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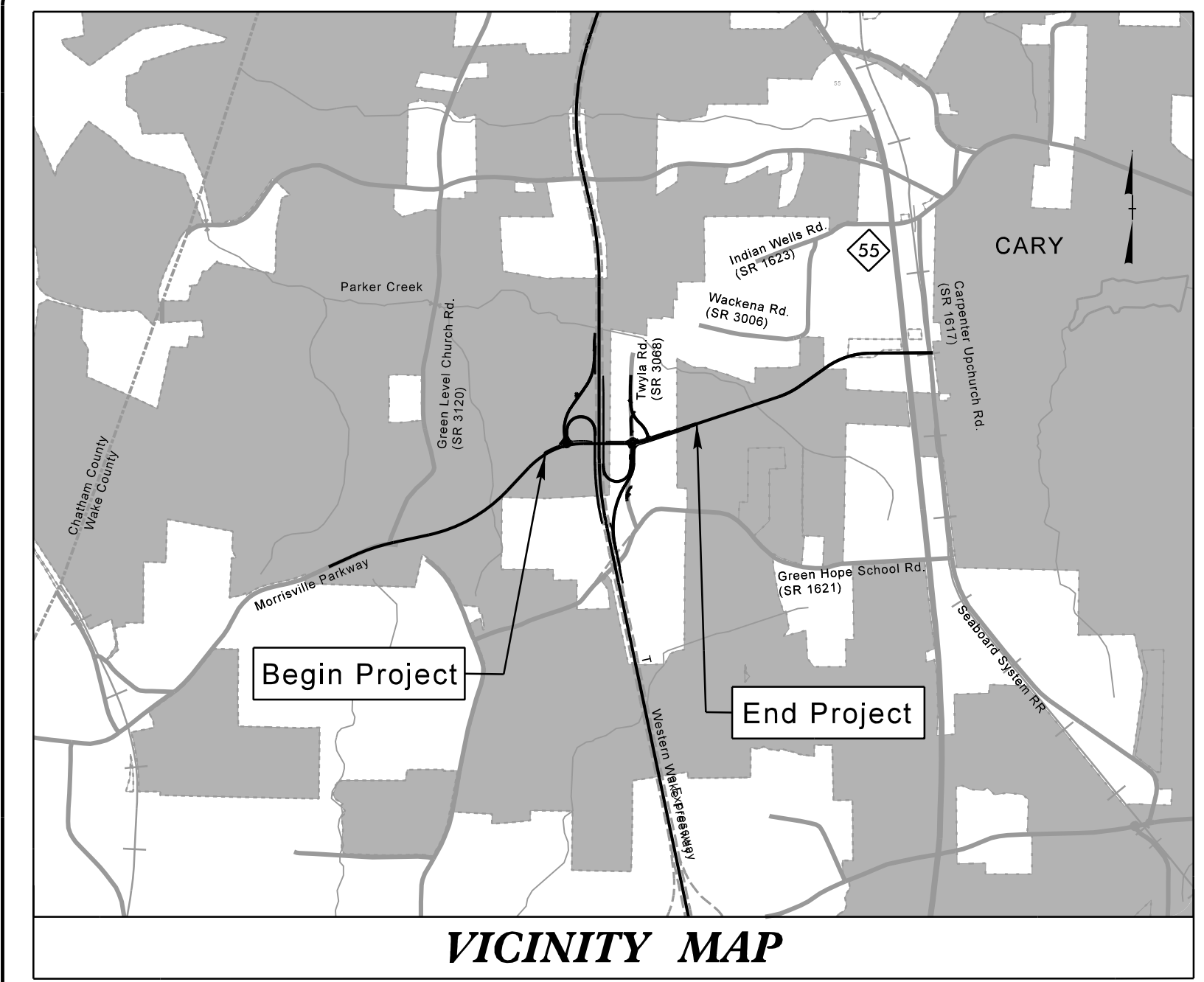
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09_08/19

TIP PROJECT: U-5315 A&B

CONTRACT: C203991

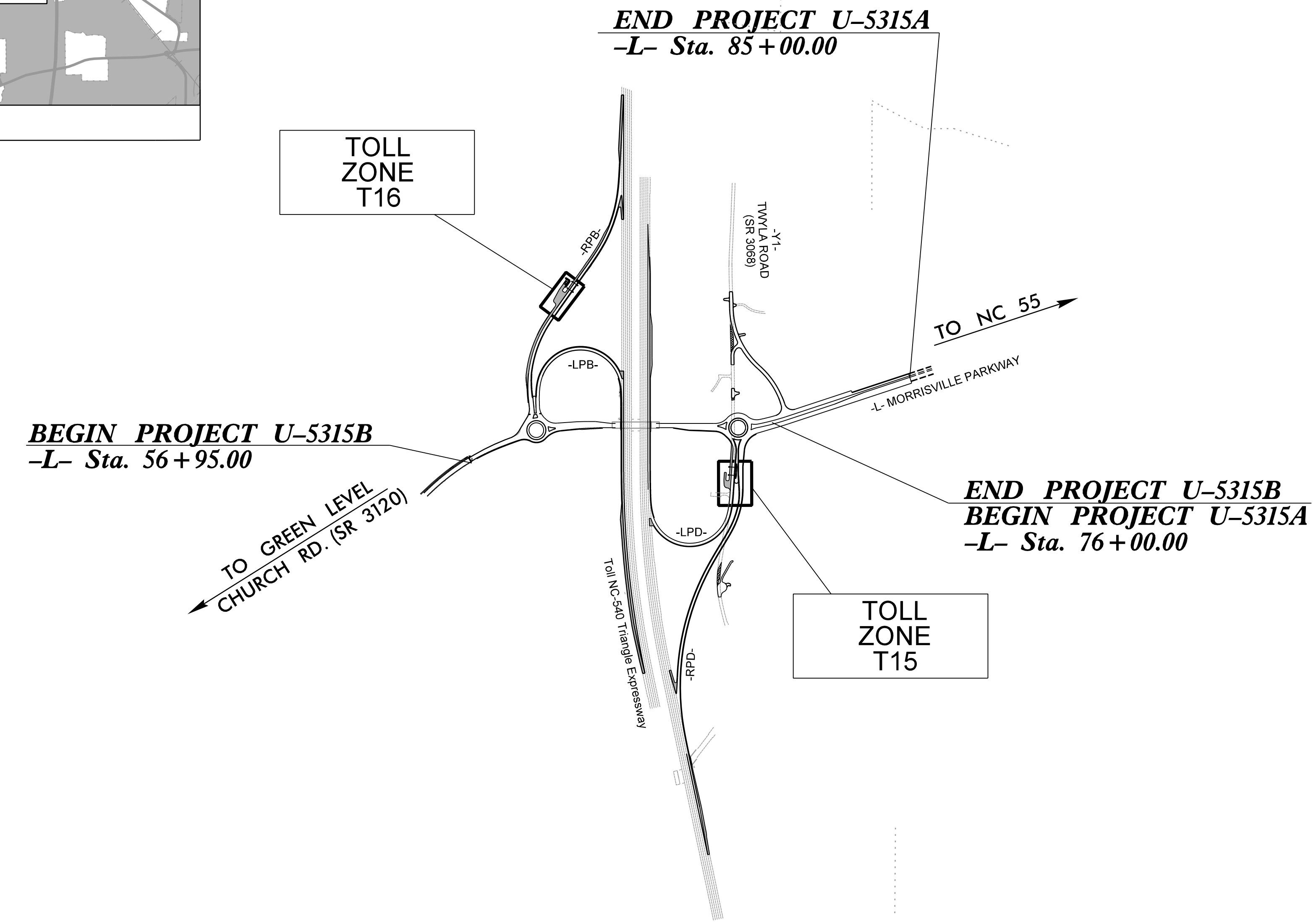


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

**LOCATION: MORRISVILLE PARKWAY EXTENSION AND NC 540 INTERCHANGE
FROM WEST OF HIGHCROFT DRIVE TO EAST OF MILLS PARK DRIVE IN CARY**
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT,
SIGNING, AND TOLL INFRASTRUCTURE**

STATE	STATE PROJECT REFERENCE NO.		SHEET NO.
N.C.	U-5315A/U-5315B		AET-1
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
U-5315A	45429.1.F2	STPDA-0503(19)	PE
U-5315A	45429.2.2	STPDA-0540(38)	R/W, UTILITIES
U-5315B	45429.1.F3	STPDA-0503(19)	PE
U-5315B	45429.2.3	STPDA-0540(39)	R/W, UTILITIES
U-5315A&B	45429.3.3	STPDA-0540(39)	CONST.
U-5315B	45429.5.TA1		TURNPIKE CONST.
U-5315B	45429.5.TA3		TURNPIKE ROW

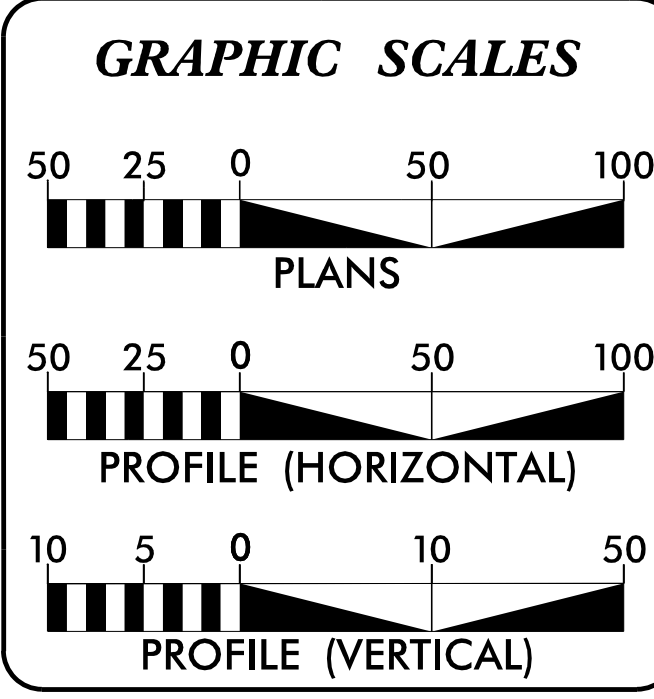


INDEX OF SHEETS	
SHEET NUMBER	SHEET
AET-1	TITLE SHEET
AET-1A	CONVENTIONAL PLAN SHEET SYMBOLS
AET-1B THRU AET-1N	NCTA AET STANDARD DRAWINGS
AET-1O	PAVEMENT DETAILS
AET-1P	GANTRY LOCATIONS
AET-1Q	SPOT ELEVATIONS
AET-1R	GRADING DETAILS
AET-1S	SCREEN WALL- LOCATION DETAIL
AET-2	TOLL ZONE T16 DETAIL SHEET
AET-3	TOLL ZONE T15 DETAIL SHEET
AET-4	TOLL ZONE T15 AND T16 PROFILE SHEET
AET-5	TOLL ZONE T16 CROSS SECTIONS
AET-6	TOLL ZONE T15 CROSS SECTIONS



NOTES:
1. THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

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DESIGN DATA

ADT 2017 =	11,850
ADT 2037 =	23,005
K =	12 %
D =	60 %
T =	4 % *
V =	50 MPH
* (TTST 1% + DUALS 3%)	
FUNC. CLASS =	MAJOR THOROUGHFARE / URBAN ARTERIAL

PROJECT LENGTH

LENGTH OF PROJECT U-5315B.....	0.322 mi
LENGTH OF PROJECT U-5315A.....	0.170 mi
TOTAL LENGTH.....	0.492 mi

PREPARED IN THE OFFICE OF:
RK&K
FOR NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS
RIGHT OF WAY DATE:
NOVEMBER 20, 2015
LETTING DATE:
DECEMBER 19, 2017

NCDOT CONTACT: MOHAMMED E. MAHJOUB
SPECIAL DESIGN PROJECT ENGINEER
ROADWAY DESIGN UNIT

B. KEITH SKINNER, P.E.
PROJECT ENGINEER

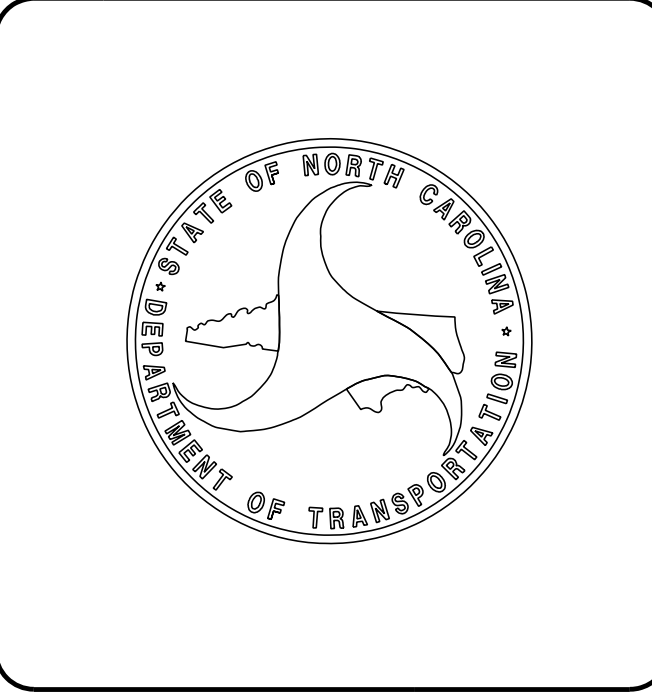
STEPHEN ROBERTS, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

Decisigned by: 11/10/2017
Jeffrey W. Merdorp
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

Decisigned by: 11/10/2017
David T. Seams
SIGNATURE: P.E.



12/05/11

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	⑫③
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	-WLB-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-
Known Soil Contamination: Area or Site	☠ ☠
Potential Soil Contamination: Area or Site	☠ ?

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	✕
Foundation	□
Area Outline	□
Cemetery	⊕
Building	□
School	□
Church	⊕
Dam	□

HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	□
Jurisdictional Stream	-JS-
Buffer Zone 1	-BZ 1-
Buffer Zone 2	-BZ 2-
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	⬇
Proposed Lateral, Tail, Head Ditch	← FLOW
False Sump	▽

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	○ RW
Proposed Right of Way Line with Iron Pin and Cap Marker	○ RW ▲
Proposed Right of Way Line with Concrete or Granite RW Marker	○ RW ▲
Proposed Control of Access Line with Concrete CA Marker	○ CA
Existing Control of Access	○ CA
Proposed Control of Access	○ CA
Existing Easement Line	-E-
Proposed Temporary Construction Easement	-E-
Proposed Temporary Drainage Easement	-TDE-
Proposed Permanent Drainage Easement	-PDE-
Proposed Permanent Drainage / Utility Easement	-DUE-
Proposed Permanent Utility Easement	-PUE-
Proposed Temporary Utility Easement	-TUE-
Proposed Aerial Utility Easement	-AUE-
Proposed Permanent Easement with Iron Pin and Cap Marker	◆

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-C-
Proposed Slope Stakes Fill	-F-
Proposed Curb Ramp	○ CR
Existing Metal Guardrail	-T-T-T-
Proposed Guardrail	-T-T-T-
Existing Cable Guiderail	-P-P-P-
Proposed Cable Guiderail	-P-P-P-
Equality Symbol	⊕
Pavement Removal	⊗

VEGETATION:

Single Tree	☼
Single Shrub	☼
Hedge	~~~~~
Woods Line	~~~~~

Orchard	☼ ☼ ☼ ☼
Vineyard	□ Vineyard

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	CONC
Bridge Wing Wall, Head Wall and End Wall	CONC WW
MINOR:	
Head and End Wall	CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	⊕
Storm Sewer	-S-

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	□
H-Frame Pole	●
Recorded U/G Power Line	-P-
Designated U/G Power Line (S.U.E.*)	-P-

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Booth	□
Telephone Pedestal	⊕
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	□
Recorded U/G Telephone Cable	-T-
Designated U/G Telephone Cable (S.U.E.*)	-T-
Recorded U/G Telephone Conduit	-TC-
Designated U/G Telephone Conduit (S.U.E.*)	-TC-
Recorded U/G Fiber Optics Cable	-T FO-
Designated U/G Fiber Optics Cable (S.U.E.*)	-T FO-

WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
Recorded U/G Water Line	-----
Designated U/G Water Line (S.U.E.*)	-----
Above Ground Water Line	-A/G Water-

TV:

TV Satellite Dish	☼
TV Pedestal	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	□
Recorded U/G TV Cable	-TV-
Designated U/G TV Cable (S.U.E.*)	-TV-
Recorded U/G Fiber Optic Cable	-TV FO-
Designated U/G Fiber Optic Cable (S.U.E.*)	-TV FO-

GAS:

Gas Valve	◇
Gas Meter	⊕
Recorded U/G Gas Line	-G-
Designated U/G Gas Line (S.U.E.*)	-G-
Above Ground Gas Line	-A/G Gas-

SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	-SS-
Above Ground Sanitary Sewer	-A/G Sanitary Sewer-
Recorded SS Forced Main Line	-FSS-
Designated SS Forced Main Line (S.U.E.*)	-FSS-

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line	-TU/L-
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊕
A/G Tank; Water, Gas, Oil	□
Geoenvironmental Boring	⊕
U/G Test Hole (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.



GENERAL NOTES:

1. See Scope of Work for additional details and requirements.
2. Provide prefabricated, pre-cast or built-in-place vault with R-24 insulation, per State building codes.
3. Provide 3/4" chamfered edge on maintenance pad.
4. Field-adjust exterior cabinets/boxes as needed for local conditions, wire size, etc.

Vault Plan - ELECTRICAL:

1. Provide SPD on all distribution panels.
2. Locate conduit stub-ups a maximum of 12" from interior wall surface.
3. Provide integral safety disconnect on HVAC unit.

LIGHTING SYSTEM:

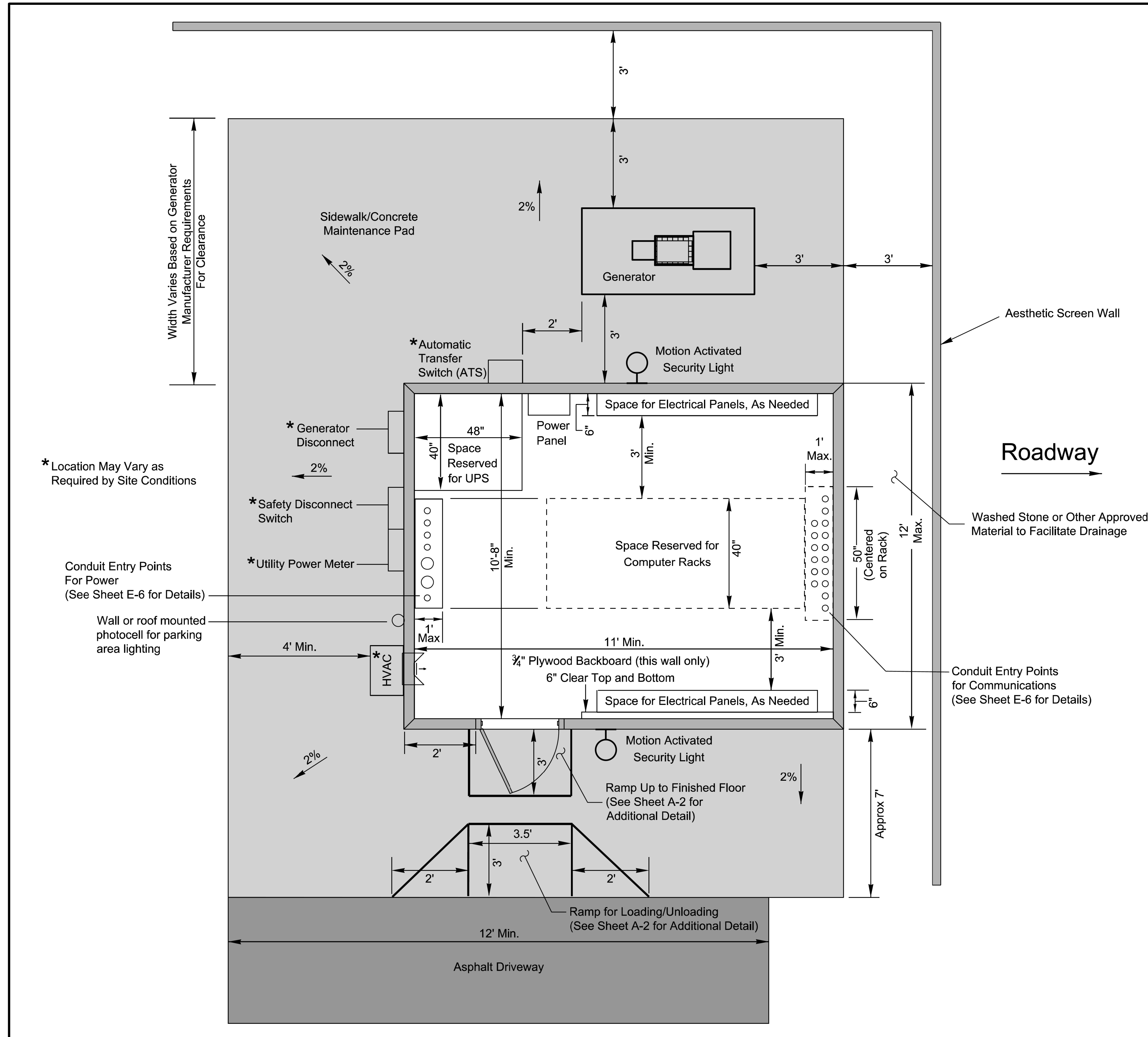
1. Provide lighting system with battery backup for power loss capable of maintaining one interior light fixture for 30 minutes minimum.

