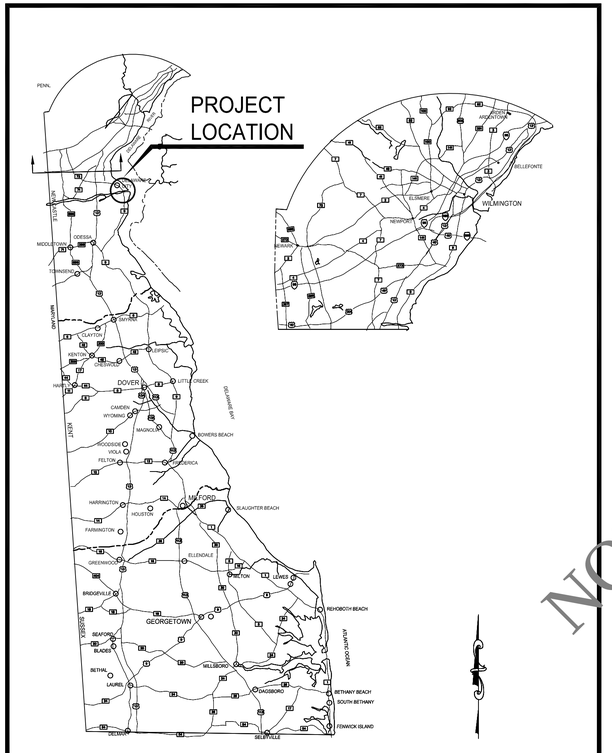
STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF PARKS & RECREATION

FORT DELAWARE STATE PARK
PEA PATCH ISLAND IMPROVEMENTS

Delaware River near Delaware City, DE 19706



STATE OF DELAWARE

LOCATION MAP

PARKS PROJECT NO. FD-20

PROJECT NO. FD-20

OCTOBER 14, 2019
ISSUED FOR BID

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

SITE MAP

INDEX OF SHEETS FOR CONTRACT NO. 2019-FD-100

DATE: | DESCRIPTION: | BY:

PEA PATCH ISLAND IMPROVEMENTS
FORT DELAWARE STATE PARK
DELAWARE CITY, DELAWARE

COVER SHEET

DESIGNED BY: KJR
DRAWN BY: KJR
BUILDING NO.: N/A
DATE: 10\14\2019
SCALE: N/A
SHEET NO.: G-01
PARKS PROJECT #: FD-20
CONTRACT #: 2019-FD-100

SYMBOLS

- Interior Elevation Number / Sheet Number
- Elevation Or Section Number / Sheet Number
- Detail Number / Sheet Number
- Door Number
- New Column
- Existing Column
- Window Type
- Partition Type
- Working Point Or Control Point
- Room Name / Room Number
- Ceiling Type / Ceiling Height
- W: Wall Finish, B: Base, F: Floor Finish
- Casework Finish
- Revision Number
- Accessory / Fixture Type
- Magnetic North
- Plan North
- And
- At
- Number Or Pound
- Diameter
- Center Line
- Plate
- Dimension to Face of Material
- Dimension to Centerline of Structure

MATERIALS

- Concrete Masonry Unit
- Brick
- Concrete
- Porous Fill, Stone Or Gravel
- Earth
- Insulation - Batt, Blanket Or Loose
- Insulation - Rigid
- Glass In Elevation
- Wood - Continuous Lumber
- Wood - Blocking
- Wood - Finish
- Plywood - Small Scale
- Plywood - Large Scale
- Gypsum Board
- Steel
- Stone

STANDARD ABBREVIATIONS

AB	Anchor Bolt
ADJ	Adjustable
AFF	Above Finished Floor
AHU	Air Handling Unit
ALUM	Aluminum
ALT	Alternate
APC	Acoustic Panel Ceiling
APPROX	Approximate
ARCH	Architectural
BD	Board
BITUM	Bituminous
BLDG	Building
BLKG	Blocking
BM	Beam
BRG	Bearing
BSMT	Basement
BUR	Built-up Roofing
BW	Both Ways
CAB	Cabinet
CB	Catch Basin
CCTV	Closed Circuit Television
CEM	Cement
CF/CI	Contractor Furnished / Contractor Installed
CF/OI	Contractor Furnished / Owner Installed
CI	Cast Iron
CIP	Cast-in-place
CJ	Control Joint
CLG	Ceiling
CLO	Closet
CLR	Clear
CMU	Concrete Masonry Unit
CNTR	Center
COL	Column
CONC	Concrete
CONST	Construction
CONT	Continuous
CORR	Corridor
CRS	Course(s)
CPT	Carpet
CT	Ceramic Tile
DBL	Double
DEPT	Department
DET	Detail
DF	Drinking Fountain
DH	Double Hung
DIA	Diameter
DIM	Dimension
DN	Down
DS	Downspout
DWG	Drawing
E	East
EA	Each
EIFS	Exterior Insulation and Finish System
EJ	Expansion Joint
EL	Elevation
ELEC	Electrical
ELEV	Elevator
EMER	Emergency
ENCL	Enclosure
EOS	Edge of Slab
EPDM	Ethylene Propylene Plene Monomer Rubber
EPS	Expanded Polystyrene Insulation
EQ	Equal
EQUIP	Equipment
ETR	Existing to Remain
EW	Each Way
EWC	Electric Water Cooler
EXIST	Existing
EXP	Expansion
EXT	Exterior
FA	Fire Alarm
FD	Floor Drain
FDN	Foundation
FE	Fire Extinguisher
FEC	Fire Extinguisher Cabinet
FHC	Fire Hose Cabinet
FIN	Finish
FIXT	Fixture
FLR	Floor
FLUOR	Fluorescent
FOC	Face Of Concrete
FOF	Face Of Finish
FOM	Face Of Masonry
FOS	Face Of Studs
FRJS	Fire Resistive Joint System
FRP	Fiberglass Reinforced Plastic
FRT	Fire Retardant Treated
FT	Foot
FTG	Footing
FURR	Furring
FUT	Future
GA	Gauge
GALV	Galvanized
GFCI	Ground Fault Circuit Interrupter
GL	Glass
GR	Grade
GYP BD	Gypsum Board
HB	Hose Bibb
HC	Hollow Core
HDW	Hardware
HDWD	Hardwood
HM	Hollow Metal
HORIZ	Horizontal
HP	High Point
HR	Hour
HSS	Hollow Structural Section
HT	Height
ID	Inside Diameter
IN	Inch
INS	Insulation
INT	Interior
JAN	Janitor
JST	Joist
JT	Joint
LAB	Laboratory
LAM	Laminate
LAV	Lavatory
LCC	Lead Coated Copper
LP	Low Point
LTTR	Long Term Thermal Resistance
LVL	Laminated Veneer Lumber
MAS	Masonry
MAX	Maximum
MDF	Medium Density Fiberboard
MECH	Mechanical
MEP	Mechanical, Electrical, Plumbing
MFR	Manufacturer
MIN	Minimum
MISC	Miscellaneous
MO	Masonry Opening
MOD BIT	Modified Bituminous
MT	Marble Threshold
MTD	Mounted
MTL	Metal
MUL	Mullion
N	North
NIC	Not In Contract
NO	Number
NOM	Nominal
NTS	Not To Scale
OC	On Center
OD	Outside Diameter
OF/CI	Owner Furnished/ Contractor Installed
OF/OI	Owner Furnished/ Owner Installed
OFF	Office
OH	Overhead
OPG	Opening
OPP	Opposite
OSB	Oriented Strand Board
PCC	Precast Concrete
PFPS	Perimeter Fire Containment System
PL	Plate
PLAM	Plastic Laminate
PLYWD	Plywood
PR	Pair
PSF	Pounds Per Square Foot
PSI	Pounds Per Square Inch
PSL	Parallel Strand Board
PT	Pressure Treated
PTAC	Packaged Terminal Air Conditioner
PTD	Painted
PVMT	Pavement
R	Riser or Radius
RD	Roof Drain
REF	Reference
REFR	Refrigerator
REINF	Reinforced
REQD	Required
RES	Resilient
RM	Room
RO	Rough Opening
RWC	Rain Water Conductor
S	South
SC	Solid Core
SCHED	Schedule
SECT	Section
SF	Square Feet
SFRM	Spray Fire Resistive Materials
SIM	Similar
SPEC	Specification
SPM	Single Ply Membrane
SQ	Square
SS	Stainless Steel
STA	Station
STD	Standard
STL	Steel
STOR	Storage
STRUCT	Structure
SUSP	Suspended
SYM	Symmetrical
T	Tread
T&G	Tongue & Groove
TEL	Telephone
THK	Thick
TOC	Top Of Concrete
TOF	Top Of Finish
TOM	Top Of Masonry
TOS	Top Of Steel
TPO	Thermoplastic Polyolefin
TYP	Typical
UNO	Unless Noted Otherwise
VCT	Vinyl Composition Tile
VERT	Vertical
VEST	Vestibule
VIF	Verify In Field
W	West
W/	With
W/O	Without
WC	Water Closet
WD	Wood
WH	Water Heater
WIC	Walk-In-Closet
WP	Working Point
WSCT	Wainscot
WT	Weight
WWF	Welded Wire Fabric
XPS	Extruded Polystyrene Insulation

KEY INFORMATION

1. Applicable Code(s) & Regulations For This Project:
   2018 IBC (International Building Code With Amendments)
   ICC/ANSI A117.1-2009 (Accessibility required by IBC)
   2010 ADA Standards for Accessible Design
   Delaware State Fire Prevention Regulation 2015
   2018 Edition of Life Safety NFPA 101
2. Occupancy Use Group: B
3. Construction Types: IBC = IV HT and NFPA 101 = TYPE IV (000)
4. Project Description: Tramway renovations,installation of pole shed maintenance building and pavilion, heronry replacement, new trails, restoration of existing trails and demolition and removal of existing maintenance building.
5. Type Of Construction: Renovation and New Construction.
6. Project Team and Responsibilities:

   Owner and Architect (Heronry Platform and pavilion & maintenance building design build specification): DNREC, Division of Parks and Recreation, State of Delaware.
   Tramway and Trail Engineer: CDA Site Engineering and Land Planning
   Maintenance Building and Pavilion Slabs: Orndorf & Associates, Inc., Structural Engineer

GENERAL NOTES

1. All work shall be in accordance with applicable state and local building codes and all other governing agencies and regulations.
2. Contractor shall verify all conditions and dimensions in the field prior to commencement of the work. Verify layout in relation to property, benchmarks, and other fixed conditions. Report discrepancies to the Architect immediately upon discovery.
3. Notify Architect of discrepancies regarding the Contract Documents or design intent immediately upon discovery. Contractor shall be responsible for obtaining clarification prior to proceeding with the work or related work.
4. Contractor shall obtain all required building permits and licenses.
5. Contractor shall remove all rubbish and debris from the site during course of project, and dispose of legally off-site.
6. Contractor shall perform all cutting, patching and protection required to complete the work indicated on the Contract Documents.
7. Contractor shall provide all inspections and tests required by state and local authorities including but not limited to mechanical and electrical work. Refer to individual drawings and specifications for additional testing requirements.
8. Unless indicated otherwise in Specifications, products and manufacturers are noted to establish the type and quality of materials to be provided. Contractor may submit proposed substitutions to the Architect for review, per Section 016000 Product Requirements. Contractor shall include costs associated with proposed substitution, including redesign, and alteration of adjacent work to accept substitution.
9. All dimensions are either to face of masonry or the face of stud, unless noted otherwise. Drawings are not to be scaled.
10. Install all equipment and materials per manufacturer's instructions and recommendations unless specifically otherwise indicated, or where local codes and regulations take precedence.
11. Contractor shall provide supervision while any subcontractors or workers are on the job site and shall supervise and direct all work.
12. Contractor shall be solely responsible for all construction means, methods, techniques, sequences, procedures, site safety, and coordinating the work of all trades under the contract.
13. No products containing asbestos or other hazardous materials shall be installed on this project or used during the construction of the project. It shall be the responsibility of the Contractor to certify to the Owner that this requirement has been met. Subcontractors shall verify to the Contractor that no asbestos or other hazardous products are used in their work.
14. Where "Architect" is referenced in the above notes, it shall mean DNREC .
15. Delegated Design: When professional design services or certifications related to pre-manufactured structures, systems, materials, or equipment are required by these documents, the Owner and their consultants will specify performance and design criteria that such services must satisfy. The Contractor shall cause such services and certifications to be provided by properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, Shop Drawings, and other related submittals. The Owner and their consultants shall be entitled to rely upon the accuracy and completeness of those delegated services. The Owner and their consultants will review submittals only for the limited purpose of checking for conformance with the performance and design criteria. Delegated design for this project will include the helical piles, new maintenance building and new pavilion.

