to be grouped on or near the drawing containing the Framing Plan includes:

1. Stringer (Girder) Elevations and Schedules
2. Camber Diagrams and Tabulations
3. Shear Stud Spacing Tabulation
4. Stiffener Details
5. Splice (Shop and Field) Details

Fabrication and Erection Notes: As a minimum for steel bridges, the following are to be included:

1. Welding shall conform to current AASHTO / AWS D1.5 with Authority Amendments (where appropriate, the note shall be expanded to include the AASHTO / AWS D1.5 Section regarding Fracture Critical Members).
2. Joint designations given in the Plans conform to current AASHTO / AWS D1.5 Code
3. Welding and NDT symbols conform with AWS A2.4-.79.

4. All material identified on the Plans with the notation (T) are Main Load Carrying Member Components Subject to Tensile stress.

Cross section drawings include size and placement of deck reinforcement. Information to be grouped on or near this sheet should include:

1. Partial plan views showing placement of special reinforcement in acute corners of skewed deck slabs.
2. Details relating to the use of permanent steel bridge deck forms.
3. Diaphragm details
4. Lateral bracing details

Miscellaneous Detail sheets include details for non-standard deck and expansion joints, special bearings and drainage.

The scale of framing plans should generally be not less than 1”=20’; however, very simple, square framing may be shown clearly at a scale of 1”=30’. Cross section scales should be either 3/8 inch or 1/2 inch. The scale of detail views will depend on the actual size of the detail and the degrees that the view would be cluttered by dimensions, material notes, welding symbols, etc.

7.3.5. Retaining Walls and Noisewalls

7.3.5.1. Retaining Walls and Noisewalls

For contracts with long walls or many walls, design information may be conveniently presented in a panel-by-panel tabulation. Panels should be identified numerically on the General Plan and Elevation and referred to in the tabulation. Similarly, various types of wall sections, reinforcement patterns, pile plans, etc. should be detailed once and identified for use in the tabulation. The tabulation also indicates footing dimensions for each panel, panel end point elevations and footing elevations.

Details such as the placement and arrangement of non-stress reinforcement on wall stems, key construction, porous fill placement, and joint construction are common to all panels and would be presented once in a contract set of plans.

7.3.5.2. Alternate Walls

Alternate walls are defined as walls, often proprietary, such as Mechanically Stabilized Earth Walls (MSE) and Prefabricated Modular Walls (PM), other than conventional walls (cantilever, gravity, piling and crib walls), deemed appropriate for construction at a given site and bid competitively.

Engineers shall consider the use of proprietary retaining wall systems at select project locations. Proprietary retaining wall systems, Mechanically Stabilized Earth Walls (MSE) and Prefabricated Modular Walls, are generally considered to be more cost effective

and provide a reduced time for construction than standard cast-in-place reinforced concrete cantilever retaining wall system.

Alternate walls shall be presented in the Common Structure Volume (CSV) format. Common Structure Volume is defined in the Authority Design Manual. Designers shall consult with suppliers of wall systems listed in the Authority's Qualified Products List (QPL), develop the CSV to encompass all proprietary alternate wall systems applicable to each site and list applicable wall systems in the contract specifications. Only wall systems participating in design consultation may be included in the contract specifications.

Develop the General Plan and Elevation to include the CSV, right of way, utilities, noise walls, lighting, drainage, staged construction, and other pertinent information. Elevations should show original and final ground lines, minimum foundation elevations and mean high and low water, where appropriate. Cross sections should show limits of CSV, wall batters, pay limits and all pertinent information.

Magnitudes, locations and directions of external loads due to bridges, overhead signs and lighting, noise walls, traffic and other surcharges should be shown on the plans.

Architectural requirements should be identified.

7.3.6. Culverts

Because of their limited plan area, culvert General Plans should be drawn to as large a scale as may be practical, preferably 1/8"=1'; scale shall not be less than 1"=20'.

7.3.7. Standard Drawings

The Standard Drawings required for each contract will be furnished by the Authority. Absolutely no changes or additions of any kind are to be made to the Standard Drawings.

Each Standard Drawing which is to be included in the plans will be given a number, and an individual original copy of each Standard Drawing will be included in each original set of contract drawings. The Standard Drawings will be numbered starting with the first number after the last construction contract drawing. They are to be listed alphabetically, according to Standard Drawing title, when arranged for assignment of sheet number.

In the margin directly under the Standard Drawing title box, space is provided to fill in the contract number, the individual sheet number and the total number of sheets in the contract. It will be the Engineer's responsibility to give the Authority's Engineering Department ample notification of which Standard Drawings will be required for each contract, so that the Authority's Engineering Department will have time to prepare original copies of the necessary drawings.

Details or dimensions, which are exceptions to the Standard Drawings, are to be shown on the Plans of the particular structure.

7.3.8. Reference Drawings

Reference Drawings are any sheets, which will aid the Contractor, whether they are from a previous contract, a concurrent contract or from a future contract. Absolutely no changes are to be made to any reference drawings.

Following the list of Standard Drawings, a separate listing is to be shown on the title sheet as Reference Drawings. These Reference Drawings will also receive a sheet number and become part of the contract. They will receive sheet numbers after the last Standard Drawing number has been assigned. All boring logs are to be included as Reference Drawings and are to appear in the contract at the end of the "Reference Drawings" division. All reference drawings are to have the words "Reference Drawing" inked immediately adjacent to the title box with lettering to have a base height of equal to 0.35 feet. In the margin below the title box, the contract number, individual sheet number and total number of sheets in the contract are to be added.

If Reference Drawings are required from another contract prepared by the same Engineer, it will be their responsibility to furnish reproduced original copies of such drawings for all contracts to which they apply.

Should the Reference Drawings be from a contract prepared by another Engineer, the Authority's Engineering Department will furnish reproduced original copies of such drawings, provided the Engineer has advised the contract number(s) and sheet description(s) that are required. It will be the Engineer's responsibility to give the Authority's Engineering Department ample notification of which Reference Drawings will be required for each contract so that the Authority's Engineering Department will have time to prepare copies of such sheets.

Thus, there will be three basic divisions to any set of construction contract drawings. The first division will be the construction drawings prepared for the individual contract. The second division will include all of the Standard Drawings applicable to that particular contract, arranged in alphabetical sequence and given sheet numbers. The third division will include all Reference Drawings, including the boring logs. All of the sheets of the various divisions will be given sheet numbers in numerical order starting with Sheet No. 1 of the construction plans and ending with that number which constitutes the last of the Reference Drawings. There shall be a complete set of original or reproduced original drawings for each construction contract.

On contracts involving the construction of structures only, at least one 30-scale roadway plan should be included as a reference drawing, showing at least 500 feet beyond the structure. As a minimum, this could be the planimetric base for the area.

7.4. DETAILING PRACTICE

7.4.1. Superstructure Details

7.4.1.1. Welded Joint Design and Detailing

Welded joint design detailing shall comply with the latest edition of the AASHTO/AWS D1.5 Bridge Welding Code. Information provided on contract plans shall conform to Subsection 2.1 of the same text. Finish grinding, where required, shall be shown on the welding symbol in the contract plans. Contract plans shall show PJP or CJP requirements for all groove welds. It is not necessary for the contract plans to detail the specific joint designation for the welding procedure, however, the specific joint designation is required for all welding symbols placed on working or shop drawings.

Fracture Critical Members shall be designated as "FCM" on the contract plans in accordance with Section 12 of the latest AASHTO/AWS D1.5 code. Specific reference is made within this section for the definition of fracture critical member and guidelines related to member identification. A note shall be added to the structural steel plans that fracture critical members and/or member components shall be subject to the provisions of the current Edition of the AASHTO/AWS D1.5 Bridge Welding Code, Section 12.

7.4.1.2. Splices

Permissible locations of field and shop splices should be given on the Framing Plan or Stringer Elevations. Splices should be fully detailed.

7.4.1.3. Cambers

For simple spans cambers are to be given at stringer half or quarter points; a closer interval may be warranted for continuous spans. In order to provide information for the correct setting of forms and reinforcement, the individual cambers comprising the total value shall be given (i.e., camber for deflection due to steel dead load, camber for deflection due to concrete dead load, camber required for vertical curve). Ordinarily, stringers shall not be cambered for sag vertical curves; the slab haunch shall be varied, and the stringer flange maintained on a vertical tangent, under full dead loads.

7.4.1.4. Temperature

All details affected by thermal movements shall be designed for a reference temperature of 68°F. Temperature ranges for design are given elsewhere.

7.4.1.5. Clearances

Unless a greater distance is required by consideration of expansion and live load movements, the ends of fascia stringers should be no more than 2 inches apart at piers

and within 2 inches of backwalls at abutments. It is customary to detail stringers so that ends will be vertical under full dead load.

7.4.1.6. Deck Joints

Transverse deck joints on new bridges and bridge deck rehabilitation projects shall typically consist of preformed elastomeric strip sealer compression seals. Strip seal joint systems are preferred. Construction details are shown on Standard Drawing No. BR-13 and BR-14.

If compression seals are utilized, a 4-inches wide x 4.75 inches deep compression joint sealer shall be placed in all joints.

During the design of the deck joints for curved or complex bridges, engineers shall consult with deck joint manufacturers for recommendations.

For combinations of span and skew outside the range of applicability of the compression seal or a strip seal, a modular system of multiple elastic sealers shall be used. Special details must be included in the Plans for these joint systems.

Systems using a bolted anchorage are not to be used on bridges carrying Authority traffic.

Open deck joints and tooth-type expansion dams are to be avoided wherever possible and should only be considered after sealed systems capable of large movements have been determined to be unsuitable or considerably more costly. In such economy comparisons, the cost of drainage facilities necessary to carry runoff from the deck surface away from the bridge substructure and into the roadway drainage network must be included.

The type and size of each joint proposed for use shall be indicated on the Preliminary Design Plan. Preliminary review will judge suitability of the recommended joint type.

7.4.1.7. Bridge Drainage

Storm sewer inlet details, shown on Standard Drawing BR-2A and 2B shall be typically utilized. For bridge projects where these details cannot be utilized due to superstructure type or other conflicts, the required modifications and / or additional details shall be shown on the Contract Plans.

7.4.2. Substructure Details

7.4.2.1. Joints

Typical details for construction, contraction and expansion joints are illustrated on the Exhibits in Design Manual Section “Structures Design”.

7.4.2.2. Bearing Surfaces

Tops of piers and abutments shall be sloped along their length in order to minimize the height of concrete bearing pads. When the height exceeds 4 inches, pads shall be reinforced. Bridge seats shall be sloped transversely, and pier tops crowned to provide for runoff. Substructure waterproofing membrane shall be applied to the tops of piers and bridge seats, including all sides of pads. The membrane shall not be required on piers when the deck is continuous (no deck joints).

7.4.2.3. Dampproofing

The rear face of all earth retaining structures shall be dampproofed from the top of footing to ground level.

7.4.3. Miscellaneous Details

7.4.3.1. Underbridge Slope Protection

For overcrossing of the Turnpike or Parkway roadways, underbridge slope protection consists of concrete slope protection or stone slope protection. Construction details are shown in Standard Drawings BR-5 and BR-8. Where the New Jersey Turnpike or Garden State Parkway roadway section approaching the crossing is in cut, the slope normal to the abutment face shall be 2:1, otherwise a slope of 1.5:1 shall be used to determine the structure length and abutment heights.

Where the Turnpike or Parkway crosses local roads or State highways, the type of underbridge slope protection will be specified by the agency having jurisdiction. Usually, a concrete pavement slope protection will be required for these locations, and details will be those of, or approved by, that agency.

7.4.3.2. Drainage Behind Walls and Abutments

Earth retained by walls and abutments shall be drained by the use of porous fill, perforated corrugated metal pipe underdrains, and in some cases, weepholes. Generally, underdrains should connect or discharge into the roadway drainage system.

7.4.3.3. Utility Supports

Utilities shall be supported by steelwork which frames into main members. Supports, which rely on deck inserts or drilled in expansion anchors, shall not be used.

7.4.4. General

Idealized views should be avoided. Few members in a structure are ever framed normally or have surfaces horizontal in all directions. Sectional views should point up variations; dimensions of a member should not be given in other than true views.

Standard Drawings have been developed which detail several often-used items. From time to time, these drawings will be amended, voided or added to. Their use will provide economy in detailing; however, total reliance on them to describe all conditions where the item may be applied may be misleading. Often, severe skews or steep grades may require that supplementary details be shown in order to clearly define connections, framing, and member shape. In developing these details, the designer may be alerted to potential problems, which might otherwise be overlooked.

7.5. REVIEW SUBMISSION FOR NEW BRIDGE CONSTRUCTION AND MAJOR BRIDGE RECONSTRUCTION

7.5.1. Structure Sketches (Phase A)

For Contracts with bridge and retaining wall structures, 8½" x 11" structure/wall sketches shall be submitted for review and approval as soon as the necessary information is available and prior to the Phase A submission. These sketches shall include information on the structure cross-sections showing lane widths, shoulder widths, cross-slopes (if known), CSV, etc. A sketch with all pertinent vertical and lateral clearance parameters shall also be shown.

7.5.2. Preliminary Design Plan and Report (Pre-Phase B)

A preliminary design plan shall be submitted for each new structure and wall within the construction contract. At this stage, the proposed structural support system (span arrangement, superstructure and substructure type, wall type and configuration, foundation design) is submitted for review. The approved preliminary plan forms the basis for final design and plan preparation. A brief report summarizing the designer's studies of alternate structure and wall types with corresponding cost estimates shall be presented at the time the preliminary design plan is submitted for review. The report shall present documentation in support of the designer's recommendation, including consultations with vendors regarding proprietary walls, as presented in the preliminary plan.

The submission shall not be made before geotechnical information is available (i.e. borings have been taken and logs analyzed) to assess the influence of foundation conditions on structure arrangement, type selection, backfill requirements, etc. Preliminary plans will not be accepted for review without accompanying soils data and formulated recommendations for foundation types (Foundation Recommendation Report). SFGER shall be included in Pre-Phase B Submission.

It is expected that for certain types of bridges and walls, namely, long viaducts and complex flyover bridges and proprietary walls, there will be discussions and reviews between the Authority and the designer and the designer and wall vendors during the preparation of the preliminary plan.

It is intended that the approved preliminary design plan and elevation, with minor alteration, serve as the final General Plan and Elevation drawing. The preliminary design plan and elevation shall also include the following information:

1. A typical section view illustrating the superstructure cross section and the form of the substructure (deck details, girder depth, spacing, etc.)/wall cross section and the limits of select backfill, retained backfill, common structure volume and wall appurtenances such as drainage, attachments, etc.
2. Design Notes
3. Seismic Design Criteria.
4. Foundation Design Criteria, (allowable soil bearing pressures, ultimate loads on pile or drilled shaft foundations) along with estimated bottom of footing elevations and/or minimum and estimated pile tip or drilled shaft elevations.
5. Computed minimum horizontal and vertical clearances at critical points.
6. Existing and proposed ground lines (in elevation).
7. Permanent sheeting limits.
8. Available information regarding existing features or proposed improvements, such as underground facilities and utilities, which may have affected the planning and location of the structure.
9. A preliminary cost estimate arrived at by applying estimated current unit prices to approximate quantities of major items, with allowances for items not measured and contingencies.

The Preliminary Design Plan and Report shall be submitted at least four (4) weeks prior to the Phase B submission deadline as part of the pre-Phase B Submission, unless otherwise noted, to allow appropriate time to review and include all necessary changes in the Phase B submission. Phase B submission will not be accepted for review prior to the approval of the preliminary design plan for all bridges and walls in the construction contract.

7.5.3. Phase B Submission

The Phase B submission would be made at that point when the plans have reached a stage of approximately 70 percent completion. When the entire Contract includes roadway construction, this submission is to be coincident with the Phase B submission of the roadway plans.

Primarily, the Phase B plans will be reviewed for presentation of information, drafting technique, and the overall development into final plans of the approved preliminary plan submission. At this time, computed geometry should be available, the General Plan and Elevation Drawing completed and partial details of most other sheets comprising

the set of plans for each structure available for an interim stage review. Details, to the extent that they have been completed, will be scrutinized and where appropriate, commented on. Final quantities are not required.

Where standard fully bonded elastomeric or approved HLMR type bearings are not selected for use on a bridge structure in lieu of a different bearing of unapproved type or manufacture, the designer shall submit a Non-Standard Bearing Report which explains the designer's rationale used for selecting the bearing based on performance and cost criteria. This document need not be longer than absolutely required to justify the designer's selection and shall include a sketch or catalog cut of the selected bearing. Elastomeric bearings with sliding surfaces, while permitted in Authority Specifications and Standard Drawings, shall also be justified in the Non-Standard Bearing Report.

Any questionable detail, revision of which would involve considerable reworking at a later date, should be submitted at this time for consideration.

7.5.4. Phase C Submission

Plans for the entire Contract, at the time of the Phase C submission, are to be complete in every respect to the extent that, barring comments arising from a final review; they could be used to advertise the work without further alternation. To be considered as a Phase C submission, final Specifications must accompany the Plans.

7.5.5. Submission Requirements

Requirements relating to data transmission for each review phase are enumerated in Section 3 - Submission Requirements of this Manual.

7.6. Review Submission for Bridge Repair Contracts

The Authority has four (4) separate plan submissions based upon the amount of design and plan preparation completed. Generally, for repair contracts, the scope of work in the OPS sets the limit of work as to the allowed construction costs and grouping of structures to be repaired. The Phase A submission for Bridge Repair Contracts shall be comprised of a report that includes the following at a minimum:

- Executive Summary of Contract (OPS) Bridges
- Bridge Condition Rating
- Repair Recommendations
- Estimated Construction Cost Estimates
- Summary of Field Conditions
- Bridge Priority Lists

7.6.1. Phase B Submission

The Phase B submission is made at the point when the plans and specifications have reached a stage of approximately 70% completion. The general plan of every affected structure shall be completed and major items of work (deck replacement areas, etc.) indicated.

Primarily, the Phase B plans will be reviewed for presentation of information, drafting technique, and the overall development into final plans of the approved preliminary plan submission. At this time, the General Plan Drawing is completed, and partial details of other sheets are available for an interim stage review. Details, to the extent that they have been completed, will be scrutinized and where appropriate, commented on.

Any questionable detail, revision of which would involve considerable reworking at a later date, should be submitted at this time for consideration.

A rough cost estimate shall be submitted at this time using major items of work with a contingency for the minor items of work. This estimate should be compared with the construction budget for the Contract.

7.6.2. Phase C Submission

Plans for the entire Contract, at the time of the Phase C submission, are to be completed in every respect to the extent that, barring comments arising from a final review, they could be used to advertise the work without further alteration. To be considered as a Phase C submission, final Specifications must accompany the Plans.

A detailed cost estimate shall be submitted at this time for review.

7.6.3. Phase D Submission

Phase D submission consists of the submission of the final plan sheets and the Specifications for the Contract.

When directed by the Authority, sets of the final Contract Documents shall be submitted to various agencies affected by the Contract.

The Engineer's Estimate shall be prepared and submitted at this time as detailed in the "CapEx & Specifications Design Guidelines."

The number of plans and specifications to be submitted to the Authority for the various submissions shall be per Section 3 - Submission Requirements of this Manual.

7.7. REVIEW SUBMISSION FOR ARCHITECTURE / BUILDINGS

In general, architectural work shall conform to the American Institute of Architects (AIA) Handbook of Professional Practice.

7.7.1. Plan Preparation

It is critical that Phase A provide programming, schematic design and design development documentation. Phase A shall be broken down into two (2) parts.

7.7.1.1. Phase A

Part 1 - Programming and Schematic Design

The written program documents the Authority's requirements for the project. It also facilitates a mutual understanding between the Authority and the project team regarding the scope and limitations of services to be provided. Programming and schematic design should be presented with sufficient information to allow a reviewer full understanding of the main design concepts and orientation. Schematic design studies are prepared to define the concepts to be developed in detail in later design phases. Drawings or sketches are most commonly used to describe the design along with narratives describing the project. Renderings, models, and photographs may also be used to augment drawings and narratives. Systems concepts (usually written descriptions of structural, mechanical, electrical, environmental, equipment requirements, etc., should be presented in sufficient detail to facilitate an understanding by the Authority and other team members of concepts being proposed. During this phase, the Architect shall prepare a written design criteria document and review all applicable codes.

Part 2 – Design Development

The purpose of the design development phase is to refine concepts developed during the schematic phase. The objectives are to establish compatibility of all project components so that final contract documents may be developed efficiently with minimal changes. The Architect shall integrate design requirements from the work of all consultants, complete review of aesthetic impact of each element or system within project, establish, and conform to design priorities according to project construction budget.

7.7.1.2. Phase B, C and D – Construction Documents

The construction documents phase includes the preparation of final contract drawings necessary to advertise for bids and construct the project. Preparation of final documents should evolve smoothly when the design development phase has been effectively developed. The construction documents should convey precise and clear information in a concise way, using standard format and presentation for all disciplines. Each discipline prepares separate sheets, placing an index on the coversheet or the second sheet in the set.

All consultants are to produce their plans following the same format, scale and drawing position as the architectural drawings. Consultants work should be coordinated with the Architect's work.

7.7.2. Specifications Preparation

Specifications for buildings shall follow the AIA Masterspec format for both general conditions and technical specification sections. Typically, building specific general conditions that are not covered by the Authority's Standard Specifications shall be included in the project-specific Supplementary Specifications, included but not limited to items such as Shop Drawing and Sample submittal requirements.

Section 8 - UTILITY INSTALLATIONS, RELOCATIONS AND ADJUSTMENTS

8.1. INTRODUCTION

Established herein are the general guidelines of the Authority's policy and procedures to be followed when the relocation of existing utilities is required due to Authority construction projects.

Utilities are defined as all public, private and Authority owned facilities constructed for the purpose of conveying, transporting (by other than vehicular means) or transmitting passengers, energy, wastes, products or communications between the source or origin and the point of purchase, receipt, discharge or destination. These utilities include railroads, facilities for water, gas, electric, telephone, cable communications, and fire alarm services, and facilities for sanitary sewage, storm drainage (other than Authority owned) and industrial product transmission. Specifically excluded from this definition of utilities are Authority lighting circuits beyond the load center, utilities inside an Authority's building lines, and E-ZPass Fiber Optic Communications facilities in toll lanes and between toll lanes and the associated toll plaza utility building.

8.2. UTILITY ORIENTATION AND CONSTRUCTION POLICY

8.2.1. Utility Alignment

Utility facilities, underground or overhead, within the Authority's right of way, other than those owned, operated or used by the Authority will not be allowed to be oriented parallel or diagonal to the Authority's right of way without the advance approval of the Authority's Engineering Department.

Right-angle utility crossings of the Authority's right of way will normally be considered by the Authority when the services offered by the utility cannot be provided by economically feasible alternate means.

In accordance with the provisions of the Authority's hurricane preparedness plan, consideration must be given to the elimination of aerial facilities crossing over Authority roadways and ramps to preserve the integrity of roadway operations. The Authority's first preference for relocation of existing aerial crossings is to relocate the utility underground. If that is not feasible, aerial crossings may be relocated within underdeck conduits on bridges carrying local roads over Authority roads with Authority approval. If neither underground or underdeck installation is feasible, aerial crossings shall be supported on structures consisting of steel construction located outside of the Authority's right of way. Aerial crossings of Authority roadways shall be located as far away from overhead structures (local roadway bridges, sign structures, etc.) as feasible to avoid potential conflict with future reconstruction. The use of non-steel supports for aerial crossings will be considered for approval by the Authority on a case by case basis. If and when it is necessary to reduce span lengths across excessively wide sections of

roadway, the use of additional supports within the Authority's right of way will also be considered on a case by case basis. The utility owner shall be responsible for substantiating non-compliance with the above relocation preferences, to the Authority's satisfaction, in all cases to be considered for approval.

OSHA and High Proximity Act regulations and One-Call requirements shall be met.

High voltage transmission crossings shall provide minimum vertical clearance as per the requirements of the individual utility owner, but in no case is the vertical clearance to be less than 30 feet over roadways and shoulders. Minimum clearances (both vertical and lateral) for communication lines and overhead power lines of any voltage shall in no case be less than the standards prescribed by the National Electric Safety Code (NESC). The Engineer shall provide the Authority with documentation for the clearance and the concurrence of the utility owner in each case. Structures carrying Authority roadways over or under Authority ramps shall not be used to support utilities, other than those required for Authority purposes.

Pipelines conveying gas of any design pressure will not be permitted to cross over Authority roadways. No pipes carrying liquids ("wet lines"), other than bridge drainage piping, will be allowed in or on structures over Authority roadways. All underground pipelines operating under pressure shall be cased or otherwise protected under Authority roadways and ramps. On a case-by-case basis, the Authority may waive the casing pipe requirements under roadways and ramps as noted in Exhibit 8-1.