SECURITY SYSTEM:

1. Provide conduit and electrical boxes to support the electronic door security system to be installed by the Toll System Integrator.

CONDUIT SYSTEM:

1. Contractor may choose to place conduit entrances in side of building rather than up through floor.



ATKINS		
1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBES #F-0326		
NORTH CAROLINA TURNPIKE AUTHORITY AET STANDARD DRAWINGS AET Toll Zone Vault Plan		
SCALE: N.T.S. Rev. Oct 2014	NORTH CAROLINA TURNPIKE AUTHORITY	SHEET NO. A-1

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PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
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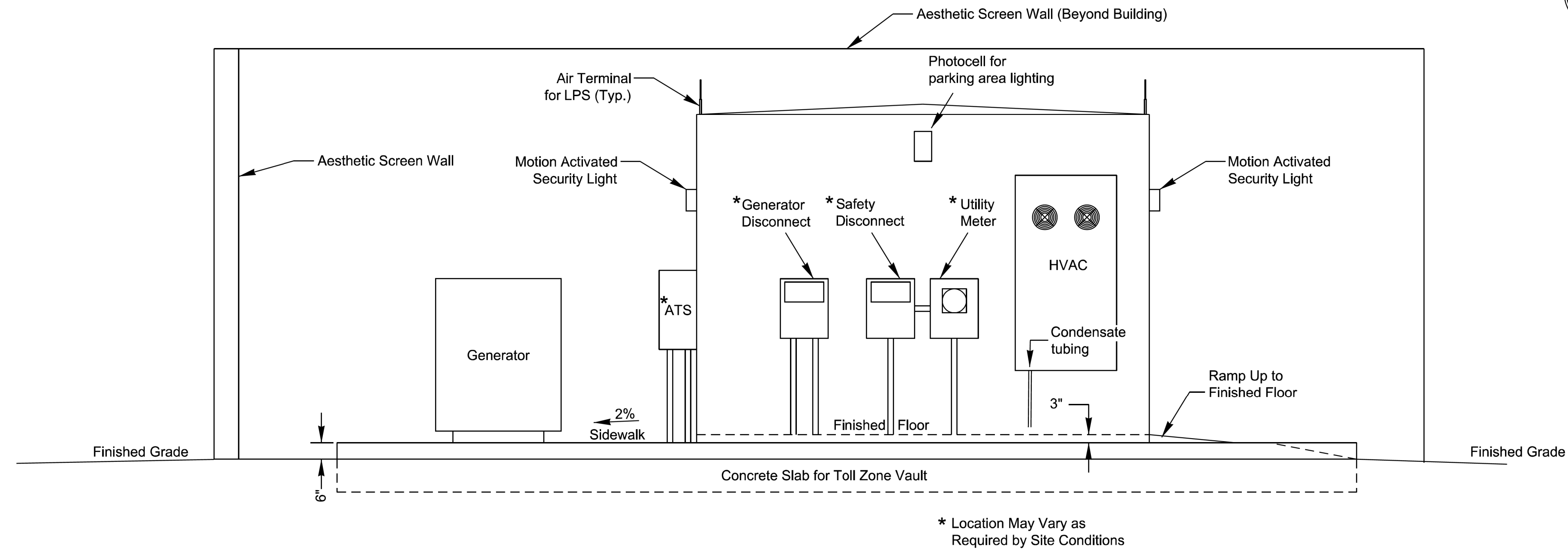
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Division of Transportation Services
750 N. Greenfield Place, Garner, NC 27529
SCALE: N/A

**NORTH CAROLINA
TURNPIKE AUTHORITY
ITS STANDARD DETAIL**

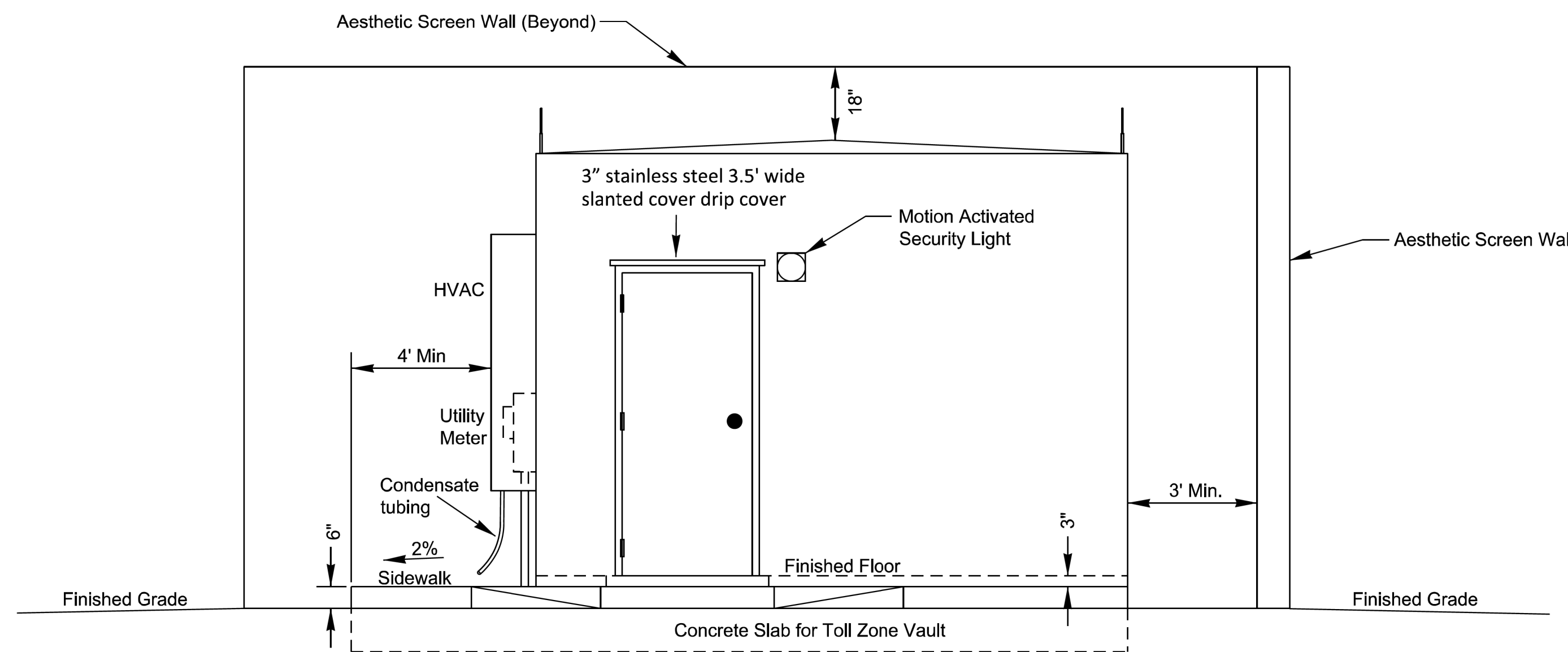
DIVISION 05 WAKE COUNTY TOWN OF CARY
PLAN DATE: SEPTEMBER 2017 REVIEWED BY: C.B. HOLDEN
PREPARED BY: D.T. SEARS REVIEWED BY:
REVISIONS: _____ INIT. DATE
_____ INIT. DATE
_____ INIT. DATE

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Side Elevation
Not to Scale



Front Elevation
Not to Scale

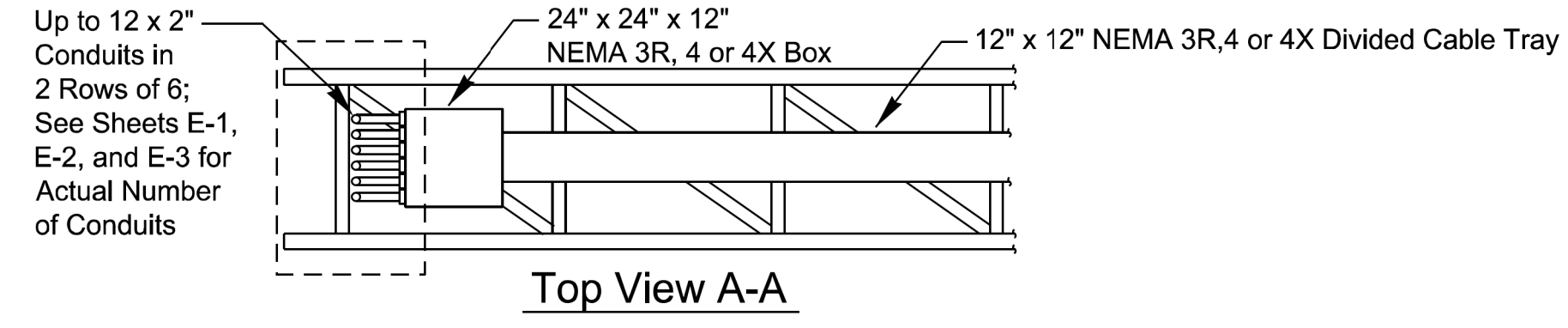
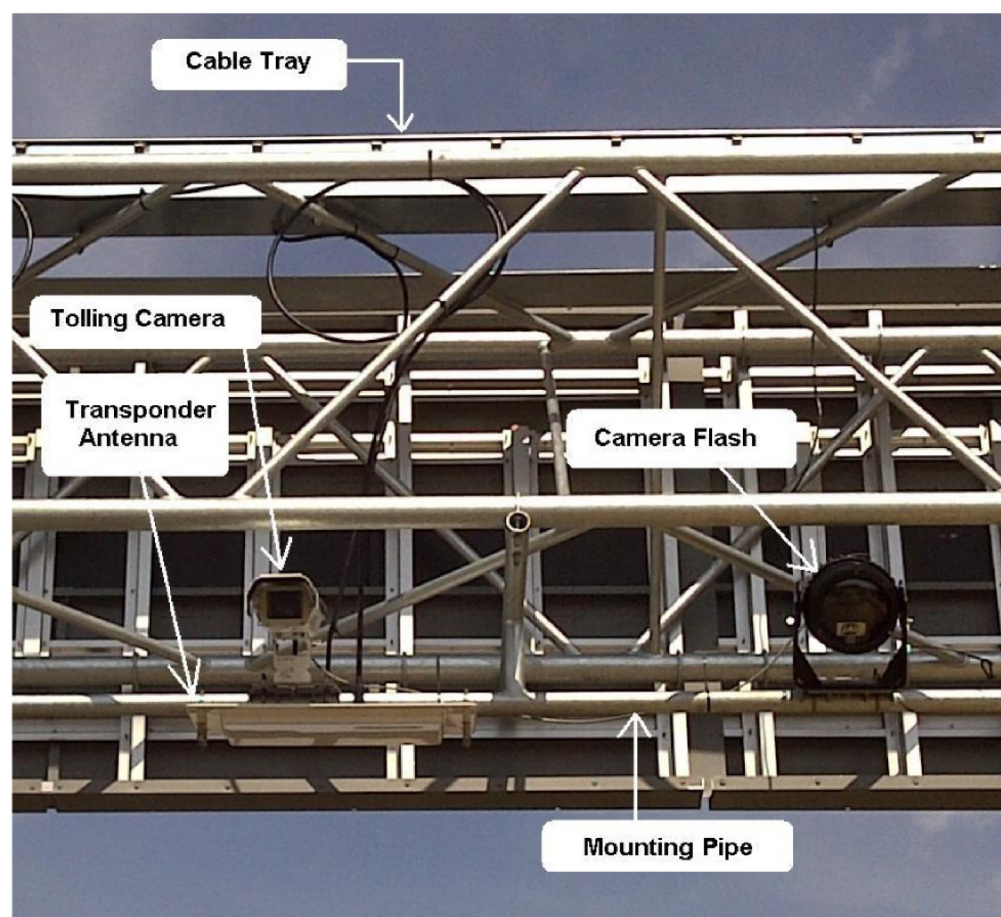
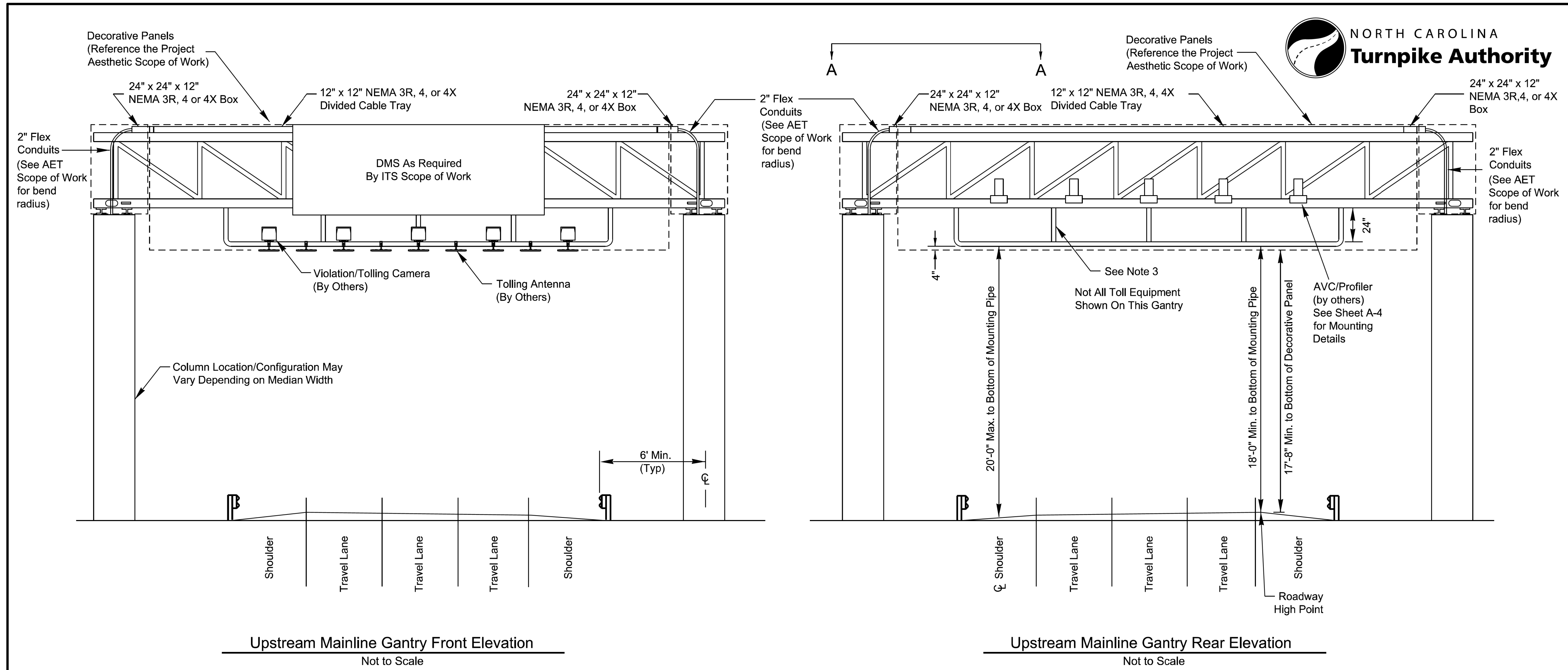
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1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBES #F-0326		
NORTH CAROLINA TURNPIKE AUTHORITY AET STANDARD DRAWINGS AET Toll Zone Vault Elevations		
SCALE: N.T.S. Rev. Oct 2014	NORTH CAROLINA TURNPIKE AUTHORITY	SHEET NO. A-2

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750 N. Greenfield Place, Garner, NC 27529		DIVISION 05 WAKE COUNTY TOWN OF CARY	
SCALE: N/A		PLAN DATE: SEPTEMBER 2017	REVIEWED BY: C.B. HOLDEN
		PREPARED BY: D.T. SEARS	REVIEWED BY:
		REVISIONS	INIT. DATE

PLANS PREPARED BY :
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

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- Notes:**
1. Downstream gantry is similar but without DMS and AVC/Profilers.
 2. Number of travel lanes may vary.
 3. Location of vertical supports to be coordinated with Toll System Integrator.
 4. Mounting pipes are horizontal.

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
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(919) 876-6888 NCBES #F-0326

NORTH CAROLINA TURNPIKE AUTHORITY
AET STANDARD DRAWINGS
Typical AET Toll Zone Gantry Elevations

SCALE: N.T.S.	NORTH CAROLINA TURNPIKE AUTHORITY	SHEET NO.
Rev. Oct 2014		A-3

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DEPARTMENT OF TRANSPORTATION

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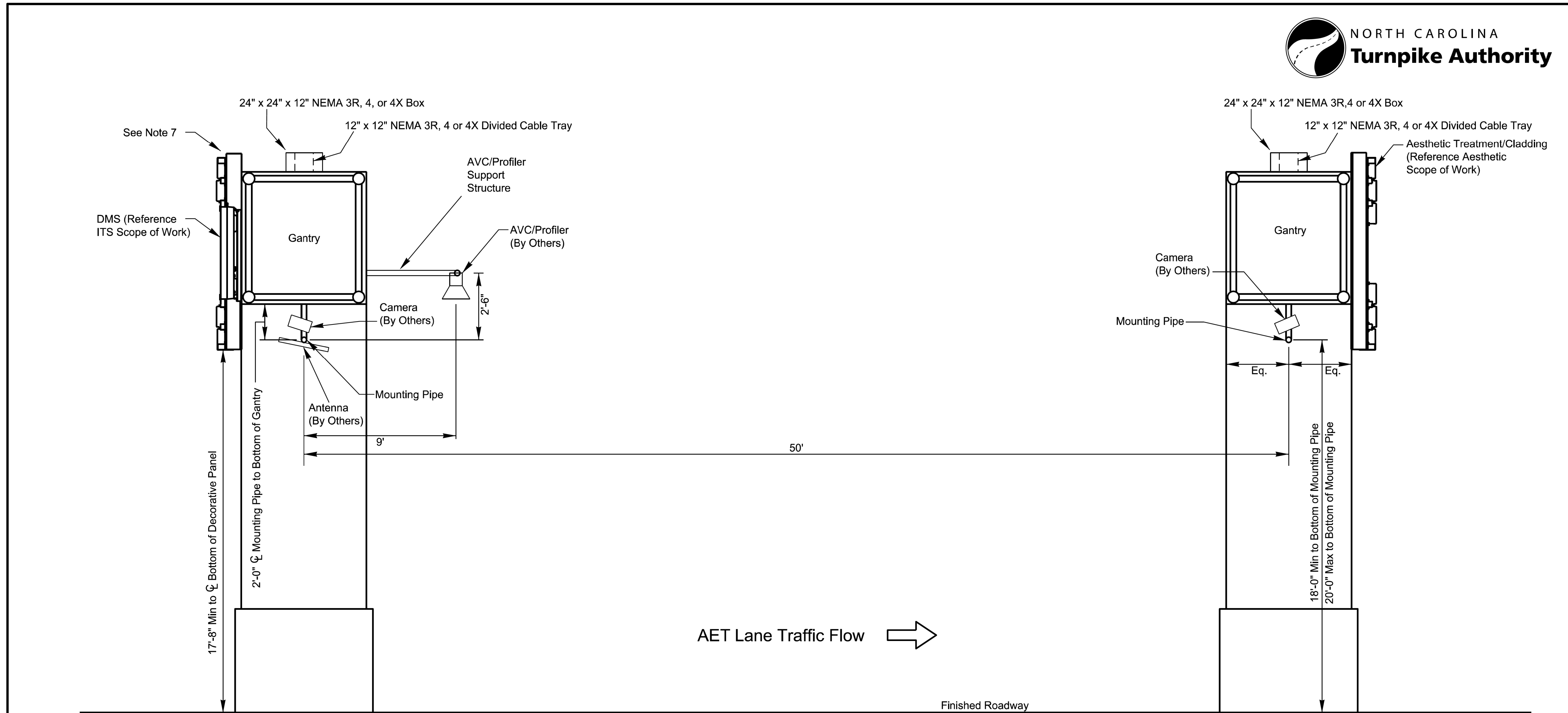
NORTH CAROLINA TURNPIKE AUTHORITY
ITS STANDARD DETAIL

DIVISION 05 WAKE COUNTY TOWN OF CARY

PLAN DATE: SEPTEMBER 2017 REVIEWED BY: C.B. HOLDEN

PREPARED BY: D.T. SEARS REVIEWED BY:

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Gantry Side Elevation
Not to Scale

- Notes:**
1. All mounting heights are to the centerline of the mounting pipe.
 2. Heights are typical for both gantries.
 3. Install DMS per the ITS Scope of Work.
 4. Mounting pipes:
Camera/Antenna - 2" Rigid Galvanized Pipe.
AVC/Profiler - 3" Rigid Galvanized Pipe (if mounting pipe is used)
 5. Divided cable tray shall be watertight (NEMA 3R) and grounded on both ends per NEC.
 6. All conduit from the divided cable tray to the top of the columns shall be concealed behind cladding or earwalls. (See Aesthetic Scope of Work for cladding details).
 7. Top of gantry aesthetic treatment shall be higher than top of cable tray and watertight box.