DATE: DESCRIPTION: BY:

PEA PATCH ISLAND IMPROVEMENTS
FORT DELAWARE STATE PARK
DELAWARE CITY, DELAWARE

GENERAL NOTES, ABBREVIATIONS & SYMBOLS

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: KJR
DRAWN BY: KJR
BUILDING NO.: N/A
DATE: 10\14\19
SCALE: NA
SHEET NO.: G-2
PARKS PROJECT #: FD-20
CONTRACT #: 2019-FD-100

SITE DATA

1. OWNER ADDRESS: STATE OF DELAWARE
BOX B
BEAR, DE 19701

2. PROPERTY ADDRESS: 1533 DELAWARE RIVER
NEW CASTLE, DE 19720

3. TAX PARCEL NUMBERS: 12-010.00-001

4. AREA OF PARCEL: 273.2± ACRES LIMIT OF DISTURBANCE (LOD) = 1.2 AC

5. ZONING: SR – SUBURBAN RESERVE

LOT AREA	LOT WIDTH	STREET YARD	SIDE YARD	REAR YARD	BUILDING HEIGHT	PAVING
5 AC.	300'	100'	50'	100'	50'	75'/40'

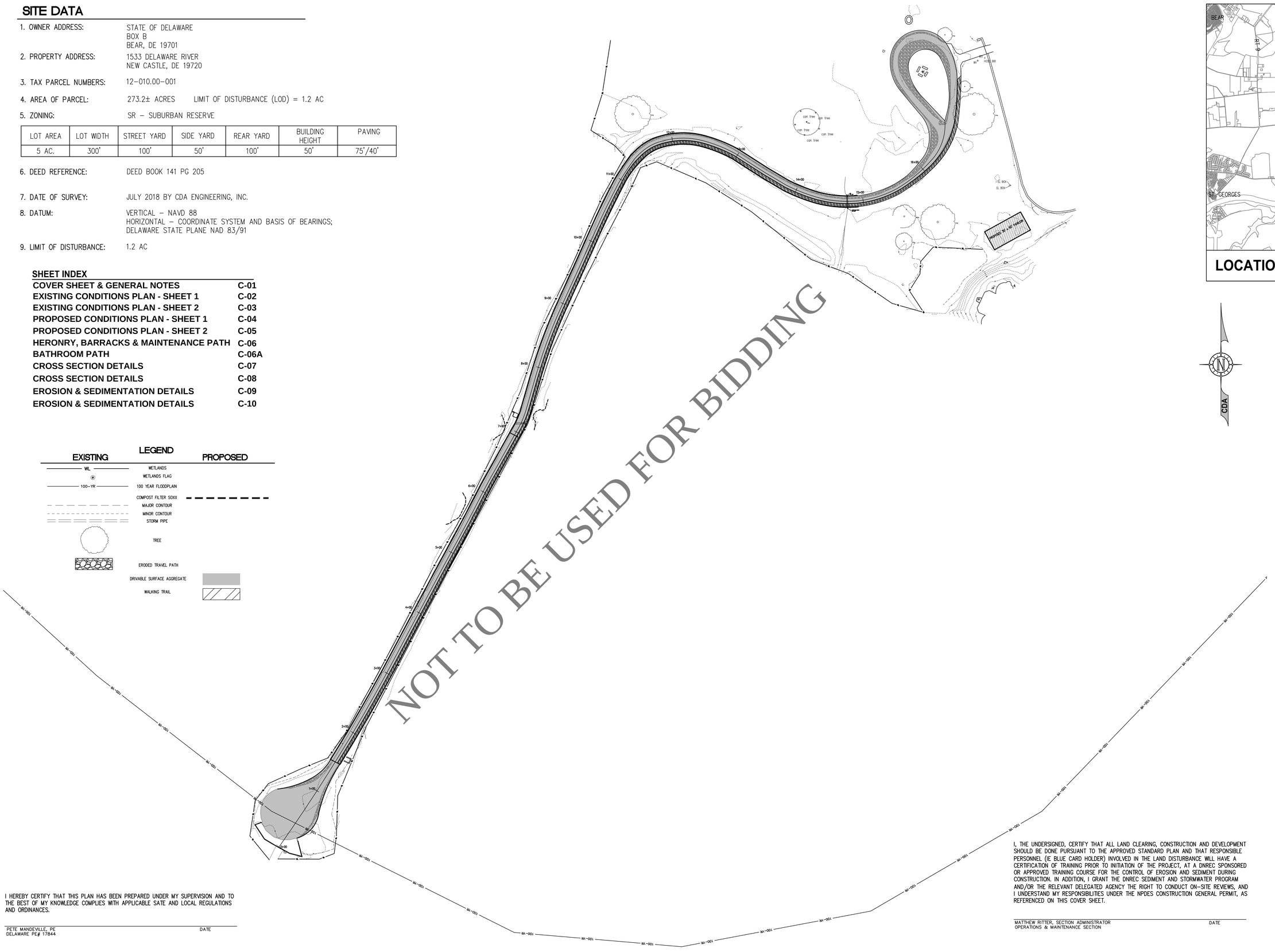
6. DEED REFERENCE: DEED BOOK 141 PG 205

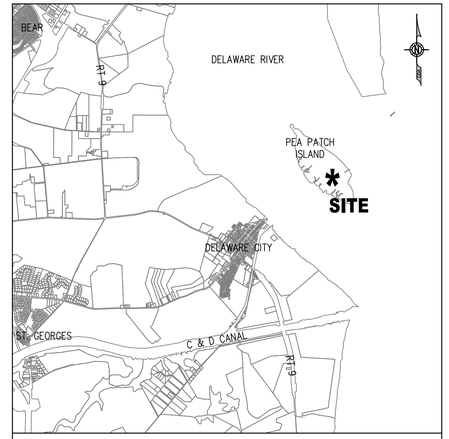
7. DATE OF SURVEY: JULY 2018 BY CDA ENGINEERING, INC.

8. DATUM: VERTICAL – NAVD 88
HORIZONTAL – COORDINATE SYSTEM AND BASIS OF BEARINGS;
DELAWARE STATE PLANE NAD 83/91

9. LIMIT OF DISTURBANCE: 1.2 AC

SHEET INDEX





LOCATION MAP SCALE: 1"=1 MILE

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLIES WITH APPLICABLE SATE AND LOCAL REGULATIONS AND ORDINANCES.

PETE MANDEVILLE, PE
DELAWARE PE# 17844 DATE

I, THE UNDERSIGNED, CERTIFY THAT ALL LAND CLEARING, CONSTRUCTION AND DEVELOPMENT SHOULD BE DONE PURSUANT TO THE APPROVED STANDARD PLAN AND THAT RESPONSIBLE PERSONNEL (IE BLUE CARD HOLDER) INVOLVED IN THE LAND DISTURBANCE WILL HAVE A CERTIFICATION OF TRAINING PRIOR TO INITIATION OF THE PROJECT, AT A DNREC SPONSORED OR APPROVED TRAINING COURSE FOR THE CONTROL OF EROSION AND SEDIMENT DURING CONSTRUCTION. IN ADDITION, I GRANT THE DNREC SEDIMENT AND STORMWATER PROGRAM AND/OR THE RELEVANT DELEGATED AGENCY THE RIGHT TO CONDUCT ON-SITE REVIEWS, AND I UNDERSTAND MY RESPONSIBILITIES UNDER THE NPDES CONSTRUCTION GENERAL PERMIT, AS REFERENCED ON THIS COVER SHEET.

MATTHEW RITTER, SECTION ADMINISTRATOR
OPERATIONS & MAINTENANCE SECTION DATE

REVISION	DATE
JPP SUBMISSION	9.12.18
DESIGN DEVELOPMENT SUBMISSION	2.22.19
DFM COMMENTS	6.17.19
SWM SUBMISSION	9.13.19
PER DNREC COMMENTS	10.7.19
ISSUED FOR BID	10.14.19

CDA ENGINEERING INC.