Conduits with power or communications lines crossing under or bridging over Authority roadways typically do not require casing. On a case by case basis, the Authority may require casing or other protection of these conduit installations. All underground casings shall be installed in accordance with the provisions of Exhibit 8-1.

Existing utilities will be permitted to be relocated onto a new structure over Authority roadways if the existing structure carrying the utilities is to be removed / replaced. New utilities will be permitted to be carried by structures carrying local roads over Authority roadways only if the utility company has determined to the Authority's satisfaction and approval that installing the utilities underground is not feasible.

Gravity flow pipelines need not be cased under Authority roadways, provided that no erosive, corrosive or caustic conditions or stability problems exist which would predictably limit the life of the pipe. Under doubtful circumstances, such pipelines should be sleeved within a casing pipe or concrete encased, whichever is more economical and appropriate. Future enlargement of the cased gravity flow pipeline should be considered when determining the size of the casing pipe.

Casings are not required for pipelines of any type passing under paved public parking lots at Authority service areas, toll buildings, and maintenance facilities.

All utility crossings shall be arranged such that required points of access, such as manholes and poles, are outside the Authority's right of way. This policy may be modified with specific Authority approval where unusual conditions make such arrangements unrealistic.

Criteria for railroad and other such major utility alignments shall be established for each specific case by the Authority's Engineering Department, except for clearances and other geometric requirements which are set forth under Design Manual Sections for "Geometric Design".

8.2.2. Construction Methods

When an Authority construction project requires relocation of an existing utility crossing, the Authority's preference is to construct the necessary relocation as a part of the roadway contract. For utility owners that agree to this arrangement, the Authority's Engineer shall prepare the necessary plans and specifications for the work, in cooperation with the utility company, and incorporate the work in the principal contract. Specific written approval of the plans and specifications is required from the utility owner, prior to advertising. If the utility owner insists on performing the required utility relocation work themselves, the utility owner's plans are to be included in the Authority's contract documents as reference material for work "by others".

With the Authority's Engineering Department approval, the utility company may furnish all or part of the necessary construction materials for the utility relocation to be installed by the Authority's contractor (or subcontractor approved by the utility owner, as required by the owner). This is provided that such procedure will significantly expedite construction and/or result in cost savings and that the utility company shall ensure timely delivery. In such cases, the Engineer shall include a list and delivery schedule of the materials to be supplied in the contract documents as well as in the Utility Check List. The contract documents and the Utility Check List shall also indicate that it is the utility owner's responsibility to review and approve the contractor's material submissions as needed.

The Authority may consider authorizing the utility owner to order materials in advance of the formal execution of the Utility Order when Authority construction schedules and potential materials delivery delays make it mandatory to do so. No such orders shall be placed without specific written authorization by the Authority's Engineering Department.

The Engineer and the utility owner shall design for construction sequencing and maintenance and protection of traffic as necessary.

8.2.3. Materials

Casing pipe material and size shall conform to the requirements of Exhibit 8-1 for the applicable installation method used.

When steel pipe casings are used, sacrificial anodes and a corrosion-resistant coating will be required, if resistivity readings indicate. Sacrificial anodes shall be installed with accessible test leads to allow periodic voltage readings to be made which will determine when anodes require replacement. The Utility Order shall include a clause under which the utility owner agrees to replace degenerated anodes as a requirement of their routine maintenance procedure.

Pipeline casing diameters shall be chosen to accommodate the carrier pipe and standoffs as well as any potential future expansion of the carrier pipe in accordance with Exhibit 8-1.

Casings, pipelines or ducts installed in open cut within the Authority's right of way shall be constructed using excavation and backfilling methods conforming to Authority specification requirements for underground pipelines.

Buried Carrier Pipelines shall be steel, ductile iron, concrete pipe, or high-density polyethylene (HDPE) at the utility owner's option and after due consideration of the chemical characteristics of the soil at each site. The Authority's Engineering Department concurrence with the pipe material selected is required.

Carrier pipelines on structures shall be steel pipe. All supporting hangers and pipe shall conform to the Authority's Standard Specifications (or to utility company's standard practices, whichever is more stringent). All such pipelines shall be located to the interior of fascia stringers and shall not hang below the bottom flanges of stringers or girders, preferably 6 inches above the bottom flange for future catch systems. Utility supports shall generally be attached to the superstructure steel.

Utility owners normally require steel pipelines on structures to be paint-coated. Along the Turnpike, the Authority requires such pipelines to be fabricated from ASTM A-588 steel and be unpainted or coated in a permanent and maintenance-free manner. However, utility owner policy has not, in the past, permitted this alternative. On structures with ASTM A-588 (unpainted steel) superstructures, such pipelines may be the only painted items. Accordingly, the Engineer shall anticipate this condition when such work is included in Authority contracts. All pipeline painting shall be performed off the structure and before installation, except touch-up at the joints. Along the Garden State Parkway, painting of steel pipelines on structures shall conform to the current painting specifications.

Electric and telephone duct and cable installations shall generally conform to the respective utility company's practice with regard to materials and structural design (latest company standards should be checked). This design shall be modified for adequacy and form. Utility company owned underground ducts within the Authority's right of way may require concrete encasement or casing pipe, if requested by either the Authority or the utility owner on a case by case basis.

Authority owned communications, telephone and electrical ducts and cable shall conform to materials and construction requirements established under Design Manual Sections "Lighting and Power Distribution Systems" and "ITS and Communications Systems".

8.2.4. Easements and Access

If Authority improvements require relocation of utilities outside of existing right of way, the Authority may acquire right of way or easements to relocate such utilities; however, that is to be determined on a case by case basis. Generally, such easements would be of a width equal to adjacent existing easements or of a width adequate for common maintenance access, if no existing easements are established. This applies to utilities which will cross perpendicular or run parallel to the Authority's right of way but not in public road right of way, Authority property or a previously established utility easement. This also applies to projects with local road improvements which require utility relocations along or crossing local roads.

If the approved utility relocation alignment is such that ingress or egress through the Authority's right of way is required for routine maintenance, such access will be allowed, subject to the terms established by the Authority and as described in the Authority's License to Cross. The Authority's website contains additional information.

The Authority has extensive Utility Installation Permits (former New Jersey Highway Authority) and Licenses to Cross for utilities within its right-of-way. The consultant is to request the agreements within the project limits and proceed with the terms established in the agreements regarding facility relocation, should they exist. These documents are available through the Engineering Department Design Liaison.

8.2.5. Costs and Betterments

When expansion of existing Authority facilities requires the relocation of utilities previously affected by the original Authority facility, all Authority policies with regard to financial participation are subject to the terms of any crossing license or occupancy agreement issued for the original installation. The Authority prefers to include utility relocations in its contracts, therefore, for utility relocations which are to be paid for by the utility owner as required by a previously issued crossing license or occupancy agreement, the Engineer shall obtain an authorizing letter from the utility owner to allow the Authority to include the utility relocations in its contract and to reimburse the Authority for the costs.

All cost participating arrangements shall be set forth in detail in the Utility Order covering the work, or by other written authorization initiated by the Authority. No reimbursement by the Authority will be made for utility owner costs or expenses not specifically and formally authorized.

The Authority will reimburse the utility owner for authorized costs following the approval of billing. The final billing must be submitted to the Authority's representative, the Resident Engineer, within 90 days after completion of the work and no billings will be accepted beyond 120 days after the completion of the work. The Resident Engineer must approve and sign invoices before forwarding to the Authority.

No reimbursement for utility owner expenditures in excess of the amount authorized will be made by the Authority without a duly executed Supplemental Utility Order specifically justifying the need for additional expenditures. This supplemental authorization is to be made prior to the expenditure of additional monies and must include all additional monies necessary to complete all work.

If the Authority agrees to relocate a utility for an owner at Authority expense, the Authority will bear the cost of such work directly. The cost of any utility relocation work done under an Authority contract, which is determined to be a betterment by the Authority, shall be reimbursed to the Authority by the utility owner to pay the cost of the betterment.

Betterments are defined as those costs for utility relocation construction which result in increased function, capacity or the potential therefore, and/or increased value of the relocated system over that previously in existence in the system which are being replaced. Exceptions to this definition are as follows:

1. If the utility owner has formally adopted minimum utility size criteria which he routinely used to replace-in-kind small existing sizes in his own work, such substitution on Authority projects will not be considered, of itself, a betterment.
2. If the utility owner has formally adopted the use of a new material which he routinely uses to replace-in-kind existing materials in his own work, such substitution on Authority projects will not be considered, of itself, a betterment.
3. Pipeline casings which are required by the Authority for its own interest to be larger than would otherwise be required will not, in themselves, be considered betterments.

Betterment cost allocation procedures are covered under Subsection 8.2.8.3.

8.2.6. Relocation of Authority Owned Utilities

The Authority owns and maintains various sanitary sewer, water, power and communications systems connecting Authority facilities to facilities owned and maintained by various utility companies and communications carriers.

Buried conduit facilities support the Authority's voice, video, and data communications via buried fiber optic communications backbone and lateral cable/conduit to interconnect components of the Authority's network throughout both roadways.

Telephone and electrical service connections to Authority owned facilities are normally constructed, owned, and maintained by the utility company. Any underground ducting and manholes for such services within Authority right of way are constructed, owned, and maintained by the Authority.

The Authority owns right-of-way, conduit and fiber optic cable as part of the E-Z Pass system and communications network which consists of a backbone system along both the Parkway and Turnpike roadways, as well as laterals from the backbone to various Authority-owned facilities. The conduit and cable may be maintained by the Authority or an outside utility agency. Relocations and protection of facilities which are not maintained by the Authority are subject to a Utility Order.

The Authority also owns and maintains other conduits and ducts along the Parkway roadway generally known as the PTAT System, which is located along the northbound Parkway lanes between Milepost 36 and Milepost 128. The Authority leases some of these conduits and ducts to telecommunication companies which install, own and maintain cable. Relocations of affected facilities shall be arranged with the lease designated utility owner by the Engineer as a negotiated “No Cost” Utility Order.

Within roadway toll plazas and other Authority-owned facilities, all power, communication, sanitary sewer, water, and other utility services are provided and maintained by outside utility companies. New installations, relocations, and protection of these facilities do not require a Utility Order; however, the Engineer shall be responsible for coordinating such work with the utility owner. The design requirements for the Engineer are outlined in Design Manual Section “Facility Buildings/Toll Plazas”.

All Authority contracts in the area of existing Authority-owned utilities shall include provisions for the relocation or protection of these utilities as required by the work. Mark-outs and phone call notification may be required as determined by the contract.

Relocations of affected existing telephone and electric services shall be arranged with the utility owner by the Authority’s Engineer. Necessary duct and manhole construction shall be included in an Authority construction contract. The procedures for arranging the relocation of existing services are the same as those for establishing new services and are set forth under Subsection 8.2.8.

The Authority leases several locations along both roadways to cell tower operators. Special consideration is to be taken by the Engineer when working with utilities in and around these sites to ensure that the terms and conditions of the cell tower lease holder agreements are not violated.

8.2.7. Provision for New Authority Owned Utilities

All Authority contracts shall provide for any necessary new construction of Authority owned utilities. All arrangements for these services and also for utility owned services shall be made by the Engineer, subject to the review of the Authority.

Procedures in this regard are set forth under Subsection 8.2.8.

8.2.8. Administrative Procedures

8.2.8.1. Authorizing Documents, Content and Procedures

1. Utility Order

The Utility Order is the formal document through which the Authority and utility owner agree to the terms under which utility relocations, ordering of materials and/or inspection are to be performed. This document consists of the order proper and associated schedules and exhibits which are appended to the Utility Order. The Authority's website contains additional information.

The schedules and exhibits set forth the complete details of the work and the costs.

Schedules include the utility owner's estimates of the cost of the work, betterment computations and other necessary tabulations. Exhibits are the associated plans illustrating the work and correspondence outlining details and special considerations related to the work. As a minimum, there shall be one schedule which is the utility owner's cost and construction time estimate and two exhibits which are Exhibit A, Utility Check List and Exhibit B, the Scheme of Accommodation with an inset vicinity map. The Authority's website contains additional information.

The Scheme of Accommodation shall consist of a plan(s) at a suitable scale and sheet size that minimizes the number of plans yet clearly depicts the existing utilities and the utility relocations with all designations, sizes and types of material, existing and proposed, clearly labeled. Any associated right of way requirements shall be depicted. The Authority prefers 8.5" x 11" or 11" x 17" sheet size, if feasible. The color legend shall be:

red – existing facilities to be removed or abandoned

green – proposed relocated facilities

yellow – temporary facilities

blue – betterment facilities

Color does not have to be provided, if other means such as line style, symbols, callouts and/or shading clearly convey the scheme. The work shall be numbered in the order in which it is to be performed. The same numbers shall appear in the Check List. Critical cross sections of proposed utilities may be necessary to confirm horizontal and vertical clearances.

Other exhibits may include the utility owner's plans on which the estimate was based. All schedules and exhibits shall be labeled alphabetically

(SCHEDULE A, B, C, EXHIBIT A, B, C), folded as necessary and appended to the Utility Order. The upper right corner of each page of each attachment shall have the schedule or exhibit designation, the Utility Order number, and the page number of that attachment except for plans, which shall have that information above the title box. The Authority's website contains additional information.

The Utility Order cost, which is entered on the first page of the order proper, represents the maximum cost the Authority will pay for the work included in the Order. Where betterments are a part of the work, this figure represents the total cost of the work less the cost of betterments.

Separate Utility Orders are required for each utility owner affected by any one construction contract. Where several independent relocations of the utilities of any one owner in any one contract are widely separated geographically within a construction contract or are separated in time because of construction sequences, separate Utility Orders covering each area or each phase of the work may be prepared.

Where utility relocations require close coordination with the Authority's contractor, construction access on the Authority's right of way, or where unusual cost participation concepts are present, all aspects of these considerations shall be spelled out in detail through written correspondence until concurrence on all points is obtained. All such pertinent correspondence shall be included as an exhibit in the Utility Order. The Engineer shall include the details of coordination in the Construction Contract.

Utility Orders are not required for utility relocations to be performed under an Authority construction contract. However, any Authority reimbursement for inspection by the utility owner of the Authority's work in relocating the utilities must be authorized by a Utility Order. In this case, the schedule sets forth hourly inspection rates and the total estimated inspection cost, and the check list and scheme show the work to be performed under an Authority construction contract.

Authorizing letters from the utility owner approving the Authority's plans and specifications for relocation work to be included in the Authority construction contract, and agreeing to pay for any resulting betterments, are required by the Authority prior to advertisement of the construction contract.

The Engineer's procedure in preparing Utility Orders is as follows:

a. Early in the preliminary design studies, contact and preferably meet with all utility owners within the project area. The Authority's website contains additional information regarding the initial contact letter.

Furnish the utility companies with a 1”=100’ or 1”=200’ scale map, with or without alignment, and request the utility companies to show the type, size, material and age of their facility and its approximate location. All municipalities and privately-owned utilities in the area must be contacted. During the initial contacts with utility owners, the Engineer shall ascertain the requirements of each utility owner with respect to the type of right of way or easement property descriptions needed. Should metes and bounds descriptions be required, the Engineer shall accordingly arrange for the necessary surveys and descriptions.

In order to assure the Authority that all utilities have been contacted, (public, municipal, private, etc.) the Engineer is to furnish copies of their contact letters and the utility’s responses either acknowledging their facility or stating that they have no facilities within the project limits.

The Engineer shall show the proposed project and the approximate locations of existing utilities in plan with conflicts identified.

b. Early in Phase “A”, if there was no Preliminary Design, the Engineer shall make the initial contact as described above. Present information provided by the utility owners on preliminary 1”=30’ or 1”=50’ scale plans. Supplement and verify the information through field surveys and investigations. Send the plans to the utility owners for verification.

   The Engineer shall maintain a Utility Status Schedule to be presented at intervals determined by the Authority project engineer on a project by project basis. The Authority’s website contains additional information.

   Upon return of the verification plans by the utility owners, update the plans. Show the existing utilities and the proposed project, and identify the utility conflicts for Phase “A”. Verify the accuracy of as-built data with test holes as required. Test hole data shall correspond to the project survey baseline control.

c. Early in Phase “B”, the Engineer is to meet with the utility owners and mutually agree upon the most economical relocation scheme which is compatible with the utility owner’s policy and the Authority’s policy. The selected scheme shall be compared to all considered alternates and justified as the most economical. Provisions for owner access to the utility shall be considered at this time as well.

   The selected relocation scheme shall also be considered during preparation of erosion prevention and sediment control plans for review by the local soil conservation district(s) in order to identify potential conflicts with proposed drainage facilities.

The Engineer shall prepare a Check List and the Scheme of Accommodation for each utility owner, and request a preliminary cost estimate including engineering, materials, inspection and construction as applicable. The check lists and schemes should show existing facilities and proposed work, with betterments noted where applicable. The Authority prefers that all costs to be reimbursed to a utility owner be covered under the Utility Order. However, if a utility owner insists on reimbursement of early expenditures such as for engineering or long lead materials before execution of the Utility Order, the Engineer shall arrange to do so. At this time, the Engineer should obtain an estimate from the utility owner for such costs and issue a Utility Order. The Authority's website contains additional information. The Engineer shall reimburse the utility owner invoices as a direct cost in the Engineer's OPS.

The Engineer is to submit the approved Scheme and Check List (including time frames for notification and duration of work) and the owner's preliminary cost estimate for each affected owner to the Authority for approval a minimum of four weeks prior to a Phase "B" submission. This utility submission shall include for each location the details of the existing facility (size, materials, appurtenances, etc.), proposed facility (lengths, materials, sizes, etc.), facilities to be abandoned or removed, betterments and owner participation, and by whom the work is to be performed.

d. Once the Phase "B" submission is approved, the Engineer shall furnish the utility owner with full-scale plans for the Authority facility, showing the proposed utility relocations and requesting that the utility owner estimate and submit in writing the cost of the relocation and the schedule including ordering of materials, construction durations, and seasonal and time restrictions. At this time the Engineer and utility owner shall determine the availability of materials for the work and make arrangements necessary to obtain critical materials. All long lead equipment and materials need to be identified and considered in the timeline developed for the utility relocation to assure any and all delays are minimized. All betterment concepts shall be resolved to the satisfaction of all parties at this stage. Any utility relocation that is independent of the construction contract that can be performed in advance of the construction contract (without detriment to the project) should be ordered to be completed as soon as possible and the relocated as-built information provided as part of the contract documents. The Engineer and utility owner shall complete the schedule for construction staging of utility relocations.

e. Upon receipt of the utility owner's estimate, the Engineer shall review the estimate for accuracy and content and forward the accepted estimate to

the Authority. The Authority will assign a Utility Order number which will appear on the final Utility Order. The Engineer shall prepare the formal Utility Order and forward three draft copies of the Order, complete with the associated schedules and exhibits, to the Authority. Upon Authority approval, the Engineer shall forward seven final complete copies to the Authority. Utility Orders are to be forwarded to the Authority prior to making a Phase "C" submission. The Engineer shall verify that the Utility Order information is consistent with the utility relocation work in the Phase C plans and specifications.

The Engineer shall include copies of the check lists in an Appendix of the Supplementary Specifications.

The Engineer shall keep the utility owner apprised of the contract plan development at all times by sending him copies of the appropriate drawings from all Phase "B", "C" and "D" submissions.

After Phase "D", the Engineer shall schedule meetings, as appropriate, with all impacted utility owners and the Authority's design and construction representatives to advise of project status and continue coordination.

Additional utility installation submittal requirements related to underground installations are outlined in Exhibit 8-1.

2. Supplemental Utility Order

A Supplemental Utility Order is the formal document through which the Authority and the utility owner agree to the terms under which utility relocation costs, in excess of those covered in the initial Utility Order, will be paid. The Authority's website contains additional information regarding the Supplemental Utility Order.

Supplemental Utility Orders are occasionally required when changes in Authority construction concepts or unforeseeable construction complications increase utility relocation costs beyond those anticipated in the original Utility Order estimate. The circumstances requiring the execution of a Supplemental Utility Order must be thoroughly documented. Unexplained errors and omissions in the original estimate may not be accepted by the Authority as a basis for issuance of a Supplemental Order.

The Engineer shall prepare and justify all Supplemental Orders, and forward same to the Authority.

The Authority shall review the Supplemental Order for form and content. The same procedures and number of copies are to be used as described for Utility Orders.

3. Authorizing Letters

Authorizing letters are used by the Authority to authorize the commitment of Authority funds prior to or in lieu of the execution of the formal Utility Order. Authorizing letters would be required to authorize utility owners to order critical materials in advance of Utility Order execution, or to authorize utility owners to expend funds for engineering studies and estimates for proposed relocations. Upon Authority authorization, the Engineer shall prepare the Utility Orders described in 7.2.8.1.c.

Where betterments are included in utility relocation work to be performed under Authority contracts, the Authority will normally accept an authorizing letter from the utility owner accepting responsibility for the betterment cost as sufficient agreement to proceed with the work. Utility owner originated letters to the Authority are also normally considered adequate to establish the utility owner's intention to provide a portion of the utility materials to be installed under an Authority contract, or to establish the utility owner's concurrence with the Authority's plans to relocate his facilities under an Authority contract.

8.2.8.2. Other Agreements, Permits, and Licenses

1. License to Cross (LTC)

A License to Cross (LTC) (formerly referred to as an Occupancy Agreement) is to be entered into by the Authority with any utility company or authority which will have their facilities within the Authority's existing or proposed right of way. In all cases, the License to Cross document is prepared by the Authority's Engineering and Law Departments. When a utility owner has its own project that crosses Authority right of way, the utility owner shall prepare and submit a License to Cross application to the Authority for consideration. The Authority's website contains information on the application process and requirements. For utility installations that will require trenchless installation methods, refer to Exhibit 8-1 for additional LTC application requirements.

2. Other Agency Permits

Other Agency Permits, if applicable, are those permits for road openings, flight path clearance, stream encroachments, navigation, wetland, treatment works, water distribution, etc. which are necessary to allow the utility owner to relocate his facilities. These permits are normally applied for by the utility owner; however, the Engineer shall closely monitor the utility owner's progress in obtaining the necessary permits and provide such assistance and information as may be required. The last two permits may not be well known. Any work of building, installing, or modifying a sanitary sewer line, pumping station or force main having a flow of more than 8,000 gallons per day within

the public ROW or a septic system with flows greater than 2,000 gallons per day requires a Treatment Works Approval from NJDEP as per N.J. A. C. 7:14A. Whenever more than 1500 feet of new main that interconnects with a public water system, or there are more than 6,000 gallons per day of non-residential average demand, a Water Distribution permit is required from NJDEP as per N.J.A.C. 7:10A.

8.2.8.3. Betterment Calculations

Improvement betterments are the increases in cost which result from the replacement of existing facilities with facilities capable of increased function or service. Such additional costs will not be paid for by the Authority, except as provided in Subsection 8.2.5. Participating costs are the portion of the overall utility relocation cost which the Authority agrees to pay.

Where betterments are recognized, one method is to express participating costs as a percentage of the total utility construction cost, thus establishing the basis for determining the amount the Authority agrees to pay according to the terms set forth in the Utility Order. Another method is to determine the cost of each item of work and identify those that are subject to betterment percentages. In that these percentages must be established before the contract is awarded, it must be determined on the basis of past costs for similar work, or on some other fair and equitable basis. Other methods may be considered. The chosen method is subject to Authority approval. In all cases, betterments shall be based on a comparison of installed costs, including materials and labor.

Where the utility owner has sufficient staff and experience to do so, improvement betterments should be computed by the utility owner and checked and verified by the Engineer. Where small municipal or private utilities are involved, the Engineer shall perform such betterment computations as may be beyond the capacity of the utility owner and shall obtain the concurrence of the utility owner on the results.

The following commentary will clarify betterment conditions and the procedure to follow in determining calculations.

1. <u>Case 1 - The Authority's contractor placing conduit between abutments, and the utility Company doing work outside the abutment limits for any crossings involving a partial betterment.</u>

   Separate betterment calculations will be required for the Authority contractor's billings and the Utility Company's billings.

   The Utility Company will only be required to pay that betterment portion of hanger supports, hangers, conduit, cable / pipe and appurtenances.

However, all hanger supports, hangers, conduit, cable / pipe and appurtenances will be placed by the Authority's contractor between abutments, and the Authority will bill the Utility Company on the basis of the betterment percentage computed by the Utility Company. This betterment calculation must be approved by the Authority prior to construction by the Authority's Contractor.

It is not necessary to compute an aggregate betterment percentage for billing purposes. All invoices will be handled with the particular betterment involved in the area being worked. Each invoice under any one particular Utility Order will reflect the various betterment percentages within that order, as the work is completed in the respective areas. Any invoice can contain a certain part of a betterment, various different betterments or no betterment at all, depending on the work done under that particular invoice.