ATKINS		1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBES #F-0326
NORTH CAROLINA TURNPIKE AUTHORITY AET STANDARD DRAWINGS Typical AET Toll Zone Gantry Side Elevation		
SCALE: N.T.S. Rev. Oct 2014	NORTH CAROLINA TURNPIKE AUTHORITY	SHEET NO. A-4

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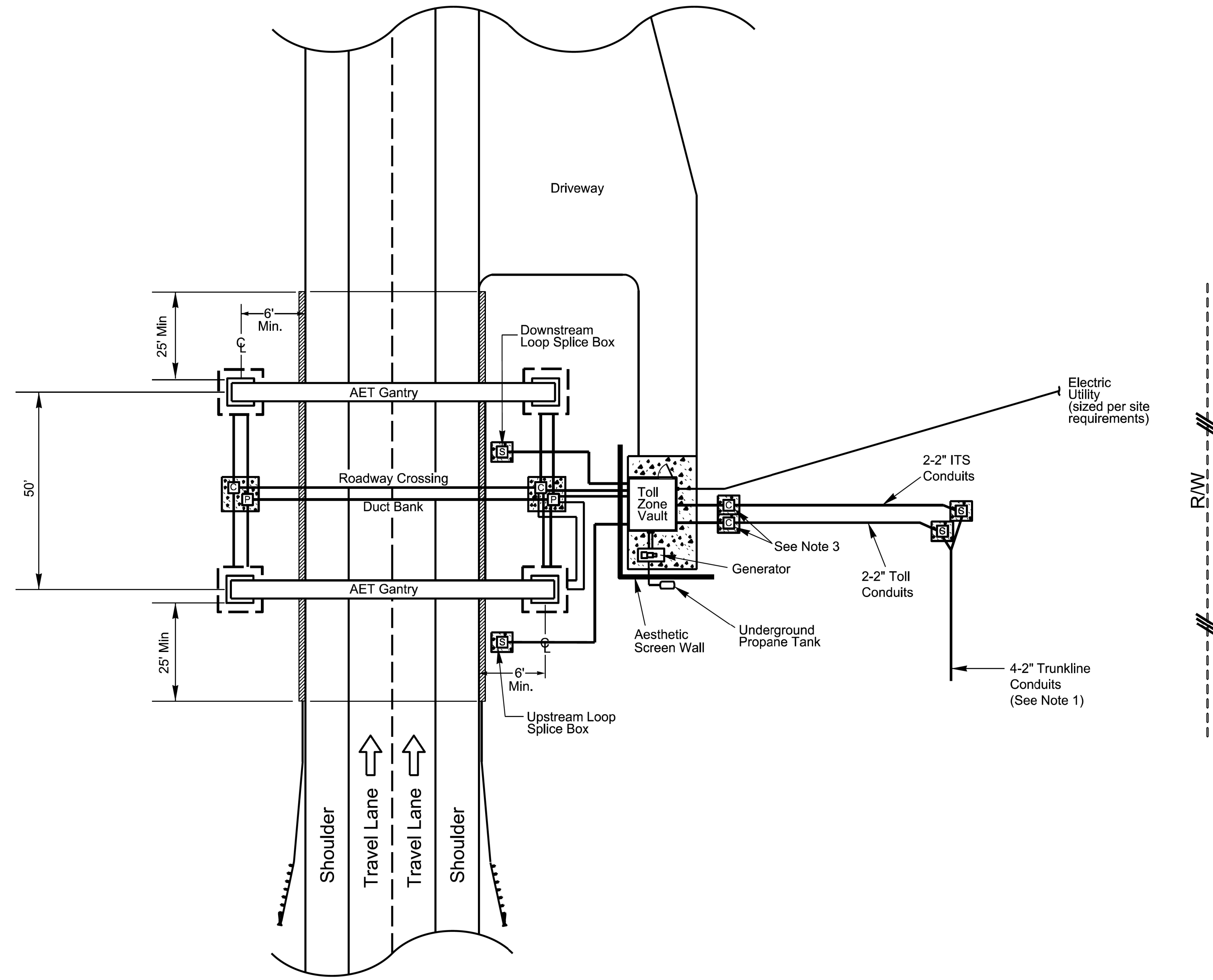
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**NORTH CAROLINA
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DIVISION 05 WAKE COUNTY TOWN OF CARY
PLAN DATE: SEPTEMBER 2017 REVIEWED BY: C.B. HOLDEN
PREPARED BY: D.T. SEARS REVIEWED BY:

REVISIONS	INIT.	DATE

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Notes:

1. The FON trunkline as shown is approximate. The specific location of the FON trunkline will be designed and installed in coordination with ITS Scope of Work.
2. Lane and shoulder configuration may vary.
3. For all conduit runs entering Toll Zone Vault, place conduit boxes as needed to ensure last box before entering Toll Zone Vault is below level of sidewalk concrete slab.
4. Locations and length of steel beam guardrail and location of end terminals shall be determined during design in accordance with AASHTO roadside safety design guidelines and NCDOT standards.
5. Anchor Barrier Wall on top of pavement edge by installing dowel bars tied into every other vertical reinforcing bar of the Barrier Wall.
6. Provide concrete aprons for all junction boxes as per the ITS and AET Scope of Work.

Legend

- C - Communications Junction Box
- P - Power Junction Box
- S - Loop Splice Box
- [] - Structure Foundation
- Guardrail
- Guardrail with doubled posts
- Box with 18" concrete apron; 1" above grade

ATKINS		
1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-8326		
NORTH CAROLINA TURNPIKE AUTHORITY AET STANDARD DRAWINGS		
Morrisville Parkway Ramp AET Toll Zone Plan View		
SCALE: N.T.S.	NORTH CAROLINA TURNPIKE AUTHORITY	SHEET NO. C-2
Rev. Sept. 2017		

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Department of Transportation
Division of Transportation Systems
NORTH CAROLINA
TURNPIKE AUTHORITY

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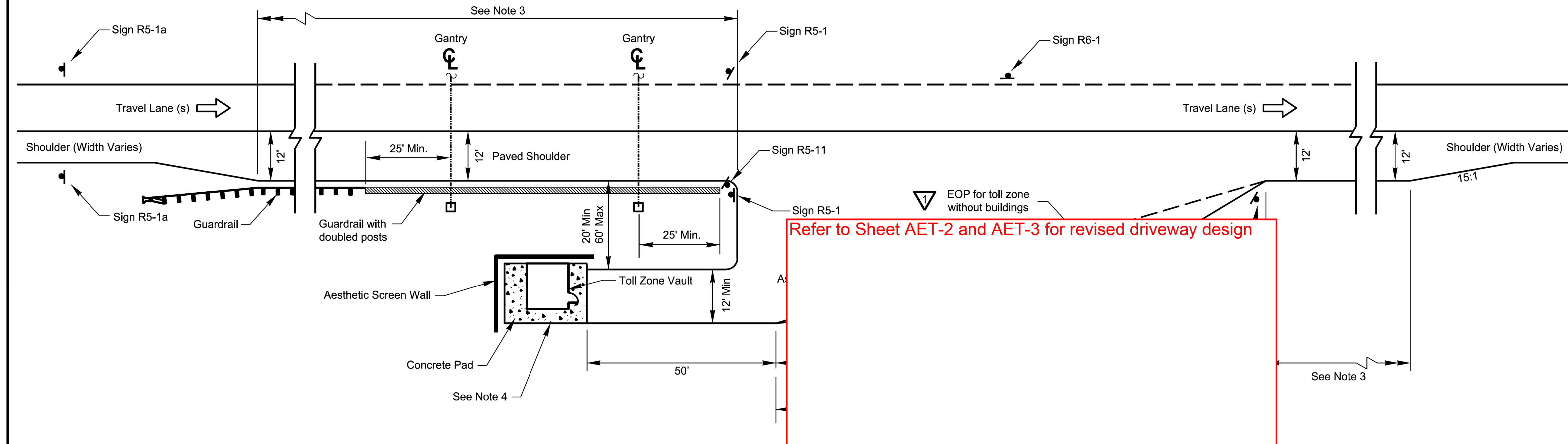
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Signing Notes:

1. Signing applies to AET Toll Zones with and without buildings.
2. Signing applies to both mainline and ramp AET Toll Zones.
3. Sign spacing shall be in accordance with NCDOT and MUTCD standards.
4. Sign sizes shall be in accordance with MUTCD Table 2B-1.
5. U-channel support design shall be in accordance with NCDOT standards.

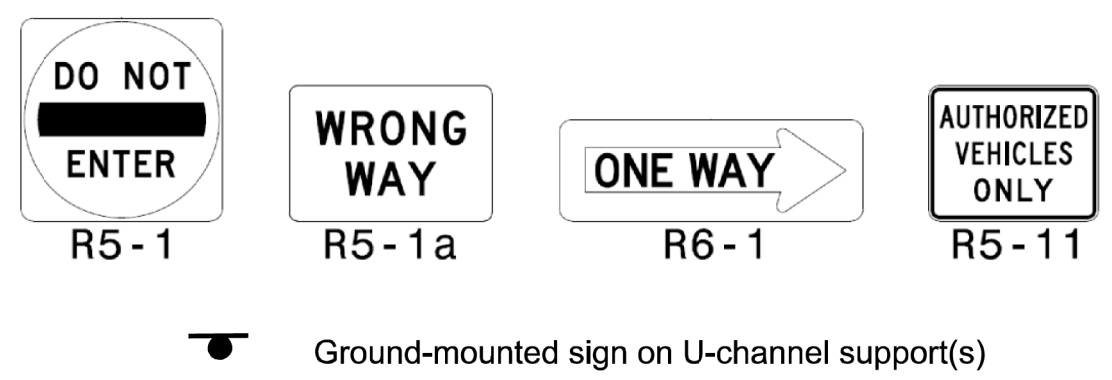


Access and Signing Detail for AET Facility

Sign Key Not to Scale

Notes:

1. AET Toll Zone Vault and concrete pad may vary in size.
2. Locations and length of steel beam guardrail and location of end terminals shall be determined during design in accordance with AASHTO roadside safety design guidelines and NCDOT standards.
3. Acceleration and deceleration lengths shall be determined based on the design criteria included in the Roadway Scope of Work.
4. Center Toll Zone Vault between gantries.
5. Provide driveway whether vault is present or not.



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Revised 4/21/2015

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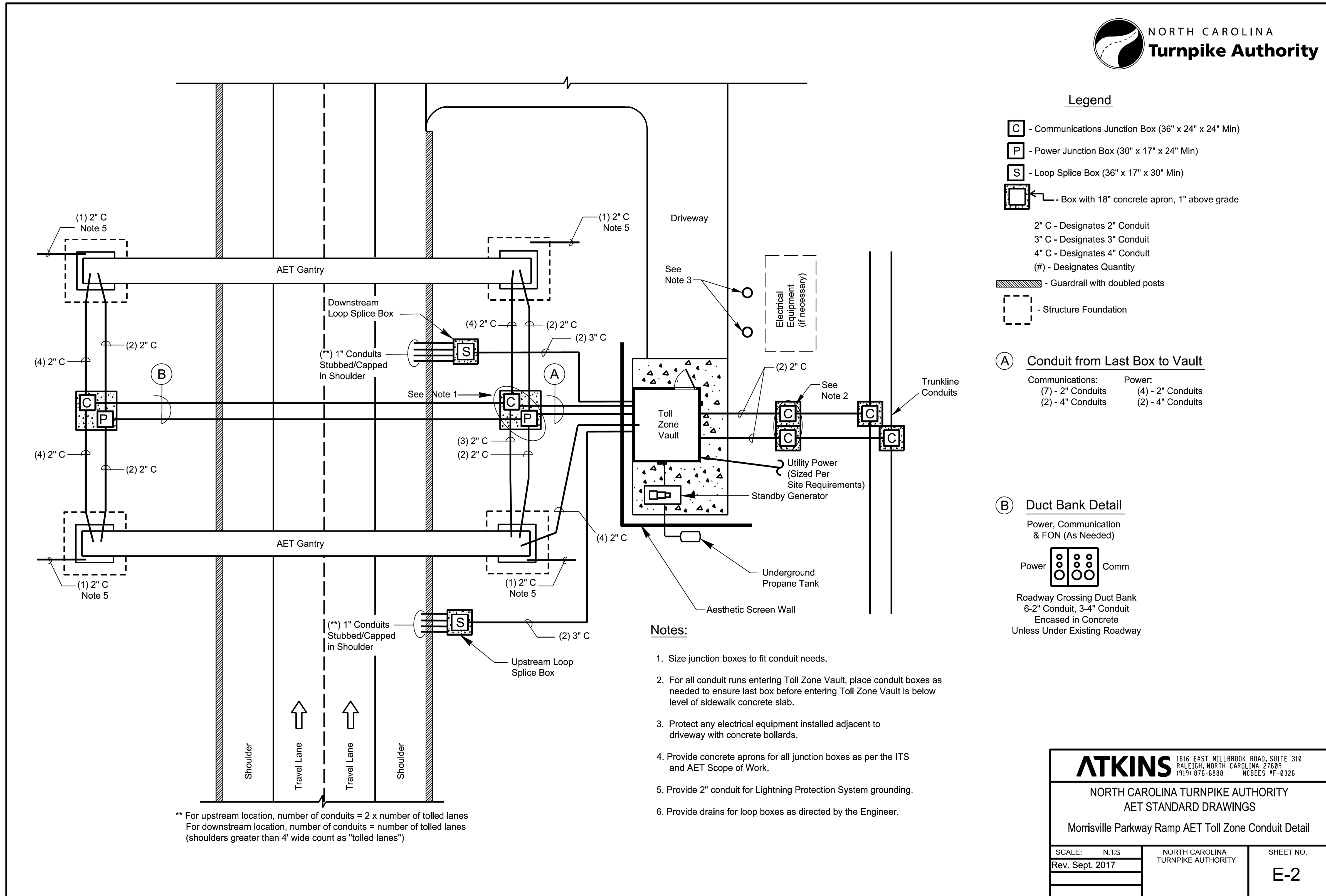
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PLANS PREPARED BY :

RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
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 NC LICENSE NO. F-0112 • (919) 878-9560

Prepared for the Offices of:
 Transportation Mobility and Safety Division
 NORTH CAROLINA TURNPIKE AUTHORITY
 750 N. Greenfield Place, Garner, NC 27529
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- Legend**
- C** - Communications Junction Box (36" x 24" x 24" Min)
 - P** - Power Junction Box (30" x 17" x 24" Min)
 - S** - Loop Splice Box (36" x 17" x 30" Min)
 - Box with 18" concrete apron, 1" above grade
 - 2" C - Designates 2" Conduit
 - 3" C - Designates 3" Conduit
 - 4" C - Designates 4" Conduit
 - (#) - Designates Quantity
 - Guardrail with doubled posts
 - Structure Foundation

A Conduit from Last Box to Vault

Communications:	Power:
(7) - 2" Conduits	(4) - 2" Conduits
(2) - 4" Conduits	(2) - 4" Conduits

B Duct Bank Detail

Power, Communication & FON (As Needed)

Power	Comm
-------	------

Roadway Crossing Duct Bank
6-2" Conduit, 3-4" Conduit
Encased in Concrete
Unless Under Existing Roadway

- Notes:**
1. Size junction boxes to fit conduit needs.
 2. For all conduit runs entering Toll Zone Vault, place conduit boxes as needed to ensure last box before entering Toll Zone Vault is below level of sidewalk concrete slab.
 3. Protect any electrical equipment installed adjacent to driveway with concrete bollards.
 4. Provide concrete aprons for all junction boxes as per the ITS and AET Scope of Work.
 5. Provide 2" conduit for Lightning Protection System grounding.
 6. Provide drains for loop boxes as directed by the Engineer.

** For upstream location, number of conduits = 2 x number of tolled lanes
For downstream location, number of conduits = number of tolled lanes (shoulders greater than 4' wide count as "tolled lanes")

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27689 (919) 876-6888 NCBEES #F-8326		
NORTH CAROLINA TURNPIKE AUTHORITY AET STANDARD DRAWINGS		
Morrisville Parkway Ramp AET Toll Zone Conduit Detail		
SCALE: N.T.S. Rev. Sept. 2017	NORTH CAROLINA TURNPIKE AUTHORITY	SHEET NO. E-2

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

PLANS PREPARED BY:

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

Prepared for the Offices of: NORTH CAROLINA TURNPIKE AUTHORITY ITS STANDARD DETAIL	
DIVISION 05 WAKE COUNTY TOWN OF CARY	PLAN DATE: SEPTEMBER 2017 REVIEWED BY: C.B. HOLDEN
PREPARED BY: D.T. SEARS	REVIEWED BY:
SCALE: N/A	REVISIONS: INIT. DATE