CIVIL/SITE ENGINEERING AND LAND PLANNING

6 LARCH AVENUE
SUITE 401
WILMINGTON, DE 19804

Tel: 302 998 9202
Fax: 302 691 1314
cdaengineering.com

DRAWN BY: PJM
CHECKED BY: CD
PROJECT No.: 18.135.00
SCALE: 1" = 60'
DATE: 10.14.19
CAD FILE: ...\DWG\1813500 BASE.DWG

APPLICATION No. 2019-049

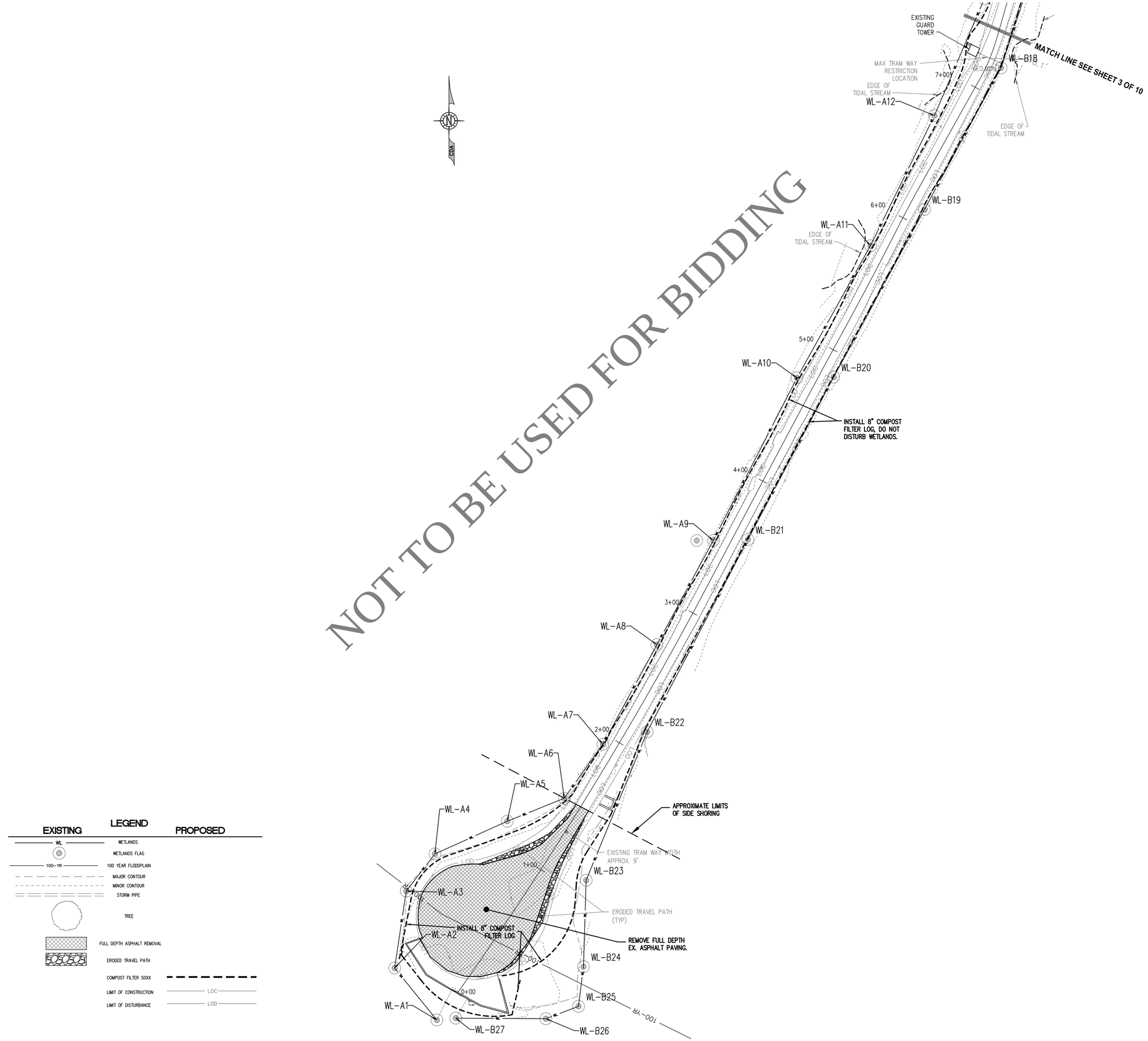
STATE OF DELAWARE

PEA PATCH ISLAND IMPROVEMENTS

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **INDEX SHEET**

DRAWING NUMBER: **C-01**



LEGEND

EXISTING		PROPOSED
WL	WETLANDS	
	WETLANDS FLAG	
100-YR	100 YEAR FLOODPLAIN	
	MAJOR CONTOUR	
	MINOR CONTOUR	
	STORM PIPE	
	TREE	
	FULL DEPTH ASPHALT REMOVAL	
	ERODED TRAVEL PATH	
	COMPOST FILTER SOXX	
	LIMIT OF CONSTRUCTION	LOC
	LIMIT OF DISTURBANCE	LOD

REVISION	DATE
JPP SUBMISSION	9.12.18
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CAD FILE:	...\DWG\1813500 BASE.DWG

0' 15' 30' 60'
1"=30'

APPLICATION No. 2019-049

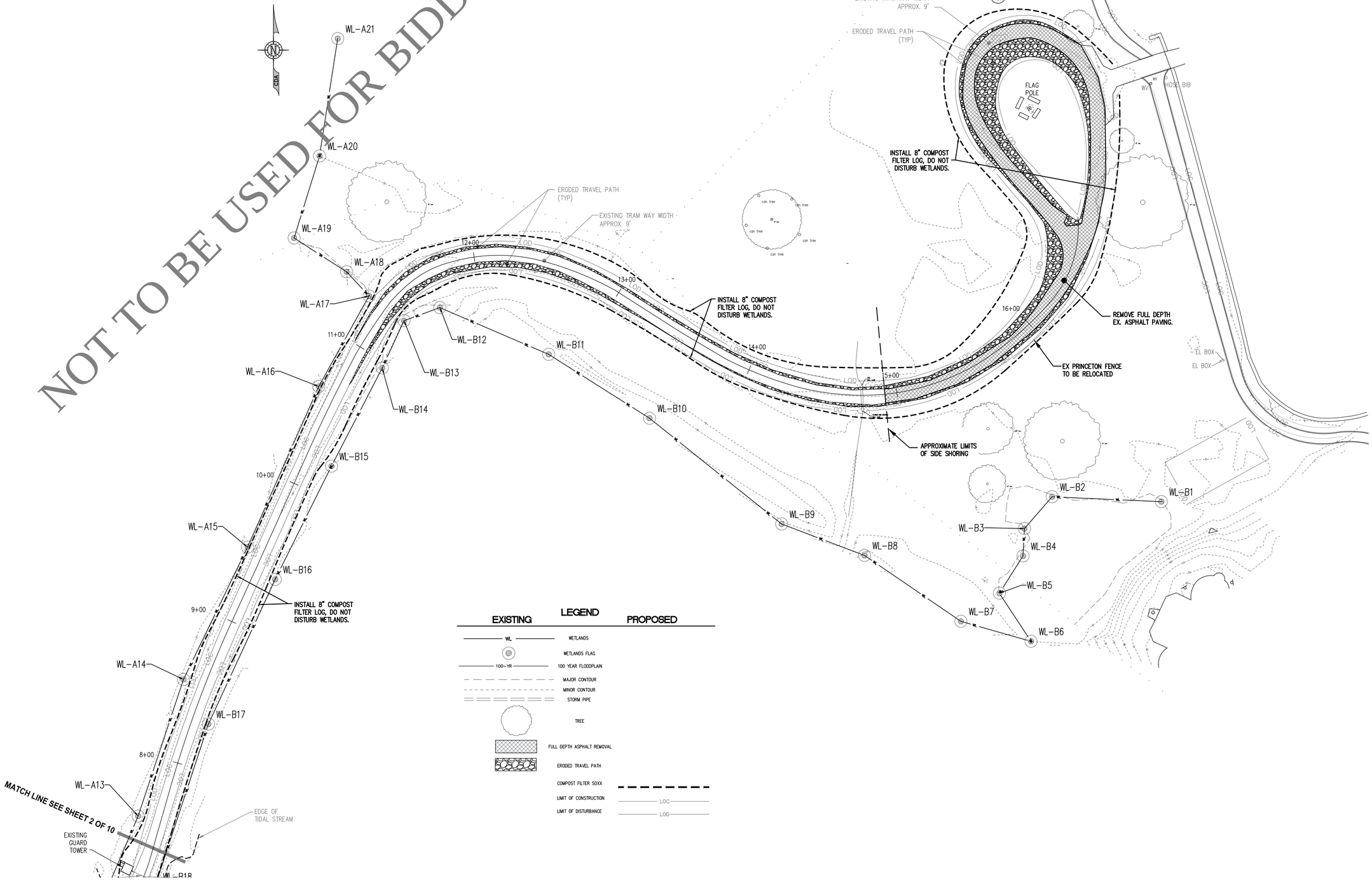
STATE OF DELAWARE

PEA PATCH ISLAND IMPROVEMENTS

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **EXISTING CONDITIONS TOPOGRAPHIC SURVEY PLAN**

DRAWING NUMBER: **C-02**



LEGEND

EXISTING		PROPOSED
WL	WETLANDS	
	WETLANDS FLAG	
100-YR	100 YEAR FLOODPLAIN	
	MAJOR CONTOUR	
	MINOR CONTOUR	
	STORM PIPE	
	TREE	
	FULL DEPTH ASPHALT REMOVAL	
	ERODED TRAVEL PATH	
	COMPOST FILTER SOXX	
	LIMIT OF CONSTRUCTION	LOC
	LIMIT OF DISTURBANCE	LOD

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0' 15' 30' 60'

APPLICATION No. 2019-049

STATE OF DELAWARE

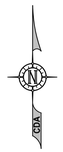
PEA PATCH ISLAND IMPROVEMENTS

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

SITE DEMOLITION AND PRE-CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN

DRAWING TITLE:

DRAWING NUMBER: **C-03**



LEGEND

EXISTING		PROPOSED
WL	WETLANDS	
	WETLANDS FLAG	
100-YR	100 YEAR FLOODPLAIN	
	MAJOR CONTOUR	
	MINOR CONTOUR	
	STORM PIPE	
	TREE	
	FULL DEPTH ASPHALT REMOVAL	
	ERODED TRAVEL PATH	
	COMPOST FILTER SOXX	
	DRIVABLE SURFACE AGGREGATE	
	WALKING TRAIL	
	LIMIT OF CONSTRUCTION	LOC
	LIMIT OF DISTURBANCE	LOD

REVISION	DATE
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0' 15' 30' 60'
1" = 30'

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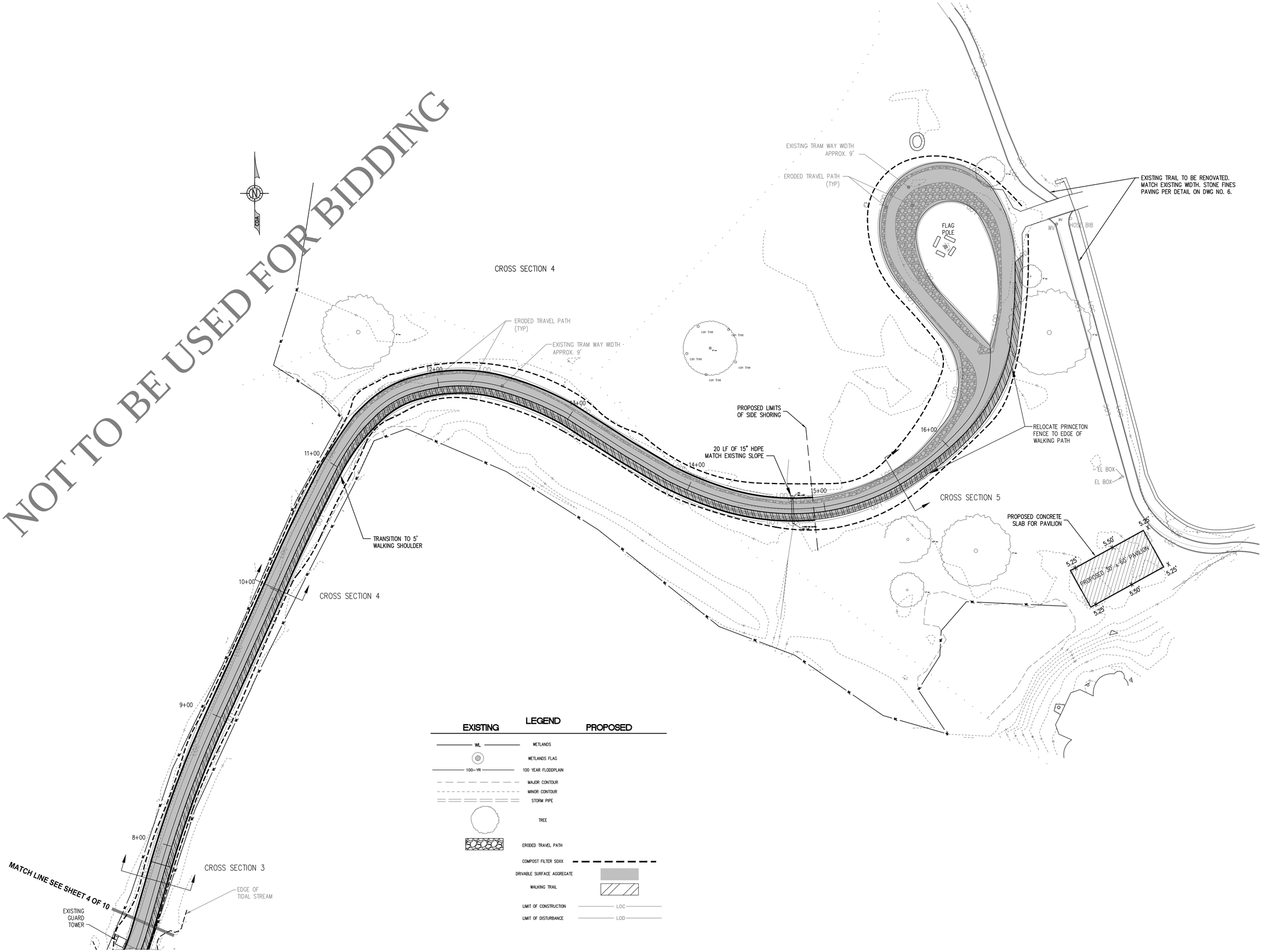
STATE OF DELAWARE