2. Case 2 - Utility Company doing all work involved in a relocation.

The Utility Company will submit betterment calculations to the Engineer for review and approval as above. All betterments involved within the Utility Order will be combined to form an aggregate betterment percent to be included on all the invoices sent to the Authority.

a. "Payment for Utility Line Supports on Structures"

For all miscellaneous hardware (U-bolts, neoprene pads, hanger rods, rollers, clamps, washers, nuts, etc.) required for utility conduit installations on structures, the cost of furnishing and installing such hardware is to be included in the linear foot unit price bid for the conduit.

Where these installations will be made on structures with steel superstructures, the weight of the structural steel members used to support the conduits, exclusive of hanger rods, rollers, etc., shall be included in the item for Structural Steel and paid for by the pound.

Where these conduit installations will be made on structures with concrete superstructures, the cost of the structural steel members used to support the conduits and their associated hardware shall be included in the linear foot unit price bid for the conduit.

Where pipelines and casings are involved, prices based on standard estimating guides, such as the "Dodge Estimating Guide for Public Works Construction" or some other basis, approved by the Authority, should be used by the Engineer for estimating or checking betterment costs.

8.2.8.4. Utility Service to Authority Facilities

Utility Service to Authority Facilities shall be arranged by the Engineer with the utility owner. The Engineer shall determine service demands and shall meet with the utility owner to establish the responsibilities for the various items of work to be performed, the date the service will be required, and the utility owner's terms for providing service as a requirement for Phase "B". The Engineer shall forward to the Authority any necessary agreement forms, together with a detailed outline of the size and type of required service, the costs, and the detailed individual responsibilities of the Authority and the utility owner. On the basis of this information, the Authority will sign and return agreement forms and if necessary provide a check payable to the order of the utility owner to the Engineer who shall formally request service from the utility owner. Service requests shall be completed by Phase "C".

8.2.8.5. Public Telephone

Public telephone facilities have been provided at Authority facilities at points convenient to the traveling public. For each project which includes toll plazas, rest areas or other public spaces, the number and locations of public telephones are to be determined by the Engineer in conjunction with Patron Services Department.

If public telephones will be provided, the Engineer will provide, in the Authority's construction contract, for the installation of conduit and appurtenant junction boxes between the existing public telephone lines and the telephone stand or building line. The Authority contract shall also provide for the power cable and conduit for lighting the stand and the power connection to the pre-wired stand, and for the stand foundation slab and concrete walkway serving the stand.

The Telephone Company will furnish and install the telephone, the stand, and the telephone cable. All telephone connections to the telephone and stand will be made by the Telephone Company. All materials furnished and work done by the Telephone Company shall be without cost to the Authority.

The Engineer will make all necessary arrangements with and will obtain all pertinent information from the Telephone Company and shall provide field liaison at the time of construction.

8.2.8.6. Tax Exempt Status

The Authority is exempt from taxes on materials ordered by utility owners for utility relocations to be made at Authority expense. In order to obtain this exemption, the Engineer shall request utility owners to arrange for shipment

in the name of the Authority in care of the Utility owner, thus gaining exemption from the tax.

8.2.8.7. Utility Policies

The following are the Utility Policies which have been approved by the Authority:

1. Power

There shall be at least one (1) full size spare conduit installed in addition to the necessary quantity of conduits containing the power cables required by design.

Riser poles are to be located outside the right of way lines. Cables are to be placed underground between structures.

2. Telephone

For the first cable, provide two (2) ducts. Provide one (1) duct for each additional cable.

The power and telephone ducts in structures are to be furnished and installed by the Authority's contractor.

Exhibit 8-1 Appendix A – General Requirements for Utility Installations

I. INTRODUCTION:

When utilities cannot be installed by cut and cover construction, trenchless technologies shall be considered and designed in accordance with the procedures described below. Due to the impact to pavement performance, presence of other utilities, and traffic impact, cut and cover construction methods will not be allowed for utility installations below any Authority roadway or facility without written approval from the Authority.

Definitions:

A. **Auger Boring (AB)** A technique where a horizontal bore hole is created from a drive shaft to a reception shaft by means of a rotating cutting head. Spoils are transported back to the drive shaft by helical-wound auger flights rotating inside a steel casing that is being jacked in place simultaneously. AB may provide limited tracking and steering capability. It does not provide continuous support to the excavation face. AB is typically a 2-stage process (i.e., casing installation and carrier pipe installation).

B. **Pipe Jacking (PJ)** A pipe is jacked horizontally through the ground from the drive shaft to the reception shaft. The excavation can be accomplished manually or mechanically.

C. **Microtunneling (MT)** A remote controlled guided pipe-jacking process that provides continuous support to the excavation face. The guidance system usually consists of a laser mounted in the drive shaft communicating a reference line to a target mounted inside the MT machine's articulated steering head. The MT process provides the ability to better control excavation face stability by applying mechanical or fluid pressure to counterbalance the earth and hydrostatic pressures.

D. **Horizontal Directional Drilling (HDD)** A multi-stage process that consists of drilling a small diameter pilot hole along a predetermined path. The pilot hole is then developed into a suitable bore hole that will accommodate the desired utility which is ultimately pulled back through the developed alignment. The HDD process provides the ability to track the location of the drill bit and steer it during the drilling process. The vertical profile of the bore hole is in the shape of an arc entrapping drilling fluid to form a slurry pathway rather than an open hole. This entrapped slurry provides continuous support to the bore hole.

E. **Casing Pipe** or casing is defined as a pipe which is installed for the purpose of stabilizing an excavation.

F. **Carrier Pipe** is defined as pipe which is installed inside of casing pipe to house the utility.

G. **Driving Shaft** is an excavation constructed for initiating the advancement of a casing as part of a trenchless technology operation, a.k.a. sending shaft or jacking pit.

H. **Reception Shaft** is an excavation constructed at the termination point of a trenchless technology operation.

I. **License to Cross (LTC)** is a legal document that grants permission to outside parties (i.e. utility owners) to impact Turnpike Authority property.

The Authority will only allow trenchless technology methods defined above (Items A through D) to be used under Authority roadways and facilities. All other alternative methods will not be allowed by the Authority including; slurry boring, pipe ramming, soil compaction, or utility tunneling, as defined in *NCHRP Synthesis 242 Trenchless Installation of Conduits beneath Roadways*.

II. REQUIREMENTS:

A. General

1. Design of trenchless utility installations shall conform to current AASHTO LRFD Bridge Design Specifications
2. Design for trenchless methods shall accommodate protection against soil instability and uncontrolled ground water inflow into the driving shaft and/or reception shaft and prevention of soil subsidence/settlement along the alignment with adequate instrumentation/monitoring procedures. In addition, the design shall consider safe shaft ingress and egress where applicable, including but not limited to ladders, stairs, walkways, and hoists, protection against mechanical and hydraulic equipment operations, and for lifting and hoisting equipment and material, ventilation and lighting, monitoring for hazardous gases, protection against flooding and means for emergency evacuation, protection of shafts including traffic barriers, accidental or unauthorized entry, and falling objects, emergency protection equipment and safety supervising responsibilities.

3. Casings shall generally be new welded, threaded, or interlocking connected steel pipe with a minimum wall thickness as per design calculations and shall be shown on the plans included with the LTC application. Other materials may be allowed for specific methods of installation, as described below. It is recommended that the smallest diameter casing viable given a particular installation method, and capable of carrying the utility to be installed, be used. The larger the diameter of casing, the greater the potential for subsidence. If future expansion is planned, a larger casing may be installed to allow for additional / larger carrier pipe to be installed in the future. In addition, the casing should be capable of accommodating equipment for drilling through obstructions.

4. The horizontal limits of casing for pipelines carrying hazardous material or materials under pressure, shall extend from right of way line to right of way line unless precluded by field conditions and approved by the Authority. Casings for pipelines carrying products other than hazardous materials or materials under pressure may be terminated at the toe of slope or center line of the ditch.

5. With approval from the Authority's Engineering Department, casing pipe may also serve as the carrier pipe depending on the installation method, pipe material, facility use and depth underneath Authority ROW.

6. Carrier Pipe may be composed of the following materials depending on the installation methods as described in the Authority's Supplementary Specifications:
    a. High Density Polyethylene (HDPE)

b. Polyvinylchloride (PVC)
c. Glass Fiber Reinforced Polymer Pipe (GFRP)
d. Centrifugally Cast Fiberglass Reinforced Polymer Concrete (CCFRP)
e. Steel
f. Vitrified Clay Pipe
g. Reinforced Concrete Pipe (RCP) Class III

7. A minimum cover of the greater of 6 feet or two casing diameters below the lowest pavement surface shall be provided for all acceptable methods except HDD, which shall require a minimum cover of the greater of 10 feet or five casing diameters.

8. Ends of casing pipe shall be sealed with a flexible material prior to backfilling to prevent flowing water and debris from entering the annular space between the casing and the carrier pipe.

9. To ensure voids were not created by the operation, ground penetrating radar is required as described in 2016 Standard Specifications Section 534. Any voids found to have been created outside of the casing pipe must be filled in accordance with a method approved by the Authority.

10. The use of bentonite or polymer slurry to lubricate the outside of the casing to reduce driving forces may be allowed contingent upon Authority approval.

11. Overcut outside of the casing diameter shall not exceed 1 inch. Oversized holes must be backfilled with grout to fill the annulus between the pipe and the surrounding soil.

12. All pipeline casings shall be furnished with standoffs, which center and adequately support the carrier pipeline within the casing, and with link seals and casing end seals, manufactured especially for this purpose.

13. Manholes are to be located outside of the Authority right of way.

14. The utility owner shall place an above ground marker within 5’ feet inside the Authority’s right of way or fence to indicate the presence of the utility.

15. After trenchless installation begins, the operation must proceed continuously until complete.

16. Driving and receiving shafts shall conform to the following requirements:
    - The shaft shall not be located within 10 feet of the outer edge of the paved shoulder.
    - When located between 10 to 30 feet from the outer edge of the paved shoulder, the shaft shall be constructed with steel sheeting.
    - When located beyond 30 feet from the outer edge of the paved shoulder, the shaft shall be constructed with steel or timber sheeting for the closest face to the roadway, with the option of the remaining sides being unsheeted.
    - The exit and entrance face of all driving or receiving shafts must be sheeted, regardless

of the distance from the outer edge of the paved roadway.

- Unsheeted shaft sides are only permitted provided a 1 to 1 slope can be maintained and the excavation in other respects complies with OSHA regulations.
- Steel sheeting may be extracted upon backfilling the excavation except the front line closest to the roadway which shall be left in place and cut off 2 feet below grade.
- Timber sheeting shall be tongue-and-groove and cut off 2 feet below finished grade.
- Excavated materials shall be placed outside of the clear zone and surplus and waste materials shall be disposed of off Authority right of way.
- When the driving or receiving shaft is located between 10 and 30 feet from the outer edge of paved shoulder, a standard shoulder closing shall be installed as per the Authority's Manual for Traffic Control in Work Zones.
- If there is existing guide rail, concrete construction barrier is not required.
- Driving and receiving shafts in the median area shall not be permitted, unless 10 feet of clearance to the edge of pavement is available. All driving or receiving shafts in the median shall be constructed using steel sheetpiles.
- All work areas must be enclosed with 4-foot high fencing.

B. **Cut and Cover**

Cut and cover construction methods for utility installations crossing Authority roadways and facilities will only be allowed if approved by the Authority. The use of cut and cover will be considered if special circumstances exist, for example if the existing pavement box will be replaced in the near future or if the roadway will be taken out of service for other reasons. Cut and cover installations will be allowed below spans between foundations but will require the assessment and mitigation of any impact to adjacent foundations.

Trenches shall be excavated in accordance with 2016 Standard Specifications Section 206. Fill material shall be Embankment Grade A as described by 2016 Standard Specifications Section 901. Compaction criteria shall be as described in 2016 Standard Specifications Section 203. If the designer requires more stringent criteria, it may be specified on the plans submitted with the LTC application.

C. **Auger Boring**

Casing material shall be steel. Thickness, section length, connection details, and grade of steel shall be specified on the plans included with the LTC application and must satisfy the minimum requirements provided here and in the 2016 Standard Specifications Section 534. The Authority will generally not consider less than 4-inch diameter or greater than 60-inch diameter casings installed with this method but may consider other diameters on an individual basis. The Authority will generally not consider this method feasible for installation lengths greater than 300 feet.

Although tracking and steering capabilities are limited, the equipment shall include any tracking and steering capabilities available for this method. The tolerances of these capabilities will be determined on a project specific basis and indicated on the plans included with the LTC application. The auger shall remain a minimum of 1 casing diameter behind the casing face, or as necessary to maintain a stable face. The leading edge of the casing shall also be reinforced with a surrounding band, which shall be detailed in the LTC application plans. 2016 Standard

Specifications Section 534 provides a minimum standard for monitoring excessive settlement. As the designer deems necessary, a more stringent monitoring program can be specified on the LTC application plans.

D. **Pipe Jacking**

The Authority will generally consider the following materials acceptable for casing: steel, reinforced concrete pipe (RCP), glass-fiber reinforced pipe (GFRP), or polymer concrete pipe (PCP). Thickness, section length, connection details, and material properties shall be specified on plans submitted with the LTC application but must satisfy the minimum requirements provided here and in the 2016 Standard Specifications Section 534. For this method, the Authority will generally allow these types of pipe for diameters between 36 inches and 72 inches but may consider other diameters on an individual basis.

Intermediate jacking stations will be allowed below the Authority roadways. The proposed length shall be verified to ensure the equipment and methods proposed are capable of exerting enough thrust. Excavation shall remain a minimum of 1 casing diameter behind the casing face, or as necessary to maintain a stable face.

E. **Microtunneling**

The Authority will generally consider the following materials acceptable for casing; steel, RCP, or GFRP. Thickness, section length, connection details, and material properties shall be specified on the LTC application plans but must satisfy the minimum requirements provided here and in 2016 Standard Specifications Section 534. For this method the Authority will generally allow these types of pipe for diameters between 24 inches and 48 inches but may consider other diameters on an individual basis.

Intermediate jacking stations will be allowed below the Authority roadways. The proposed length shall be verified to ensure the equipment and methods proposed are capable of exerting enough thrust. The shield shall remain at the face for the entire microtunneling operation.

F. **Horizontal Directional Drilling**

The Authority will generally consider the following materials acceptable for casing; steel, polyvinyl chloride PVC, or HDPE. Thickness, section length, connection details, and material properties shall be specified on LTC application plans but must satisfy the minimum requirements provided here and in 2016 Standard Specifications Section 534. For this method the Authority will generally allow these types of pipe for diameters between 3 inches and 48 inches but may consider other diameters on an individual basis.

2016 Standard Specifications Section 534 provides a minimum standard for monitoring excessive settlement. This method may require the Engineer to require a more stringent Instrumentation program. In addition, this specification provides minimum standard limitations on fluid pressures, which can be modified by the Engineer. Tracking and steering shall be provided with this method.

III. SUBMITTALS:

For new underground utilities to be installed using trenchless technology methods, the following information shall be required by the Authority for inclusion in the LTC application submission:

1. Calculations including, but not limited to:
    a. Soil boring logs
    b. Subsurface profile
    c. Laboratory test results
    d. Determination of loads on the proposed utility at Service Load Combination I (Reference 2, Article 12.5.2, Table 3.4.1-1, and Article 12.6, Article 3.6.2.2). Also consider hydraulic uplift and jacking or driving forces.
    e. Corrosion potential or abrasion loss of pipe (Reference ***1***, Article 12.6.9)
    f. Adequacy of proposed pipe section and material for shear, buckling, seam resistance, etc.
    g. Scour potential (Reference ***1***, Article 12.6.5)
    h. Deflection shall be accounted for when checking clearances
    i. Geotechnical bearing resistance and settlement of pipe
    j. Dewatering or ground improvement if necessary
    k. Drilling fluid will not enter pavement box
    l. Impact of vibration to existing foundations or utilities
    m. Anticipated heave or subsidence and mitigation proposed if necessary.
    n. Design of any walls required to provide thrust for the pipe or to stabilize an excavation. This shall include, but not be limited to, checking for sliding or lateral resistance if deep foundations are required, overturning, global stability, bearing capacity or axial resistance if deep foundations are required, uplift, amount and rate of settlement, and structural resistances. These tasks shall be performed in accordance with AASHTO (Reference 2).

2. Utility plans, in conformance with the plan requirements as specified on the Authority's website for LTC applications, shall include, but may not be limited to:
    a. Plan sheets showing:
        i. Proposed utility location and dimensions (length, wall thickness, and diameter)
        ii. Driving and receiving shafts locations and dimensions
        iii. Boring locations
        iv. Right-of-way lines
        v. Existing utilities
        vi. Existing features, such as buildings, roadway, barrier, structures, etc.
        vii. Instrumentation plans and monitoring requirements
    b. Profile sheets along the proposed utility alignment showing:
        i. Soil or rock conditions
        ii. Groundwater conditions
        iii. Existing and proposed utilities
        iv. Existing and proposed foundations
        v. Driving and receiving shafts
        vi. Existing and proposed ground lines
        vii. Limits of pavement box (i.e. Asphalt, DGA, Grade A Embankment, Common Embankment)
    c. Three cross sections perpendicular to the alignment showing the same information as listed above for the utility profile if six or more borings were taken at the site. No cross sections will be required if the site is considered to have low variability based on existing data
    d. Any incidental, environmental, drainage, staging, or structural plans as necessary.

3. 2016 Standard Specifications Section 534, modified as necessary to accommodate the site conditions and project constraints, shall also be required. This document includes the requirements of the Site Specific Work Plan (SSWP).

REFERENCES:

1. AASHTO. *LRFD Bridge Design Specifications*. Fifth Ed. 2010
2. AASHTO. *Technical Manual for Design and Construction of Road Tunnels – Civil Elements*. September 2010 Ed.
3. New York State Department of Transportation. *Design Guidance for Trenchless Installations of Casing*. 2007.
4. Transportation Research Board National Research Council. *NCHRP Synthesis 242 Trenchless Installation of Conduits Beneath Roadways*. 1997.

Section 9 - RIGHT OF WAY

9.1. GENERAL

9.1.1. Purpose

The intent of this document is to provide reference for required procedures and technical guidance to the design community and those professionals participating in the acquisition of property for Authority sponsored transportation projects. The acquisition of Right of Way (ROW) is not just a financial or legal transaction to support a transportation project but is a right empowered by the New Jersey Turnpike Authority to acquire private property for public use and for the benefit of the greater good. These guidelines have been developed to promote uniformity of the ROW documents; however, Engineers are encouraged to be creative and flexible when considering their design and be mindful of the sensitivity of the purpose and need associated with proposed acquisitions. It is the expectation that all persons representing the Authority throughout this process exhibit the highest level of professionalism, understanding and knowledge of the activities required to generate quality ROW documents. It is imperative to maintain the public trust and confidence of the citizens of the State of New Jersey. This section of the Procedures Manual supports the responsibility of providing quality and effective ROW delivery, while understanding the sensitivity of the ROW process.

All maps, plans, and legal descriptions of parcel properties required by the Authority in connection with the acquisition of all interests in real estate shall be prepared under the supervision and direction of a land surveyor licensed by the State of New Jersey and in accordance with Title Recordation Law (N.J.S.A. 46:26A, 26B and 26C et seq. effective date May 1, 2012), successor to the Map Filing Law. The purpose and intent of this work is to provide all information necessary for the Authority's Law Department to obtain the necessary title search to conduct negotiations for a right-of-entry and/or an agreement with property owner for the acquisition of all rights (fee or easement) necessary for the project or, if necessary, to facilitate an eminent domain action. All work shall be completed in accordance with applicable statutes, laws, regulations of the State of New Jersey and the policy and procedures established by the Authority, as set forth herein and in accordance with good practice and procedure of the profession.

9.1.2. ROW Document Process

The Authority will approve the sequence in which the work will progress so that it will be coordinated with the requirements of design and construction. The ROW documents prepared and submitted should meet the roadway and construction design requirements with each corresponding phase. The level of completeness of each parcel may vary depending upon the complexity of the ROW design required. An example of

this may be that a parcel was identified early during preliminary engineering as an entire taking and therefore the Individual Property Parcel Map (IPPM) can advance to a finalized level prior to Phase D submission. Other examples of such parcels can be environmentally sensitive parcels or parcels that have a historical component. Again, the complexity and size of the project will determine the sequence of work and preparation of ROW documents. Any deviation from the standard phase submission requirements will be directed and approved by the Authority. Close liaison will be required between the Engineer, Authority's Project Manager and ROW Manager. Rapid and orderly progress of the work is essential. Duplication and revision of work is to be avoided if possible. To this end, the Engineer shall, as their first work, prepare IPPMs and descriptions involving one sample at each phase of work so that the results may be reviewed in detail by the Authority as a means of clarifying the procedures which these instructions attempt to define. All submissions are to be made to the Authority's Project Manager.

The matrix (Exhibit 9-1) reflects the standard ROW document deliverable(s) required for each Phase submission. Preliminary and Final Design Phase are further discussed below..

Exhibit 9-1 ROW Deliverable Checklist

PHASE	DESIGN COMPLETE %	DELIVERABLES
A	35%	☐ ROW IMPACT PLAN (GPPMs AND ETMs) ☐ ROW IMPACT MATRIX ☐ SAMPLE IPPMs ☐ SAMPLE JURISDICTIONAL LIMIT MAP ☐ MUNICIPAL TAX MAPS AND RECORDS ☐ CADD & GIS FILES
B	70%	☐ DRAFT IPPMs ☐ DRAFT METES AND BOUNDS DESCRIPTIONS ☐ UPDATED IMPACT MATRIX ☐ DRAFT JURISDICTIONAL LIMIT MAP
C	95%	☐ DRAFT GPPMs/ETM SHEET SET (*)
D	100%	☐ FINAL SUBMISSION ALL ROW DOCUMENTS (*) ☐ UPDATED ROW IMPACT MATRIX ☐ UPDATED TAX MAPS AND RECORDS ☐ UPDATED CADD & GIS

(*) Acquisition Documents (IPPMs/Metes and Bounds Descriptions) may be accelerated and submitted Final based upon individual parcel design status. Interim Review of documents may be required.

Note: All submissions should be coordinated per Section 3.3 of the Procedures Manual.

9.1.3. Preliminary Submission

At the initiation of Preliminary Design, the Engineer shall begin preparation of the necessary ROW documents required to define the ROW impacts. Some projects may require a simplistic impact plan identifying ROW impacts based upon tax maps, existing ROW plans and Geographic Information System (GIS) data. This type of simplistic plan is

commonly utilized for concept development and feasibility studies, where the creation of a Deed Mosaic or survey base mapping is not necessary. In some cases when limited ROW and Environmental impacts are identified, the project moves directly to final design. The Authority's Engineering Department will determine the level of mapping and survey required for each project. The DE shall supply the Authority's Engineering Department with electronic submission (PDF) of the ROW Impact Plan (Preliminary Entire Tract Map), tax maps and records of all impacted properties based on the Certified Property Owner's List obtained from respective Municipalities within the project corridor and an aerial GIS-based plan referencing the proposed baseline and preliminary proposed ROW lines. All CADD and GIS data will be required to use the most current New Jersey State Plane/North American Datum and Authority CADD Manual.

The Authority utilizes an eGIS platform which contains information for its key assets. The Authority has several layers such as easements, the ROW boundary, and parcels inventoried in their enterprise GIS database. The Consultant will coordinate with the Authority's Project Manager and Authority's eGIS Group to receive a copy of the Authority's most current GIS dataset for New Jersey Turnpike for ROW layers for reference. This data set will be provided as feature classes in a file geodatabase. The geodatabase template is required and will be used as a basis from which to populate new changes to the ROW boundary, easements and parcels. This is the data set in which the consultant will provide the updated Turnpike ROW information and populated attributes back to the Authority along with metadata. Examples of feature classes included in the geodatabase template are the ROW boundary as a polygon, easements and surplus parcels (X parcels). On surplus parcel, an example attribute the consultant is expected to fill would be "status" with options such as 'conveyed' or 'sold'. The Consultant shall coordinate with the Authority's Project Manager and the Authority's eGIS group for any additional data standards and submission requirements of the populated File Geodatabase.

The File Geodatabase will include required and optional fields to be coordinated with the Authority's eGIS representative and shall include spatial accuracy requirements for the boundaries. The template and layer requirements will be flexible to accommodate the phases of design and ROW submission.

The Engineer should also provide a ROW Impact Matrix listing all known impacted property owners and addresses based upon the current tax records (see **Exhibit 9-19 Sample ROW Impact Matrix**). At the discretion of the Project Manager, a ROW Design kick-off meeting may be scheduled at which time the Engineer will share the ROW Impact Plan and Matrix and discuss major impacts and potential design challenges. At the same time, the Authority's Engineering Department will provide to the Engineer a range of parcel numbers and a map quote for the title block to be utilized in the development of the ROW plans.