11/13/2017 R:\Roadway\Proj\AET\U5315-Roy-AET_StandardDetail1.s.dgn dscors

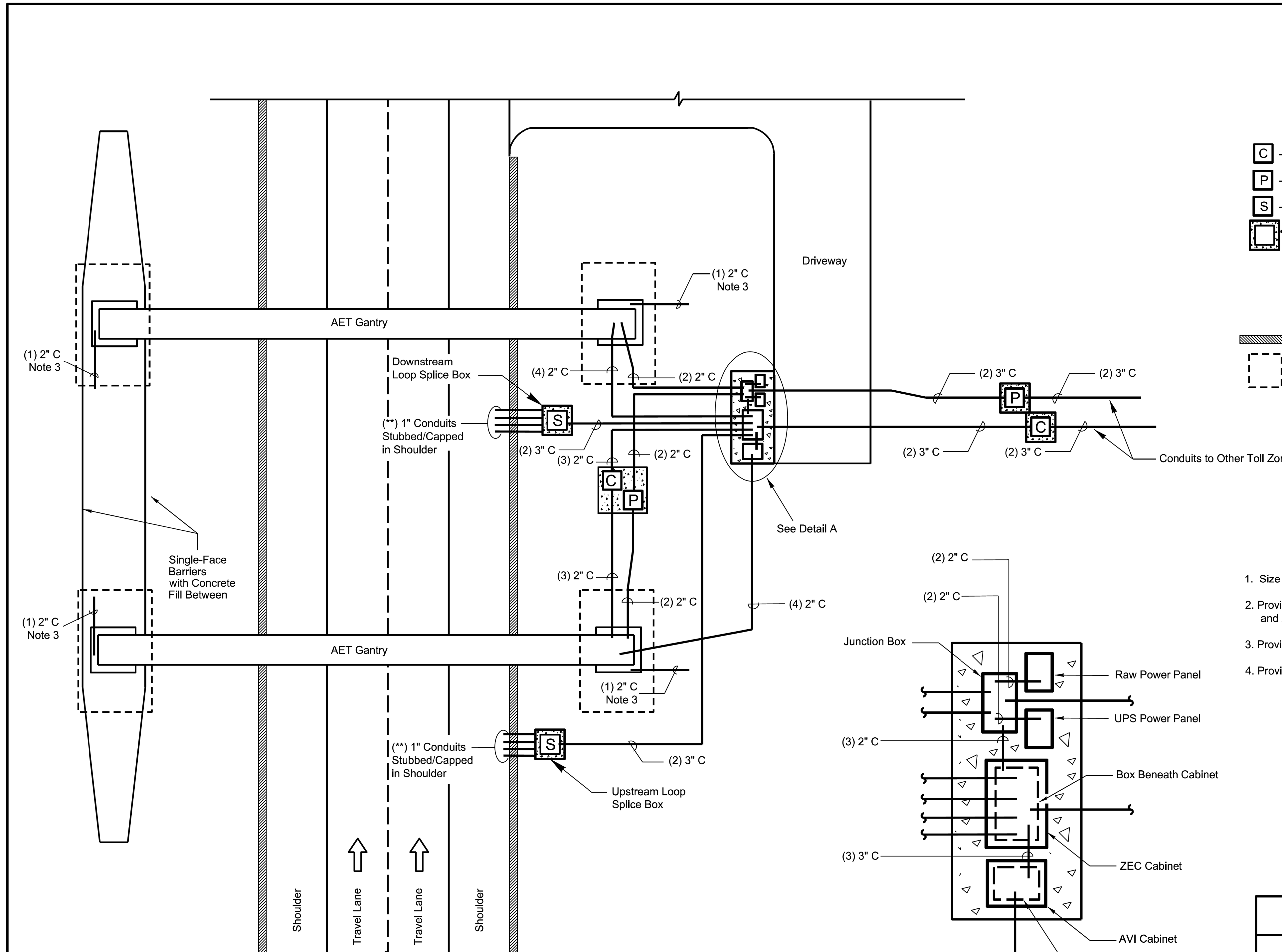


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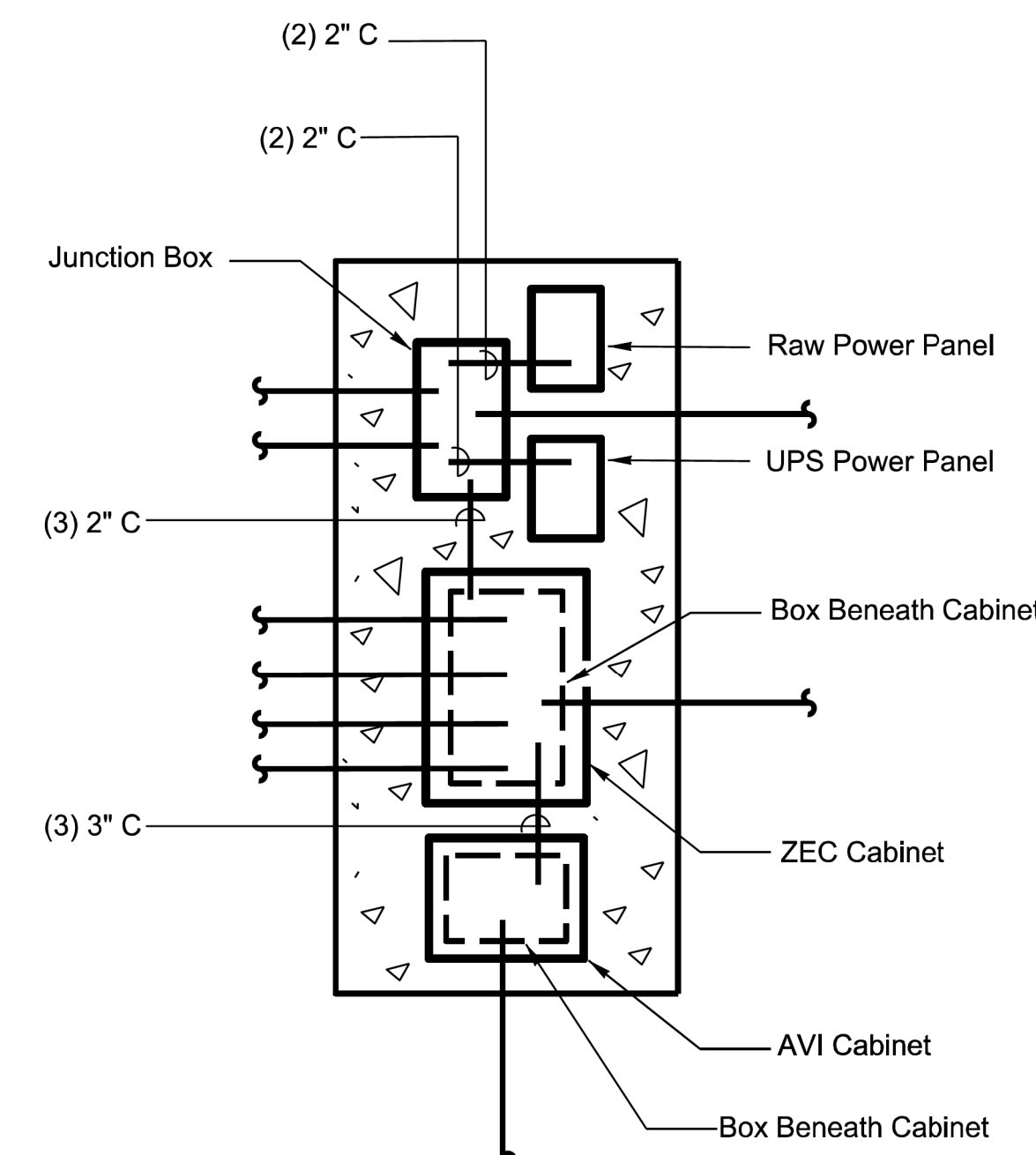
- C** - Communications Junction Box (36" x 24" x 24" Min)
- P** - Power Junction Box (30" x 17" x 24" Min)
- S** - Loop Splice Box (36" x 17" x 30" Min)
- Box with 18" concrete apron, 1" above grade

- 2" C - Designates 2" Conduit
- 3" C - Designates 3" Conduit
- 4" C - Designates 4" Conduit
- (#) - Designates Quantity

- Guardrail with doubled posts
- Structure Foundation



1. Size junction boxes to fit conduit needs.
2. Provide concrete aprons for all junction boxes as per the ITS and AET Scope of Work.
3. Provide 2" conduit for Lightning Protection System grounding.
4. Provide drains for loop boxes as directed by the Engineer.



** For upstream location, number of conduits = 2 x number of tolled lanes
For downstream location, number of conduits = number of tolled lanes
(shoulders greater than 4' wide count as "tolled lanes")

ATKINS		
1616 EAST MILLBROOK ROAD, SUITE 318 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBES #F-8326		
NORTH CAROLINA TURNPIKE AUTHORITY AET STANDARD DRAWINGS		
Morrisville Parkway Ramp AET Toll Zone Conduit Detail		
SCALE: N.T.S.	NORTH CAROLINA TURNPIKE AUTHORITY	SHEET NO.
DATE: June 2017		E-2A

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 NORTH CAROLINA TURNPIKE AUTHORITY ITS STANDARD DETAIL	
DIVISION 05 WAKE COUNTY TOWN OF CARY PLAN DATE: SEPTEMBER 2017 REVIEWED BY: C.B. HOLDEN PREPARED BY: D.T. SEARS REVIEWED BY:	
REVISIONS _____ _____ _____	INIT. DATE _____ _____ _____
CADD File name: u5315_115_standarddetail1.dgn	

PLANS PREPARED BY :

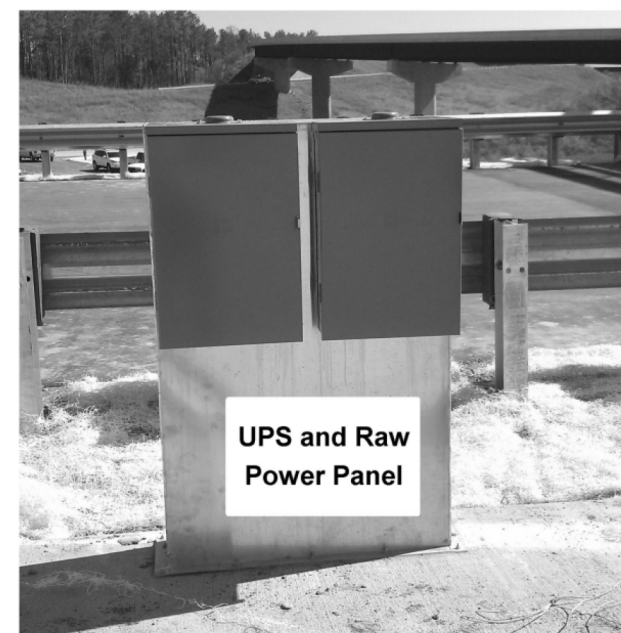
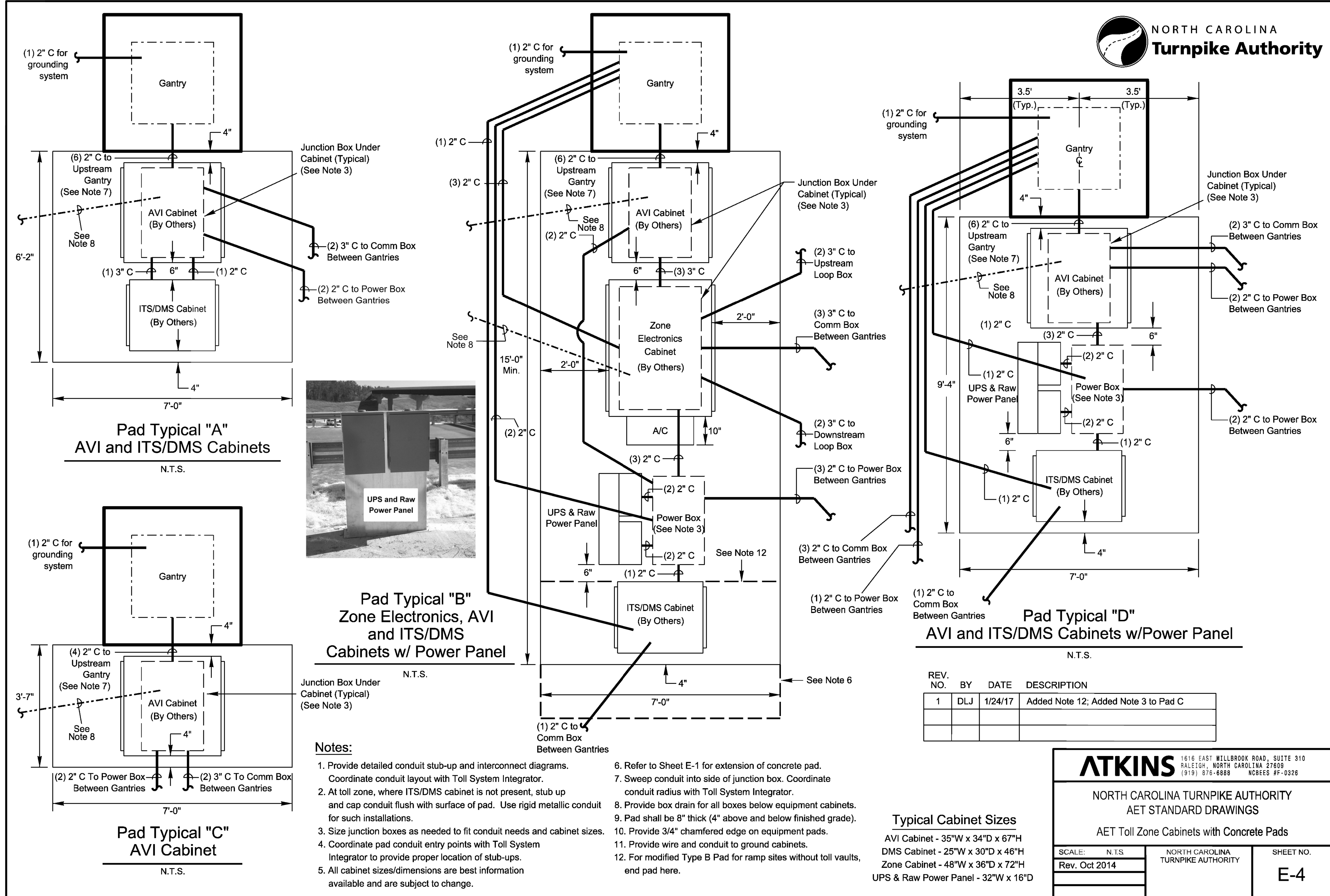
RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

Prepared for the Offices of:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 750 N. Greenfield Place, Garner, NC 27529
 SCALE: N/A

11/13/2017
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 dsears



- Notes:**
1. Provide detailed conduit stub-up and interconnect diagrams. Coordinate conduit layout with Toll System Integrator.
 2. At toll zone, where ITS/DMS cabinet is not present, stub up and cap conduit flush with surface of pad. Use rigid metallic conduit for such installations.
 3. Size junction boxes as needed to fit conduit needs and cabinet sizes.
 4. Coordinate pad conduit entry points with Toll System Integrator to provide proper location of stub-ups.
 5. All cabinet sizes/dimensions are best information available and are subject to change.
 6. Refer to Sheet E-1 for extension of concrete pad.
 7. Sweep conduit into side of junction box. Coordinate conduit radius with Toll System Integrator.
 8. Provide box drain for all boxes below equipment cabinets.
 9. Pad shall be 8" thick (4" above and below finished grade).
 10. Provide 3/4" chamfered edge on equipment pads.
 11. Provide wire and conduit to ground cabinets.
 12. For modified Type B Pad for ramp sites without toll vaults, end pad here.

REV. NO.	BY	DATE	DESCRIPTION
1	DLJ	1/24/17	Added Note 12; Added Note 3 to Pad C

Typical Cabinet Sizes
 AVI Cabinet - 35"W x 34"D x 67"H
 DMS Cabinet - 25"W x 30"D x 46"H
 Zone Cabinet - 48"W x 36"D x 72"H
 UPS & Raw Power Panel - 32"W x 16"D

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
 RALEIGH, NORTH CAROLINA 27609
 (919) 876-6888 NCRES #F-0326

NORTH CAROLINA TURNPIKE AUTHORITY
 AET STANDARD DRAWINGS
 AET Toll Zone Cabinets with Concrete Pads

SCALE: N.T.S.	NORTH CAROLINA TURNPIKE AUTHORITY	SHEET NO. E-4
Rev. Oct 2014		

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 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION

PLANS PREPARED BY:
RK&K
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 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NO. F-0112 • (919) 878-9560

NORTH CAROLINA TURNPIKE AUTHORITY
 ITS STANDARD DETAIL

DIVISION 05 WAKE COUNTY TOWN OF CARY
 PLAN DATE: SEPTEMBER 2017 REVIEWED BY: C.B. HOLDEN
 PREPARED BY: D.T. SEARS REVIEWED BY:

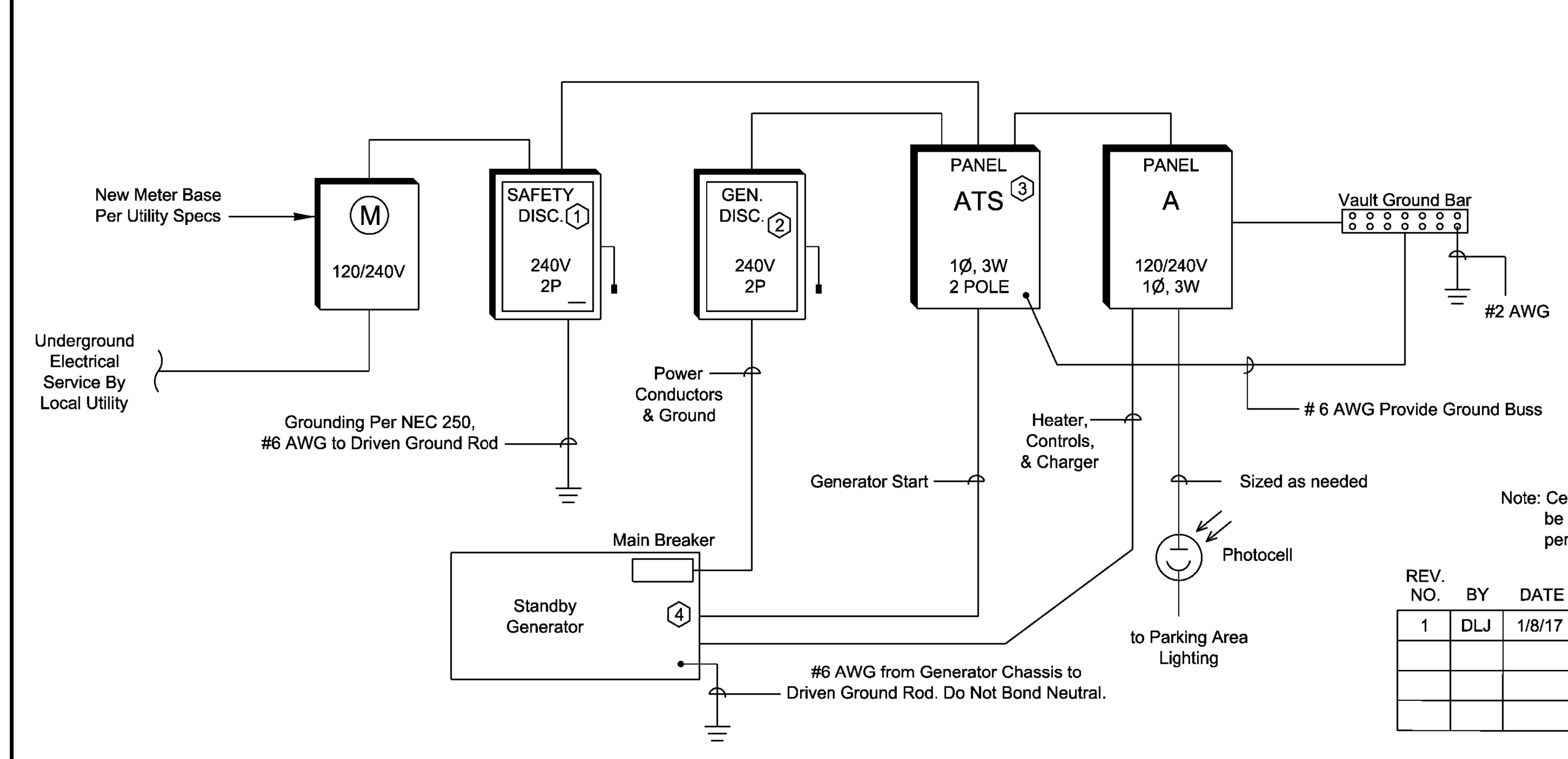
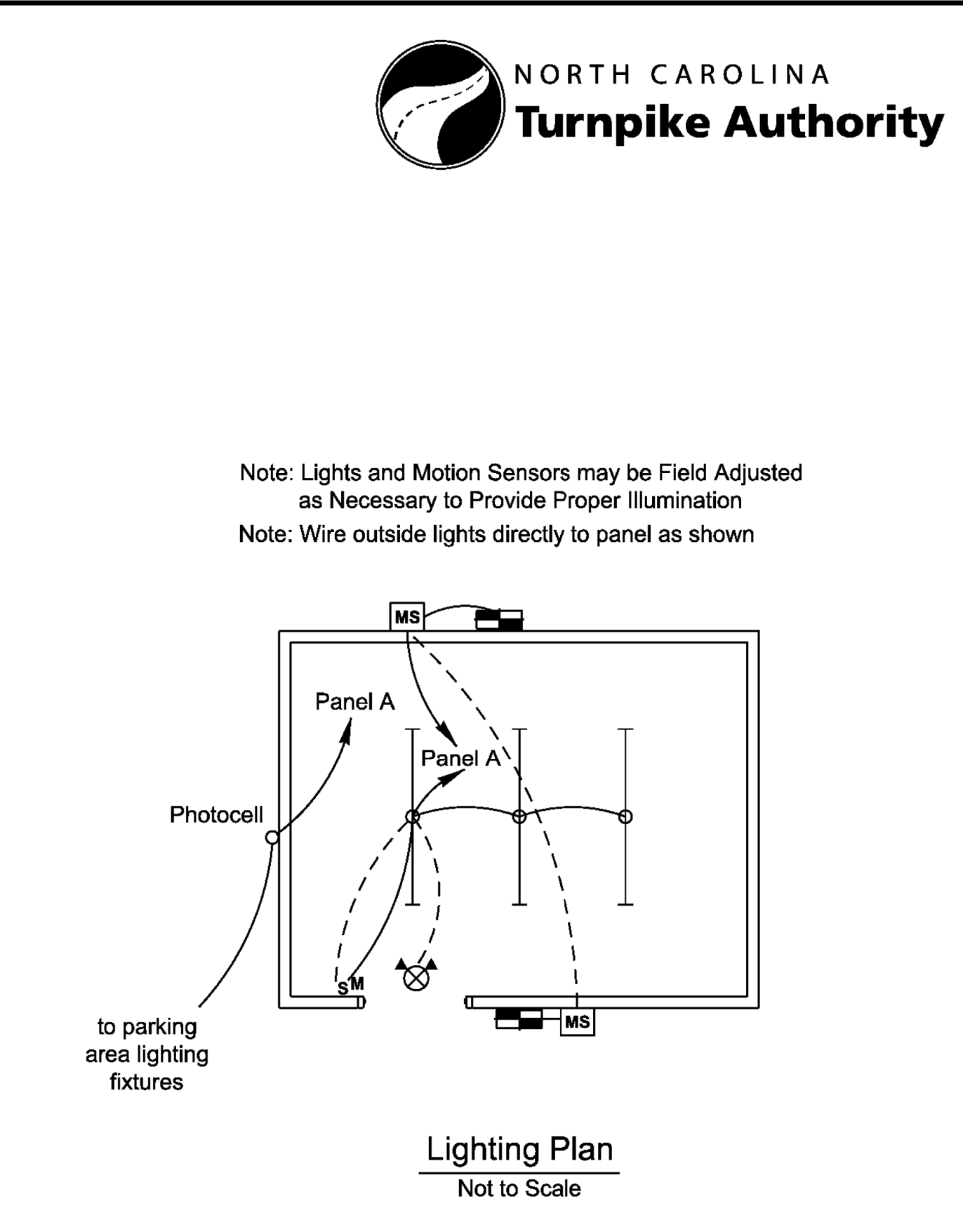
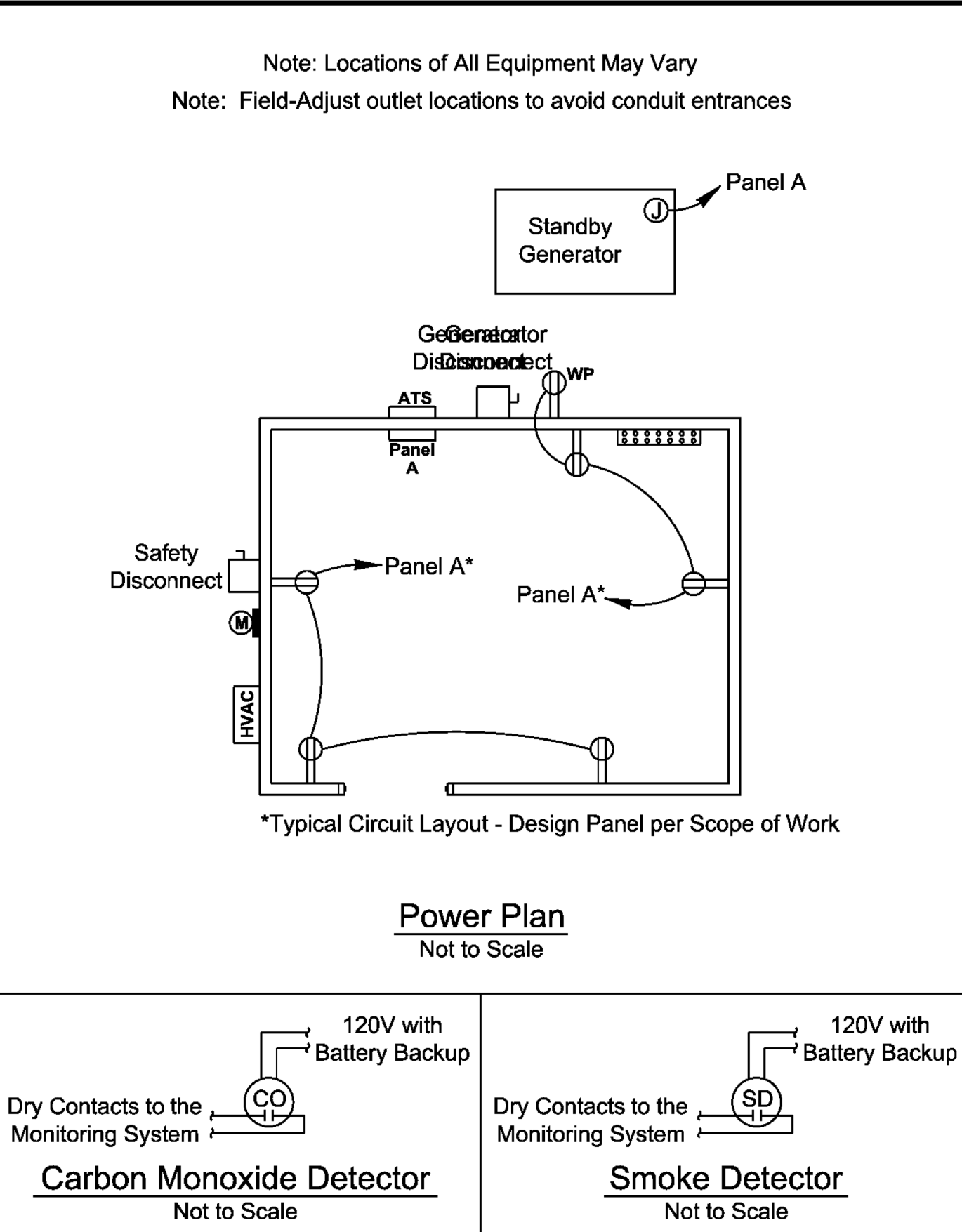
REVISIONS	INIT.	DATE