PEA PATCH ISLAND IMPROVEMENTS

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **PROPOSED CONDITIONS**

DRAWING NUMBER: **C-04**



LEGEND

EXISTING		PROPOSED
WL	WETLANDS	
	WETLANDS FLAG	
100-YR	100 YEAR FLOODPLAIN	
	MAJOR CONTOUR	
	MINOR CONTOUR	
	STORM PIPE	
	TREE	
	ERODED TRAVEL PATH	
	COMPOST FILTER SOXX	
	DRIVABLE SURFACE AGGREGATE	
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	LIMIT OF CONSTRUCTION	LOC
	LIMIT OF DISTURBANCE	LOD

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0' 15' 30' 60'
1"=30'

APPLICATION No. 2019-049

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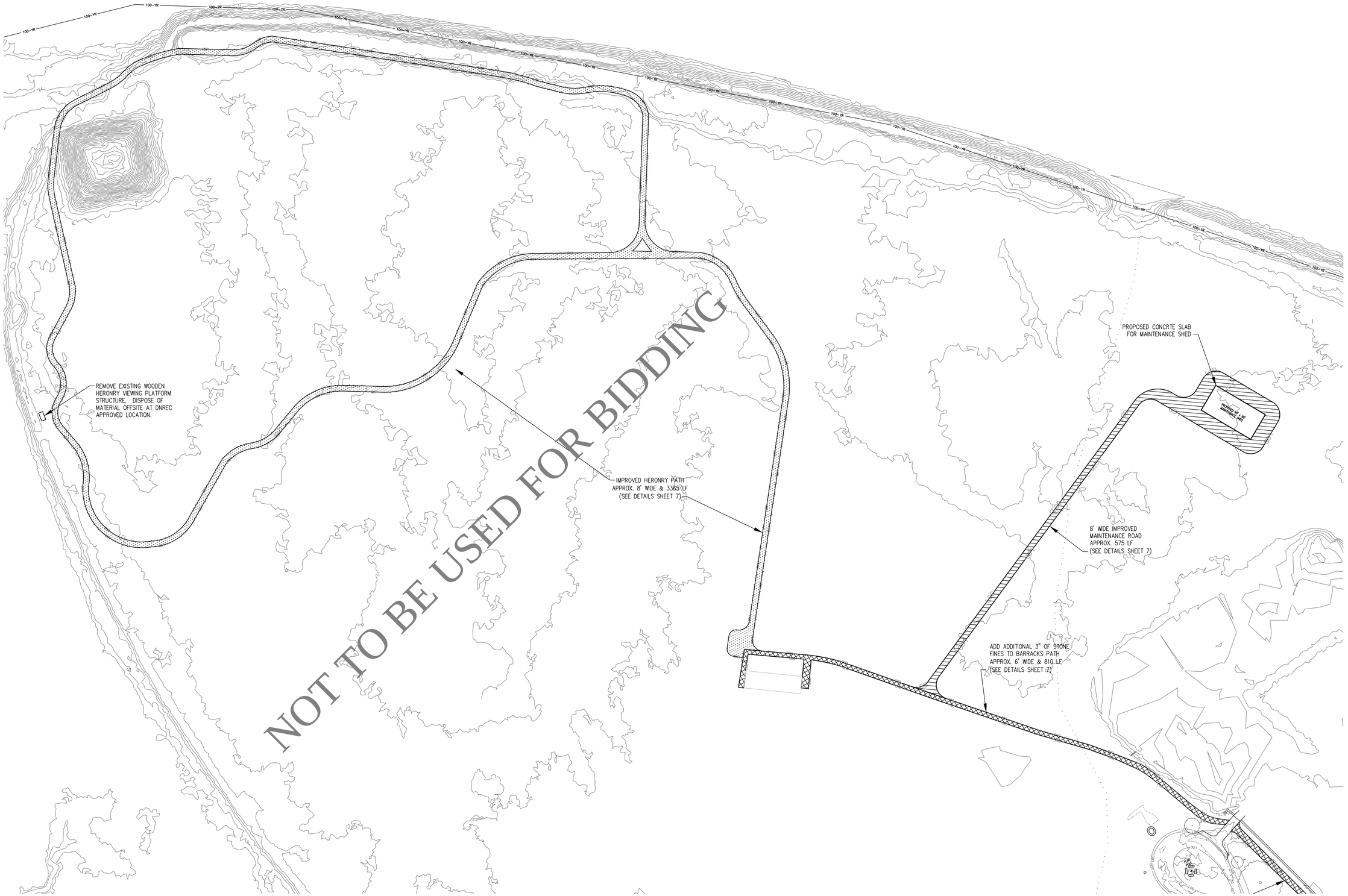
PEA PATCH ISLAND IMPROVEMENTS

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **PROPOSED CONDITIONS**

DRAWING NUMBER: **C-05**



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CAD FILE:	...\DWG\1813500 BASE.DWG

0' 30' 60' 120'
1" =60'

APPLICATION No. 2019-049

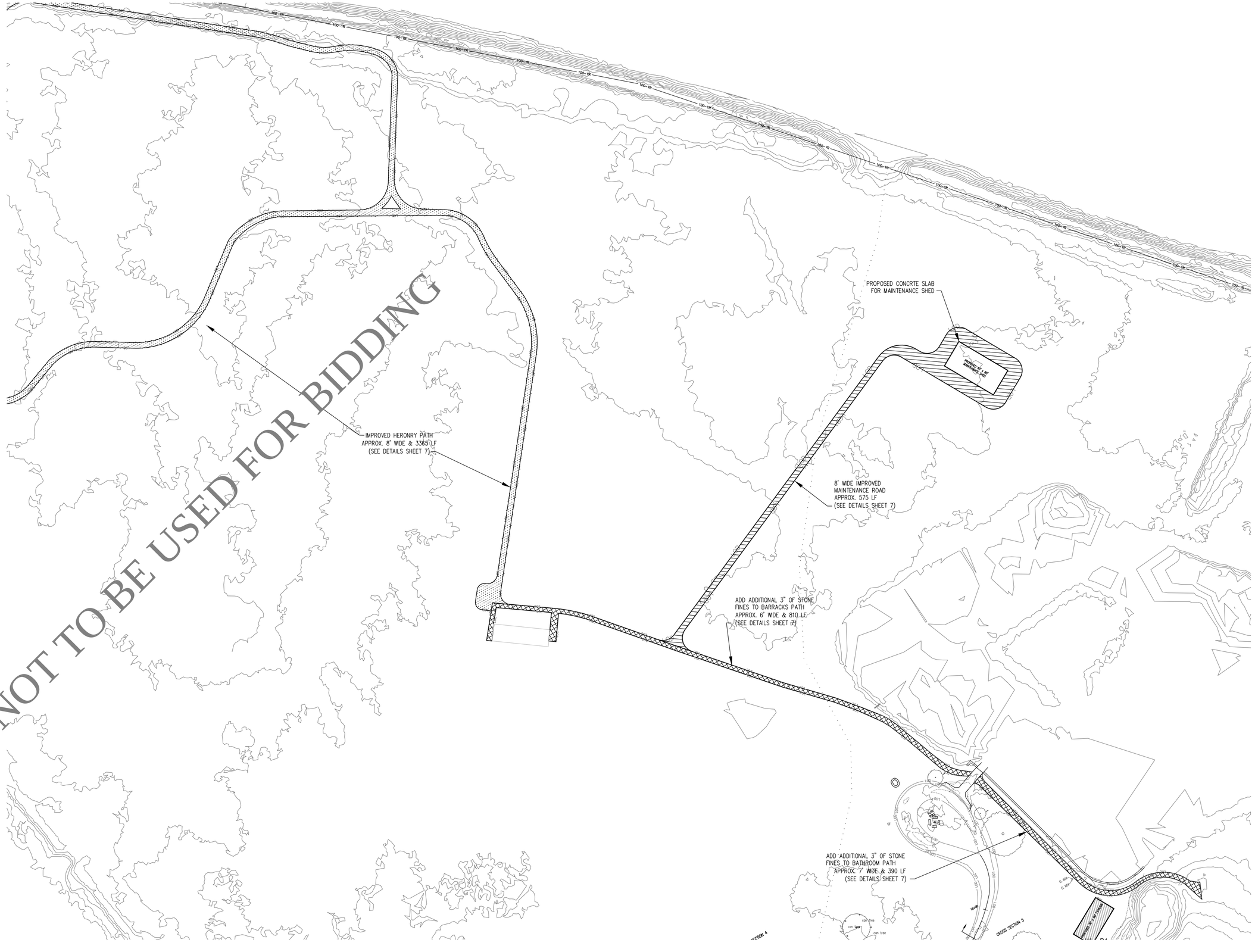
STATE OF DELAWARE

PEA PATCH ISLAND IMPROVEMENTS

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **PROPOSED HERONRY, BARRACKS AND MAINTENANCE PATHS**

DRAWING NUMBER: **C-06**



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CAD FILE:	...\DWG\1813500 BASE.DWG

0' 30' 60' 120'
1" = 60'

APPLICATION No. 2019-049

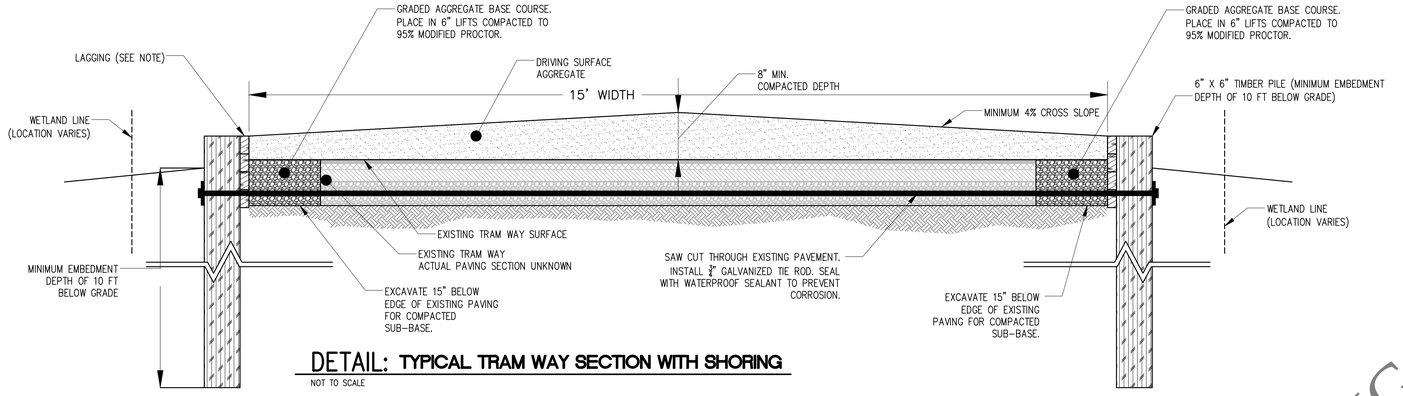
STATE OF DELAWARE

PEA PATCH ISLAND IMPROVEMENTS

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **PROPOSED HERONRY, BARRACKS AND MAINTENANCE PATHS**

DRAWING NUMBER: **C-06a**



DETAIL: TYPICAL TRAM WAY SECTION WITH SHORING

NOT TO SCALE

*NOTE:

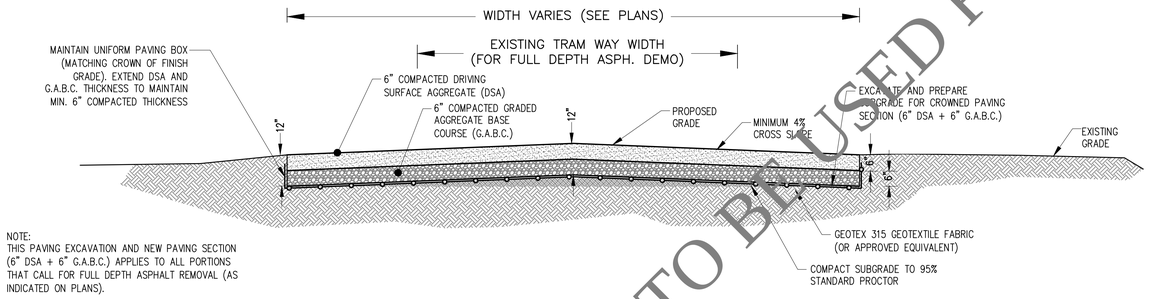
CONTRACTOR TO SELECT 16 FT LONG, MIXED HARDWOOD 6"x6" PRESSURE TREATED POSTS, FREE FROM DEFECTS FOR DRIVING. PILES ARE TO BE DRIVEN PLUMB, WITH CARE TAKEN TO AVOID DAMAGE TO THE POST TO ALLOW ATTACHMENT OF LAGGING AND TIE ROD.

POST TO BE DRIVEN TO A MINIMUM EMBEDDED DEPTH OF 10 FT UNLESS OTHERWISE DIRECTED BY GEOTECHNICAL ENGINEER.

POSTS TO BE SPACED AT A MAXIMUM OF 4 FT ON-CENTER. CONTRACTOR TO FIELD ADJUST AS NEEDED TO AVOID CONFLICTS ENCOUNTERED IN THE FIELD.

TIE ROD TO BE SPACED EVERY OTHER SET OF POSTS AS SHOWN IN THE TYPICAL PLAN VIEW. MAXIMUM SEPARATION OF 8 FT ON CENTER.

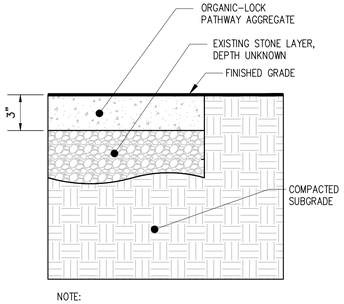
LAGGING SHALL BE NOMINAL 3" MIXED HARDWOOD PRESSURE TREATED LUMBER, FREE FROM DEFECTS.



NOTE:
THIS PAVING EXCAVATION AND NEW PAVING SECTION (6" DSA + 6" G.A.B.C.) APPLIES TO ALL PORTIONS THAT CALL FOR FULL DEPTH ASPHALT REMOVAL (AS INDICATED ON PLANS).

TYPICAL TRAM WAY SECTION W/O SHORING
DETAIL: (FOR LIMITS OF FULL DEPTH ASPHALT DEMO)

NOT TO SCALE

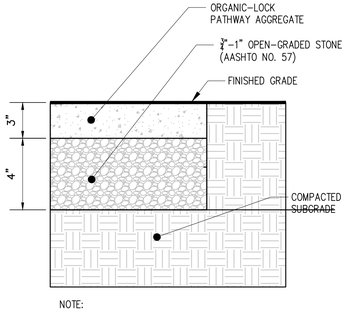


NOTE:

1. ORGANIC-LOCK PATHWAY AGGREGATE, BY ENVIRONBOND PRODUCTS CORPORATION, OR APPROVED EQUAL.

DETAIL: BARRACKS + BATHROOM PATHS, STONE FINES PAVING

NOT TO SCALE

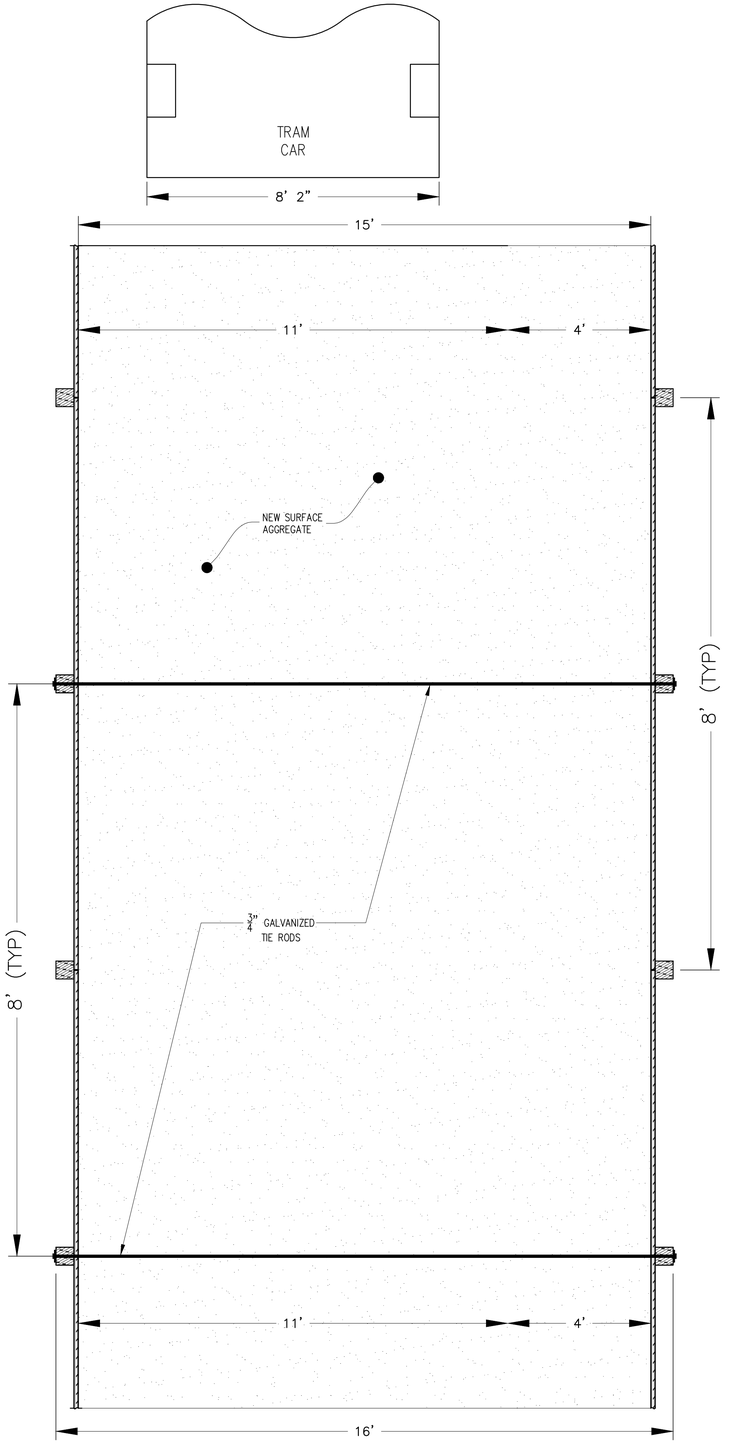


NOTE:

1. ORGANIC-LOCK PATHWAY AGGREGATE, BY ENVIRONBOND PRODUCTS CORPORATION, OR APPROVED EQUAL.

DETAIL: MAINTENANCE ROAD AND HERONRY PATH

NOT TO SCALE



DETAIL: TYPICAL PLAN VIEW

NOT TO SCALE

REVISION	DATE
JPP SUBMISSION	9.12.18
DESIGN DEVELOPMENT SUBMISSION	2.22.19
DFM COMMENTS	6.17.19
SWM SUBMISSION	9.13.19
PER DNREC COMMENTS	10.7.19
ISSUED FOR BID	10.14.19

CDA ENGINEERING INC.
CIVIL/SITE ENGINEERING AND LAND PLANNING
6 LARCH AVENUE
SUITE 401
WILMINGTON, DE 19804
Tel: 302 998 9202
Fax: 302 691 1314
cdaengineering.com

DRAWN BY:	PJM
CHECKED BY:	CD
PROJECT No.:	18.135.00
SCALE:	NO SCALE
DATE:	10.14.19
CAD FILE:	...\DWG\1813500 BASE.DWG

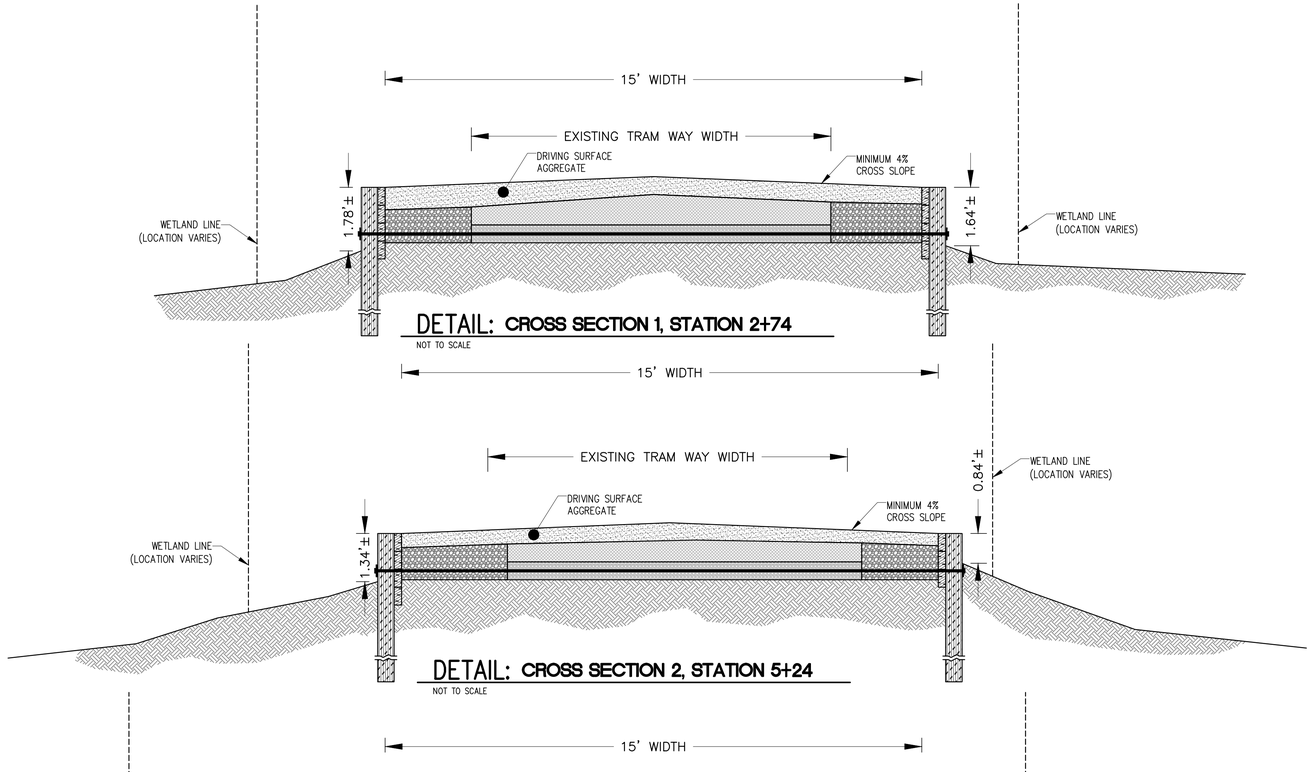
APPLICATION No. 2019-049

STATE OF DELAWARE
PEA PATCH ISLAND IMPROVEMENTS

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: TRAM WAY CROSS SECTION DETAILS