1. Preliminary submission of draft IPPMs and corresponding Metes & Bounds descriptions required for a construction contract are to be included with the Phase B submission. The preliminary submission date and interim review submissions may be established earlier than Phase B depending on project requirements and schedules.
2. Preliminary submission shall consist of electronic (PDF and Microsoft Word Document) deliverables only. Required submission deliverables by project phase are listed in Exhibit 9-1.

9.1.4. Final Submission

1. Prior to the final submission, the Engineer shall meet with the Authority's Engineering Department, and/or its designee, to go over the final ROW Submission and discuss all plan changes to ensure that all issues have been properly addressed. At the discretion of the Project Manager, a ROW Acquisition kick-off meeting may be scheduled for the Engineer to present and familiarize the Authority's Law Department with proposed acquisitions. At this time the Engineer will share the updated ROW Impact Matrix referencing the specific parcel acquisition types and areas for each property. This is an updated version of the ROW Impact Matrix previously provided during Preliminary Engineering referencing the more detailed Final Design data.
2. In addition to the deliverables identified in Exhibit 9-1, Final submission shall consist of:
    a. Cover letter listing all parcels and owners required for the construction contract, parcels being submitted, and parcels not identified in prior submissions.
    b. Two copies of the Final ROW submission documents consisting of the Key Map Cover Sheet, Parcel Index/Ownership Data Sheets, Entire Tract Maps (ETMs), General Property Parcel Maps (GPPMs), and Alignment Schematic Data Sheets as defined in Subsections 9.2 through 9.4
    c. Twelve (12) full-size sets of the ROW acquisition documents (IPPMs and Metes and Bounds Descriptions), signed and sealed by a licensed New Jersey Land Surveyor. Depending upon project schedule, these documents may be advanced earlier during design.
    d. Electronic files of all Final ROW submission documents in CADD (DGN), GIS and Word (DOCX) formats. All electronic files must be included for future reproduction.

3. When instructed by the Authority's Engineering Department, the Engineer is responsible for all revisions to the acquisition documents (IPPMs and Metes and Bounds Descriptions) previously submitted. The acquisition documents will be recorded at the county clerk's office by the Authority's Law Department. Any revisions made to these documents shall carry through to the GPPM and ETM Sheet set. The submission procedure will be similar to that outlined in Items 2b and 2c above.

4. In the event that condemnation becomes necessary to acquire a particular parcel, the Engineer will be required to submit additional signed and sealed IPPMs and Metes and Bounds Descriptions at the request of the Authority's Law Department. This is to enable distribution of a map and description, along with the associated court documents, to all parties having an interest in the action.

5. The original maps of the Final ROW submission documents (GPPMs and ETMs) are to be sent to the Authority's Engineering Department for execution upon final notification by the Authority. It is the responsibility of the Engineer to file and record the Final ROW documents at the County Clerk's Office. At this time, correspondence prepared and executed by the Authority's Law Department will be provided to the Engineer to be presented to the County Clerk with the Final ROW documents to be recorded. Proof of filing in the form of a receipt is required and is to be provided by the Engineer to the Authority's Project Manager and ROW Manager.

9.1.5. Acquisition Process

For the Engineer to better understand and appreciate the necessity for complying with ROW submission dates, the following is a brief outline of the Authority's procedure, once Final ROW plans and descriptions have been received.

- A Notice of Entry letter is sent to the property owner in advance of appraisal and negotiations to permit access by the Authority for design purposes. The Engineer as requested, may be required to provide an exhibit and description of work to be completed.

- The Authority's Engineering Department, and/or its designee, checks to verify that all of the parcel maps and descriptions required for a particular Contract have been submitted. Engineering then retains one (1) set of the plans and data sheets for its files and forwards the remainder to the Law Department. One (1) set of the documents is retained by the Law Department, while the others are used by the Law Department to obtain appraisals, environmental screenings, title work, and to conduct negotiations for the parcel to be acquired.

When the appraisal is complete, the negotiation process commences in accordance with the appropriate procedure of the Law Department and applicable law. Upon completion of appraisals, negotiations are undertaken to arrive at an agreement based on fair market value. In the event there is a failure of agreement between the Authority and the property owner, the Authority may exercise its right to Eminent Domain and commence condemnation.

The Authority then institutes condemnation at which time a hearing date is set. The case is heard by a group (usually three (3)) of condemnation Commissioners appointed by the courts. The Engineer may be required to provide a Professional Land Surveyor or other engineering professionals familiar with the property to testify at condemnation hearings and/or jury trials. The Commissioners will hear the facts and decide upon an Award of Just Compensation. Should either party feel this decision to be unjust, it has the right of appeal, with the case possibly reaching a jury trial.

Whether the matter is a voluntary acquisition or a condemnation case, the owner or tenant must be given a reasonable amount of time in which to vacate the property. Where commercial or industrial buildings are involved, this period could be considerable.

The above information is provided to stress to the Engineer that the ROW process is only approximately half-done with the submission of Final ROW plans and description. The ROW acquisition process is time consuming and requires as much advanced preparation as possible. Due to the number of steps involved, revisions become a complicated problem. The Engineer should take every precaution to ensure that the project ROW documents are submitted on time and reviewed adequately to avoid wasted effort by attorneys, appraisers and negotiators and the consequent loss of time, which in most projects is at a premium.

In accordance with Title Recordation Law (N.J.S.A. 46:26A, 26B and 26C et seq effective date May 1, 2012), successor to the "Map Filing Law", Final ROW documents are required to be submitted to the county for filing. As discussed above, the Engineer will file the Final ROW documents at the County Clerk's Office and pay the appropriate fees. The Authority's Law Department will file the Deeds and IPPMs and descriptions with the appropriate county.

Upon completion of all negotiations, the Engineer shall meet with the Authority's Project Manager and other required staff to assure all terms and conditions of the settlement are compliant with the original understanding of work being performed by the Authority's contractors and the work to be performed by owners (for which they were compensated). Contract documents and specifications shall be modified as necessary to assure that all work efforts are accounted for and that ROW availability for the contractor is clearly stated within the specifications.

9.2. MAPS

9.2.1. Types

There are generally four types of maps with varying scales as identified in Exhibit 9-2:

Exhibit 9-2 Maps and Standard Scale

Map Type	Standard Scale (*)
Entire Tract Map (ETM)	1” = 200’
ROW Impact Plan	Consistent with ETM
General Property Parcel Map (GPPM)	1” = 30’
Individual Property Parcel Map (IPPM)	Variable scale (must show entire property)
Jurisdictional Limit Map (JLM)	1” = 100’

(*) Standard scale may change if approved by Authority’s Engineering Department

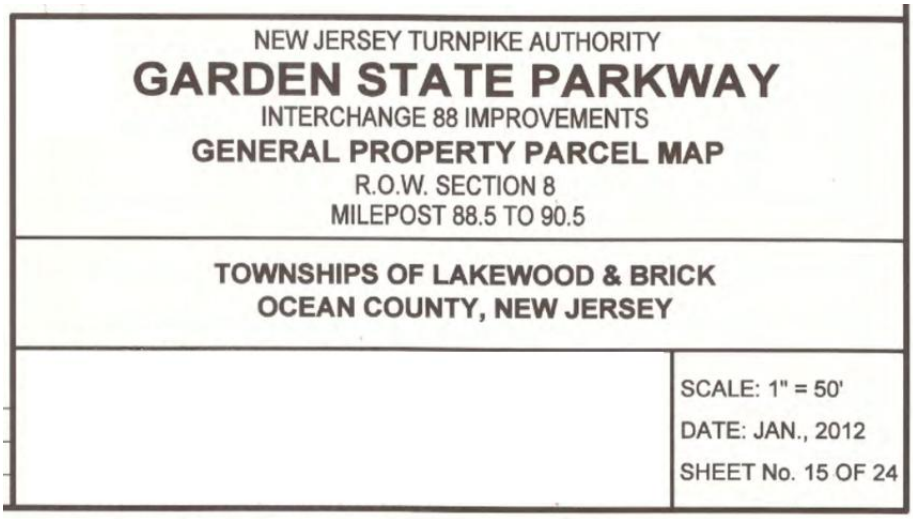
There are also additional sheet sets that are part of the overall ROW submission. These include Key Map/Cover Sheet, Owner/Parcel Index Data Sheet, ETM and GPPM Index Sheets, and Alignment Schematic Data Sheets. See Sample Plans on the Authority’s website. It is important for the Engineer to understand the relevance of each type of map and its use by the Authority. Generally, IPPMs along with the corresponding Metes and Bounds Descriptions, also known as the ROW acquisition documents, are utilized by the Authority’s Law Department to acquire the property required for a project. The ETMs and GPPMs, inclusive of the Key/Cover Sheet, Owner Index Sheets and Alignment Schematic Data Sheets and also known as the overall ROW submission documents, are the documents which define the overall project footprint and related ROW acquired. These are recorded by the Engineer at the County Clerk’s Office. The Jurisdictional Limit Maps (JLMs) are maps created and used as exhibits for the Jurisdictional Limit Agreement (JLA) and reflect the maintenance and jurisdictional responsibilities of specific parties. All of these maps are discussed more specifically below.

9.2.2. General Requirements for Maps (ETMs, GPPMs, IPPMs and ROW Impact Plans)

1. Final map plans shall be prepared on mylar material 0.003 inch to 0.004 inch thick for recording purposes with the appropriate County Clerks. Maps are to be made in accordance with the current version of the Authority’s CADD standards entitled “New Jersey Turnpike Authority, New Jersey Turnpike and Garden State Parkway Roadways, CADD Standards Manual”. The standards may be found on the Authority’s website.

2. The map title box shall appear with the specific map type identified as shown below as “GENERAL PROPERTY PARCEL MAP” in Exhibit 9-3:

Exhibit 9-3 Example Title Block



3. The various maps shall be numbered sequentially according to sheet numbers assigned by the Authority's Engineering Department. Numbers shall appear both in the title box and on the right sheet margin as indicated in the example in Exhibit 9-14. The approximate number of sheets required shall be given to the Authority's Project Manager as early as possible to facilitate the assignment process.
4. The overall ROW Submission Document shall be arranged sequentially in the following order: Key Sheet/Cover Sheet, Owner Index/Parcel Data sheet, ETM sheet set, GPPM sheet set, Alignment Schematic Data sheet set.
5. The Authority's standard ROW legend (see Sample Plans on the Authority's website) is to appear immediately following the Owner Index/Parcel Data Sheet in the project ROW Section(s).
6. All lettering and line weights generally shall be as indicated on Exhibit 9-16. Variations in lettering size and line weights should be used to emphasize relative importance of items presented.
7. The New Jersey Plane Coordinate System is to be used and shown on all maps and mentioned in all deed descriptions together with the adjustment date tag to allow for proper adjustments to be applied to the NAD1983 (1995) datum.
8. All County, Municipal and other political subdivisions shall be clearly indicated.
9. Map scale and north arrow shall be shown on every map.
10. Reasonable planimetric coverage, as the map size and scale permit, shall be shown outside the ROW lines.

11. All revisions to a finalized map shall be numbered, dated and noted as to their nature in the Revision Box provided on each map (see Exhibit 9-14). The latest alteration number (highest number shown in the revision box) shall be marked in the right-hand border of each sheet (see Exhibit 9-14)

12. All Final IPPMs are to be signed and sealed.

9.2.3. Entire Tract Maps (ETMs)

The Entire Tract Map sheet set reflects a broad representation of the overall project footprint. These maps capture a "birds eye view" of the GPPM sheet set, as well as provides detailed data related to the parcel acquisitions and survey baselines and alignment. The information below are standard requirements to be utilized in the preparation of the ETM sheet set. More detailed ROW design guidelines are discussed in Section 9.5 of the Procedures Manual. Prior to submission, the checklist in Exhibit 9-4 shall be utilized by the Engineer to confirm the documents are prepared accordingly

1. Scale
   a. 1"=200' unless otherwise approved by the ROW Manager.
   b. If necessary, include an insert at a different scale in order to show owner's complete (contiguous) property.
2. Sheet size shall be 22" x 36".
3. Topography
   a. All buildings to be acquired shall be shaded solid. Other buildings shall be shown unshaded.
   b. Increased detail shall be shown in areas not to be covered by the GPPMs.
   c. Important features on parcel remainders such as buildings, roadways, etc. shall be shown.
   d. All topography should be screened.
4. Property Lines
   a. All lines to be shown, plus deed or map information not shown on the GPPMs.
   b. Complete tracts must be shown to their street or highway limits, or to their boundaries with other owners (all adjoining owners must be identified).
5. Baselines, stationing, and equations of all major roadways referred to in Metes and Bounds descriptions are to be shown.
6. Identify match lines between strip maps, showing adjacent sheet number.
7. Include sheet layout for the GPPMs.
8. Existing and proposed ROW lines are to be labeled.

9. For parcel delineation and callout, see 9.5, Specific Requirements .
10. Restrictions (encumbrances) other than municipal must be clearly identified, (see Subsection 9.2.4).
11. Include a tabulation listing all streets being vacated, the controlling agency and the approximate mainline station.

Exhibit 9-4 ETM Checklist

☐	SCALE
☐	SHEET SIZE
☐	TITLE BLOCK/SURVEYOR'S TITLE BLOCK
☐	REVISION BOX
☐	TOPOGRAPHY (PER SECTION 9.5.6)
☐	COUNTY/MUNICIPAL LINES
☐	PROPERTY LINES
☐	NORTH ARROW
☐	BAR SCALE
☐	EXISTING/PROPOSED BASELINE DATE
☐	MATCH LINES
☐	GPPM SHEET LAYOUT
☐	EXISTING AND PROPOSED ROW LINE CALLOUTS
☐	EXISTING DEED COURSE INFORMATION WHEN NOT SHOWN ON GPPM
☐	PARCEL DELINEATION AND CALLOUT
☐	RESTRICTIONS (ENCUMBRANCES)
☐	TABULATION LISTING ALL STREET VACATIONS
☐	BLOCK AND LOT FOR EACH PROPERTY
☐	SURVEYOR SIGNATURE AND SEAL

9.2.4. General Property Parcel Maps (GPPMs)

The GPPM sheet set is a larger scale map set reflecting a more detailed representation of the ETM sheet set. This mapping is more detailed and should mirror the Individual Property Parcel Maps (IPPMs) prepared for the project. The information below are standard requirements to be utilized in the preparation of the GPPM sheet set. More detailed ROW design guidelines are discussed in Section 9.5.2 of the Procedures Manual. Prior to submission, the checklist in **Exhibit 9-5** shall be utilized by the Engineer to confirm the documents are prepared accordingly.

1. Scale shall be 1"=30' or as directed by the Authority's Engineering Department.

2. Sheet size shall be 22” x 36”.
3. Planimetry to be clearly shown and labeled.
    a. Existing Building Type shall be called out (e.g. 2 1/2 Sty. brick) with street address. Structure shall be hatched if in the taking area. Perpendicular offsets to remaining structures less than 5 feet from the proposed ROW line and those within slope areas (outside of ROW) must be measured and so indicated to the nearest 0.10 foot in accordance with proper survey procedures.
    b. Any deeds, maps or recorded documents utilized in establishing the existing ROW and property lines shall be referenced within the notes.
    c. Any existing property markers and monuments found should be shown on map and labeled accordingly.
    d. Driveways and other paved areas shall be outlined with pavement type noted.
    e. Fences, walls, valuable shrubbery, etc.
    f. Railroads, transmission lines, sewer mains, water mains, gas mains, etc., along with all related easements, etc.
    g. Wells, underground storage tanks, leaching fields, etc.
    h. Existing drainage.
    i. Tree lines.
    j. Any special features, with appropriate notation.
    k. Show grid coordinate ticks - minimum three per sheet.
    l. Wetland delineation.
    m. ROW legend shall be included on or immediately following Parcel/Owner Index Data Sheet
4. Sources of Property line dimensions shall be identified using the following designations:
    a. Deed data (D), courses numbered as per deed description.
    b. Survey data (Sur.)
    c. Calculated data (C)
    d. Development map data (DM) also known as Filed Map (FM)
    e. Tax Map data (TM)
    f. Scaled (S), (to be used only when no other information is available.)
    g. Measured (Meas.), (incomplete survey-only some courses measured.)
    h. Property corner information shall be noted when available.

5. Ownership Information to be shown shall include the following:
    a. Owner's name, (per deed), using et. ux., et. vir., et. al., etc. as appropriate.
    b. Lot and block.
    c. For change of ownership during project, add new owner's name and insert "Formerly" prior to previous owner's name and enclose in parentheses.
    d. Deed book and page (Book/Page) or Will book and page.
    e. Deed area when applicable (subsequent deeds may invalidate original deed area).
    f. Tract number and lines.
    g. Exceptions cited in the deed outlined and noted.
    h. Easements and leases outlined and described as follows:
        - Width,
        - what used for,
        - deed book and page.
    i. Names of adjacent owners.
    j. Existing ROW outlined and described as follows:
        - Width,
        - what used for,
        - deed book and page.
    k. Plans will include roads and streets with official name, width, and information as to how such roadways were created or established, whether by filed development map, tax map, deed calls, etc. The Engineer should verify that streets were officially adopted by local ordinance. Should the local roads and streets be vacations or abandonments, they must be noted as to date and the location of source of information.
    l. Existing easements or ownership previously acquired by the Authority when pertinent. Reference to route, section, and date of acquisition.
6. Proposed edges of pavement shall be shown by dashed lines, on the GPPMs only.
7. Proposed baseline data shall include the following:
    a. All baselines necessary for establishment of ROW lines.
    b. Continuous and original stationing, equations, PC's, PT's, tangent bearings.
    c. Baselines of crossroads tied into coordinate system.

d. Curve data and coordinates tabulated and labeled on appropriate sheet.

e. Relationship between new and existing baselines shall be accurately shown.

f. Existing monuments designating or controlling existing baselines must be shown.

8. Proposed monuments showing relation to proposed or existing baselines are to be shown. All monuments are to have New Jersey Plane Coordinates shown.

9. Match lines, showing adjacent sheet numbers, shall be identified.

10. Parcel delineation shall be as follows:

    a. Parcels shall be field surveyed (NJAC Title 13, Chapter 40) and maps prepared in accordance with the Title Recordation Law and Title 46, Chapters 26A, 26B & 26C effective date May 1, 2012, successor to the "Map Filing Law"

    b. Proposed ROW line labeled.

    c. Set points, stations, offsets, angles and/or bearings shown accurately and clearly. Field establishments of ROW line must be possible from ROW plans. All distances shall be indicated to the 100th of a foot, ± and scaled distances will not be accepted.

    d. Proposed drainage and slope lines shown when outside ROW line or when necessary for delineation of parcel.

    e. Proposed temporary roads, easements, etc. clearly delineated.

    f. For outlining of parcel, numbering, revisions, etc., see Subsection 9.5

11. Restrictions: (Encumbrances - other than municipal) Delineation and or notes shall be made on maps to specifically locate, or denote the absence of, these restrictions. This is important since such restrictions affect both design (permits and Environmental Impact Statements required) and property (taking and remainder) value. Some of the restrictions that must be investigated are listed below. The explanation of the following terms are generally introductory descriptions rather than precise definitions. Applicable law should be consulted where additional information is necessary or appropriate.

    a. State of New Jersey, Department of Environmental Protection, Division of Marine Services, Bureau of Marine Lands Management.

       Riparian Lands ("tideland") are now or formerly flowed lands to which the State of New Jersey holds title to up to the highwater mark (mean or ordinary high tide - if possible, an average based on 18.6 years of records). These tidelands are affected by "Riparian Rights" which may be acquired or may have been acquired from the State of New Jersey by grant or rented by lease, easement or license. Riparian Rights are delineated on State maps entitled "Areas Now or Formerly

Below Mean High Water." At locations where pierhead and bulkhead lines are not defined by the U.S. District Engineer (see Paragraph 9.2.4); such lines should be determined from said maps.

"Wetlands" under S404 of the Federal Water Pollution Control Act, are waters of the United States. No one may add dredged or fill materials into water bodies of the United States, including wetlands without obtaining a permit from the Corps of Engineers. Wetlands have been defined as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil condition.

Additionally, Freshwater Wetlands, including certain buffer areas, are subject to state regulation as well under the Freshwater Wetlands Protection Act.

"Coastal Wetlands" are lands over which the State of New Jersey for ecological reasons, has been given regulatory powers covering both use and development. These wetlands include any bank, marsh, swamp, meadow, flat or other low land subject to tidal action in the State of New Jersey, at particular locations stated in the "Wetlands Act" of 1970 N.J.S.A. l3:9A-l et seq. and whose surface is at or below an elevation of 1 foot above local extreme highwater and upon which may grow or is capable of growing some, but not necessarily all, of certain grasses and plants listed in the act. These "Wetlands" shall not include any land ("meadowland") or real property subject to the jurisdiction of the Hackensack Meadowlands Development Commission.

b. State of New Jersey, Department of Environmental Protection, Division of Water Resources.

"Floodway" areas when specifically designated by the Department includes the natural water channel and portions of the immediate adjacent overbank. This area carries the major portion of the flood flow with correspondingly greater depths and higher velocities and, therefore as such, makes up a higher energy zone.

The major objective of this land use classification is to control those land uses which have a high potential for environmental harm, particularly increased flood damage, such as structures that obstruct or back-up flood waters, pollution sources, dangerous objects which a flood might sweep along, and stream modifications.

c. U.S. Army Corps of Engineers District Engineer, Philadelphia or New York District. In some areas of New Jersey, harbor lines have been established by the Secretary of the Army for the protection and preservation of the harbor. Detailed location information may be obtained from the District Engineer.

"New Jersey Meadowlands" are lands to which the State of New Jersey has assumed a certain control, and which are shown on filed maps entitled the "Hackensack Meadowland Reclamation and Development Act".

"Coastal Area" is any area described in the Coastal Area Facility Review Act in which certain facilities cannot be constructed without first obtaining a permit. Generally, this Act does not apply to those portions of the coastal areas regulated pursuant to enforceable orders under the Coastal Wetlands Act.

"Pierhead Line" is the outward limit line by the Secretary of the Army and sometimes adopted by the State of New Jersey, to which an open structure may be built through which, however, a tide can ebb and flood.

"Bulkhead Line" is also the outward limit line established by the Secretary of the Army and sometimes adopted by the State of New Jersey, on which a structure may be built and to which solid fill may be deposited.

"Pierhead-Bulkhead Line" is a combined line and the solid fill may be extended thereto.

"New Jersey Pinelands Commission" is a regulated area protecting the Pinelands National Reserve.

Exhibit 9-5 GPPM Checklist

☐	SCALE
☐	SHEET SIZE
☐	TITLE BLOCK/SURVEYOR'S TITLE BLOCK
☐	REVISION BOX
☐	TOPOGRAPHY (PER SECTION 9.5.6)
☐	NORTH ARROW
☐	BAR SCALE
☐	COUNTY/MUNICIPAL LINES
☐	EXISTING/PROPOSED BASELINE DATE
☐	OWNERSHIP INFORMATION
☐	PROPOSED EDGE OF PAVEMENT AS DASHED
☐	EXISTING/PROPOSED BASELINE DATA
☐	PROPOSED & EXISTING MONUMENTS
☐	NOTES/SURVEYOR NOTES/RESEARCH REFERENCES
☐	MATCH LINES
☐	FIELD TIES
☐	NJ PLANE COORDINATE GRID MARKS
☐	PARCEL METES AND BOUNDS TABLES
☐	WETLAND DELINEATION*
☐	SURVEYOR SIGNATURE AND SEAL
☐	RESTRICTIONS (ENCUMBRANCES)*
☐	RESOURCES UTILIZED (MAPS, TAX MAPS, ETC.)
*WHERE APPROPRIATE	

9.2.5. Individual Property Parcel Maps (IPPMs)

Individual Property Parcel Maps (IPPMs) serve as the acquisition mapping. This mapping along with the corresponding Metes and Bounds descriptions are utilized by the Authority's Law Department to acquire all necessary rights for a project. The mapping itself is property specific and defines the existing property boundaries and improvements as they relate to the proposed takings. These are the most refined and specific form of mapping, similar to a puzzle piece in the overall GPPM and ETM sheet set. The information below are standard requirements to be utilized in the preparation of the IPPM sheet set. More detailed ROW design guidelines are discussed in section 9.5 of the Procedures Manual. Prior to submission,

Exhibit 9-6 IPPM Checklist shall be utilized by the Engineer to confirm the documents are prepared accordingly.