CADD File name: u5315_115_standarddetail1.s.dgn

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Symbol	Description	Remarks
	Industrial Fluorescent Fixture	Lithonia EJ-332-MVOLT
	Sharp Cut-Off Fluorescent Walpack Suitable for Wet Location	Lithonia TWFI-2/42TRT-120-CW20-LPI
	Combination Exit/Emergency Light	Lithonia LHQMS-W3R-120-H
	Outdoor Motion Sensor for Fixture Control	Watt Stopper EW-200-120-G
	20 AMP, Specification Grade Switch, Mount 42" A.F.F.	Hubbell 1221-H with PJ1 Cover
	Ultrasonic Motion Sensor Switch, Mount 42" A.F.F.	Watt Stopper UW-100-1
	Specification Grade 20 AMP, 120 Volt Duplex Receptacle Mount 18" A.F.F. Unless Otherwise Noted	Hubbell 5362-1 with PJ8 Cover Plate
	Specification Grade Weather Resistant/Ground Fault Interrupting Duplex Receptacle with In-Use Weather Proof Cover, Mount 18" A.F.F.	Hubbell GFTR20-** with WP26M Cover Plate
	New Concealed Wiring	Per NEC
	Unswitched Lighting Conductor	Per NEC
	Home Run to Panel Board; Numbers of Arrow Indicate Circuits	Per NEC
	Heavy Duty, Fusible Disconnect	Square D Heavy Duty
	Junction Box Sizing Per NEC	
	120/240V 1Ø, 3W Panel Board	Square D NQ
	Utility Meter Base	See Power Riser
	Vault Ground Bar	
A.F.F.	Above Finished Floor - Note All Mounting Dimensions Given are to the Bottom of the Outlet Box	
	Ground Rod Per NEC, Copper; Copper/Aluminum, See Scope of Work for Details	



- Key Notes:**
- Utility Service Disconnect: Sized per Scope of Work, 2 Pole, NEMA 3R. Fuse at Rated AMPS
 - Generator Service Disconnect: Sized per Scope of Work, 2 Pole, NEMA 3R Non Fused
 - New Automatic Transfer Switch: Sized per Scope of Work, Rated, 2 Pole, Neutral Conductor is not switched
 - KVA sized per Scope of Work 120/240 Volt, Single Phase, 3 Wire Standby Generator with the following features:
 - Provide exhaust silencer and sound attenuated weather proof enclosure
 - Provide 120 volt battery charger and 120 volt jacket heater
 - Generator shall be propane (LP) gas fired. Contractor to provide fuel tank with 72 hour capacity at full load. Provide all piping, valves, and regulators
 - Provide appropriately sized circuit breakers

Note: Certified Lightning Protection System shall be installed on AET Toll Zone Vaults and gantries per Scope of Work

REV. NO.	BY	DATE	DESCRIPTION
1	DLJ	1/8/17	Add connection from generator to Panel A and other minor edits

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCREES #F-0326

NORTH CAROLINA TURNPIKE AUTHORITY
AET STANDARD DRAWINGS
Toll Zone Vault Electrical Plan

SCALE: N.T.S. SHEET NO. E-5
Rev. Oct 2014 NORTH CAROLINA TURNPIKE AUTHORITY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

RK&K

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

Prepared for the Offices of:

STATE OF NORTH CAROLINA
Department of Transportation

750 N. Greenfield Place, Garner, NC 27529

SCALE: N/A

NORTH CAROLINA TURNPIKE AUTHORITY
ITS STANDARD DETAIL

DIVISION 05 WAKE COUNTY TOWN OF CARY

PLAN DATE: SEPTEMBER 2017 REVIEWED BY: C.B. HOLDEN

PREPARED BY: D.T. SEARS REVIEWED BY:

REVISIONS	INIT.	DATE

CADD File name: u5315_115_standarddetail1.dgn

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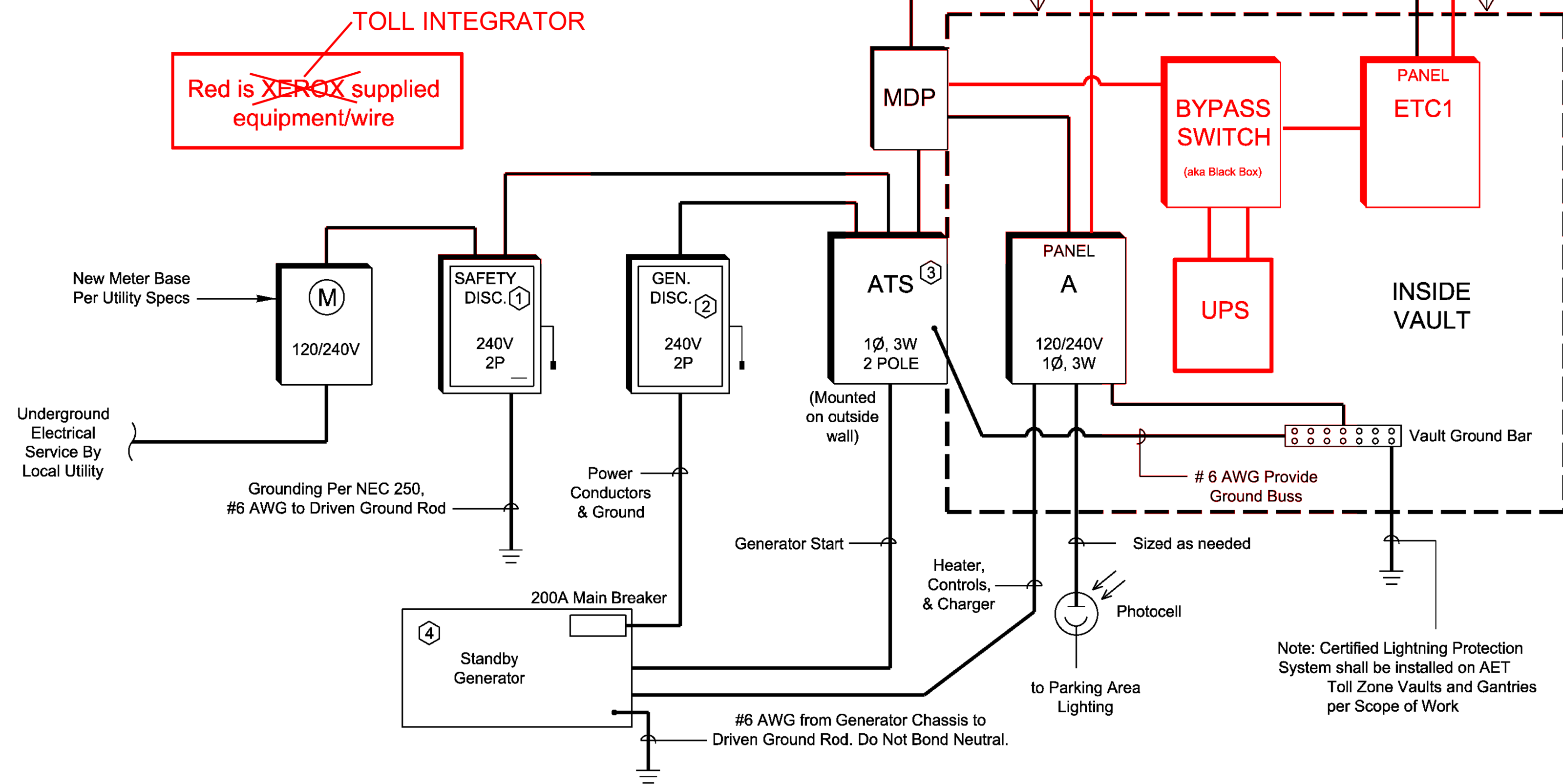


NOTE: THIS SHEET IS SPECIFIC TO THE MORRISVILLE PARKWAY AND VERIDEA INTERCHANGES AND IS NOT CONSIDERED PART OF THE NCTA AET STANDARD DRAWINGS

Electrical Line Diagram for RAMP Toll Zone with 1 Vault and 1 x 200A Power Service

Key Notes:

- ① Utility Service Disconnect: 200A, 2 Pole, NEMA 3R. Fuse at Rated AMPS
- ② Generator Service Disconnect: 200A, 2 Pole, NEMA 3R Non Fused
- ③ New Automatic Transfer Switch: 200A, Rated, 2 Pole, Neutral Conductor is not switched
- ④ KVA, 65kVA, 120/240 Volt, Single Phase, 3 Wire Standby Generator with the following features:
 - Provide exhaust silencer and sound attenuated weather proof enclosure
 - Provide 120 volt battery charger and 120 volt jacket heater
 - Generator shall be propane (LP) gas fired. Contractor to provide fuel tank with 72 hour capacity at full load. Provide all piping, valves, and regulators
 - Provide appropriately sized circuit breakers



ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBES #F-0326

NORTH CAROLINA TURNPIKE AUTHORITY
AET STANDARD DRAWINGS
Toll Zone Vault Electrical Plan

SCALE: N.T.S.	NORTH CAROLINA TURNPIKE AUTHORITY	SHEET NO.
DATE: Jan 2017		E-5a

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Prepared for the Offices of:
NORTH CAROLINA TURNPIKE AUTHORITY
ITS STANDARD DETAIL

DIVISION 05 WAKE COUNTY TOWN OF CARY

PLAN DATE: SEPTEMBER 2017 REVIEWED BY: C.B. HOLDEN

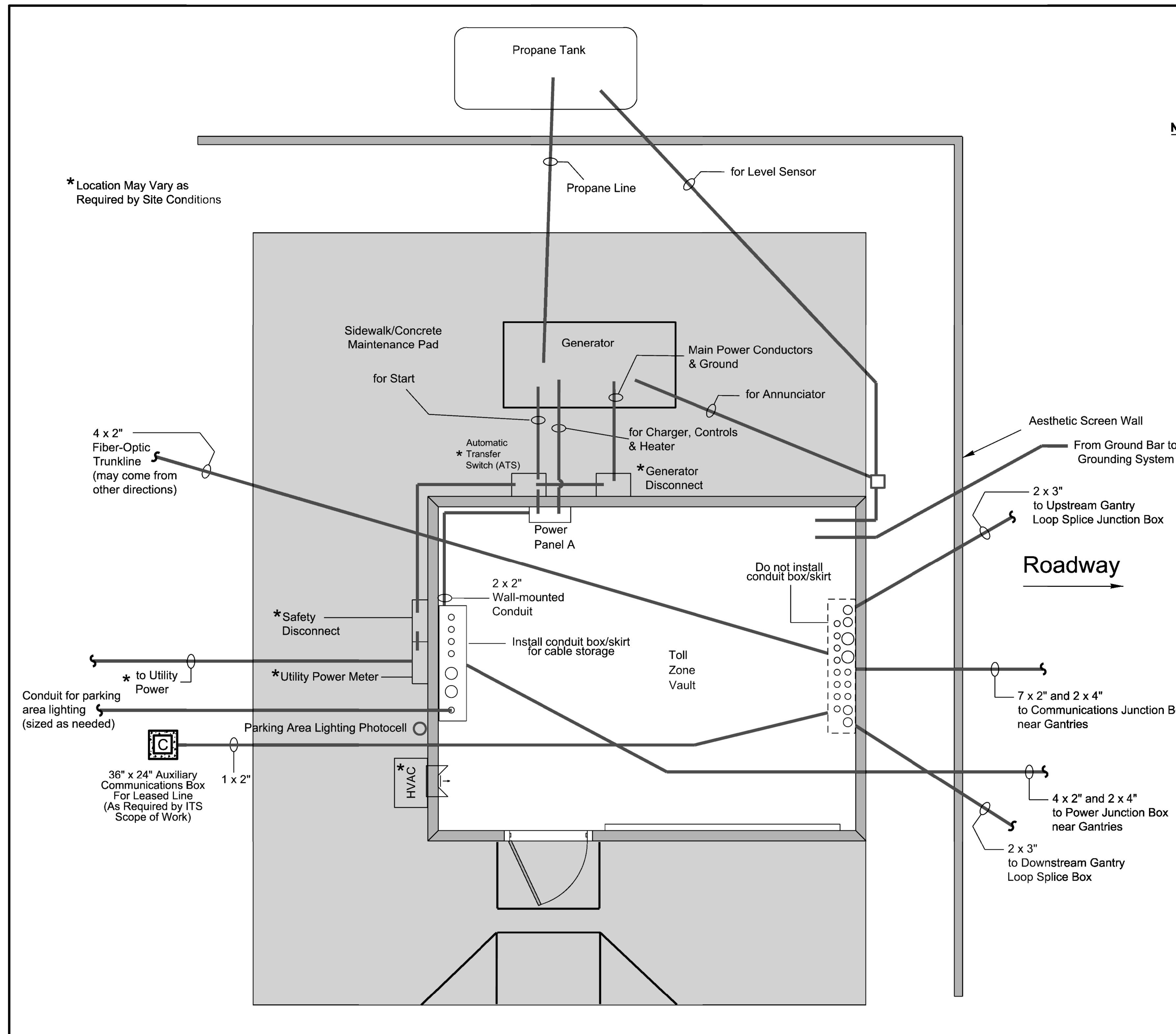
PREPARED BY: D.T. SEARS REVIEWED BY:

REVISIONS	INIT.	DATE

CADD File name: u5315_115_standarddetail1.dgn

PLANS PREPARED BY:
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

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NOTES:

1. Provide UL-Listed PVC or HDPE conduit for all underground conduit runs.
2. Provide rigid galvanized conduit for all above-ground exterior conduit runs.
3. Unless otherwise labeled, provide one (1) conduit, size to be determined by Design/Build Team, for all conduit runs.
4. Contractor may choose to run conduit entrances thru the walls rather than the floor.