DRAWING NUMBER: C-07

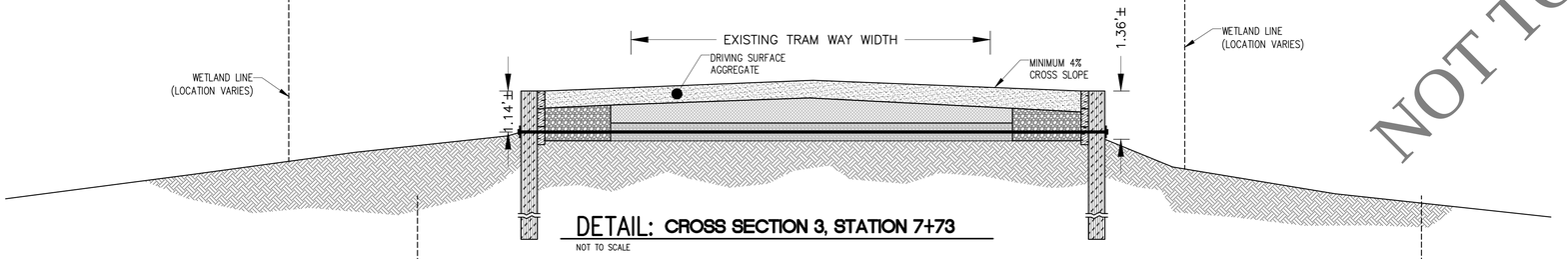


DETAIL: CROSS SECTION 1, STATION 2+74

NOT TO SCALE

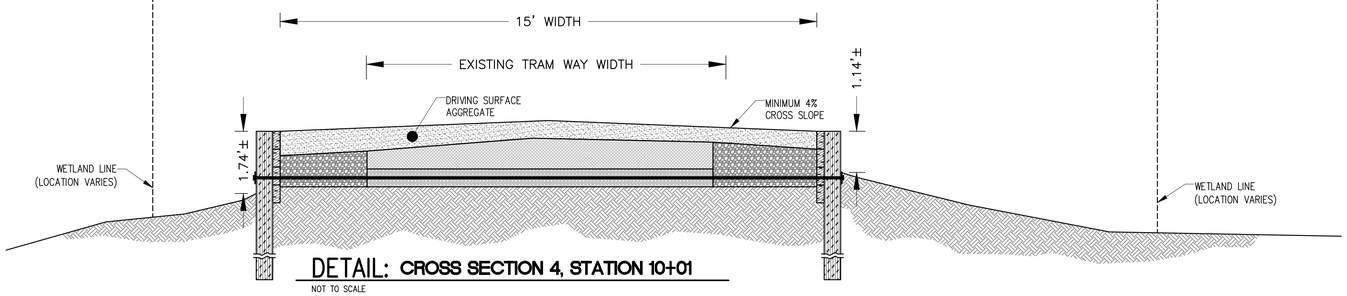
DETAIL: CROSS SECTION 2, STATION 5+24

NOT TO SCALE



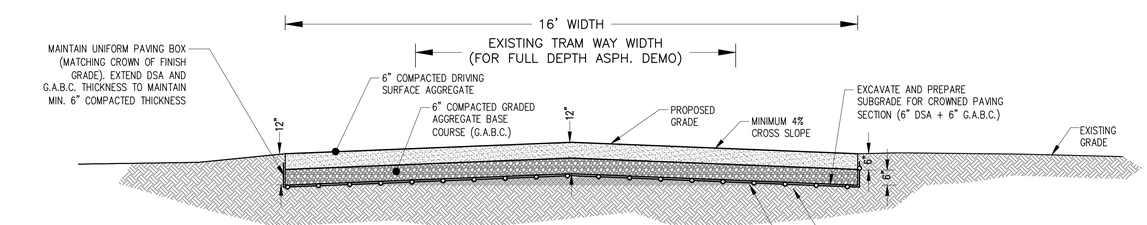
DETAIL: CROSS SECTION 3, STATION 7+73

NOT TO SCALE



DETAIL: CROSS SECTION 4, STATION 10+01

NOT TO SCALE



NOTE:
THIS PAVING EXCAVATION AND NEW PAVING SECTION (6" DSA + 6" G.A.B.C.) APPLIES TO ALL PORTIONS THAT CALL FOR FULL DEPTH ASPHALT REMOVAL (AS INDICATED ON PLANS).

DETAIL: CROSS SECTION 5, STATION 15+56

NOT TO SCALE

REVISION	DATE
JPP SUBMISSION	9.12.18
DESIGN DEVELOPMENT SUBMISSION	2.22.19
DFM COMMENTS	6.17.19
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CAD FILE:	...\DWG\1813500 BASE.DWG

APPLICATION No. 2019-049

STATE OF DELAWARE

PEA PATCH ISLAND IMPROVEMENTS

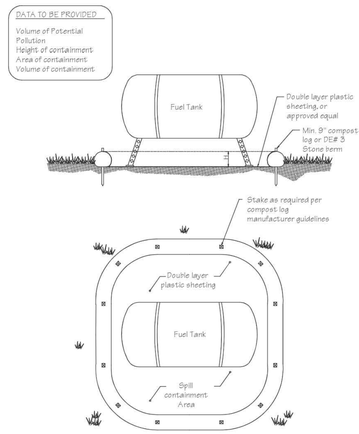
RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **TRAM WAY CROSS SECTIONS**

DRAWING NUMBER: **C-08**

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control



Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.6.1** Sheet 1 of 5 Effective FEB 2019

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Pollution Prevention – Spill Prevention

1. Fueling should only take place in signed designated areas, away from downstream drainage facilities and watercourses.
2. Fueling must be with nozzles equipped with automatic shut-off to control drips. Do not top off.
3. Protect the areas where equipment or vehicles are being repaired, maintained, fueled or parked from storm water run-on and runoff.
4. Use barriers such as berms to prevent storm water run-on and runoff, and to contain spills.
5. Place a "Fueling Area" sign next to each fueling area.
6. Store hazardous materials such as fuel, solvents, oil and chemicals in secondary containment.
7. Inspect vehicles and equipment for leaks on each day of use. Repair fluid and oil leaks immediately.
8. Absorbent spill clean-up materials and spill kits must be available in fueling areas and on fuel trucks.
9. If fueling is to take place at night, make sure the fueling area is sufficiently illuminated.
10. Properly dispose of used oil, fluids, lubricants and spill clean-up materials.

CLEAN UP SPILLS

1. If it is safe to do so, immediately contain and clean up any chemical and/or hazardous material spills.
2. Properly dispose of used oil, fluids, lubricants and spill clean-up materials.
3. Do not bury spills or wash them down with water.

LEAKS AND DRIPS

1. Use drip pans or absorbent pads at all times. Place under and around leaky equipment.
2. Do not allow oil, grease, fuel or chemicals to drip onto the ground.
3. Have spill kits and clean up material on-site.
4. Repair leaky equipment promptly or remove problem vehicles and equipment from the site. Clean up contaminated soil immediately.
5. Store contaminated waste in sealed containers constructed of suitable material. Label these containers properly.
6. Clean up all spills and leaks. Promptly dispose of waste and spent clean up materials.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.6.1** Sheet 2 of 5 Effective FEB 2019

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes:

The Construction Site Pollution Prevention Plan should include the following elements:

1. **Material Inventory**

   Document the storage and use of the following materials:
   a. Concrete
   b. Detergents
   c. Paints (enamel and latex)
   d. Cleaning solvents
   e. Pesticides
   f. Wood scraps
   g. Fertilizers
   h. Petroleum based products

2. **Good housekeeping practices**
   a. Store only enough product required to do the job.
   b. All materials shall be stored in a neat, orderly manner in their original labeled containers and covered.
   c. Substances shall not be mixed.
   d. When possible, all of a product shall be used up prior to disposal of the container.
   e. Manufacturers' instructions for disposal shall be strictly adhered to.
   f. The site foreman shall designate someone to inspect all BMPs daily.

3. **Waste management practices**
   a. All waste materials shall be collected and stored in securely lidded dumpsters in a location that does not drain to a waterbody.
   b. Waste materials shall be salvaged and/or recycled whenever possible.
   c. The dumpsters shall be emptied a minimum of twice per week, or more if necessary. The licensed trash hauler is responsible for cleaning out dumpsters.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 3 of 5 Effective FEB 2019

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes (cont.)

   d. Trash shall be disposed of in accordance with all applicable Delaware laws.
   e. Trash cans shall be placed at all lunch spots and littering is strictly prohibited. Recycle bins shall be placed near the construction trailer.
   f. If fertilizer bags can not be stored in a weather-proof location, they shall be kept on a pallet and covered with plastic sheeting which is overlapped and anchored.

4. **Equipment maintenance practices**
   a. If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
   b. If performed on-site, vehicles shall be washed with high-pressure water spray without detergents in an area contained by an impervious berm.
   c. Drip pans shall be used for all equipment maintenance.
   d. Equipment shall be inspected for leaks on a daily basis.
   e. Washout from concrete trucks shall be disposed of in a temporary pit for hardening and proper disposal.
   f. Fuel nozzles shall be equipped with automatic shut-off valves.
   g. All used products such as oil, antifreeze, solvents and tires shall be disposed of in accordance with manufacturers' recommendations and local, state and federal laws and regulations.

5. **Spill prevention practices**
   a. Potential spill areas shall be identified and contained in covered areas with no connection to the storm drain system.
   b. Warning signs shall be posted in hazardous material storage areas.
   c. Preventive maintenance shall be performed on all tanks, valves, pumps, pipes and other equipment as necessary.
   d. Low or non-toxic substances shall be prioritized for use.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 4 of 5 Effective FEB 2019

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes (cont.)

   e. Contact information for reporting spills through the DNREC 24-Hour Toll Free Number shall be prominently posted.

6. **Education**
   a. Best management practices for construction site pollution control shall be a part of regular progress meetings.
   b. Information regarding waste management, equipment maintenance and spill prevention shall be prominently posted in the construction trailer.