1. Scale - variable - appropriate to show complete parcel on 8 1/2" x 11" sheets with match lines. If necessary, 8 1/2" x 14", 18" x 24", 11" x 17", or 22" x 36" sheets may be used. If one sheet, it is noted "Exhibit A". If more than one sheet, they are noted "Exhibit A-l, A-2, etc.".
2. Information shown is the same as for the GPPMs for the specific parcel including adjacent owner's names; and specifically noting the current owner/owners' name/names. Any deeds, maps or recorded documents utilized in establishing the existing ROW and property lines shall be referenced within the notes. All existing property markers and monuments found shall be labeled and shown on map.
3. IPPMs must include an inset of the entire property on which the parcel is located, if needed to show the entire property. The parcel to be acquired should be the focus and remain at the specified scale.
4. IPPMs are to be color-coded as follows:
    a. Outline proposed fee taking parcels and fee taking parcel number balloons in red.
    b. Outline proposed slope easement parcels and slope easement parcel number balloons in yellow.
    c. Outline proposed bridge easement parcels and bridge easement parcel number balloons in purple.
    d. Outline proposed drainage easement parcels and drainage easement parcel number balloons in green.
    e. Outline proposed utility easement parcels and utility easement parcel number balloons in blue.
    f. Outline proposed permanent and temporary construction easement parcels and construction easement parcel number balloons in orange.
    g. Outline temporary and/or detour roads or other features outside the ROW, not mentioned above, in brown.
    h. Outline dominant estate parcels and lines in pink.

Exhibit 9-6 IPPM Checklist

☐	SCALE
☐	INSET*
☐	COLOR CODE
☐	OFFSETS
☐	BASELINES
☐	SLOPES (INCLUDING RATIO)
☐	TOPOGRAPHY (PER SECTION 9.5.6)
☐	EXISTING EASEMENTS
☐	EXISTING STREET WIDTHS
☐	PROPOSED EASEMENTS
☐	EXISTING DEED COURSES
☐	WETLAND DELINEATION
☐	RESOURCES UTILIZED (MAPS, TAX MAPS, ETC.)
☐	SCALED DISTANCES
☐	BLOCK AND LOT
☐	NORTH ARROW
☐	BAR SCALE
☐	PARCEL BUBBLE
☐	TITLE BLOCK/SURVEYOR'S TITLE BLOCK
☐	REVISION BOX
☐	SURVEY NOTES (ESTABLISHING ROW)
☐	PARCEL IDENTIFICATION AREA
☐	REMAINING AREA
☐	CONTIGUOUS FEE PARCELS
☐	PARCEL METES AND BOUNDS TABLE
☐	SURVEYOR SIGNATURE AND SEAL
*WHERE APPROPRIATE	

9.2.6. Jurisdictional/Special Maps

Jurisdictional Limit Maps (JLMs) are utilized as exhibits to the Jurisdictional Limit Agreements (JLAs) and should only show features that will exist when the project is completed. While not being part of the Final ROW document submission recorded by the Engineer at the County Clerk's Office, the Jurisdictional Agreement and mapping play an equally important role in a project. It is necessary that the Authority apportion the jurisdiction for highway maintenance and control in an equitable manner to prevent future legal or maintenance problems where local or State roads intersect with the New Jersey Turnpike and Garden State Parkway. This section of the ROW procedure guidelines will serve as a supplement to Section 6.5.9 of this manual. The maps and jurisdictional agreements should only show proposed features that will exist once the project is completed.

It is imperative that the Design Engineer inquire about the necessity of preparing or updating a JLM during the Preliminary Engineering phase of the project. Depending upon the proposed improvements and scale of the project, the Authority will direct the Engineer of its applicability to the project. Bearing in mind that the mapping is an exhibit to a legal document, it is paramount that the Design Engineer work closely with the Authority's Engineering and Law Departments early during the design and establish an overall draft Jurisdictional Map. This will assist the Authority in beginning conversations with appropriate stakeholders early during the project, so that a more refined and accurate Jurisdictional Limit Agreement can be executed prior to construction and ultimate use of the improvements. Upon determination of jurisdictional limits, design standards shall be verified between stakeholders.

Depending upon project needs and stakeholder requirements, some projects may require preparation of multiple JLAs and related JLMs for the same area. While a single JLA is the preference by the Authority at interchanges and crossings, some stakeholders may be reluctant to execute multiple party agreements. The stakeholders to be included in the agreement is at the direction of the Authority.

The guidelines and checklist in Exhibit 9-7 are for general JLM preparation only. Depending upon the Stakeholders involved, the standard notes and maintenance responsibilities and control may be modified at the direction of the Authority's Engineering and Law Departments. Key JLM components and examples are discussed below. A full example of a JLM can be found in the Sample Plans on the Authority's website.

Exhibit 9-7 JLM Checklist

☐	TITLE BLOCK
☐	NORTH ARROW
☐	SCALE
☐	ROADWAY NAMES AND ROUTE NUMBER
☐	BASELINES AND STATIONING
☐	COUNTY/MUNICIPAL LINES
☐	COUNTY/MUNICIPAL NAMES AT TOP OF PLAN
☐	FINAL ROW AND PROPERTY LINES
☐	NO ACCESS LINES
☐	TOPOGRAPHY*
☐	DRAINAGE WITH DIRECTIONAL FLOW
☐	FINAL/EXISTING EASEMENTS
☐	LEGEND
☐	LIMITS OF SHADING/HATCHING IDENTIFIED
☐	STANDARD NOTES DEFINING ROADWAY AND STRUCTURAL MAINTENANCE AND HIGHWAY CONTROL
☐	SIGNATORY TITLE AND EXECUTION LINES
☐	REVISION BOX
☐	AUTHORITY AGREEMENT NUMBER
*WHERE APPROPRIATE	

Exhibit 9-8 depicts the standard notes designating roadway and structural maintenance responsibilities to be utilized in the preparation of the JLM. The maintenance responsibilities need to mirror the language within the JLA, so close coordination with the Authority is required to ensure the mapping and agreement are consistent. Note that dependent upon the stakeholders executing the JLA, the notes utilized may change.

Exhibit 9-8 Standard JLM Notes

ROADWAY MAINTENANCE:

ROADWAY MAINTENANCE INCLUDES MAINTENANCE AND REPAIR OF PAVEMENT, CURBS, DRAINAGE, STORMWATER BASINS, MANUFACTURED TREATMENT DEVICES, FENCING, BERMS, GUIDE RAIL, SLOPES OF CUT OR FILL ASSOCIATED WITH THE ROADWAY, PAVEMENT MARKINGS, DELINEATORS, SIGNS, GUIDE RAIL END TREATMENTS, MOWING, LANDSCAPING AND SNOW AND ICE REMOVAL.

STRUCTURAL MAINTENANCE:

STRUCTURAL MAINTENANCE INCLUDES MAINTENANCE AND REPAIR OF THE SUPERSTRUCTURE, SUBSTRUCTURE, UNDER BRIDGE SLOPE PAVING, ABUTMENTS, ABUTMENT JOINTS, APPROACH SLABS, WING WALLS, BRIDGE PARAPET MOUNTED FENCING, SIGN STRUCTURES, DECK LIGHTING, RETAINING WALLS, REPAIR OF STRUCTURE DAMAGE DUE TO NORMAL WEAR AND USE AND ANY ACCIDENTAL STRUCTURE DAMAGE, AND PERIODIC BRIDGE INSPECTION. STRUCTURAL MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE NJTA. UNDERBRIDGE LIGHTING SHALL BE THE RESPONSIBILITY OF THE PARTY WHO MAINTAINS THE BRIDGE STRUCTURE.

As discussed above, the stakeholders executing the JLA determines the notes to be utilized in the JLM preparation. Exhibit 9-9 depicts the notes required for a JLA to be

executed with the New Jersey Department of Transportation (NJDOT). This is to be utilized at the direction of the Authority's Engineering and Law Departments. Again, it is imperative that the maintenance responsibilities and control language mirror each other within both the agreement and mapping.

Exhibit 9-9 Sample Notes for JLM with NJDOT (at the direction of the Authority)

ROADWAY MAINTENANCE:

MAINTENANCE OF HIGHWAY AREA INCLUDING, BUT NOT LIMITED TO; THE UPKEEP OF PAVEMENT, CURBS, SIDEWALKS, DRAINAGE, STORMWATER BASINS, MANUFACTURED TREATMENT DEVICES, BERMS, INFIELDS, SLOPES OF CUT OR FILL ASSOCIATED WITH THE ROADWAY, LIGHTING, GUIDERAIL, SIGNS, DELINEATORS, IMPACT ATTENUATORS, PAVEMENT MARKINGS, TURF MANAGEMENT, MOWING, LANDSCAPING, FENCING, LITTER PATROL, POLICING, EMERGENCY SERVICES, SNOW AND ICE PATROL.

HIGHWAY CONTROL:

REGULATION AND MANAGEMENT OF THE HIGHWAY AREA INCLUDES, BUT NOT LIMITED TO; CONTROLLING ACCESS, REVIEWING PERMITS FOR ROADWAY OPENINGS, DRIVEWAYS AND UTILITIES, TRAFFIC PERMITS AND LICENSES TO CROSS, AS APPLICABLE, REVIEWING ALL PROPOSED GEOMETRIC CHANGES, AND SETTING SPEED LIMITS, NO PARKING ZONES AND OTHER TRAFFIC CONTROL.

STRUCTURAL MAINTENANCE:

MAINTENANCE OF STRUCTURE TO PRESERVE OR RESTORE ITS STRUCTURAL INTEGRITY INCLUDING, BUT NOT LIMITED TO, MAINTENANCE AND REPAIR OF THE SUBSTRUCTURES, SUPERSTRUCTURES, UNDERBRIDGE SLOPE PAVING, ABUTMENTS, ABUTMENT JOINTS, APPROACH SLABS, BRIDGE DECKS, WINGWALLS, SIGN STRUCTURES, NOISE BARRIERS, RETAINING WALLS, AND SIDEWALKS ON STRUCTURE. ADDITIONALLY, "STRUCTURAL MAINTENANCE" SHALL ALSO INCLUDE SAFETY RELATED ELEMENTS PERTAINING TO THE STRUCTURE SUCH AS GUIDERAIL ATTACHMENTS, PARAPETS, AND BRIDGE PARAPET MOUNTED FENCE, AS WELL AS RESPONSIBILITY OF BRIDGE INSPECTION.

The JLM title block is prepared similar to the title block on the GPPM/ETM sheet set. The exhibit should be identified appropriately (i.e. "Exhibit – X"). See Sample Plans on the Authority's website.

9.2.7. Special Maps/Right-of-Entry Exhibits

For all property to be acquired whether in fee or in easement, the Engineer on an as needed basis shall submit to the Authority's Engineering Department Right-of-Entry Exhibits of an adequate scale, which have been color coded, to assist in the procurement of a Right-of-Entry (ROE) for the Project.

These Exhibits shall show the owner's property in its entirety along with the Parcels being acquired by the Authority on 8-1/2" x 11", 8-1/2" x 14", 11" x 17" or 22" x 36" sheets.

Larger sizes are acceptable provided they can be folded "accordion style" to comply with the previously stated sizes.

Specific requirements are as follows:

1. Three copies will be submitted with each ROW submission.

2. Exhibit shall include the Section Number, Parcel Number, Parcel Area, Roadway Names and/or Numbers, Remainder Areas, Scale and North Arrow.
3. The color-coding shall be in accordance with Paragraph 9.2.5, 4a through 4g.

On occasion and at the direction of the Authority's Engineering Department, special mapping may also be required in instances of unforeseen impacts where the ROW impact is so insignificant and not permanent in nature. The Authority may utilize the option of obtaining a ROE to secure temporary rights of access. This type of request is not a preferred method to gain access and is utilized, for example, when an unforeseen need arises for the contractor to access an area outside of the ROW. Typically, a construction plan is utilized as an inset to a standard IPPM template with the limits of disturbance identified with offsets and distances shown from the existing ROW. The plan is intended to be simplistic in nature so that the property owner has a clear understanding of the temporary impacts. The Engineer should also provide the Authority's Engineering Department a description of the work to occur within the temporary use area and an estimated term of use. An example of this type of map can be found in Exhibit 9-17

9.2.8. Cover Sheet/Alignment Data Sheet

The Cover or Key Map Sheet represents an overall snapshot of the project location, as well as serves as the signatory page for not only the Surveyor and Engineer but the Authority's Chief Engineer and General Consulting Engineer (GCE). The execution of this cover sheet affirms acceptance of the ROW documents by the Authority, its GCE and preparers. It is very important that the information provided on the cover sheet is current and accurate. During the life cycle of a project, Authority Commissioners or titles may change. Prior to finalizing the cover sheet, the Engineer is to confirm all names and signatories are reflected correctly. The surveyor certification notes in

Exhibit 9-10 should be shown and executed on the cover sheet upon final approval by the Authority. An example of a Cover Sheet can be found in the Sample Plans on the Authority's website.

Exhibit 9-10 Surveyor Certification Notes

I CERTIFY THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS MAP AND LAND SURVEY DATED_____, 20____ MEET THE MINIMUM SURVEY DETAIL REQUIREMENTS OF THE STATE BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS AND THE MAP HAS BEEN MADE UNDER MY SUPERVISION, AND COMPLIES WITH THE APPLICABLE SECTIONS OF TITLE 46 OF THE REVISED STATUTES (N.J.S.A. 46:26A-1 THROUGH N.J.S.A. 46:26B-8 ET SEQ.).

THE PROPOSED CORNER MARKERS, (MONUMENTS AND CAPPED PINS), ARE TO BE SET BY A N.J. LICENSED LAND SURVEYOR AFTER THE COMPLETION OF CONSTRUCTION ACTIVITY AND ARE THE RESPONSIBILITY OF THE CONTRACTOR. IN THE EVENT THAT A MONUMENT CANNOT BE SET IN THE LOCATION SHOWN, A MONUMENT WILL BE SET ON AN OFFSET.

FOR:

_____ DATE _____

JOHN DOE
PROFESSIONAL LAND SURVEYOR
NJPLS Lic. No. XXGSXXXXXXXX

Preparation of Alignment Data Sheets are required for all projects and are part of the GPPM/ETM Sheet set recorded at the County Clerk's Office. Most projects involve proposed construction along the existing alignment of the road. In order to accurately locate the ROW, the centerline and other features of the existing facility, ROW markers/monuments, bridge abutments and other easily identifiable improvements should be accurately tied to the control points established by survey. Once coordinates are computed, the existing centerline and ROW line can be established. The Alignment Data sheets should depict the relationship between the existing and proposed ROW with ties and related survey-based data referenced and computed. An example of an Alignment Data sheet can be found in the Sample Plans on the Authority's website.

9.3. METES AND BOUNDS DESCRIPTIONS/ROW PARCEL DATUM

1. For all property to be acquired whether in fee or easement, the Engineer shall prepare a Metes and Bounds description also known as a ROW Parcel Data Sheet. This written description is utilized as an exhibit to the IPPM further describing the ROW taking as it relates to the property and illustrated on the corresponding IPPM. The metes and bounds description is utilized by the Authority's Law Department during the Acquisition Process and is part of the acquisition documents.

2. The ROW Parcel Data Sheet is to be incorporated into a form as shown in Exhibit 9-15. The date of the preliminary submission should be in the upper left corner of each Data Sheet. Subsequent revisions shall be noted. This applies to property taken in fee as well as easements. If negotiations indicate the need for separate descriptions, or the attachment of additional specific forms supplied by others, they shall be prepared in accordance with instructions from the Authority's Engineering Department.

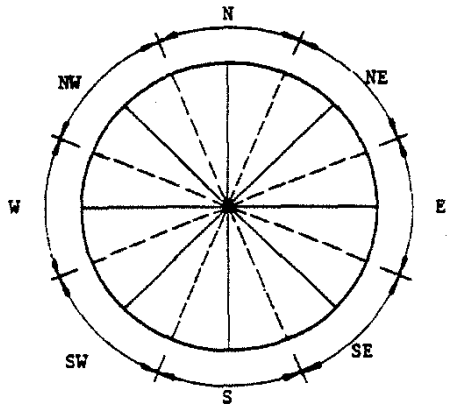
3. During negotiations with Property Owners, the Authority's Law Department may make accommodations regarding partial takings, including but not limited to, limitations regarding access to the property. In such cases, it may be necessary to revise maps and descriptions to delineate adequately the nature of the commitments, and the provision of information for engineering design in conformity with the accommodations. The Engineer is to assure that any and all of these "commitment driven" modifications are properly shown within the final contract documents (plans and specifications) so that all of these issues are clear to the contractor prior to bidding on the project.

4. Metes and Bounds descriptions shall include referencing each parcel by project baseline stationing so that the location of each parcel will be defined with respect to the baseline. The station selected shall identify the extremities of the parcel (see Exhibit 9-14). When deemed necessary, the Engineer may reference parcels fronting on local, county or State roads to stationing other than New Jersey Turnpike or Garden State Parkway baselines, with prior approval from the Authority's Engineering Department. All Metes and Bounds Descriptions are to be signed and sealed by the surveyor.

5. Types of Descriptions

   a. Standard format - format - Each description shall contain metes and bounds beginning at an easily identifiable proposed or existing ROW line, side street, road, etc., and continuing clockwise around the parcel to the point of beginning. The directions in the description used shall be as indicated in **Exhibit 9-11**.

Exhibit 9-11 Compass Direction



When referring in the descriptions to side lines of roads or to any lines other than those Authority owned, the lines shall be referred to as "northerly line", "southwesterly line", etc., instead of "right of way" to eliminate confusion. Standard clauses are indicated in Exhibit 9-18.

   b. Easements - note these additions on the Parcel Description. See standard clauses (Exhibit 9-18)

c. Entire taking - the lot and block clause should be included in the description on the ROW Parcel Data Sheet.

d. Partial taking – "Being a portion of Lot No. ___ in Block No. __" should be noted.

e. Remainder Parcel (RA-Parcel) - a ROW Parcel Data Sheet and parcel description is to be prepared when the Engineer is advised that the remainder will be purchased by the Authority, the associated GPPM and IPPM shall be amended at the same time to reflect the RA parcel number.

f. Vesting clause should be included at the close of description referencing the last recorded deed information.

g. All Metes and Bounds descriptions should be prepared in accordance with Title Recordation Law (N.J.S.A. 46:26A, 26B and 26C et seq effective date May 1, 2012), successor to the "Map Filing Law and shall be signed by a New Jersey State Licensed Professional Land Surveyor.

h. All metes and bounds descriptions shall be submitted electronically in both PDF and Word (DOCX) format.

9.4. Parcel Index and Ownership Data Sheets

1. The Engineer shall prepare a tabulation of property parcels for the project. This listing will serve as a composite reference for all pertinent information given on the ETMs and GPPMs and shall appear after the Key Map/Cover Sheet (see Sample Plans on the Authority's website).

2. Due to contract phasing, additional parcel takings having a common owner, may be designated by a different suffix letter, even if they are adjacent or continuous tracts of land from a previous contract.

3. General Requirements

   a. CADD Standards shall be the same as for ETMs and GPPMs.

   b. Sheet numbers will be assigned by the Authority's Engineering Department.

   c. Title box shall be similar to ETMs and GPPMs (see Exhibit 9-3).

4. All reference maps used in the preparation of the ROW plans shall be listed at the bottom of the sheet.

5. Sheet shall be of tabular format, listing the required information beneath the following column headings. Ditto marks are to be used for identical repeating entries. All presently owned Authority "RA-Parcels" should be noted as such in the remarks column.

   a. Baseline or centerline used for station reference

   b. Parcel number

c. Map reference number - the GPPMs

d. Parcel area

e. Parcel location (Station to Station - Left or Right)

f. Easement, type and ownership

g. Name and mailing address of owner

h. County of recording

i. Deed book and page number

j. Tax map, block and lot

k. Filed map, block and lot

l. Remarks *

*Parcels that are acquired to support infrastructure other than that of the Authority shall have a note within the Remarks column, designating that parcel to be assigned or conveyed to the appropriate party. This should include fee and easement parcels for local roads, utility easements for private entities, etc.

9.5. ROW DESIGN GUIDELINES

9.5.1. Parcel Types and Numbering

There are two types of property interests acquired to facilitate proposed project improvements. Fee parcels are parcels that are acquired by the Authority as the underlying fee interest owner. These parcels are usually acquired to accommodate that actual infrastructure, such as roadway surface, bridge abutments, guide rail, etc. The limits of the fee parcel define the "Proposed Right of Way Line". Fee parcels may be acquired subject to easement rights. Depending upon the design criteria, nature of the utility and existing rights of the utility, these utilities may have to be relocated within the proposed ROW or outside of the fee parcel in the form of a separate fee or easement. Fee parcels can also be required for mitigation or for satisfaction of environmental permitting requirements.

Types of Fee parcels include:

- Entire acquisition - whole property is acquired with no remaining area (RA).
- Partial acquisition – only a portion of the property is acquired with the owner having a remaining area (RA).
- Tidelands - a parcel to be acquired that is located within actual flowing tidal waters and having a riparian interest.
- Mitigation Parcels – fee parcels beyond the Proposed ROW Line that are required for mitigation purposes due to environmental permitting associated with a project. Land already owned by the Authority can also be utilized to

satisfy mitigation requirements and should be investigated prior to initiating ROW mapping of privately-owned property.

An easement parcel is a parcel that acquires a partial interest for a specific right or use of property outside of the ROW. Unlike fee parcels, once acquired the Authority is not the underlying fee owner of the land itself and has a less than fee interest.

Types of easement parcels include:

- Slope easement
- Drainage easement
- Utility Easement
- Bridge Easement
- Aerial Easement
- Roadway Easement
- Construction and Maintenance Easement
- Temporary Construction Easement
- Private Access Easement
- Sight Triangle Easement
- Conservation Easement
- Flood Fringe Easement

Parcels will be designated using a series of basic parcel numbers which will be assigned by the Authority's Engineering Department. These numbers will be part of an overall Authority numbering sequence. The Engineer shall furnish to the Authority's Project Manager the approximate number of parcels involved, as early as possible, so that the numbers to be assigned can be established.

1. Parcel designations shall be placed on the maps in locations that promote clarity, and shall be situated adjacent to the owner's name, using leader extensions if necessary. The parcel designation shall be enclosed in a circle of 5/8-inch diameter as noted in Attachments. (Larger only if required for clarity)
2. Different parcels having a common owner shall be identified by the same basic numeral and these individual parcels shall be further designated by adding a suffix letter. These letters shall be assigned in sequence from "A" to "Z", then "Ak" to "Az", except that the letters I, 0, U, X, and Y shall not be used.
3. The prefix letter RA shall be used to designate any remaining area adjacent to an area of taking. When there is only one such remainder, it shall be designated RA. When there are more than one such remainders for a given parcel, they are

designated, RA-l, RA-2, RA-3, etc. When a remainder is clearly associated with a specific parcel of a common owner, the common ownership suffix letter is included in the RA-Parcel designation. Remaining areas (RA prefix) do not have a Parcel Bubble placed around them unless being acquired as uneconomic. The Engineer will be instructed by the Authority as to the treatment of such remainders on Project Plans.

4. Prefix Letters

a. Prefix Intended Use or Encumbrance (Consider additional description in previous section)

A.....permanent access or marginal (frontage) road

AE.....Aerial easement

BE.....Bridge easement

C.....Construction easements (a temporary easement) are to be given a parcel number only when there is no fee taking or other easement required from a given owner. Where other transactions are involved, construction easements should be shown as an additional clause in the Agreement, preceded by the words “AND ALSO the right to Construction Easements are necessary for reconstruction / relocation of private driveways.”

D.....Drainage easement (limits or width defined)

DA.....Denial of access

E.....Easement (slope)

F.....“Floodway” is a specific designation by D.E.P., Division of Water Resources which aims to control activities harmful to the environment by this land-use classification.

PA.....Private access

PE.....Protective easement

RA.....Remaining Area adjacent to an area of taking.

SD.....Sight Distance

T.....Parcel involves tidal land for which the riparian rights are owned or claimed by the State. A “T” parcel is that land owned or claimed up to the mean high- water line.

TE.....Easement on parcel having riparian “T” prefix.

Q.....Parcel involves tidal land for which the riparian rights are owned or claimed to some extent (more questionable ownership or land which is subject to State regulations and lies between mean high water line and some other line, such as a

line at an elevation of 1 foot above local extreme high water forming an area subject to State regulatory powers, (see Subsection 9.2.4 "Wetlands"). This Q prefix shall also be used to designate State owned interests, other than those represented by the riparian "T" prefix, labeled "portions of these areas were formerly below mean high water" as shown on maps entitled "Hackensack Meadowlands". Proof as to the State's ownership is to be provided with the parcel submission.

QE.....Easement on parcel having riparian "Q" prefix.