REV. NO.	BY	DATE	DESCRIPTION
1	DLJ	1/8/17	Add connection from generator to Panel A and moved gen. disc. to back wall

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NGBEES #F-0326

NORTH CAROLINA TURNPIKE AUTHORITY
AET STANDARD DRAWINGS
AET Toll Zone Vault Conduit Plan

SCALE: N.T.S.	NORTH CAROLINA TURNPIKE AUTHORITY	SHEET NO.
Rev. Oct 2014		E-6

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PLANS PREPARED BY :

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900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

Prepared for the Offices of:

750 N. Greenfield Place, Garner, NC 27529
SCALE: N/A

NORTH CAROLINA TURNPIKE AUTHORITY
ITS STANDARD DETAIL

DIVISION 05 WAKE COUNTY TOWN OF CARY

PLAN DATE: SEPTEMBER 2017 REVIEWED BY: C.B. HOLDEN

PREPARED BY: D.T. SEARS REVIEWED BY:

REVISIONS	INIT.	DATE

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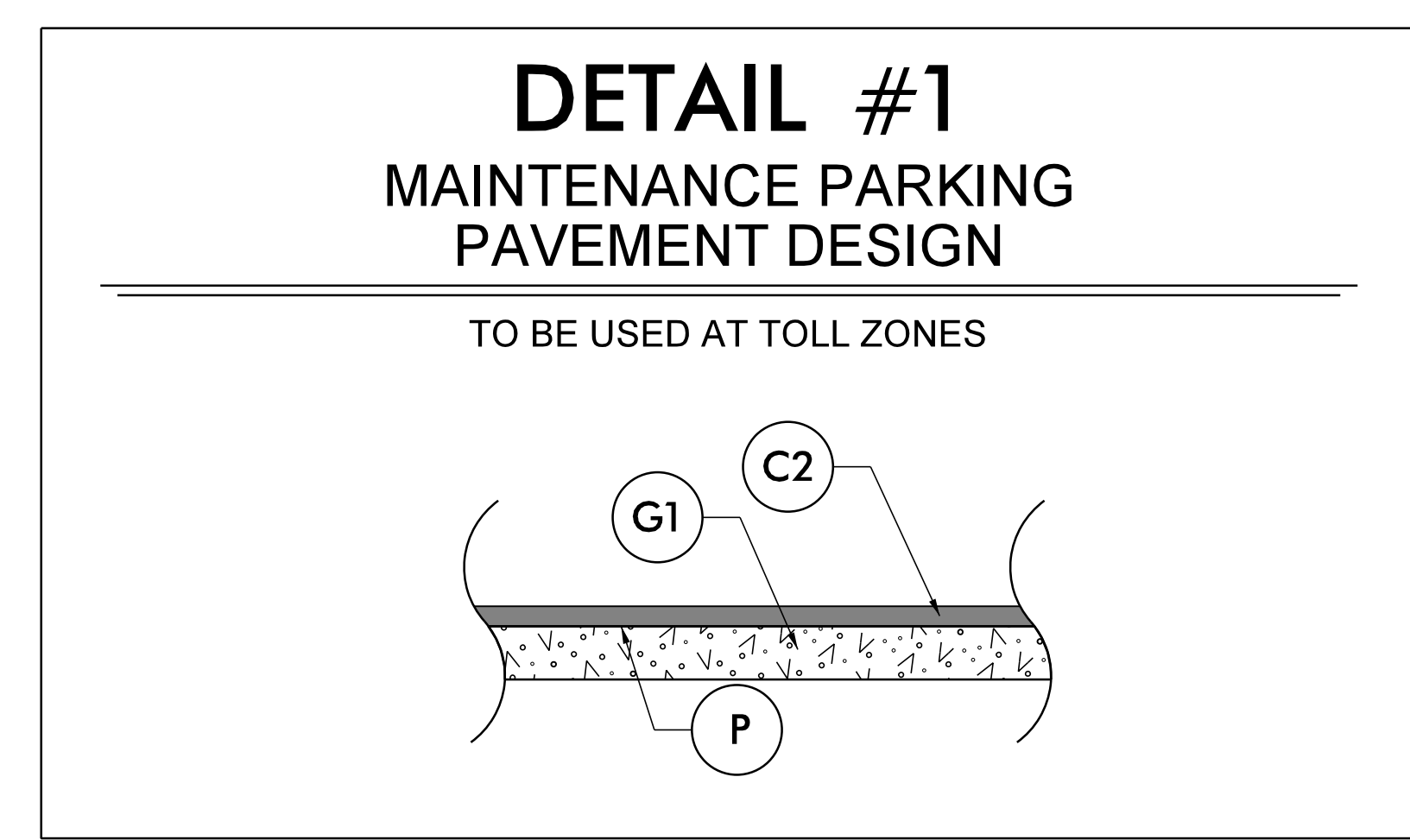
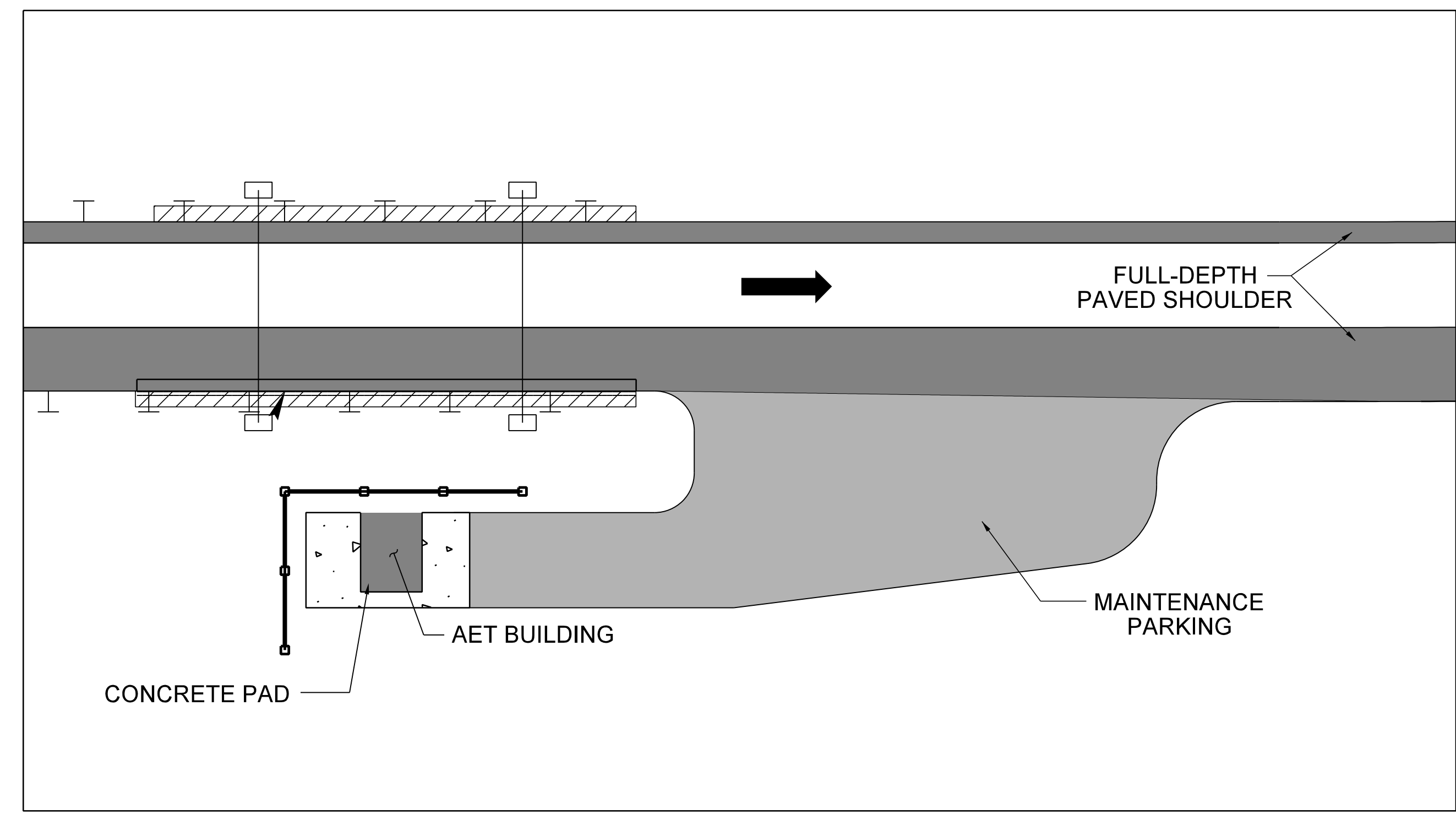
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6/2/17

PROJECT REFERENCE NO. <i>U-5315 A&B</i>	SHEET NO. <i>AET-10</i>
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 044558 ENGINEER DAVID T. SEARS 11/10/2017	
Documented by: <i>David J. Sears</i>	
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TYPICAL AET FACILITY PAVEMENT DETAILS

PAVEMENT SCHEDULE	
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
G1	8" CEMENT TREATED AGGREGATE BASE COURSE
P	PRIME COAT AT THE RATE OF 0.35 GAL PER SQ YD



FOR FULL-DEPTH PAVED SHOULDER PAVEMENT
 DESIGN SEE RFC ROADWAY PLANS

TOLL ZONE	SHEET NUMBER
T16	2A-3
T15	2A-3

PLANS PREPARED BY :

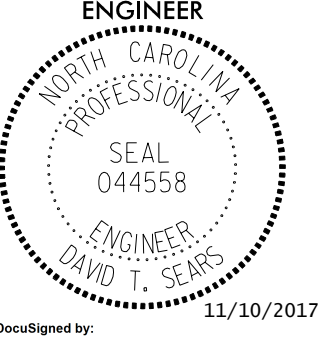
RK&K

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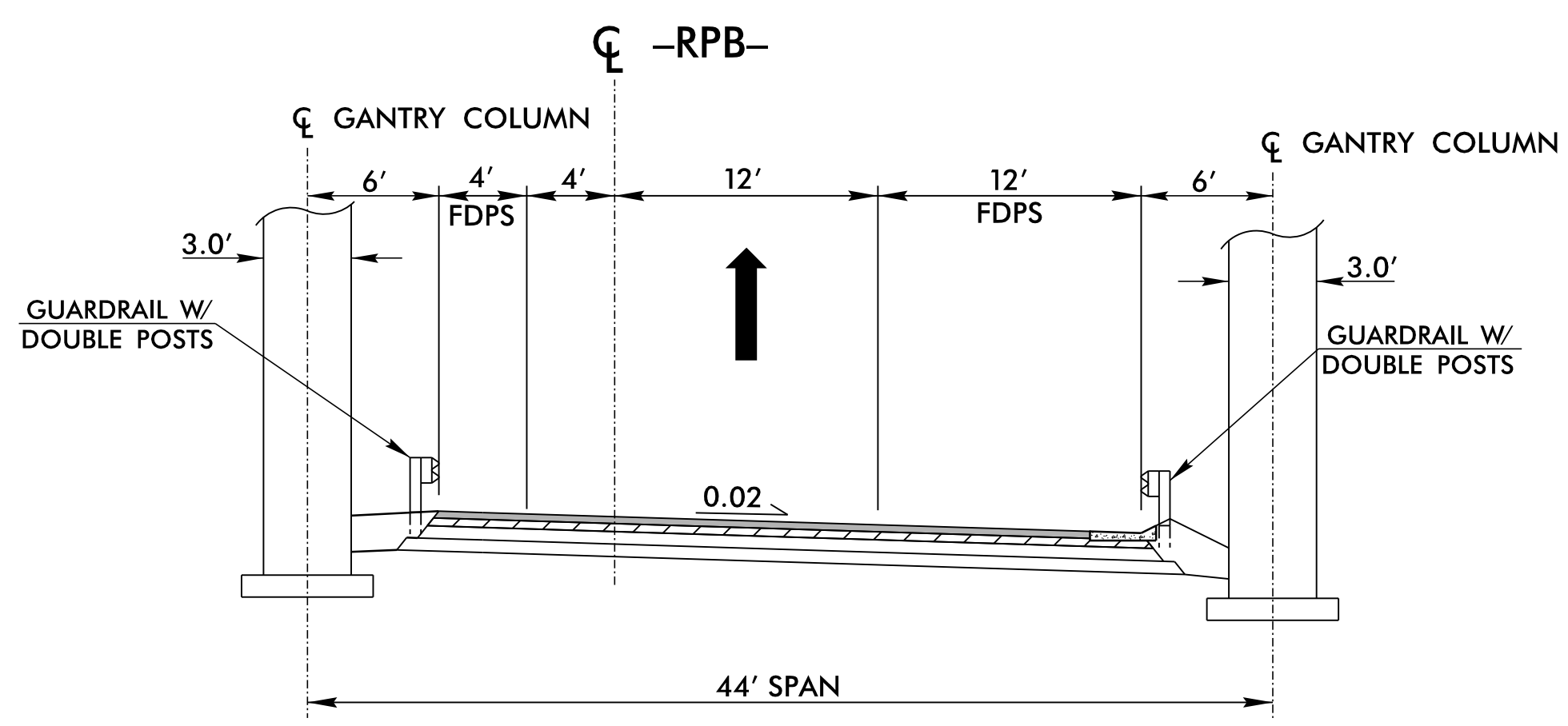
FOR
THE NORTH CAROLINA
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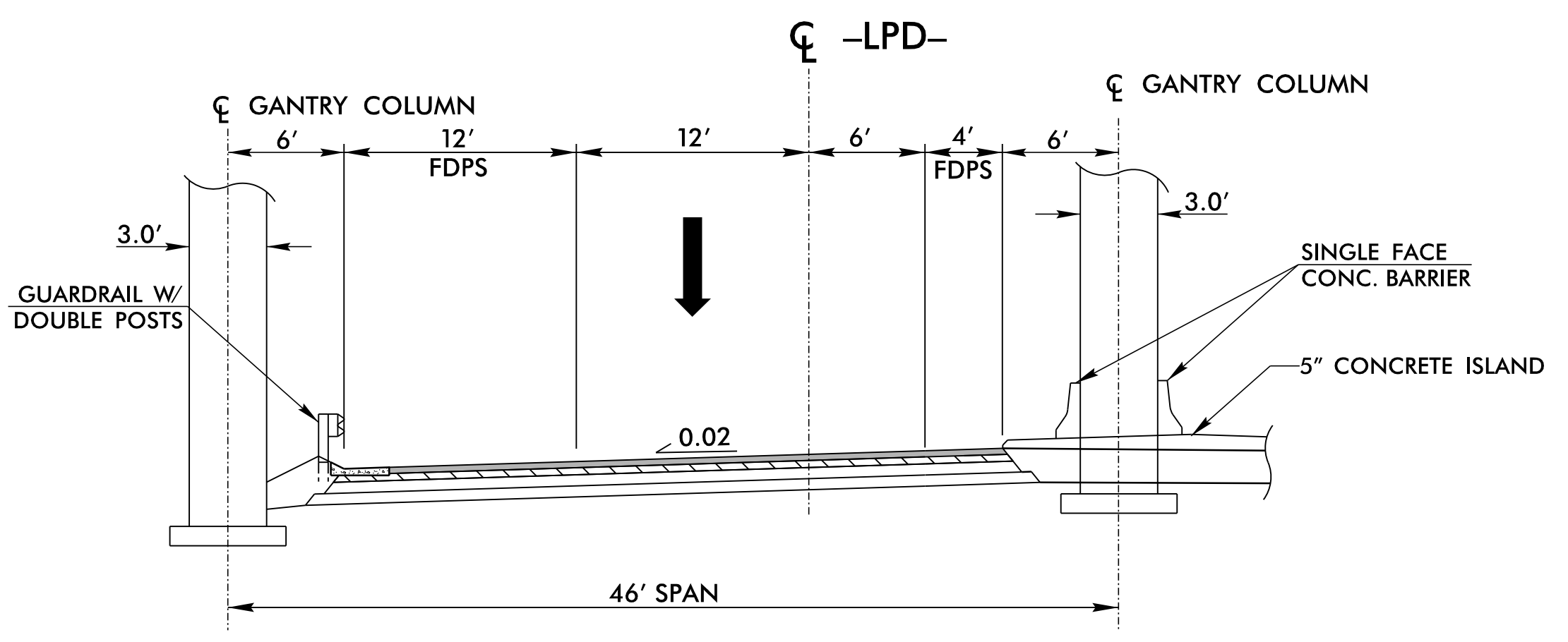
6/2/17

PROJECT REFERENCE NO. U-5315 A&B	SHEET NO. AET-1P
ROADWAY DESIGN ENGINEER	
	
Signed by: <i>David T. Sears</i> 11/10/2017	

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RAMP AET GANTRY
 -RPB- STA. 20+14.00 TO 20+64.00 (TOLL ZONE T16)



LOOP AET GANTRY
 -LPD- STA. 20+66.00 TO 21+16.00 (TOLL ZONE T15)

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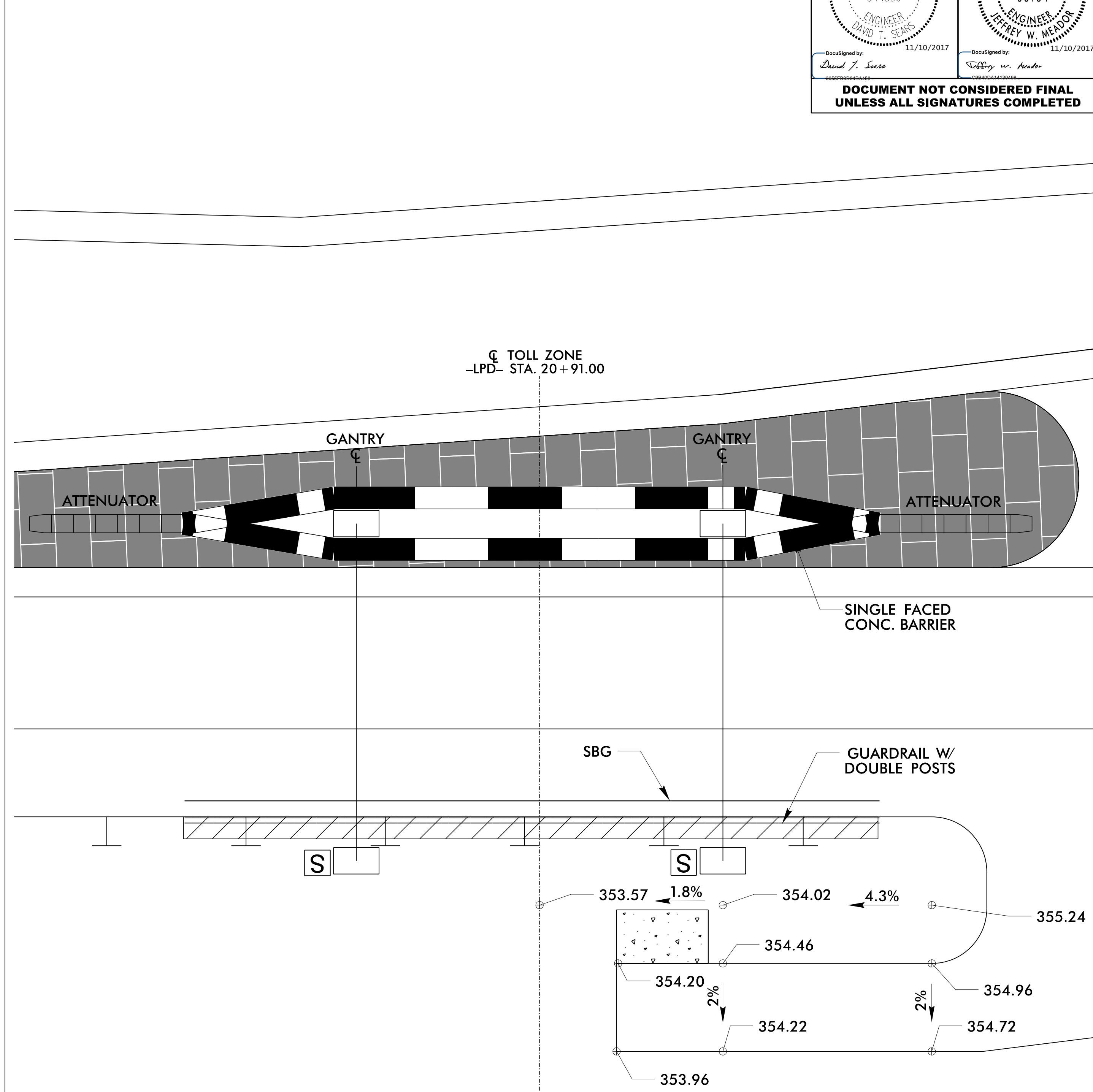
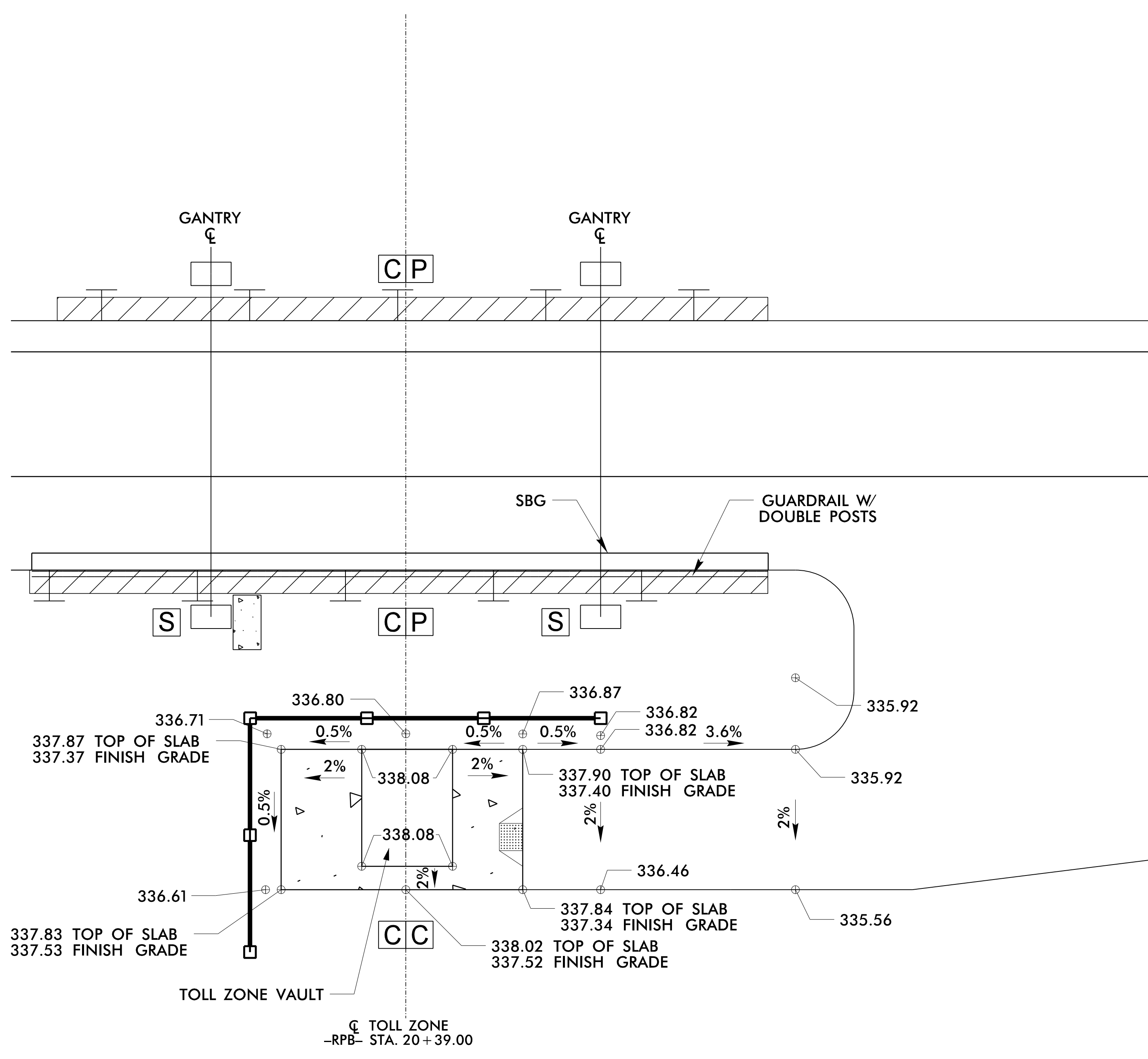