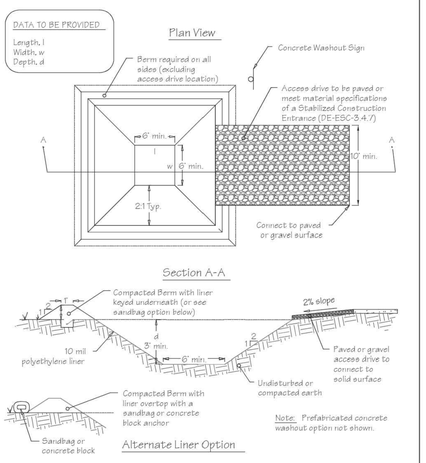
CONTACT INFORMATION

DNREC 24-Hour Toll Free Number	**800-662-8802**
DNREC Solid & Hazardous Waste Management Section	**302-739-9403**

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 5 of 5 Effective FEB 2019

Standard Detail & Specifications

Concrete Washout



Source:	Symbol:	Detail No.
Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3	CW	**DE-ESC-3.6.2** Sheet 1 of 2 Effective FEB 2019

Standard Detail & Specifications

Concrete Washout

Construction Notes:

1. Locate washout area a minimum of 50 feet from open channels, stormdrain inlets, wetlands or waterbodies.
2. Locate washout area so that it is accessible to concrete equipment (service with a minimum 10 foot wide gravel accessway), but so it is not in a highly active construction area causing accidental damage.
3. Minimum dimensions for prefabricated units are 4 feet by 4 feet by 1 foot deep with a minimum 4mil polyethylene plastic liner. Minimum dimensions for constructed concrete washout areas are 6 feet by 6 feet by 3 feet deep, with a minimum 10mil polyethylene liner, 2:1 side slopes, and a 1 foot high by 1 foot wide compacted fill berm.
4. The liner must be free of tears or holes and placed over smooth surfaces to prevent puncturing. For excavated washouts, anchor the liner underneath the berm or overtop with sandbags or concrete blocks to hold in place.
5. Provide a sign designating the washout area, and for large construction sites, provide signs throughout directing traffic to its location.
6. Allow washed out concrete mixture to harden through evaporation of the wash water. Once the facility has reached 75 percent of its capacity, remove the hardened concrete by reusing the broken aggregate onsite, recycling, or disposing of offsite. The hardened material can be buried on site with minimum of 1 foot of clean, compacted fill.
7. Apply a new liner before reusing the station for additional washouts after maintenance has occurred.

Source:	Symbol:	Detail No.
Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3	CW	**DE-ESC-3.6.2** Sheet 2 of 2 Effective FEB 2019

GENERAL NOTES FOR EROSION AND SEDIMENT CONTROL

1. THE DNREC SEDIMENT AND STORMWATER PROGRAM (OR DELEGATED AGENCY) SHALL BE NOTIFIED IN WRITING 5 DAYS PRIOR TO COMMENCING WITH CONSTRUCTION. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.

2. REVIEW AND/OR APPROVAL OF THE SEDIMENT AND EROSION CONTROL PLAN SHALL NOT RELIEVE THE CONTRACTOR FROM HIS OR HER RESPONSIBILITIES FOR COMPLIANCE WITH THE REQUIREMENTS OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS, NOR SHALL IT RELIEVE THE CONTRACTOR FROM ERRORS OR OMISSIONS IN THE APPROVED PLAN.

3. IF THE APPROVED PLAN NEEDS TO BE MODIFIED, ADDITIONAL SEDIMENT AND STORMWATER CONTROL MEASURES MAY BE REQUIRED AS DEEMED NECESSARY BY DNREC OR THE DELEGATED AGENCY.

4. FOLLOWING SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED FOR ALL PERIMETER SEDIMENT CONTROLS, SOIL STOCKPILES, AND ALL OTHER DISTURBED OR GRADED ARES ON THE PROJECT SITE WITHIN 14 CALENDAR DAYS UNLESS MORE RESTRICTIVE FEDERAL REQUIREMENTS APPLY.

5. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL COMPLY WITH THE DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST REVISION.

6. AT ANY TIME A DEWATERING OPERATION IS USED, IT SHALL BE PREVIOUSLY APPROVED BY THE AGENCY CONSTRUCTION SITE REVIEWER FOR NON-EROSIVE POINT DISCHARGE, AND A DEWATERING PERMIT SHOULD BE APPROVED BY THE DNREC WELL PERMITTING BRANCH.

7. APPROVED PLANS REMAIN VALID FOR 5 YEARS FROM THE DATE OF APPROVAL.

8. POST CONSTRUCTION VERIFICATION DOCUMENTS SHALL BE SUBMITTED TO THE DEPARTMENT OR DELEGATED AGENCY WITHIN 60-DAYS OF STORMWATER MANAGEMENT FACILITY CONSTRUCTION.

9. APPROVAL OF A SEDIMENT AND STORMWATER MANAGEMENT PLAN DOES NOT GRANT OR IMPLY A RIGHT TO DISCHARGE STORMWATER RUNOFF. THE OWNER/DEVELOPER IS RESPONSIBLE FOR ACQUIRING ANY AND ALL AGREEMENTS., EASEMENTS, ETC, NECESSARY TO COMPLY WITH STATE DRAINAGE AND OTHER APPLICABLE LAWS.

10. THE NOTICE OF INTENT FOR STORM WATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER A NPDES GENERAL PERMIT FOR THIS PROJECT IS ( ) THE PERMITTEE OF RECORD SHALL NOT BE RELIEVED OF THEIR RESPONSIBILITIES UNTIL A NOTICE OF TERMINATION HAS BEEN PROCESSED BY THE DEPARTMENT.

11. THE OWNER SHALL BE FAMILIAR WITH AND COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION GENERAL PERMIT.

12. THE CONTRACTOR SHALL AT ALL TIMES PROTECT AGAINST SEDIMENT OR DEBRIS LADEN RUNOFF OR WIND FROM LEAVING THE SITE. PERIMETER CONTROLS SHALL BE CHECKED DAILY AND ADJUSTED OR REPAIRED TO FULLY CONTAIN AND CONTROL SEDIMENT FROM LEAVING THE SITE. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT HAS REACHED HALF OF THE EFFECTIVE CAPACITY OF THE CONTROL. IN ADDITION, THE CONTRACTOR MAY NEED TO ADJUST OR ALTER MEASURES IN TIMES OF ADVERSE WEATHER CONDITIONS, OR AS DIRECTED BY THE AGENCY CONSTRUCTION SITE REVIEWER.

13. BEFORE AND EARTHWORK OR EXCAVATION TAKES PLACE, THE CONTRACTOR SHOULD CALL MISS UTILITY AT 811 OR 1-800-282-8555 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION, TO HAVE ALL EXISTING UTILITIES MARKED ON SITE.

14. BEST AVAILABLE TECHNOLOGY (BAT) SHALL BE EMPLOYED TO MANAGE TURBID DISCHARGE IN ACCORDANCE WITH REQUIREMENTS OF 7. DEL C. CH 60, AND THE CURRENT DELAWARE CONSTRUCTION GENERAL PERMIT (CGP).

15. DOCUMENTATION OF SOIL TESTING AND MATERIALS USED FOR TEMPORARY OR PERMANENT STABILIZATION INCLUDING BUT NOT LIMITED TO SOIL TEST RESULTS, SEED TAGS, SOIL AMENDMENT TAGS, ETC SHALL BE PROVIDED TO THE DEPARTMENT OR DELEGATED AGENCY TO VERIFY THAT PERMANENT OR TEMPORARY STABILIZATION HAS BEEN COMPLETED IN ACCORDANCE WITH THE APPROVED PLAN.

16. THE DEPARTMENT OR DELEGATED AGENCY MAY REQUIRE ADDITIONAL SOIL TESTING AND REAPPLICATION OF PERMANENT OR TEMPORARY STABILIZATION IN ACCORDANCE WITH THE SPECIFICATIONS IN THE DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK, OR ALTERNATIVE MEASURES THAT PROVIDE FUNCTIONAL EQUIVALENCY.

NOTES FOR CONSTRUCTION

1. ALL MATERIALS AND WORKMANSHIP ON THIS PROJECT SHALL CONFORM TO THE FOLLOWING:
   – NEW CASTLE COUNTY STANDARDS FOR CONSTRUCTION, LATEST REVISION
   – STATE OF DELAWARE, DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST REVISION.
   – STATE OF DELAWARE, DEPARTMENT OF TRANSPORTATION DETAIL STANDARDS, LAST REVISION
   IF A CONFLICT EXISTS BETWEEN STANDARDS, THE MORE STRINGENT SHALL APPLY.
2. EXISTING UTILITIES ARE SHOWN IN ACCORDANCE WITH THE BEST AVAILABLE INFORMATION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS PRIOR TO COMMENCEMENT OF WORK. MISS UTILITY SHALL BE NOTIFIED THREE (3) WORKING DAYS PRIOR TO EXCAVATION AT 1-800-282-8555.
3. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO PROTECT ALL EXISTING TREES AND SITE FEATURES. CONTRACTOR SHALL CONTACT OWNER WHEN EXCAVATING NEAR LARGE TREES. OWNER SHALL CUT ROOTS CLEANLY TO MINIMIZE DAMAGE TO TREES. OWNER SHALL PROVIDE MULCH WHERE REQUIRED AND PROVIDE FINAL GRADING AND RAKING. SHOULD ANY TREES, FENCES, OR OTHER SITE FEATURES BE DAMAGED OR DESTROYED DUE TO THE CONTRACTOR'S NEGLIGENCE, THE CONTRACTOR SHALL BEAR THE COST AND RESPONSIBILITY FOR REPAIR AND/OR REPLACEMENT OF THE DAMAGED ITEMS.
4. ALL CONCRETE SHALL BE 4,500 PSI, UNLESS OTHERWISE SPECIFIED, AND BE PER NEW CASTLE COUNTY STANDARDS.
5. ALL BACKFILL MATERIALS AND COMPACTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH APPLICABLE DNREC AND NEW CASTLE COUNTY STANDARDS AND AS SHOWN ON THESE PLANS.
6. CONTRACTOR MUST ENSURE ALL SOIL IS FREE OF ALL FOREIGN MATERIALS (I.E. CONCRETE, REAR, PLASTIC, TRASH, ASPHALT, ETC.). CONTRACTOR MUST NOT PROOF-ROLL AND SHALL MINIMIZE COMPACTION OF SUB-SOILS WHERE TURF, LANDSCAPING, AND/OR OTHER AREAS NOT INTENDED FOR HARDSCAPE OR PAVING. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR OPERATE EQUIPMENT ON GRASS AREAS OUTSIDE THE FENCED CONSTRUCTION AREA.
7. MATCH PROPOSED PAVEMENT GRADES TO EXISTING WHEREVER THEY ADJOIN.
8. CONTRACTOR SHALL REIMBURSE DNREC FOR SITE RESTORATION OUTSIDE LIMITS OF DISTURBANCE IDENTIFIED ON BID DOCUMENTS.
9. THE CONTRACTOR WILL PROTECT THE PUBLIC AT ALL TIMES. THE WORK AREA WILL BE PROPERLY BARRICADED OFF WITH BARRICADES, SAFETY FENCE, CAUTION TAPE, ETC. TO KEEP PEDESTRIANS OUT OF THE WORK AREA. THE WORK AREA WILL BE LEFT IN A SAFE CONDITION AT THE END OF EACH WORK DAY. FOR EACH PHASE OF CONSTRUCTION, CONTRACTOR SHALL MAINTAIN SECURE PERIMETER AROUND WORK AREA. CONTRACTOR SHALL MAINTAIN FIRE ACCESS AS SHOWN ON PLANS.
10. CONTRACTOR SHALL COORDINATE WITH DNREC FOR ALL REQUIRED TREE PROTECTION AND SITE RESTORATION.