UE.....Utility easement

b. The meaning of these letters is dependent upon the meaning of the suffix letters described above. That is, parcel UE2OF is adjacent to Parcel 20F. Two UE parcels would be noted UE2OF and 2UE2OF.

c. To indicate that a revision to the description or map for a given parcel has been made, R, 2R, 3R, RUE, 2RUE, etc. will be used for successive revisions. Revision shall be made only after a Phase C parcel submission has been made to the Authority's Engineering Department, unless otherwise directed due to project scheduling.

d. If the same prefix is required for a given owner more than once, the prefix letters are preceded by the appropriate numbers (e.g. E, 2E, 3E, or UE, 2UE, 3UE, etc.).

e. All temporary easement descriptions shall include the duration of time necessary for the proposed work to be completed. This duration is to be based only on the time necessary to complete the work on the subject property, and not the project in general. The description shall indicate the easement as beginning upon the owner's receipt of written notification from the Authority's Construction Engineer or designee. Should the duration need to be extended for cause, the description should also state that the owner shall be compensated at the same rate of payment indicated within the Authority's approved appraisal, (see Exhibit 9-18).

5. Different Uses

In those cases where various parts of a property are to be used for different purposes, each such different-use part shall be given a separate parcel designation even though the different uses may overlap. The only difference between the separate designations shall be in the prefix letter described elsewhere in this Section.

6. In some cases, multiple use of all or part of a taking will be contemplated. For example, it may be necessary to obtain a drainage easement for all of a parcel and an easement for relocation of a utility on part of it. In such cases the same basic numeral shall be used in the parcel number, but each easement shall be identified by a separate parcel designation (the designations differing only in the appropriate prefix letter in each case) and shall be treated in all respects as a separate and

distinct unit in itself. The easement areas shown are for the particular easement involved, even though the areas may overlap (see Exhibit 9-15).

7. Previously Acquired Parcels

   a. Property outside of the existing Authority ROW line that is presently owned by the Authority shall be treated as a normal parcel in that it is assigned a parcel number. All such tracts within a Section shall be indicated by one basic Parcel number and suffix letters accordingly.

   b. Property previously acquired by an agency other than the Authority, which is outside of the ROW established by that agency (e.g. a slope easement outside a State route), shall be clearly noted on the Property Map with reference to the route, section, date of acquisition, etc.

8. Parcels that have been identified and later eliminated from the contract are to be noted "Parcel Eliminated" and a cross is to be drawn through the parcel number on both the ETMs and GPPMs. A line should also be drawn through the entire parcel entry on the Parcel Index and Ownership Data sheet and the parcel noted as "Eliminated". The parcel number is not to be reassigned to another property.

9. For parcels that are identified and later subdivided, a note is to be made next to the original parcel designation clearly identifying the parcels into which it was subdivided on the ETMs and GPPMs (e.g. Parcel 25 subdivided into Parcels R25 and RA-25, or 25A and 25B, Parcel 25A subdivided into Parcels 25A-l and 25A-2). The original parcel designation is to remain on the maps.

9.5.2. Specific Design Considerations

When warranted, the Engineer is encouraged to be creative in its ROW design in an effort to minimize potential ROW and Environmental impacts. The Authority being a toll agency with limited access roadway, standard minimum roadway widths and offsets tend to be required. This may somewhat limit the Engineer's ability to be creative but when considering impacts to parcels where damages are significant, design alternatives should be considered to limit the impacts to a feasible extent without sacrificing the design needs. Any alternative approach should be discussed with the Project Manager, ROW Manager and Authority Engineering.

In the following situations, the criteria to be used for the establishment of a proposed ROW taking line shall be the one which results in the designated maximum ROW width as determined by the Authority's Engineering Department. However, where special conditions or constraints are present, reduced or enlarged limits of taking may be necessary. Additional studies may be required, such as side slope analysis and the use of retaining walls. While utilizing retaining walls is not preferential to the Authority, such value engineering studies may be necessary as a means of comparison. In these latter

cases, approval shall be obtained from the Authority's Engineering Department for such revised widths.

Earthwork Sections unless otherwise approved by the Authority's Project Engineer

a. The ROW line, where practical, shall be a minimum of 70 feet from the outside edge of through-travel pavement, unless otherwise approved by the project engineer.

b. The ROW line shall be a minimum of 25 feet from toe of slope, where no drainage ditch at the toe of slope is present.

c. The ROW line shall be a minimum of 10 feet from the top of ditch back slope where a drainage ditch at the toe of slope is required.

d. The ROW line shall be a minimum of 10 feet outside the top of slope where no top of cut ditch is required.

e. Imbedded slope supports (e.g. Soil nails) need to be included in the fee and with an appropriate offset for maintenance.

f. The ROW line shall be a minimum of 10 feet from the top of ditch backslope where a top of cut ditch is required.

Structures unless otherwise approved by the Authority's Project Engineer

a. At short overpass type structures, the ROW line is to be determined by the approach embankment.

b. Along long bridges and viaducts, the ROW lines are to be established at minimum of 50 feet outside the fascia lines of structure. Easements will be acceptable for those cases where fee acquisition is not feasible, i.e. as at railroads, certain utilities, etc.

The above noted criteria also apply to design sections. In addition, for those areas on a new alignment a minimum right of way width will be determined by the ROW Manager.

For areas where something less than fee is required outside of the ROW, an easement must be secured. All work that is done on, or associated with disturbance to, property outside of the ROW requires rights whether permanent or temporary in nature. All easements shall be assigned a parcel designation and area. When advancing the ROW Design, the following list of design guidelines should be considered:

1. As stated in this Section with respect to parcel designations, easements for different types of work or disturbances are separate and distinct. Easement areas may overlap and should also be shown on Authority owned land outside the ROW. Within the ROW, utilities are not located within easements but are there by permit as explained in Section 8.2.8. Utility Installations of this Manual.

2. Slope easements and drainage rights shall be of a size adequate to include an allowance for "wash and spread" consistent with the type of material in the embankment and the height and steepness of slope, and also an allowance for drainage rights along the toe of slope. The slope ratio should be referenced on the IPPM, see Exhibit 9-15 note 8. In cases where the slope easement is within 5' of a structure, an approximate distance should also be shown on the IPPM. Slope design criteria is further discussed above in earthwork section.

3. The descriptions of drainage easements shall provide for all requirements necessary in connection with cross-drains, culverts, ditches, headwalls and related appurtenances. The right and/or the responsibility for maintenance and the need for the privilege to enter upon lands of the owner for the purpose of deepening, widening, or straightening an existing water course shall be considered, and the appropriate clauses included in the Description.

4. Maps will be the same for permanent and for temporary easements. The description and prefix letter shall indicate the permanent or temporary nature. In the description, a suitable statement should denote the conditions governing terminations.

5. The limits of easement lines shall be referenced by project baseline stationing and offset right or left on the Parcel Index and Ownership Data Sheet and in the easement description.

6. An explanation of each easement shall be entered in the "Remarks" column of the Parcel Index and Ownership Data sheet; all easements shall be clearly indicated and labeled on the maps, and descriptions shall be prepared just as completely as for parcels for which fee title is to be acquired.

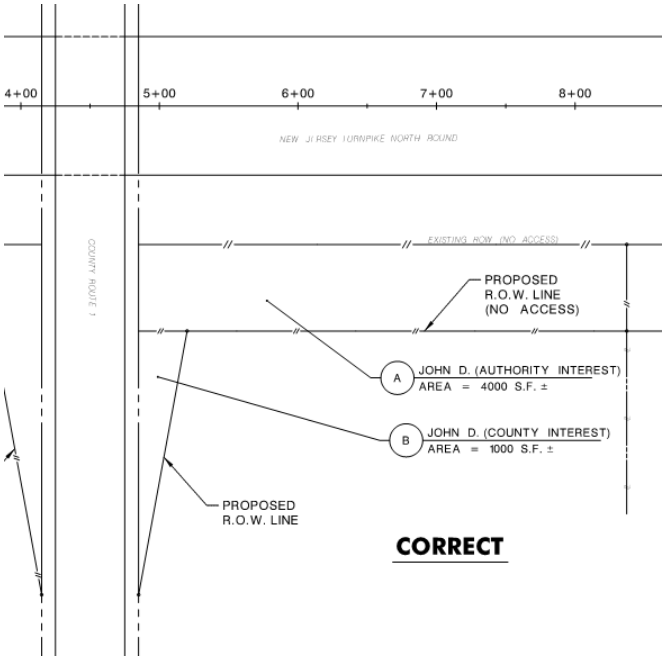
7. Treatment of public utility easements is often subject to the requirements of that utility. The Authority often must purchase an easement across public utility property rather than a purchase in fee. Specific agreement terms between the Authority and the public utility must be determined by the Engineer in conjunction with the utility owner.

8. Right-of-way fence is normally constructed approximately 0.3 - 0.6 meters (1 to 2 feet) inside the established right-of-way. Normally, the centerline offsets, survey for right-of-way markers and other control surveys have basically established the fence line location. Some additional staking may be required, such as gate, end panel and brace panel locations. Fence should be measured as construction progresses and gate, cattle guard, brace panel, and end panel installations documented in relation to the project stationing. Construction area fencing should be staked prior to any construction activity in the area.

9. When designing the proposed ROW, it is the responsibility of the Engineer to have a clear understanding of the end user or benefactor of the ROW to be acquired and to

incorporate that into the ROW design. The ROW plans must accurately depict parcels that support Authority owned infrastructure versus parcels that are being acquired by the Authority to support State, County or Municipal infrastructure. Parcels whether Fee or Easement should be designed so they are standalone parcels that support each individual party interest. Similar to shading and hatching found on the Jurisdictional Mapping, the ROW design and parcels should be reflective of the separation of ownership interests. Parcels that do not support the Authority's infrastructure will ultimately be assigned or conveyed to the appropriate party of which the improvements support. See Exhibit 9-12 demonstrating the correct ROW design.

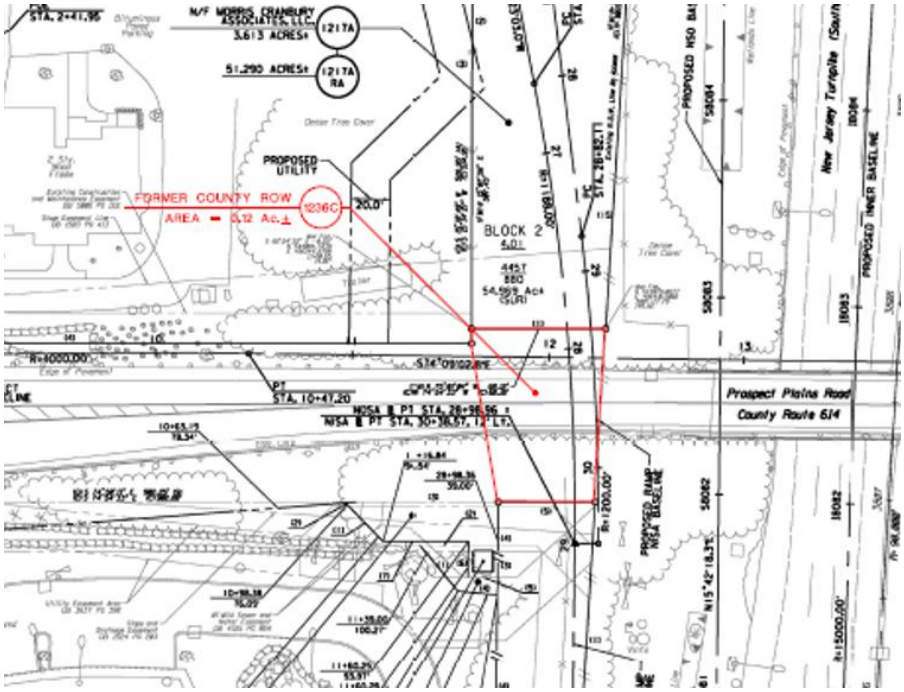
Exhibit 9-12 Sample of Parcel Split



Additionally, when incorporating State, County or Municipal ROW into the Authority's ROW, a parcel designation is required. The ROW design should capture the former ROW whether in fee or easement. Exhibit 9-13 shows a fee parcel that is required where

former County ROW has been incorporated into Authority ROW to accommodate an at grade slip ramp and shoulder. This same practice should be applied to secure aerial rights over with a parcel prepared and ultimately acquired.

Exhibit 9-13 Sample of Local ROW Parcel



It is recognized that special situations, based on other than the above criteria may dictate ROW acquisition. In these cases, the recommended ROW should be reviewed with the Authority's Engineering Department and approval secured before final ROW maps are prepared. Right of way lines shall be defined by "set' stations and offsets from a proposed baseline. These set dimensions should be established at maximum intervals of approximately 500 feet along the baseline. A series of chords is preferable for the ROW line; however, curves may be used if necessary, for a concentric ROW line. At least two set dimensions are required to define each ROW line. Existing property lines may be used as the ROW lines, provided these are located by actual field survey. It is intended to define the ROW line primarily from the roadway baseline with sufficient data being shown so that a land surveyor may establish the ROW line from the Parcel Property Map and field surveys of the existing properties. The intersections of the ROW lines so established and existing property lines shall not be designated on the drawings by station and offset from the baselines, but shall be shown merely as the drawn intersections without baseline stations and offsets.

9.5.3. Parcel Ownership

Full names of parcel owners shall be shown on the maps and in descriptions when identifying the owners of bounding properties if possible. Abbreviated names, if used, are to be as shown below:

"Richard Roe, et. ux."..... a man and wife

"Mary Roe, et. vir." ..... a woman and husband

"Richard Roe, et. al."..... two owners

"Richard Roe, et. als." ..... several owners

"Richard Roe Estate"..... the estate of a deceased owner

"Roe Realty Co."..... a company

On the Description form and Parcel Index and Ownership Data Sheet, the full names of all owners shall be completely shown.

9.5.4. Parcel Areas

Parcel areas are to be calculated using dimensions obtained from the best available data from one of the following sources: deeds, surveys (in cases where surveys have been accomplished), and calculations. Areas shall be as accurate as the basic data permits, but every effort is to be made to attain a high degree of accuracy. Areas shall be computed to the nearest square foot and 0.001 acre. When areas are shown on maps and stated in descriptions, the numbers on maps will be followed by the symbol "plus or minus" and the phrase "about' will precede the area quantity in the descriptions. Units of measure shall be shown in all instances. When more than one parcel has been designed under the same owner's name, each such parcel shall have its area expressed in the same units of measurement where feasible. Areas shall be shown on all the GPPMs.

All acquisition areas and remaining areas for a given owner shall be shown separately. The total of all acquisition areas and remaining areas shall represent that owner's complete property.

9.5.5. Street and Road Areas

In some instances, a deed is recorded which delineates the property boundaries to the center of road. Street and road areas, except where privately owned, shall not be included in an area designated by a parcel number, even though the present deeds run to the middle of the street, or even if the street or road is to be vacated. Boundaries of parcels shall be the ROW line of the contiguous street or road. Areas shall be computed, descriptions written, and referencing made accordingly. Vacated streets, proposed

streets and streets which may or may not be vacated will be noted on maps when their final status is determined. At this time the Engineer shall consult the Authority's ROW manager to determine how to move forward with the ROW mapping. In some instances, an additional parcel may be appropriate but only at the direction of the Authority. In all cases, access rights to the local road needs to be memorialized. An appropriate clause should be added to the metes and bounds description of any property which may have a right, title, and interest to the street area, or to any other areas such as those carrying reversionary clauses, etc.

9.5.6. ROW Survey

Surveys are necessary to develop data not already available or to describe adequately any proposed fee or easement acquisitions required for a project. Recordable ROW documents need to be prepared and are utilized by the Authority to acquire rights. An inaccurate survey completed during the initial phases of a project, leads to inaccurate ROW document preparation, which compromises ROW availability and results in costly project delays to the Authority. This section pertains specifically to elements of survey that relate to ROW and creation of the ROW Documents and is to be used as a supplement to Section 4 – "Design Surveys" of this manual. The topics discussed below are presented to further define the survey activities required by the Engineer and surveyor.

Existing Monumentation

All existing monumentation found shall be located and referenced by project baseline station and offset right or left and, where possible, tied to physical features, which will not be disturbed by construction. Such references shall be noted in field notebooks. Monuments reset in the field shall be referenced and tied in their new locations. Monuments shall be shown and described on the GPPM's. Before construction begins, the pertinent agencies will be contacted by the Authority's Engineering Department, and requested to remove and relocate promptly all Federal, State, County, and Municipal Government Monuments, which lie within the proposed ROW or within easements taken for project construction. It is therefore imperative that all such existing monuments be shown and referenced accurately, thus enabling accurate subsequent relocations. If an existing property marker or monument is disturbed or destroyed within a proposed temporary or permanent easement area during construction, it is the responsibility of the contractor to replace and reset that monument under the supervision of a licensed surveyor in the State of New Jersey.

Proposed Monuments

Monuments shall be proposed at each set point defining the ROW line and at all angle points in the ROW line except where the ROW line is defined by a property line not located by a property survey. The intervals between monuments shall not be greater than 1,000 feet (500 feet in built-up areas). In general, monuments shall be placed by

the Engineer supervising the construction under the direct supervision of a New Jersey licensed Land Surveyor. These monuments shall be set on the ROW line unless otherwise directed. Consideration shall be given in locating these monuments so that they will not be covered, disturbed or removed by subsequent construction or for other reasons.

All proposed monuments shall be shown on the GPPMs, shall be referenced to the proposed baseline and to the New Jersey Plane Coordinate System. Any monument reset in the field shall be referenced and shown in its new location. Applicable requirements of "Instructions Covering the Inspection of Construction" shall be strictly adhered to.

Topography

Topography for the preliminary survey is defined as all man-made or physical permanent objects in or adjacent to the highway corridor that would normally be shown on plans. The survey should include such items as existing fencing, roads, billboards, buildings, drainage courses, drainage structures and flow direction, power lines, land features, signage, waterways, railroads, pipes, utilities, etc. If the plan sheets are to be made from aerial photography or GIS data, much of the information listed below can be identified and located but should be confirmed by field verification/inspection and noted appropriately.

9.5.7. Field Inspection

A field inspection and check of each parcel shall be made to insure that the GPPMs, IPPMs and the Special Maps accurately define and show in proper location and extent all physical features which in any way affect the value of the property, such as; driveways, sidewalks, size and type of all buildings which shall be shown to scale, trees, drainage features, underground utility connections, and other appurtenances typified by oil tanks, wells, septic systems, etc. It is imperative and the responsibility of the designer to confirm that the surveyor has fully documented field inspections at all phases of the project. Prior to submitting final ROW documents, it the responsibility of the Engineers to perform a site visit of each parcel to confirm that the surveyor has fully captured all necessary topographic features and improvements accurately and nothing has changed since the draft ROW document submission. It is important for the survey and field inspection notes to specifically identify those features that are located within the proposed takings as these may involve additional payment or relocation. The Engineer shall submit in writing that a site visit has occurred and the final IPPMs are reflective of the existing conditions as of the date of submission.

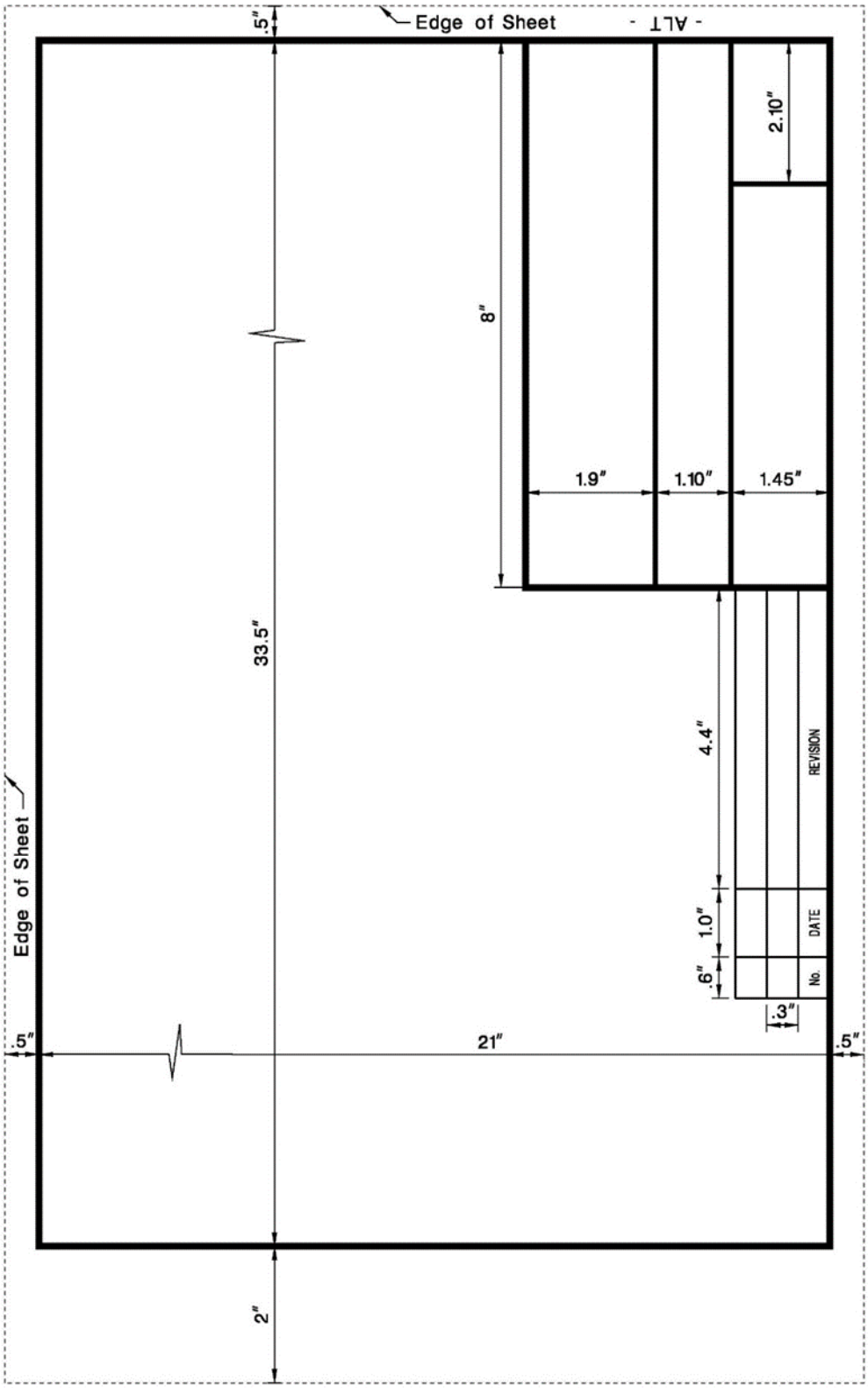
9.5.8. Supplemental Survey/Additional Survey Requests

On occasion the need may arise for additional survey that may be required to help satisfy property owner negotiations or assist the Authority in making informed decisions

as they relate to the proposed acquisition. An example of such may be a proposed partial acquisition from a property that has abundant wetlands. Typically, the wetland information and limits are defined utilizing GIS and NJDEP wetland mapping. This information may be out of date or not accurately depict the actual wetlands or uplands on a particular site. In such cases, the Authority may request that additional supplemental survey be performed to further confirm and establish wetland areas beyond the proposed taking. This type of supplemental survey shall only be performed at the direction of the Authority's Project Manager and close coordination is required between the surveyor and the Authority's Environmental Consultant.