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6/2/2017

AET FACILITY SPOT ELEVATIONS

PROJECT REFERENCE NO. U-5315 A&B	SHEET NO. AET-1Q
ROADWAY DESIGN ENGINEER DAVID T. SEARS NORTH CAROLINA PROFESSIONAL SEAL 044558	HYDRAULICS ENGINEER JEFFREY W. MEADOR NORTH CAROLINA PROFESSIONAL SEAL 33184
DocuSigned by: David T. Sears 11/10/2017	DocuSigned by: Jeffrey W. Meador 11/10/2017
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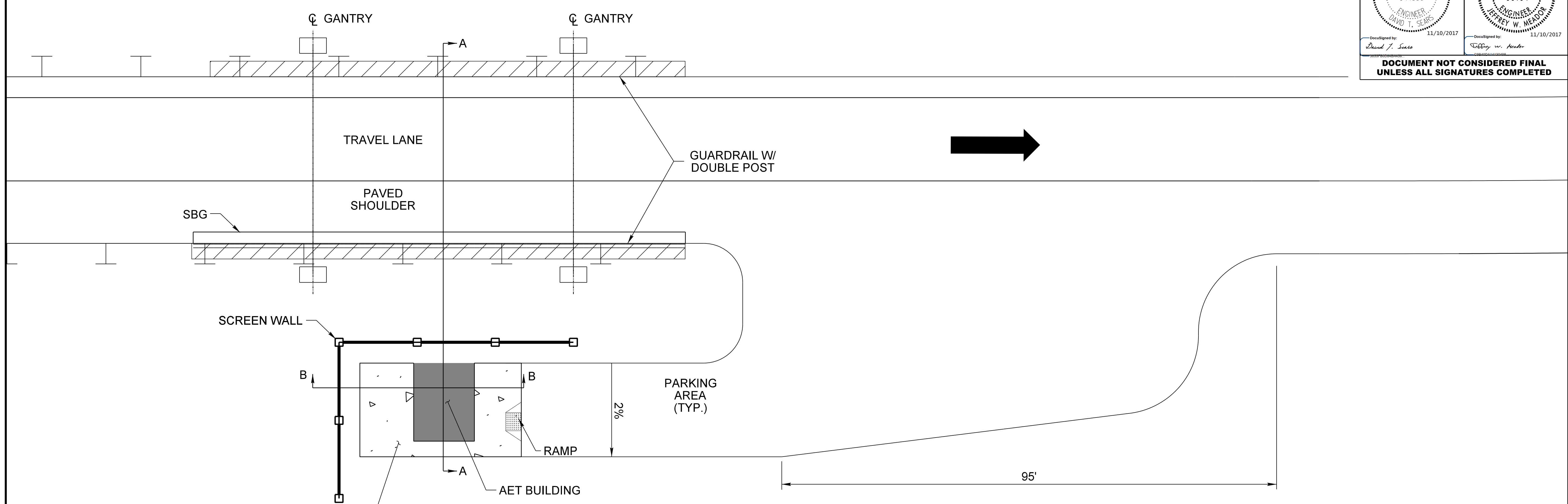
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FOR
**THE NORTH CAROLINA
 TURNPIKE AUTHORITY**

6/2/2017

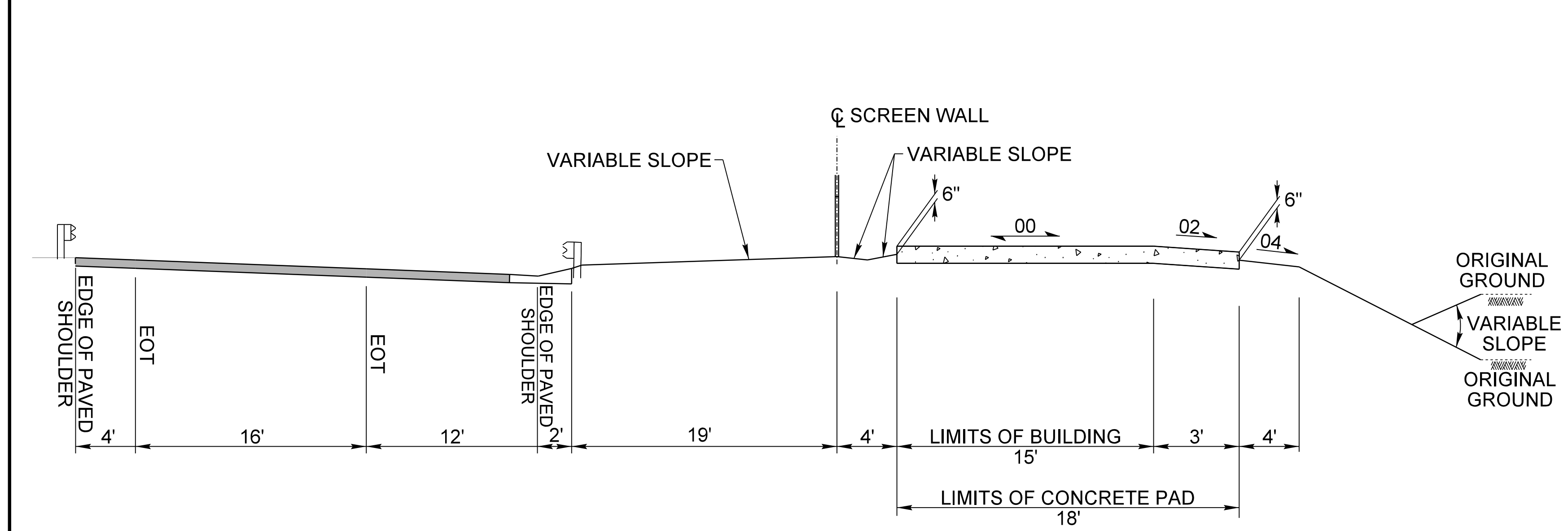
AET FACILITY GRADING DETAILS

PROJECT REFERENCE NO. <i>U-5315 A&B</i>	SHEET NO. <i>AET-1R</i>
ROADWAY DESIGN ENGINEER DAVID T. SEARS SEAL 044558 11/10/2017	HYDRAULICS ENGINEER JEFFREY W. MEADOR SEAL 33184 11/10/2017
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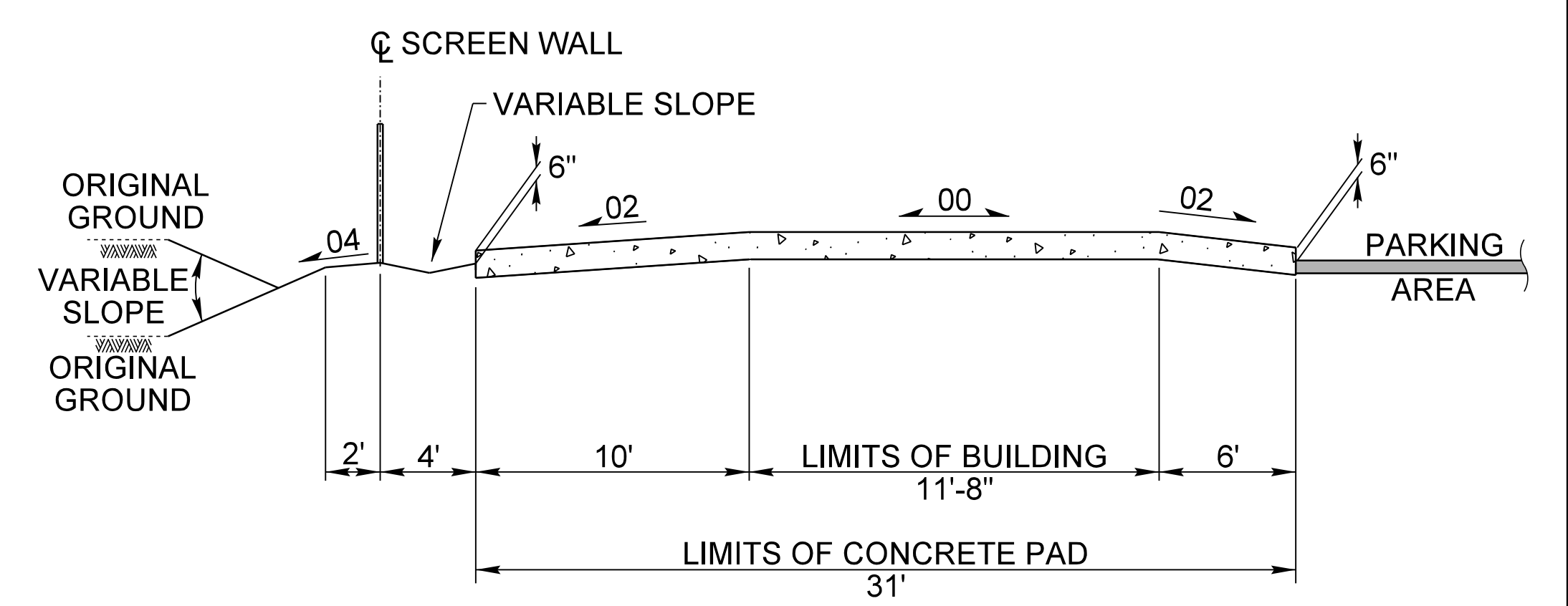
TYPICAL RAMP PLAN VIEW

TOLL ZONE T16
(NOT TO SCALE)



SECTION A-A

(NOT TO SCALE)



SECTION B-B

(NOT TO SCALE)

PLANS PREPARED BY :

RK&K

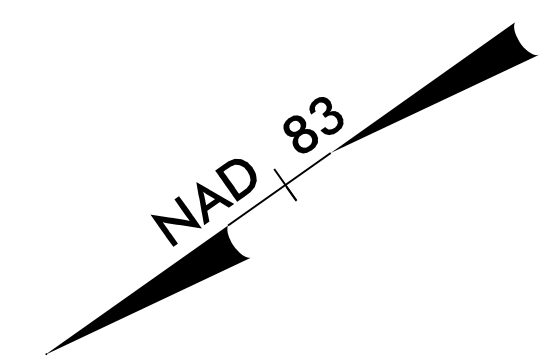
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FOR
**THE NORTH CAROLINA
TURNPIKE AUTHORITY**

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PROJECT REFERENCE NO. <i>U-5315 A&B</i>	SHEET NO. <i>AET-15</i>
ROADWAY DESIGN ENGINEER DAVID T. SEARS SEAL 044558 11/10/2017	PAVEMENT DESIGN ENGINEER JEFFREY W. MEADOR SEAL 33184 11/10/2017
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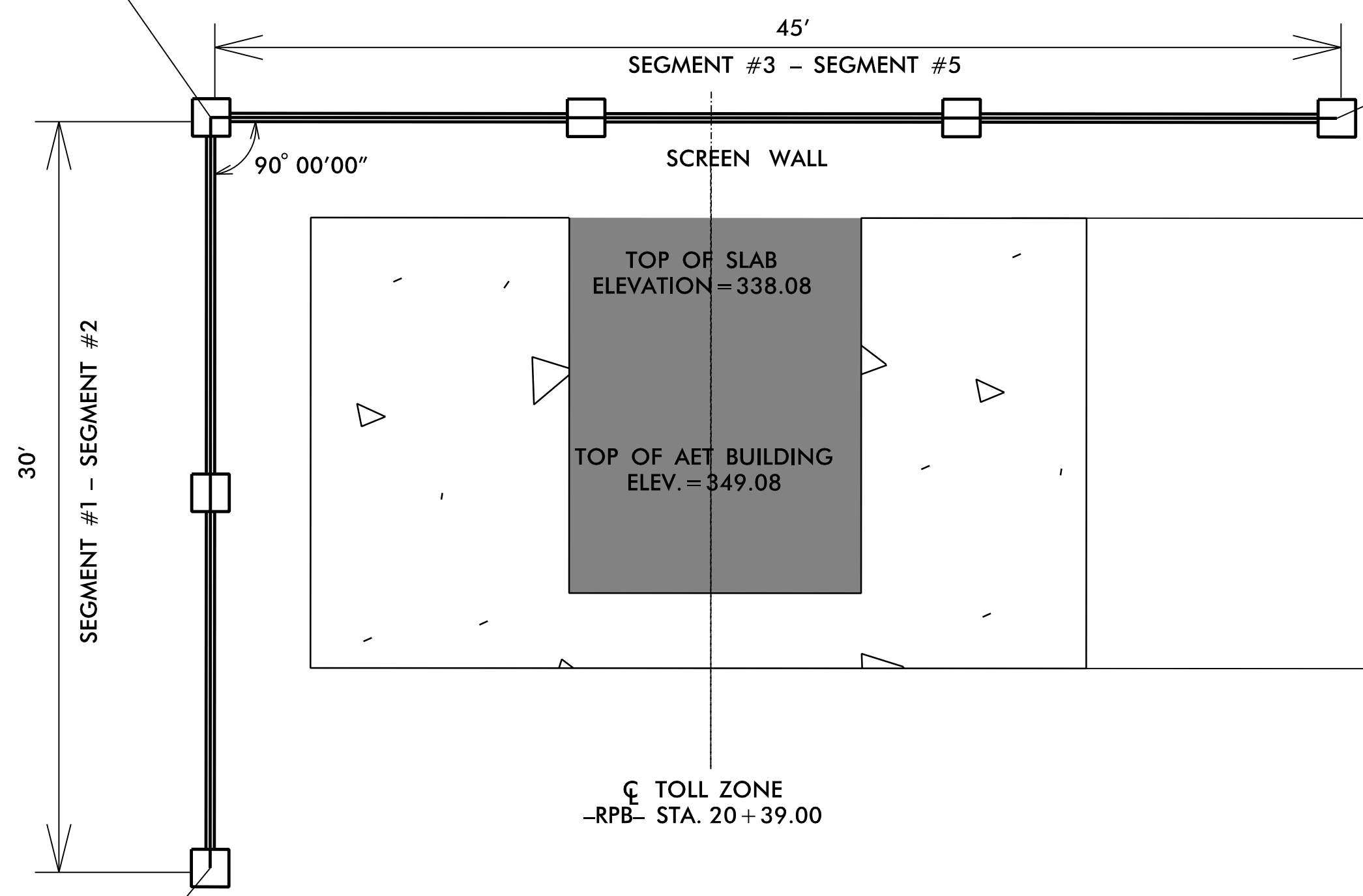
SCREEN WALL – LOCATION DETAIL



75' (MEASURED ALONG CENTERLINE OF SCREEN WALL)

SCREEN WALL STA. 1+30.00 =
-RPB- STA. 20+19.00 (OFF. 43.00' RT)

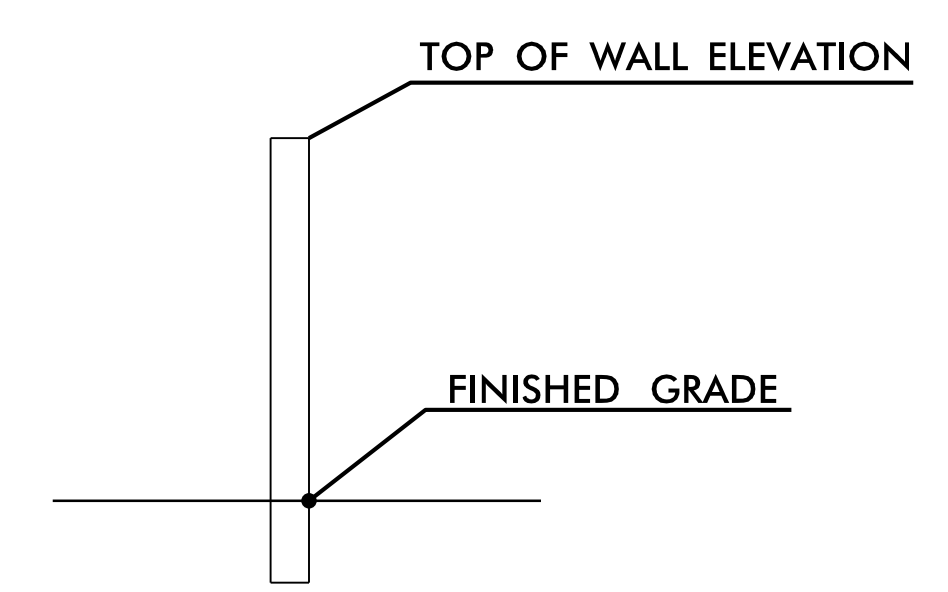
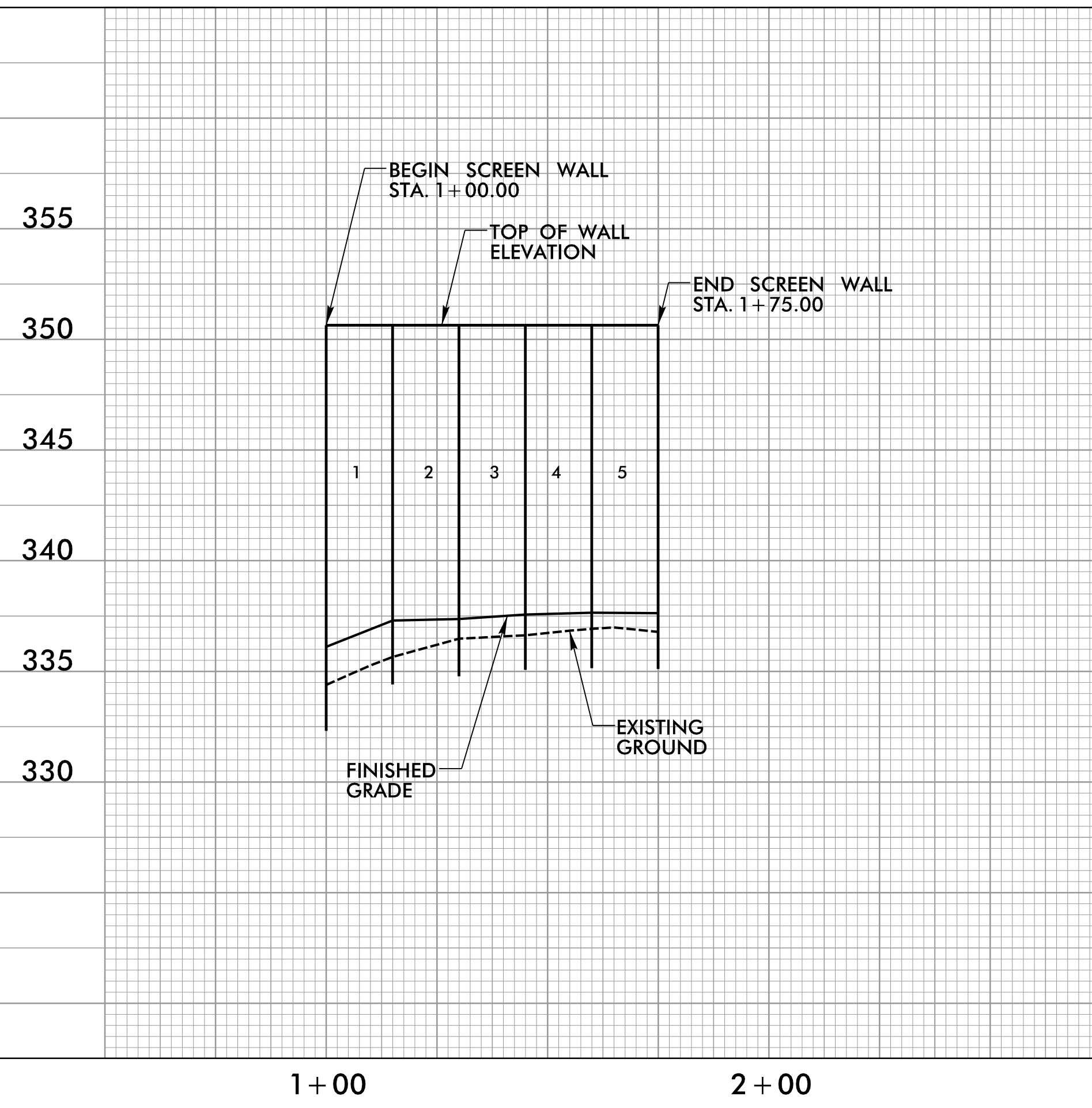
END SCREEN WALL STA. 1+75.00 =
-RPB- STA. 20+64.00 (OFF. 43.00' RT)



TOLL ZONE T16

BEGIN SCREEN WALL STA. 1+00.00 =
-RPB- STA. 20+19.00 (OFF. 73.00' RT)

SCREEN WALL – PROFILE DETAIL



ELEVATION LOCATIONS
N.T.S.