9.6. EXHIBITS

Exhibit 9-14 Entire/General Property Parcel Map Dimensions 22"x36"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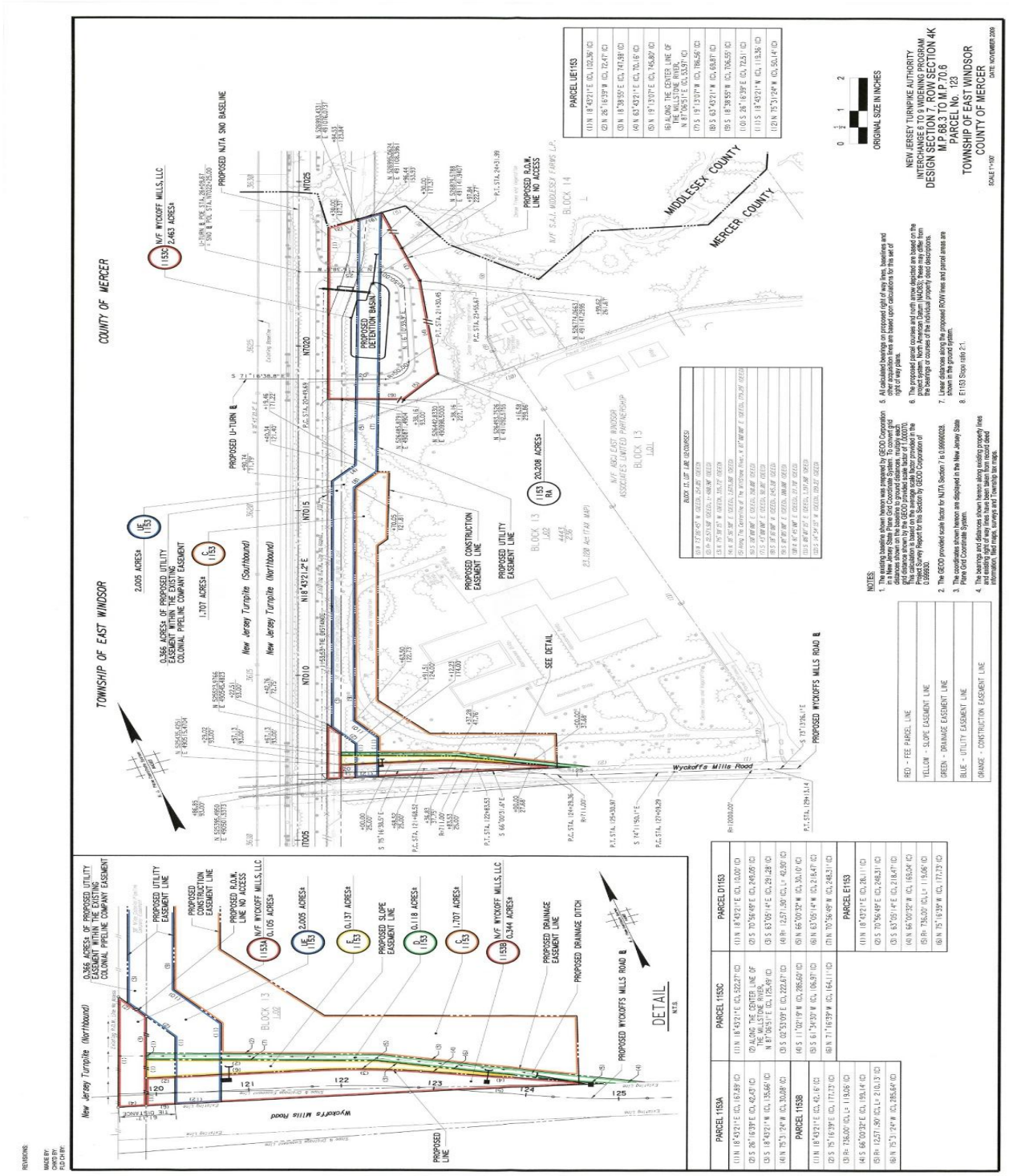
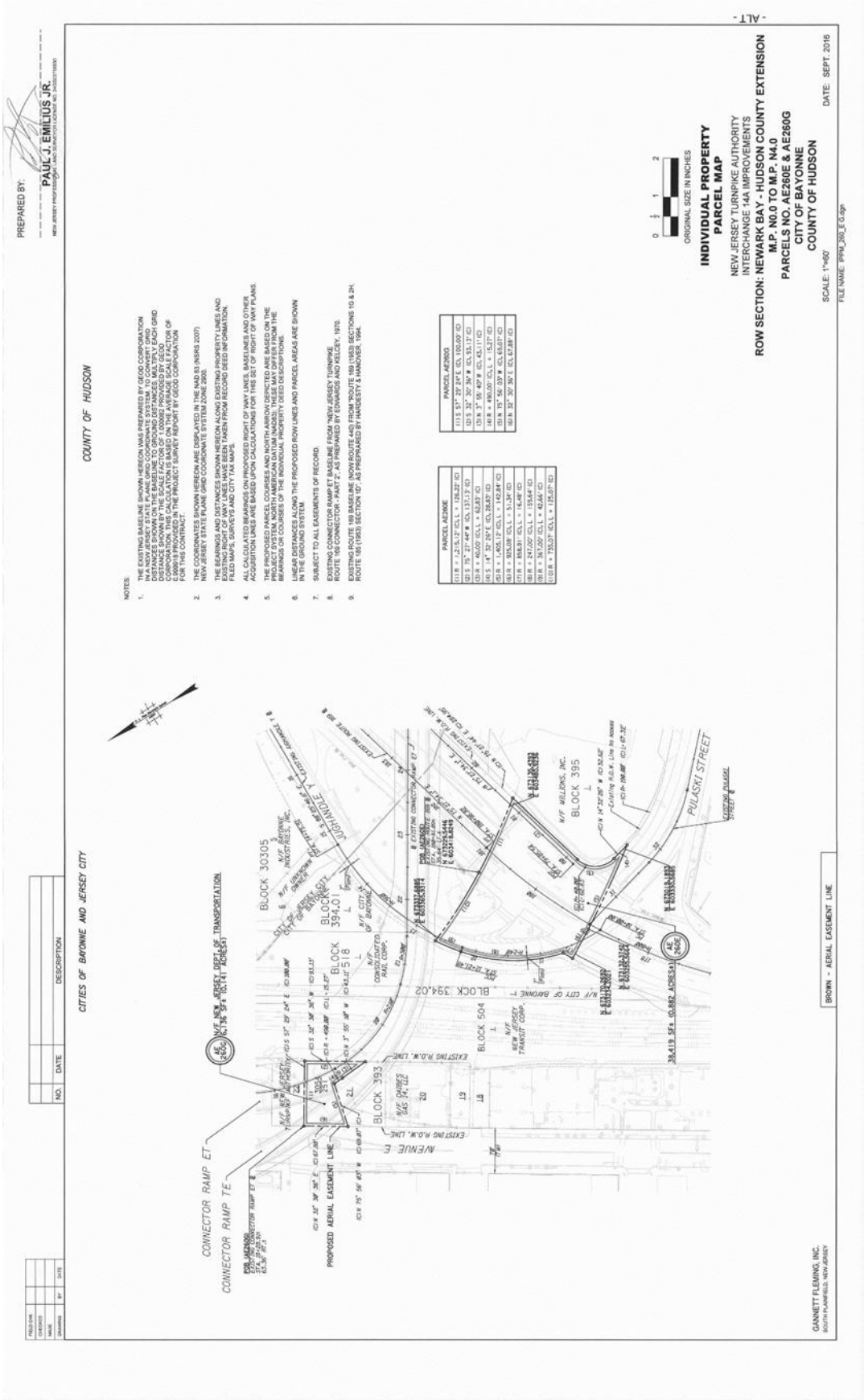
2.10"
8"
1.9"
1.10"
1.45"
33.5"
4.4"
REVISION
DATE
No.
1.0"
.6"
.3"
Edge of Sheet
.5"
21"
.5"
2"

Exhibit 9-15 Sample Individual Property Parcel Maps Multiple Sizes & Description




PREPARED BY:
PAUL J. EMILIUS JR.
NEW JERSEY PROFESSIONAL ENGINEER (PROFESSIONAL ENGINEER NO. 24GE02178300)
CITIES OF BAYONNE AND JERSEY CITY
COUNTY OF HUDSON
NOTES:
1. THE EXISTING BASELINE SHOWN HEREON WAS PREPARED BY GEOD CORPORATION IN A JANUARY 2016 SURVEY. THE COORDINATES, BEARINGS, AND DISTANCES SHOWN ON THE BASELINE TO GROUND DISTANCES, MULTIPLY EACH GRID DISTANCE SHOWN BY THE SCALE FACTOR 0.9999618 PROVIDED BY GEOD CORPORATION. THE SCALE FACTOR IS DERIVED FROM THE COMBINED SCALE FACTOR OF 0.9999618 PROVIDED IN THE PROJECT SURVEY REPORT BY GEOD CORPORATION FOR THIS CONTRACT.
2. THE COORDINATES SHOWN HEREON ARE DISPLAYED IN THE NAD 83 (NSRS 2007) NEW JERSEY STATE PLANE COORDINATE SYSTEM, ZONE 2013.
3. THE BEARINGS AND DISTANCES SHOWN HEREON ALONG EXISTING PROPERTY LINES AND EXISTING RIGHT OF WAY LINES HAVE BEEN TAKEN FROM RECORD DEED INFORMATION, FILED MAPS, SURVEYS AND CITY TAX MAPS.
4. ALL CALCULATED BEARINGS ON PROPOSED RIGHT OF WAY LINES, BASELINES AND OTHER ACQUISITION LINES ARE BASED UPON CALCULATIONS FOR THIS SET OF RIGHT OF WAY PLANS.
5. THE PROPOSED PARCEL COURSES AND NORTH ARROW DEPICTED ARE BASED ON THE PROJECT SYSTEM. NORTH OF AMERICAN DATUM (NAD83). THESE MAY DIFFER FROM THE BEARINGS SHOWN ON THE PARCEL DESCRIPTIONS, WHICH ARE TRUE NORTH.
6. LINEAR DISTANCES ALONG THE PROPOSED ROW LINES AND PARCEL AREAS ARE SHOWN IN THE GROUND SYSTEM.
7. SUBJECT TO ALL EASEMENTS OF RECORD.
8. EXISTING CONNECTOR RAMP ET BASELINE FROM NEW JERSEY TURNPIKE ROUTE 100 CONNECTOR - PART 2, AS PREPARED BY EDWARDS AND KELCEY, 1970.
9. EXISTING ROUTE 169 BASELINE (NOW ROUTE 440) FROM ROUTE 169 (1933, SECTIONS 10 & 24; ROUTE 185 (1933, SECTION 10". AS PREPARED BY HARDESTY & HANOVER, 1994.
PARCEL AE260E
PARCEL AE260G
CONNECTOR RAMP ET
CONNECTOR RAMP TE
PROPOSED AERIAL EASEMENT LINE
BLOCK 30305
BLOCK 394.01
BLOCK 518
BLOCK 393
BLOCK 394.02
BLOCK 504
BLOCK 395
JOHNNOLE
AVENUE E
PULASKI STREET
EXISTING R.O.W. LINE
N/F CITY OF BAYONNE
N/F MILLIONS, INC.
N/F NEW JERSEY TRANSIT CORP.
N/F NEW JERSEY TURNPIKE AUTHORITY
N/F NEW JERSEY DEPT. OF TRANSPORTATION
BROWN - AERIAL EASEMENT LINE
GANNETT FLEMING, INC.
SOUTH PLAINFIELD, NEW JERSEY
ORIGINAL SIZE IN INCHES
INDIVIDUAL PROPERTY
PARCEL MAP
NEW JERSEY TURNPIKE AUTHORITY
INTERCHANGE 14A IMPROVEMENTS
ROW SECTION: NEWARK BAY - HUDSON COUNTY EXTENSION
M.P. N0.0 TO M.P. N4.0
PARCELS NO. AE260E & AE260G
CITY OF BAYONNE
COUNTY OF HUDSON
SCALE: 1"=60'
DATE: SEPT. 2016
FILE NAME: PPM_260_E G.dgn
- ALT -

Preliminary Submission Date
Final Submission Date

RIGHT OF WAY PARCEL DESCRIPTION

PARCEL NO: 1153

MUNICIPALITY: East Windsor Township

A Portion of BLOCK 13 LOT 1.02

PROPERTY ADDRESS: 329 Wycoffs Mills Road

CURRENT RECORD OWNER:

N/F Wycoff Mills, LLC

DESCRIPTION:

Parcels 1153A, 1153B, 1153C, E1153, UE1153, D1153 and C1153, as designated on a map filed or about to be filed in the Offices of the County Clerk of Middlesex and Mercer Counties entitled: "NEW JERSEY TURNPIKE AUTHORITY, NEW JERSEY TURNPIKE, ENTIRE TRACT MAP, ROW SECTION 4K, SECTION 7, MILE 68.3 TO MILE 70.6, _____, New Jersey, SCALE 1"=200' and NEW JERSEY TURNPIKE AUTHORITY, NEW JERSEY TURNPIKE, GENERAL PROPERTY PARCEL MAP, ROW SECTION 4K, SECTION 7, MILE 68.3 TO MILE 70.6, _____, New Jersey, SCALE: 1"=30'".

Parcel 1153A; **Beginning at a point** in the existing easterly New Jersey Turnpike Authority right of way line, said point being the intersection of the said existing easterly right of way line of the New Jersey Turnpike Authority, with the existing northerly line of Wycoffs Mills Road, and from said beginning point running, thence;

1. Along the aforementioned existing easterly New Jersey Turnpike Authority right of way line, N 18º43'21" E (calculated), 167.89 feet (calculated), to a point, thence;

2. Passing through Lot 1.02, Block 13, along the proposed easterly New Jersey Turnpike Authority right of way line, as laid down on the aforesaid maps, the following two courses; S 26º16'39" E (calculated), 42.43 feet (calculated), to a point, thence;

3. Still along the same, S 18º43'21" W (calculated), 135.66 feet (calculated), to a point in the aforementioned existing northerly line of Wycoffs Mills Road, thence;

4. Along the aforesaid existing northerly line of Wycoffs Mills Road, N 75º31'24" W

(calculated), 30.08 feet (calculated), to the **Point and Place of Beginning**.

Containing 0.105 acres of land, more or less.

Parcel 1153B; **Beginning at a point** in the existing northerly line of Wycoffs Mills Road, said point being 30.08 feet (calculated) from the intersection of the said existing northerly line of Wycoffs Mills Road, with the existing easterly right of way line of the New Jersey Turnpike Authority, and from said beginning point running, thence;

1. Passing through Lot 1.02, Block 13, along the proposed easterly New Jersey Turnpike Authority right of way line, as laid down on the aforesaid maps, N 18º43'21" E (calculated), 42.16 feet (calculated), to a point in the proposed northerly line of Wycoffs Mills Road, as laid down on the aforesaid maps, thence;

2. Along the proposed northerly line of Wycoffs Mills Road, as laid down on the aforesaid maps, the following three courses; S 75º16'39" E (calculated), 177.73 feet (calculated), to a point of curvature, thence;

3. Still along the same, along a curve bearing to the right in a southeasterly direction, having a radius of 736.00 feet (calculated), a length of 119.06 feet (calculated), to a point of tangency, thence;

4. Still along the same, S 66º00'32" E (calculated), 199.14 feet (calculated), to a point in the aforementioned existing northerly line of Wycoffs Mills Road, thence;

5. Along the aforesaid existing northerly line of Wycoffs Mills Road, the following two courses; along a curve bearing to the left in a northwesterly direction, having a radius of 12,571.90 feet (calculated), a length of 210.13 feet (calculated), to a point of tangency, thence;

6. Still along the same, N 75º31'24" W (calculated), 285.64 feet (calculated), to the **Point and Place of Beginning**.

Containing 0.344 acres of land, more or less.

Parcel 1153C; **Beginning at a point** in the existing easterly New Jersey Turnpike Authority right of way line, said point being 1,153.53 feet (scaled) from the intersection of the said existing easterly right of way line of the New Jersey Turnpike Authority, with the existing northerly line of Wycoffs Mills Road, and from said beginning point running, thence;

1. Along the aforementioned existing easterly New Jersey Turnpike Authority right of way line, N 18º43'21" E (calculated), 522.27 feet (calculated), to a point in the division line between Lot 1.02, Block 13 and Lot 1, Block 14 (Cranbury Township), thence;

2. Along said division line, along the center of the Millstone River, N 87º06'51" E (calculated), 125.49 feet (calculated), to a point in the proposed easterly New Jersey Turnpike Authority

right of way line, as laid down on the aforesaid maps, thence;

3. Passing through Lot 1.02, Block 13, along the proposed easterly New Jersey Turnpike Authority right of way line, as laid down on the aforesaid maps, the following four courses; S 02º53'09" E (calculated), 222.67 feet (calculated), to a point, thence;

4. Still along the same, S 11º02'19" W (calculated), 285.60 feet (calculated), to a point, thence;

5. Still along the same, S 61º34'30" W (calculated), 106.97 feet (calculated), to a point, thence;

6. Still along the same, N 71º16'39" W (calculated), 164.11 feet (calculated), to the **Point and Place of Beginning.**

Containing 2.463 acres of land, more or less.

Said Parcels 1153A, 1153B and 1153C, being also designated as part of Lot 1.02 in Block 13 on the tax map of East Windsor Township, and also known as 329 Wycoffs Mills Road of said municipality.

BEING PART OF the premises conveyed to Wycoff Mills, LLC from Castellum, LTD, dated December 19, 2002 and recorded January 18, 2003, in the Mercer County Clerk's Office in Deed Book 4443, Page 236.

TOGETHER WITH, all right, title and interest that the owner may have in, and to, existing Wycoffs Mills Road, contiguous to the above described premises.

AND ALSO, any and all right, title and interest.

SUBJECT TO, all public utility easements of record.

Parcel E1153; **Beginning at a point** in the proposed easterly New Jersey Turnpike Authority right of way line, as laid down on the aforesaid maps, said point being 42.16 feet (calculated) from the intersection of the said proposed easterly New Jersey Turnpike Authority right of way line, as laid down on the aforesaid maps, with the existing northerly line of Wycoffs Mills Road, and from said beginning point running, thence;

1. Along the aforementioned proposed easterly New Jersey Turnpike Authority right of way line, as laid down on the aforesaid maps, N 18º43'21" E (calculated), 28.11 feet (calculated), to a point in the proposed northerly line of the herein described easement, thence;

2. Along the proposed northerly line of the herein described easement and passing through Lot 1.02, Block 13, the following two courses; S 70º56'49" E (calculated), 248.31 feet (calculated), to a point, thence;
3. Still along the same, S 63º05'14" E (calculated), 218.47 feet (calculated), to a point in the proposed northerly line of Wycoffs Mills Road, as laid down on the aforesaid maps, thence;

4. Along the proposed northerly line of Wycoffs Mills Road, as laid down on the aforesaid maps, the following three courses; N 66º00'32" W (calculated), 169.04 feet (calculated), to a point of curvature, thence;

5. Still along the same, along a curve bearing to the left in a northwesterly direction, having a radius of 736.00 feet (calculated), a length of 119.06 feet (calculated), to a point of tangency, thence;

6. Still along the same, N 75º16'39" W (calculated), 177.73 feet (calculated), to the **Point and Place of Beginning**.

Containing 0.137 acres of land, more or less.

Said Parcel E1153, consisting of the right to form and maintain slopes on lands now or formerly of Wycoff Mills, LLC, as shown on said map, for grading, drainage and support of Wycoffs Mills Road; provided, however, that the above recited slope easement may be modified or released by furnishing and maintaining adequate support or protection for the roadway so as to make the continuance of the slope right no longer necessary. The permission to modify or release said slope easement may be obtained from the New Jersey Turnpike Authority (NJTA) its successors and/or assigns, where it is demonstrated by the Grantor to the satisfaction of the NJTA in its sole discretion, that the slope is no longer needed to support the roadway or that the proposed modification will not interfere with or adversely affect the integrity of the slope; the NJTA, however, reserves the right to impose such terms and conditions on the release of any slope rights that are necessary to ensure the stability of the adjacent roadway.

Parcel UE1153; **Beginning at a point** in the existing northerly line of Wycoffs Mills Road, said point being 61.17 feet (calculated) from the intersection of the said existing northerly line of Wycoffs Mills Road, with the existing easterly right of way line of the New Jersey Turnpike Authority, and from said beginning point running, thence;

1. Along the proposed westerly line of the herein described easement, as laid down on the aforesaid maps, and passing through Lot 1.02, Block 13, the following five courses; N 18º43'21" E (calculated), 102.36 feet (calculated), to a point, thence;

2. Still along the same, N 26º16'39" W (calculated), 72.47 feet (calculated), to a point, thence;

3. Still along the same, N 18º38'55" E (calculated), 747.98 feet (calculated), to a point, thence;

4. Still along the same, N 63º43’21” E (calculated), 70.16 feet (calculated), to a point, thence;

5. Still along the same, N 19º13’07” E (calculated), 745.80 feet (calculated), to a point in the to a point in the division line between Lot 1.02, Block 13 and Lot 1, Block 14 (Cranbury Township), thence;

6. Along said division line, along the center of the Millstone River, N 87º06’51” E (calculated), 53.97 feet (calculated), to a point in the proposed easterly line of the herein described easement, as laid down on the aforesaid maps, thence;

7. Along the proposed easterly line of the herein described easement, as laid down on the aforesaid maps, and passing through Lot 1.02, Block 13, the following five courses; S 19º13’07” W (calculated), 786.56 feet (calculated), to a point, thence;

8. Still along the same, S 63º43’21” W (calculated), 69.87 feet (calculated), to a point, thence;

9. Still along the same, S 18º38’55” W (calculated), 706.55 feet (calculated), to a point, thence;

10. Still along the same, S 26º16’39” E (calculated), 72.51 feet (calculated), to a point, thence;

11. Still along the same, S 18º43’21” W (calculated), 119.36 feet (calculated), to a point, in the aforementioned existing northerly line of Wycoffs Mills Road, thence;

12. Along the aforementioned existing northerly line of Wycoffs Mills Road, N 75º31’24” W (calculated), 50.14 feet (calculated), to the **Point and Place of Beginning.**

Containing 2.005 acres of land, more or less.

Said Parcel UE1153 consisting of the right to install and maintain a pipeline for Colonial Pipeline, as shown in the area marked on the aforementioned plans. Parcel UE1153 being a portion of Lot 1.02, Block 13 as shown on the East Windsor Township Tax Maps.

Parcel D1153; **Beginning at a point** in the proposed easterly New Jersey Turnpike Authority right of way line, as laid down on the aforesaid maps, said point being 70.27 feet (calculated) from the intersection of the said proposed easterly New Jersey Turnpike Authority right of way line, as laid down on the aforesaid maps, with the existing northerly line of Wycoffs Mills Road, and from said beginning point running, thence;

1. Along the aforementioned proposed easterly New Jersey Turnpike Authority right of way line, as laid down on the aforesaid maps, N 18º43’21” E (calculated), 10.00 feet

(calculated), to a point in the proposed northerly line of the herein described easement, thence;

2. Along the proposed northerly line of the herein described easement and passing through Lot 1.02, Block 13, the following two courses; S 70º56'49" E (calculated), 249.05 feet (calculated), to a point, thence;

3. Still along the same, S 63º05'14" E (calculated), 291.28 feet (calculated), to a point in the aforementioned existing northerly line of Wycoffs Mills Road, thence;

4. Along the aforesaid existing northerly line of Wycoffs Mills Road, along a curve bearing to the left in a northwesterly direction, having a radius of 12,571.90 feet (calculated), a length of 42.90 feet (calculated), to a point, thence;

5. Along the proposed northerly line of Wycoffs Mills Road, as laid down on the aforesaid maps, N 66º00'32" W (calculated), 30.10 feet (calculated), to a point, thence;

6. Along the southerly line of the herein described easement and passing through Lot 1.02, Block 13, the following two courses; N 63º05'14" W (calculated), 218.47 feet (calculated), to a point, thence;

7. Still along the same, N 70º56'49" W (calculated), 248.31 feet (calculated), to the **Point and Place of Beginning**.

Containing 0.118 acres of land, more or less.

Said Parcel D1153 consisting of the right to construct and maintain a drainage ditch on lands N/F Wycoff Mills, LLC, discharging water into the NJTA ROW at about Proposed NJTA Baseline Station N7007+62, as shown on the aforesaid maps. The depiction of the drainage improvements is for illustration purposes only. The NJTA reserves the right to place all drainage improvements anywhere within the confines of the easement.

Parcel C1153, containing an area of 1.707 acres of land, more or less, consisting of the right to access land and area with vehicles and equipment for use during the construction of subsurface pipelines and appurtenances and the construction of grading, paving and reconstruction of the existing access. Said right shall commence upon the owner's receipt of written notification from the Authority's Construction Engineer, and shall remain in effect for 6 months or until such use is no longer required, at which time the land shall be restored to substantially the same condition that prevailed before said temporary use began. Should the duration need to be extended for cause, the description should also state that the owner shall be compensated at the same rate of payment indicated within the Authority's approved appraisal.

Exhibit 9-16 Sample Line Weights and Letter Sizes

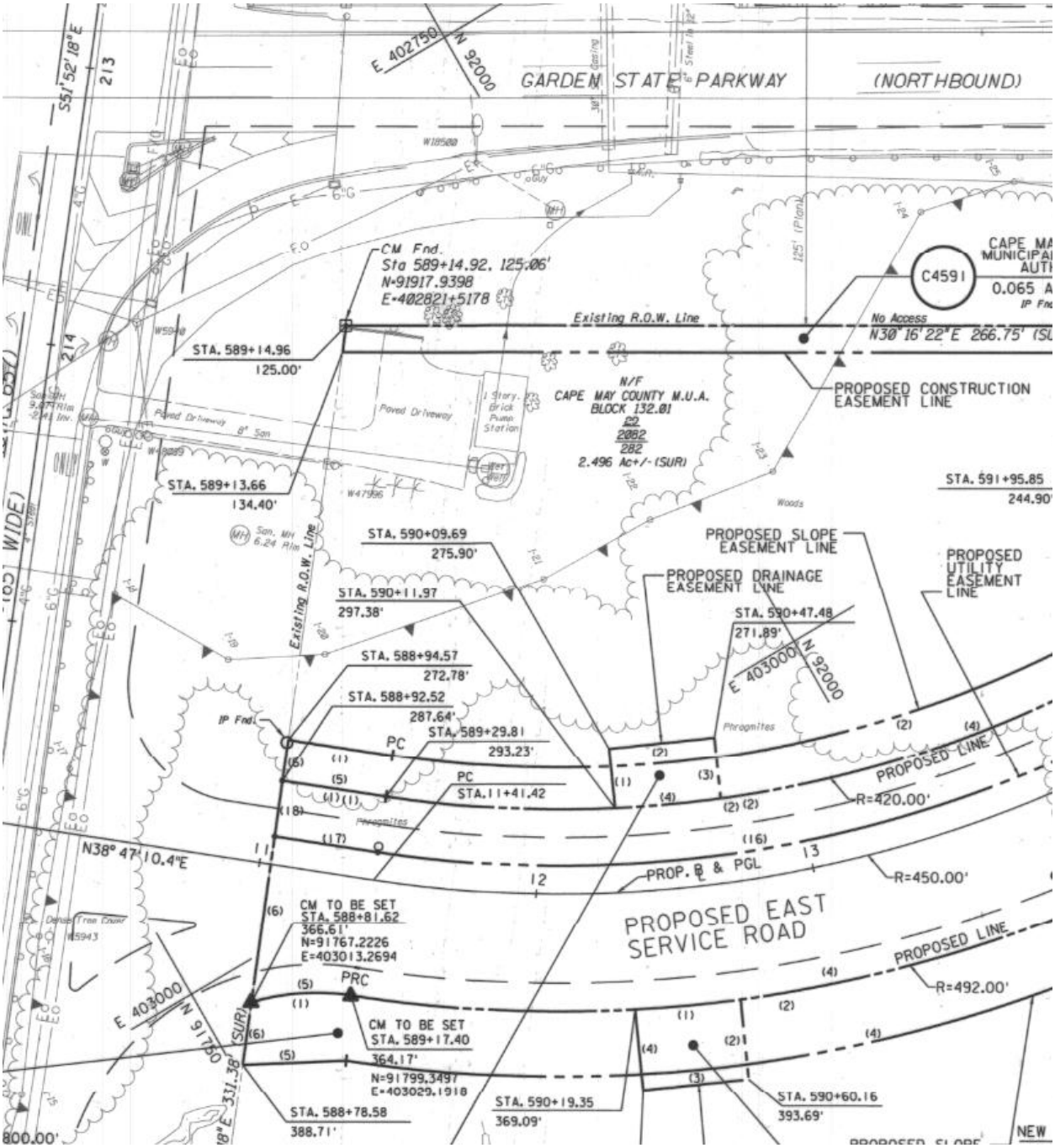


Exhibit 9-17 Sample Right of Entry Map

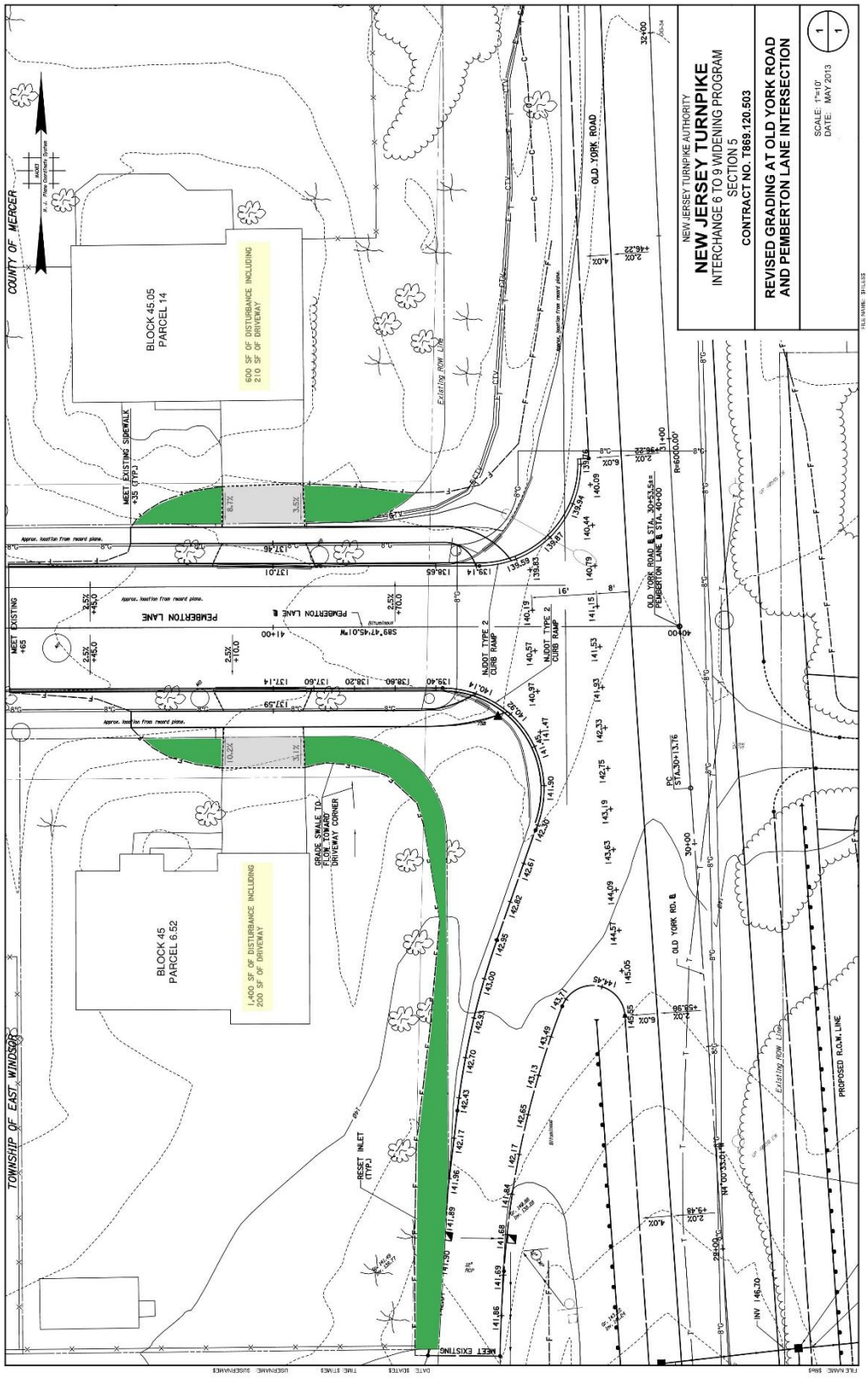


Exhibit 9-18 Typical Clauses for Description

GENERAL

Parcels 825A, 825B, 825C, A825, RCB25A, 2C825, UE825, E825, R2E825, 3E825, as designated on a map filed or about to be filed in the Office of (fill in) of (fill in) County, entitled: ("GPPM Title excluding date, municipal - county and sheet numbers"). The description shall also contain an identical reference for the ETM's.

NOTE: Parcel designations may include a prefix assigned to identify the particular project for which the ROW is required (e.g. DE9-825A, DE9-825B, etc.)

PARTIAL FEE ACQUISITION

Said Parcel 825A including specifically all the land and premises bounded on the north and west by the Proposed *[Roadway Name]* ROW line, as defined by proposed ROW monuments as shown on parcel property map, on the east by the westerly line of Walton Avenue, and on the south by lands now or formerly of Frank L. Dudley; extending from about Proposed *[Roadway Name]* Baseline Station 462+20 on the southwest to about Station 462+55 on the north, as shown on said map; containing about 2120 square feet.

ENTIRE FEE ACQUISITION

Said Parcels 825B and 825C including specifically all the land and premises lying within the Proposed *[Roadway Name]* ROW lines as laid down on said map, bounded on the north by lands now or formerly of Andrew Wood; on the east by lands now or formerly of John Smith; on the south by lands now or formerly of Sam Jones; and on the west by the easterly line of Tulip Street; extending from about Proposed *[Roadway Name]* Baseline Station 562+50 on the southeast to about Station 563+05 on the northwest, as shown on said map; containing about 1570 square feet.

Said Parcel 825B and 825C being also designated as Lot 57 in Block 432 on the tax map of (fill in Municipality), and also known as 476 Tulip Street of said municipality.

NOTE: Metes and Bounds descriptions are to be provided.

ROADWAY EASEMENT

Said Parcel E39 as designated for a roadway easement to carry the *[Roadway Name]* across the parcel of land described as follows: Bounded on the

The right to enter and re-enter the Easement Area for the purpose of conducting any and all acts, studies, testing, preparation, construction and reconstruction necessary to form, construct and maintain a roadway, cartway, shoulders, curbing, retaining walls, walkways, signs, lights, traffic control devices and all other appurtenances necessary to serve and accommodate a public road and thoroughfare.

Said roadway shall be open in perpetuity to and for use by public traffic, all vehicles of any type or description, including, but not limited to, automobiles, trucks, motorcycles, buses, trailers and any other form of transportation, in, on, over, across, under, and through the Easement Area.

NOTE: Metes and Bounds descriptions are to be provided.

AERIAL EASEMENT

Said Parcel AE39 as designated for an aerial easement to carry the *[Roadway Name]* across the parcel of land described as follows: Bounded on the

The grantor shall enjoy full utilization of his property provided the grantor agrees not to erect any structure within the aerial easement area or use said area for the storage or use of flammable or explosive material, etc. when in the opinion of the Chief Engineer of the New Jersey Turnpike Authority, said structure or use may have an adverse effect or a potential hazard on the [Roadway Name] structure, roadway, appurtenances or the safety of the traveling public. These restrictions shall not apply to railroad trains and their contents in transit or to their normal operations.

Further, the grantor shall permit the Authority and its designees the right to enter upon the property for the purpose of constructing, reconstructing, maintaining, repairing, inspecting or replacing the structure located thereon and the appurtenances thereto which includes but is not restricted to the drainage, footings and other facilities located within the aforementioned aerial easement.

CONSTRUCTION EASEMENT (Temporary)

Said Parcel C825 consisting of the temporary right to (describe temporary work) for use during the construction of (designation of proposed permanent construction). Said right shall commence upon the owner's receipt of written notification from the Authority's Construction Engineer, and shall remain in effect for (state duration in number of months), or until such use is no longer required, at which time the land shall be restored to substantially the same condition that prevailed before said temporary use began. Should the duration need to be extended for cause, the description should also state that the owner shall be compensated at the same rate of payment indicated within the Authority's approved appraisal.

DETOUR ROAD EASEMENT

Said Parcel R0825A consisting of the right to construct and maintain a temporary road and appurtenances on lands now or formerly of (owner), as shown on said map, for use during the construction of the [Roadway Name] Bridge and the grading of State Highway Route 26. Said right to exist for the duration of construction of the permanent roadway at which time said temporary road and appurtenances will be removed and the land restored to substantially the same condition that prevailed before the work was started.

DRAINAGE EASEMENT

Said Parcel D825 consisting of the right to construct and maintain a drainage ditch on lands now or formerly of (owner), as shown on said map, and also the right to maintain the flow of surface drainage from the cross drain at about Station 12+90, and discharge said water on lands of the owner on the southeasterly side of the [Roadway Name].

SLOPE EASEMENT

Parcel E267 consisting of the right to form and maintain slopes on lands now or formerly of _____, as shown on said map, for grading and draining Bordentown Chesterfield Road and Hogback Road containing an area of 1,618 square feet (calculated) or 0.037 acres, more or less; provided, however,

that the above recited slope easement may be modified or released by furnishing and maintaining adequate support or protection for the roadway so as to make the continuance of the slope right no longer necessary. The permission to modify or release said slope easement may be obtained from the New Jersey Turnpike Authority (NJTA) its successors and/or assigns, where it is demonstrated by the Grantor to the satisfaction of the NJTA in its sole discretion, that the slope is no longer needed to support the roadway or that the proposed modification will not interfere with or adversely affect the integrity of the slope; the NJTA, however, reserves the right to impose such terms and conditions on the release of any slope rights that are necessary to ensure the stability of the adjacent roadway.

PRIVATE ACCESS EASEMENT

Some PA parcels may be situated that they must be shown on a Property Strip Map in order to show their boundaries and their relationship to the Authority's roadways. When negotiation dictates no purchase of the RA-Parcel (description not included in an agreement) as access will be provided thru an PA (private access) parcel then an agreement shall be made that includes the following:

Subject, however, that the New Jersey Turnpike Authority would grant unto the Seller herein a Private Access parcel designated as _____, also known as lot _____ in block _____ on the _____ map of _____ of _____, and which lands are now or formerly of _____. Said Parcel _____, bounded _____; located about and opposite of Proposed ___ Baseline _____ Station Office of _____ entitled _____ Property Strip Map _____ 1" = 200', containing about ____ acres.

PROTECTIVE EASEMENT

Said Parcel PE39 as designated for a protective easement, contiguous to the Authority ROW or aerial easement, being described as follows: Bounded on the . . . .

Structures of fireproof construction shall be permitted within this protective easement area below the elevation of the profile grade line of the nearest Authority roadway without the prior approval from the Authority's Engineering Department as long as no structure is erected within 5 feet clear horizontally of any element of an Authority roadway or structure; provided, however, that no lights, signs or advertising media will be permitted whether upon, attached to or protruding from any structure or appurtenances and which may be above the elevation of the profile grade line of the nearest Authority roadway when, in the opinion of the Authority's Engineering Department, said lights, signs, or advertising media reflect or cause to be reflected or produce a distracting effect upon patrons traveling on the Authority's roadways.

Now or in the future, where physically accessible, the grantor shall permit the Authority and its designees the right of ingress and egress across the easement for the purpose of access to the adjacent Authority structure and appurtenances thereto after written notification by the Authority's Engineering Department.

Nothing herein shall be construed as preventing the grantors from enjoying the maximum utilization of his land in accordance with the permitted uses as enumerated by local, State and Federal ordinances, statutes and regulations, provided the above provisions are adhered to by the grantor.

SIGHT DISTANCE EASEMENT

Said Parcel 267 consisting of a permanent restriction against the use of any portion thereof for any structure, growth or physical impediment that would in any manner infringe upon a free and open line of sight over the same, as far as the line marked "Sight Triangle Easement Line", as shown on the aforesaid maps. The Authority has the permanent right to enter the easement area to remove any of the aforementioned impediments should the owner or its assigns fail to maintain the integrity of the sight triangle.

UTILITY EASEMENT

Said Parcel UES25A consisting of the right to install and maintain Colonial Pipeline; located along the Proposed Authority ROW line, adjacent to Parcel 825A, as shown in the area marked containing about 1500 square feet.

Utility Easement (Easements for Jersey Central Power and Light Co. - only).

Said Parcel UE82SA consisting of the right to construct, maintain and operate thereon one or, from time to time, more lines for the transmission and distribution of electric energy consisting of overhead and underground conductors and lighting protective and communication wires, supporting structures, guys, push braces, ducts and conduits and other accessory apparatus and equipment deemed by Jersey Central Power and Light Company to be necessary therefore, upon, over, across and under the lands of

_____

_____

including within the side lines of said easement and prolongations thereof any roads, rivers, streams, streets or highways bounding or crossing the same, subject, however, to the rights of the public or others therein.

Together with the right from time to time to patrol, inspect, redesign, rebuild or alter said lines and to install such additional lines, apparatus and equipment as Jersey Central Power and Light Company may at any time deem necessary and the right to remove any line or any part thereof.

And also with the right from time to time to remove or clear and keep clear any or all trees, underbrush, structures and other obstructions upon said easement, and such trees beyond the same as in the judgment of Jersey Central Power and Light Company may interfere with or endanger said lines or appurtenances when erected. Together also with the right to enter without notice upon Crantors said lands for all of the purposes aforesaid.

Except as provided by law and subject to Jersey Central Power and Light Company's exercise of their rights granted hereby, Grantors may farm, cultivate, or use the ground within the limits of said easement without substantial change of grade, provided that in Jersey Central Power and Light Company's opinion such use shall not endanger Jersey Central Power and Light Company's facilities nor interfere with, limit or obstruct any subsequent exercise of the rights hereby granted, and provide further that no building or other structures shall be erected within said easement.

FOR ALL PARCELS WHICH HAVE FRONTAGE ON A STREET

TOGETHER WITH all right title and interest that owner may have in and to existing Tulip Street contiguous to the above described premises. (For fee taking only where access to the existing street is being acquired).

DENIAL OF ACCESS

(Clause to be used in conjunction with a partial fee taking.)

TOGETHER WITH any and all rights of direct access to and from the (Designation of Roadway) constructed or to be constructed on land herein above described. This clause should clearly designate the roadway, i.e. New Jersey Turnpike or Garden State Parkway.

DENIAL OF ACCESS (Only Taking Involved)

Said Parcel DA2O consisting of the right to deny any and all right of direct access to and from (Designation of Roadway) ± as shown on said map, from about Station 12+30 to Station 15+30 extending about 300 feet in length.

SUBJECT, HOWEVER, to the colonial Pipeline Easement affecting the herein described premises. (Specific easements must be noted based on recorded documents and or facilities identified in the field)

RIPARIAN RIGHTS

SUBJECT, HOWEVER, to the rights of the State of New Jersey to the riparian lands (or meadowlands).

STRUCTURES/BRIDGES

AND ALSO, the right to construct, reconstruct, maintain and use an overhead bridge, together with its piers, subsurface footings and appurtenances to carry the Authority roadway across the above described parcel(s) of land.

ENVIRONMENTAL IMPACT

SUBJECT, HOWEVER, to all environmental impacts created during route location, construction, and highway use. These impacts may involve health, safety and welfare and may be evidenced by the highways effects upon water and air quality, ambient noise and aesthetic characteristics of the area. (To be used in Agreements Conveying surplus Property \ to New Owners).

CONSERVATION

Description language of conservation easement should be coordinated with Law Department and Outside Counsel.

Exhibit 9-19 Sample ROW Impact Matrix

New Jersey Turnpike Authority
Project Name
Municipality and County
OPS Number

Impacts								Type of Easement and Areas (S.F.)					
IPM No.	Parcel No.	Station	Direction	Block	Lot	Owner	Reason	Drainage	Fee	TCE	C&M	Utility	Aerial Util
							TOTAL						

Note: Matrix to be created in Excel. May be modified for future use to track ROW acquisition status and availability.

Section 10 - [RESERVED]

10.1. [RESERVED]

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Section 11 - CONSTRUCTABILITY REVIEW

11.1. PURPOSE AND INTENT

The purpose of the Constructability Review is to verify that projects are safely and logistically constructible using means and methods available to the local contractor community. The intent of the review is not to identify the actual means and methods a contractor will use to construct the project or to identify all means and methods possible to construct the project. The intent is to identify obstacles before a project is advertised to reduce or prevent delays and unnecessary cost overruns as well as verify that the prepared contract documents are "biddable and buildable" and that the work described in those documents is theoretically capable of being completed as follows:

- Within the time provided for each stage and for the overall Contract
- Using available construction work force, materials, equipment and methods
- Allowing for the physical space necessary for the work and storage, and available site access
- Without affecting the safety of the traveling public and without significantly affecting the flow of traffic (i.e., adhering to operational constraints)
- Without affecting the integrity of the Authority's infrastructure / structures to remain
- Respecting external control factors such as environmental / permit restrictions (i.e., in-water work restrictions), seasonal weather, and coordination with local road, rail, and utility crossings (where present)
- With due consideration of current or planned projects in the vicinity, as determined by project-specific maintenance and protection of traffic (MPT) requirements. For the purposes of the Constructability Review Report, the limit of consideration is defined as approximately 3 miles from the outer limits of defined roadway MPT limits visible to the traveling public. This limit may be extended on a project-by-project basis where approved by the Authority.

Constructability reviews shall be completed by qualified construction personnel and shall meet qualifications defined in the OPS RFEOI/RFP. The staff performing the constructability review shall not solely be members of the design team, i.e., construction supervision personnel or an independent constructability expert shall be part of the review team.

A copy of the Final Constructability Review Report should be provided to the Construction Manager at the Design to Construction handoff meeting.

11.2. WHEN TO SUBMIT THE REPORT

The constructability review should be initiated during Concept Development (or initial project phase) as part of the Preliminary Preferred Alternative selection process. Initial constructability review findings are to be included in the Concept Development Report and further elaborated on in the Preliminary Design Report. A standalone Constructability Review Report is to be submitted with the Final Design Phase Major Milestone Submissions (Phases B through D) as

noted in the project checklist. Comments to the Constructability Review Report provided by the reviewers are to be addressed with a comment resolution summary document and returned with the major milestone submission review comments.

The draft Constructability Review Report shall be submitted no later than four (4) weeks prior to the formal Phase B submission. It is understood that at the Phase B level of development, estimates of work durations and costs will not be exact. The Constructability Review Report is to be updated and resubmitted with each Major Milestone Submission in Final Design as the design progresses. The final Constructability Review Report shall be submitted coincident with the Phase D submission package.

11.3. General Report Format

The Constructability Review Report will generally follow the format below, but may vary based on the type of construction proposed. The Engineer is advised to consult the Authority Project Manager for specific format requirements prior to assembling the draft report for its initial submission at Pre-Phase B. It is highly recommended that the Engineer submits a proposed table of contents to the Authority Project Manager for concurrence prior to proceeding with the draft report.

11.3.1. Introduction

Provide a general description of the work including type, location, milepost limits, total anticipated project construction duration, and milepost-to-milepost limits of traffic lane shifts (taper point to taper point or placement of advance signing, whichever is greater) where present with any potential detours or roadway closures.

11.3.1. Construction Methods

Describe anticipated methods of construction with respect to protecting adjacent traffic, facilities / roadways underneath, size of equipment to be used, temporary works or erection support placement and staging of components to be erected, and anticipated duration and timeframe of construction activities subdivided by construction stage.

11.3.2. Existing Structure Demolition

Describe methods of demolishing major existing structures with respect to protecting adjacent traffic, facilities / roadways underneath, maintaining integrity of structures to remain, size of equipment to be used, behavior changes to the existing structure from partial demolition (if anticipated), placement and staging of both demolition equipment and demolition spoils, and anticipated duration and timeframe of demolition activities subdivided by construction stage.

11.3.3. Limits of Traffic Effects

Where existing traffic must be shifted, show in schematic form the severity of the move as a cross section through the work zone. Also list the limits of the traffic effects, i.e., impacts to entrance / exit ramps and toll plazas, and detours or alternate routes, as the outer limits of the project lane shift taper point mile posts. Also, the availability of lane closings to implement shifts shall be reviewed. The Engineer should review the need for special provisions such as stand-by wrecker service or special traffic / queue monitoring systems, especially if the length of closing / shift requires such measures and / or the number of lanes are reduced, or shoulders are eliminated during peak travel periods.

The Engineer shall verify with the Authority Project Manager whether other projects (Authority and non-Authority) are anticipated to be taking place concurrently to the subject project within the vicinity of the work zones, and where force account work in the Contract is to be provided to allow for emergency maintenance of other structures / infrastructure within the limits of the work zones.

The Engineer shall identify the improvements to be addressed by the Contract prior to the traffic shift so flow of traffic in the shifted position is maintained for the stage duration (i.e., installation of additional / new safety features, construction of pavement, reconstruction of existing pavement, pavement repairs, welding of inlet grates).

The Engineer shall identify any anticipated detours or High Intensity Construction Cycle (HICC) work as may be required to complete the work or to respect stakeholder limited timeframe accessible work (such as railroads or other facility owners).

11.3.4. Specialty Equipment or Water Work

Identify specialty construction equipment as it may be required to construct the project, such as large cranes, barge based work, transport equipment for large or heavy prefabricated bridge components, etc. Where long lead times to obtain specialty equipment may be anticipated or if limited use of specialty equipment is required by adjacent facility owners, the Design shall adjust the project duration as appropriate.

11.3.5. Construction Staging and Storage Areas

Ensure adequate lay-down areas for equipment and materials and identify on the plans where and how the contractor will access the construction site for supply of labor and materials and for placement of equipment including temporary construction easements and rights of entry. Need for barges or trestles should be considered for shallow draft water work. Use of schematic representations and relevant dimensions of the laydown areas and access routes to the construction site should be included in the report.

11.3.6. Approximate Construction Schedule

Create a baseline schedule that roughly estimates the order of various construction operations and their durations. The schedule should account for mobilization time for the contractor, winter shut-downs for concrete work, black-out periods for

environmental concerns or utility work, any external restrictions such as seasonal traffic, water work limits, stakeholder constraints (railroad closures, navigable channel impacts) and adjacent roadway project work, lead times for complex or specialty construction items and coordination efforts where long lead times are anticipated such as for local agency approvals or DEP/USCG/ACOE review periods.

The approximate construction schedule need only be submitted with the draft Constructability Review Report up to the Phase B submission. For the Phase C and Phase D submissions, the overall construction schedule is expected to be submitted as a separate deliverable.

REVISION SUMMARY

Revision	Date	Revised by	Summary
0	Oct 2024		Original document