SEGMENT	FINISHED GRADE ELEV. AT CENTER OF SEGMENT	TOP OF WALL ELEV.
1	336.71	350.65
2	337.34	350.65
3	337.47	350.65
4	337.61	350.65
5	337.64	350.65

PLANS PREPARED BY :

RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

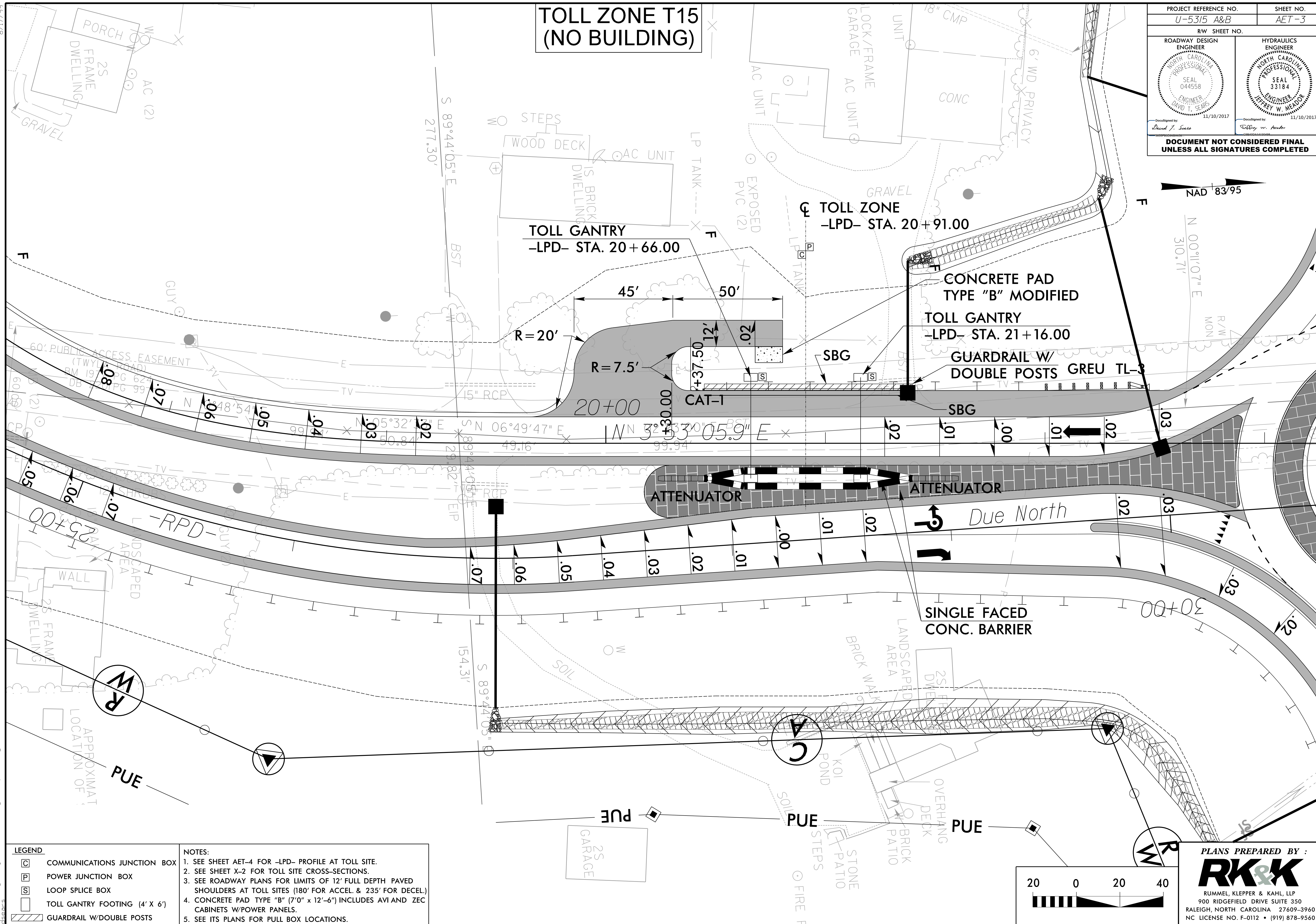
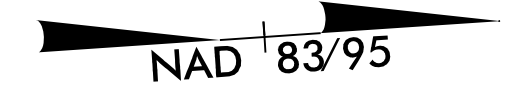
FOR
THE NORTH CAROLINA
TURNPIKE AUTHORITY

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TOLL ZONE T15 (NO BUILDING)

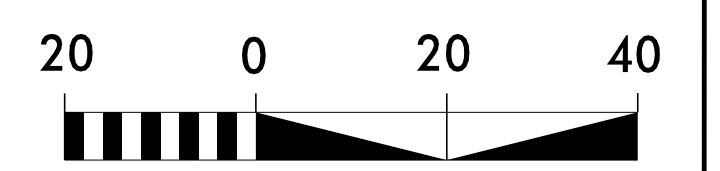
PROJECT REFERENCE NO. U-5315 A&B	SHEET NO. AET-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER DAVID T. SEARS NORTH CAROLINA PROFESSIONAL SEAL 044558 11/10/2017	HYDRAULICS ENGINEER TERRY W. MEADOR NORTH CAROLINA PROFESSIONAL SEAL 33184 11/10/2017
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LEGEND

	COMMUNICATIONS JUNCTION BOX
	POWER JUNCTION BOX
	LOOP SPLICE BOX
	TOLL GANTRY FOOTING (4' x 6')
	GUARDRAIL W/DOUBLE POSTS

- NOTES:**
1. SEE SHEET AET-4 FOR -LPD- PROFILE AT TOLL SITE.
 2. SEE SHEET X-2 FOR TOLL SITE CROSS-SECTIONS.
 3. SEE ROADWAY PLANS FOR LIMITS OF 12' FULL DEPTH PAVED SHOULDERS AT TOLL SITES (180' FOR ACCEL. & 235' FOR DECEL.)
 4. CONCRETE PAD TYPE "B" (7'0" x 12'-6") INCLUDES AVI AND ZEC CABINETS W/POWER PANELS.
 5. SEE ITS PLANS FOR PULL BOX LOCATIONS.



PLANS PREPARED BY :

RK&K

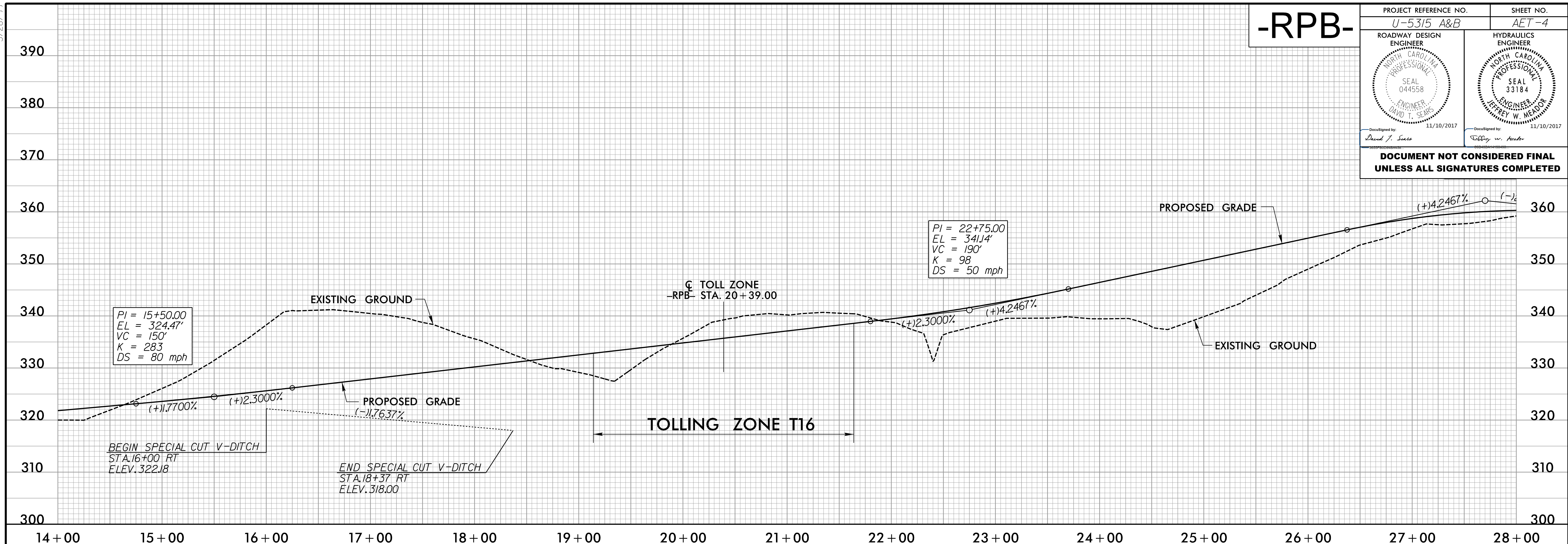
RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
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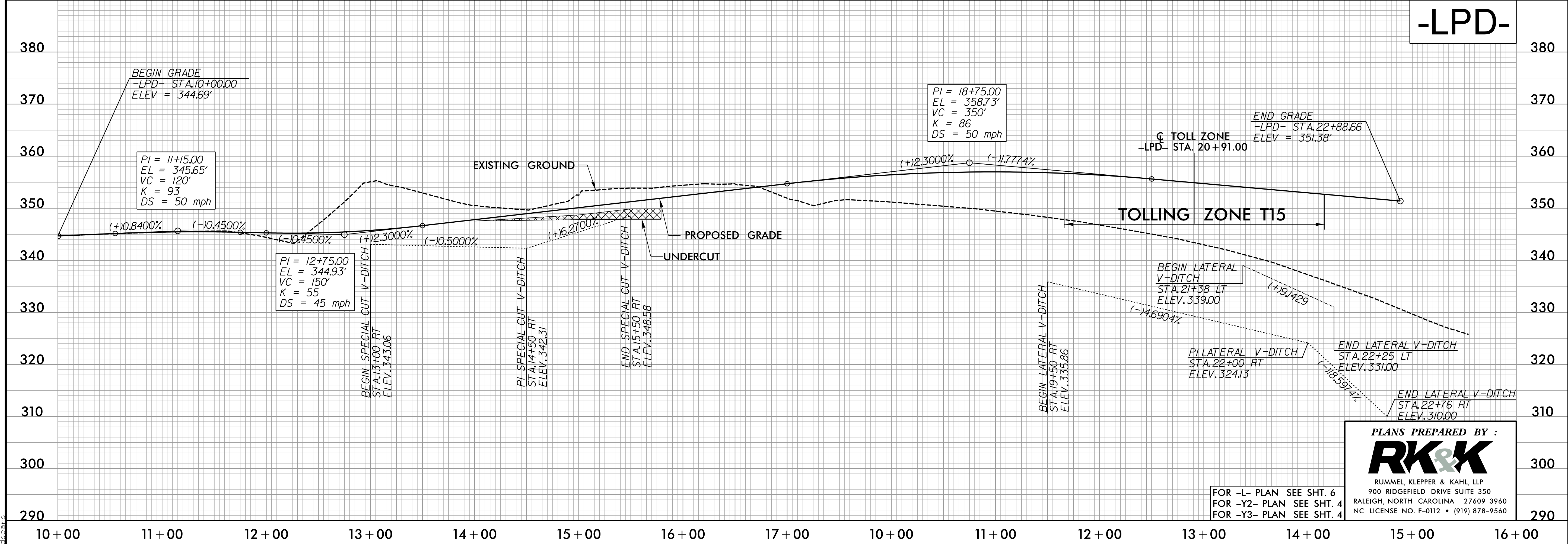
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PROJECT REFERENCE NO. U-5315 A&B	SHEET NO. AET-4
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 044558 DAVID T. SEARS	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 33184 JEFFREY W. MEADOR
DocuSigned by: David T. Sears 11/10/2017	DocuSigned by: Jeffrey W. Meador 11/10/2017
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-LPD-



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RK&K

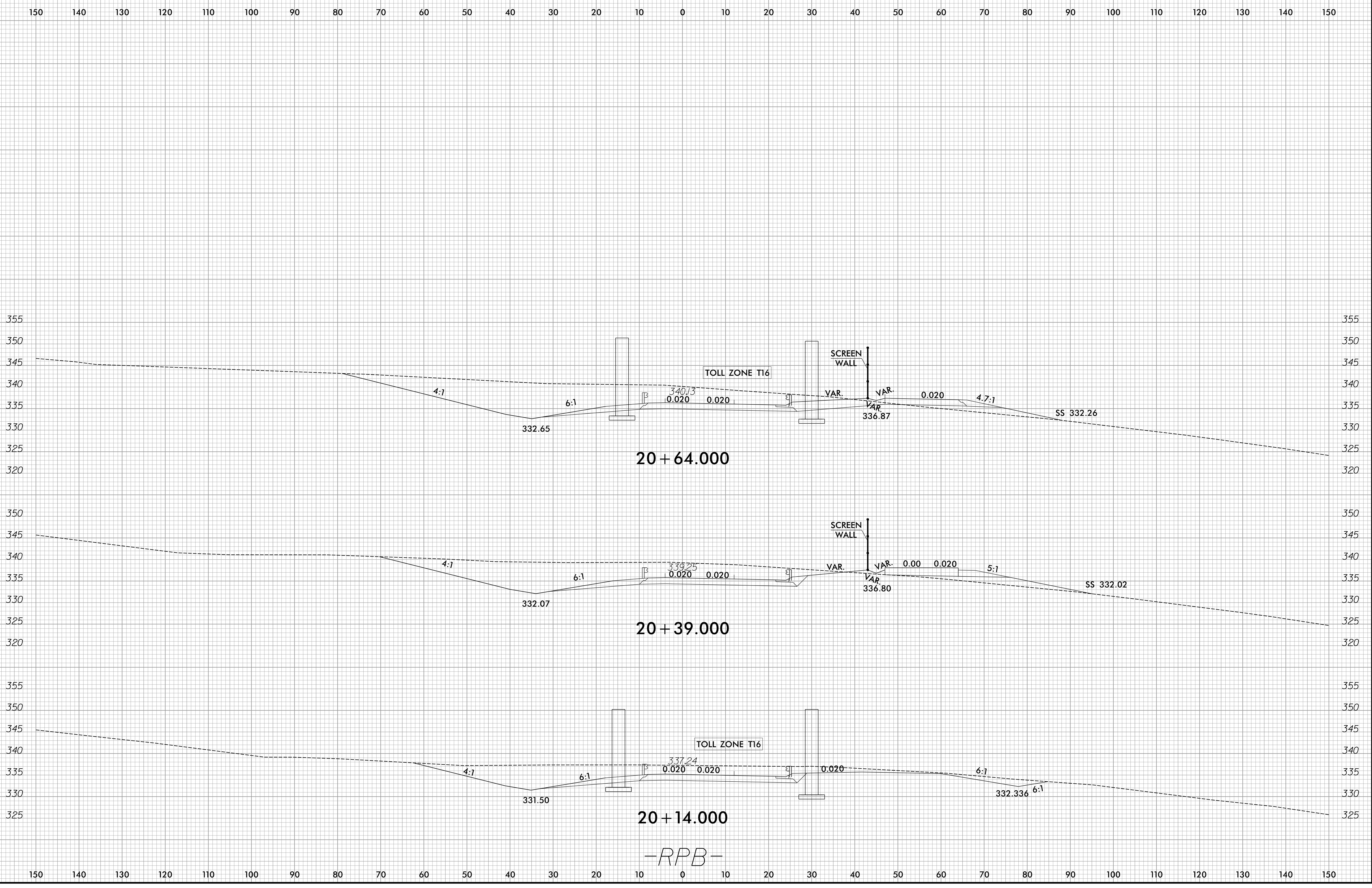
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FOR -L- PLAN SEE SHT. 6
FOR -Y2- PLAN SEE SHT. 4
FOR -Y3- PLAN SEE SHT. 4

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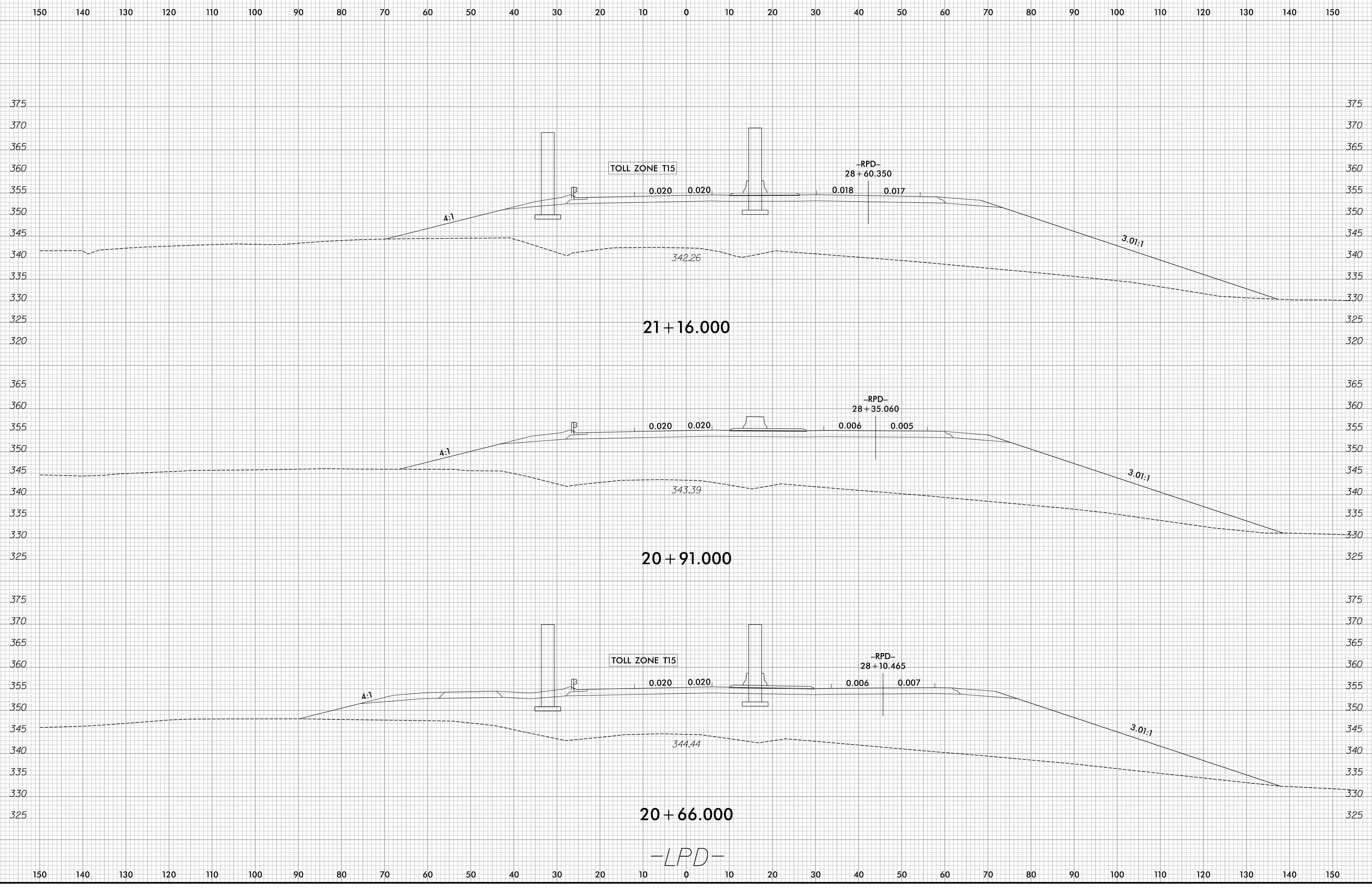


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