SEQUENCE OF CONSTRUCTION

1. NOTIFY MISS UTILITY THREE (3) DAYS PRIOR TO COMMENCING CONSTRUCTION. (1-800-282-8555)
2. NOTIFY DNREC IN WRITING AT LEAST FIVE (5) DAYS PRIOR TO COMMENCING WITH CONSTRUCTION. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.
3. THE CONTRACTOR SHALL AT ALL TIMES PROTECT AGAINST SEDIMENT OR DEBRIS LADEN RUNOFF OR WIND FROM LEAVING THE SITE. PERIMETER CONTROLS SHOULD BE CHECKED DAILY AND ADJUSTED AND/OR REPAIRED TO FULLY CONTAIN AND CONTROL SEDIMENTATION ON THE SITE. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT HAS REACHED HALF OF THE EFFECTIVE CAPACITY OF THE CONTROL. IN ADDITION, THE CONTRACTOR MAY NEED TO ADJUST OR REPAIR MEASURES IN TIMES OF ADVERSE WEATHER CONDITIONS, OR AS DIRECTED BY THE AGENCY CONSTRUCTION SITE REVIEWER.
4. INSTALL PERIMETER CONTROLS AS SHOWN ON PLANS.
5. PERFORM ALL GRADING, LAND DISTURBING, EXCAVATION, AND DEMOLITION/DISPOSAL ACTIVITIES ACCORDING TO THE APPROVED SEDIMENT AND STORMWATER PLANS.
6. ONCE FINAL GRADE IS ACHIEVED ANYWHERE ON-SITE, THOSE AREAS MUST BE STABILIZED IMMEDIATELY WITH EITHER PERMANENT VEGETATIVE STABILIZATION OR EROSION CONTROL MATTING AS DIRECTED BY CITY AND/OR CCR.
7. IMMEDIATELY AFTER ALL SITE CONSTRUCTION IS COMPLETED, PLACE TOPSOIL AND PERMANENT SEEDING AND MULCHING OVER ALL DISTURBED AREAS AND STABILIZE.
8. EROSION AND SEDIMENT CONTROL DEVICES SHOULD BE REMOVED ONLY AFTER WORK IN AN AREA HAS BEEN COMPLETED AND STABILIZED, WITH WRITTEN APPROVAL FROM THE AGENCY CONSTRUCTION SITE REVIEWER.

REVISION	DATE
JPP SUBMISSION	9.12.18
DESIGN DEVELOPMENT SUBMISSION	2.22.19
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APPLICATION No. 2019-049

STATE OF DELAWARE

PEA PATCH ISLAND IMPROVEMENTS

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **EROSION & SEDIMENTATION DETAILS**

DRAWING NUMBER: **C-09**

Standard Detail & Specifications
Vegetative Stabilization

TEMPORARY SEEDING BY RATES, DEPTHS AND DATES

Mix #	Species[4]	Seeding Rate		Optimum Seeding Dates [1] O = Optimum Planting Period. A = Acceptable Planting Period							Planting Depth[2]
				Coastal Plain			Piedmont			All	
	Certified Seed	lb/Ac.[3]	lb/1000 sq.ft.	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	10/31-2/1	
1	Barley	125	4	O	A	O	O	A	O		1-2 inches 2-3" sandy soils
2	Oats	125	4	O	A	A	O	A	A		1-2 inches 2-3" sandy soils
3	Rye	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
4	Perennial Ryegrass	125	4	O	A	O	O	A	O		0.5 inches 1-2" sandy soils
5	Annual Ryegrass	125	4	O	A	O	O	A	O	A	0.5 inches 1-2" sandy soils
6	Winter Wheat	125	4	O	A	O	O	A	O	A	1-2 inches 2-3" sandy soils
7	Foxtail Millet	30 PLS	0.7		O			O			0.5 inches 1-2" sandy soils
8	Pearl Millet	20 PLS	0.5		O			O			0.5 inches 1-2" sandy soils

1. Winter seeding requires 3 tons per acre of straw mulch for proper stabilization.
2. May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
3. Applicable on slopes 3:1 or less.
4. Fifty pounds per acre of Annual Lespedeza may be added to 1/2 the seeding rate of any of the above species.
5. Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
6. Warm season grasses such as Millet or Weeping Lovegrass may be used between 5/1 and 9/1 if desired. Seed at 3-5 lbs. per acre. Good on low fertility and acid areas. Seed after frost through summer at a depth of 0.5".

⚠ **RECOMMENDED SEED MIXTURE**

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 1 of 4 Effective FEB 2019

Standard Detail & Specifications
Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES

Mix No.	Seeding Mixtures: Certified Seed[1] / Well Drained Soils	Seeding Rate[1] lb/Ac	lb/1000 sq.ft.	Optimum Seeding Dates [1] O = Optimum Planting Period A = Acceptable Planting Period: Coastal Plain 2/1-4/30	Coastal Plain 5/1-8/14	Coastal Plain 8/15-10/31	Piedmont 3/1-4/30	Piedmont 5/1-7/31	Piedmont 8/1-10/31	All[2] 10/31-2/1	Remarks
1	Tall Fescue	140	3.2	A	O	A	A	O	A	Add 100 lbs./ac. Winter Rye	Good erosion control mix Tolerant of low fertility soils Lovegrass very difficult to mow; Germinates only in hot weather
	Weeping Lovegrass	10	0.23								
2	Deertongue	30	0.69	A	O	A	A	O	A	Add 100 lbs./ac. Winter Rye	Good erosion control mix Tolerant of low fertility soils Good wildlife cover and food
	Sheep Fescue	30	0.69								
	Common Lespedeza[3] inoculated	15	0.35								
3	Tall Fescue (Turf-type) **or**	50	1.15	O	A	O	O	A	O	Add 100 lbs./ac. Winter Rye	Good erosion control mix Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress woody vegetation.
	Strong Creeping Red Fescue **or**	50	1.15								
	Perennial Ryegrass	50	1.15								
	plus Flatpea[5]	15	0.34								
4	Strong Creeping Red Fescue	100	2.3	O	A	O	O	A	O	Add 100 lbs./ac. Winter Rye	Suitable waterway mix Canada Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.
	Kentucky Bluegrass	70	1.61								
	Perennial Ryegrass **or**	15	0.35								
	Redtop	5	0.11								
	plus White Clover[5]	3	0.07								
5	Switchgrass[4] **or**	10	0.23		O			O			Native warm-season mixture. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N fertilizer discouraged - weeds
	Coastal Panicgrass	10	0.23								
	Big Bluestem	5	0.11								
	Little Bluestem	5	0.11								
	Indian Grass	5	0.11								
6	Tall Fescue (turf-type) (Blend of 3 cultivars)	150	3.5	O	A	O	O	A	O		Managed filter strip for nutrient uptake.
7	Tall Fescue	150	3.5	O	A	O	O	A	O		Three cultivars of Kentucky Bluegrass. Traffic tolerant.
	Ky. Bluegrass (Blend)	20	0.46								
	Perennial Ryegrass	20	0.46								
8	Big Bluestem[4]	10	0.23	O	A		O	A			All species are native. Indian Grass and Bluestem have fluffy seeds. Plant with a specialized native seed drill. Creeping Red Fescue will provide erosion protection while the warm season grasses get established.
	Indian Grass[4]	10	0.23								
	Little Bluestem[4]	8	0.18								
	Creeping Red Fescue	50	0.69								
	plus one of:										
	Partridge Pea	5	0.11								
	Bush Clover	3	0.07								
	Wild Indigo	3	0.07								
	Showy Tick-Trefoil	2	0.05								

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 2 of 4 Effective FEB 2019

Standard Detail & Specifications
Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES (cont.)

Mix No.	Seeding Mixtures: Certified Seed[1] / Poorly Drained Soils	Seeding Rate[1] lb/Ac	lb/1000 sq.ft.	Optimum Seeding Dates [1] O = Optimum Planting Period A = Acceptable Planting Period: Coastal Plain 2/1-4/30	Coastal Plain 5/1-8/14	Coastal Plain 8/15-10/31	Piedmont 3/1-4/30	Piedmont 5/1-7/31	Piedmont 8/1-10/31	All[2] 10/31-2/1	Remarks
9	Redtop	75	1.72	O	A	A	O	A	O	Add 100 lbs./ac. Winter Rye	Quick stabilization of disturbed sites and waterways.
	Creeping Bentgrass	35	0.8								
	Sheep Fescue	30	0.69								
	Rough Bluegrass	45	1								
10	Reed Canarygrass[6]	10	0.23	A			O	A		O	Good erosion control, wildlife cover and wetland revegetation.
	Residential Lawns										
11	Tall Fescue	100	2.3	O	A	O	O	A	O		High value, high maintenance, light traffic, irrigation necessary. Well drained soils, full sun.
	Perennial Ryegrass	25	0.57								
	Kentucky Bluegrass Blend	30	0.69								
12	Tall Fescue	100	2.3	O	A	O	O	A	O		Moderate value, low maintenance, traffic tolerant.
	Perennial Ryegrass	25	0.57								
	Sheep Fescue	25	0.57								
13	Creeping Red Fescue	50	1.15	O	A	O	O	A	O		Shade tolerant, moderate traffic tolerance, moderate maintenance.
	Chewings Fescue	50	1.15								
	Rough Bluegrass	20	0.4								
	Kentucky Bluegrass	20	0.4								
14	Creeping Red Fescue	50	1.15	O	A	O	O	A	O		Shade tolerant, moisture tolerant.
	Rough Bluegrass **or**	90	2.1								
	Chewings Fescue										
15	K-31 Tall Fescue	150	3.5	O	A	O	O	A	O		Monoculture, but performs well alone in lawns. Discouraged.

1. When hydroseeding is the chosen method of application, the total rate of seed should be increased by 25%.
2. Winter seeding requires 3 tons per acre of straw mulch. Planting dates listed above are average for Delaware. These dates may require adjustment to reflect local conditions.
3. All seed shall meet the minimum purity and minimum germination percentages recommended by the Delaware Department of Agriculture. The maximum % of weed seeds shall be in accordance with Section 1, Chapter 2.4, Title 3 of the Delaware Code.
4. Cool season species may be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
5. All leguminous seed must be inoculated.
6. Warm season grass mix and Reed Canary Grass cannot be mowed more than 4 times per year.
7. Warm season grasses require a soil temperature of at least 50 degrees in order to germinate, and will remain dormant until then.

⚠ **RECOMMENDED SEED MIXTURE**

NOTE: Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 3 of 4 Effective FEB 2019

Standard Detail & Specifications
Vegetative Stabilization

Construction Notes:

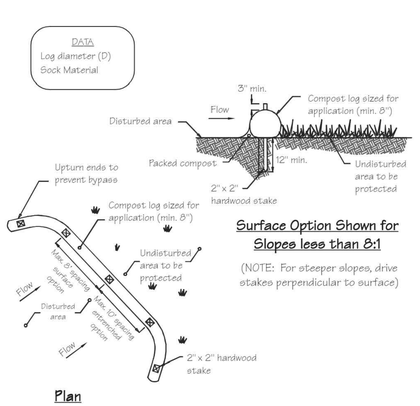
1. Site Preparation
   a. Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
   b. Final grading and shaping is not necessary for temporary seedings.
2. Seedbed Preparation

   It is important to prepare a good seedbed to insure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.
3. Soil Amendments
   a. Lime - Apply liming materials based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil.
   b. Fertilizer - Apply fertilizer based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply a formulation of 10-10-10 at the rate of 600 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soils.
4. Seeding
   a. For **temporary stabilization**, select a mixture from **Sheet 1 .** For a **permanent stabilization**, select a mixture from **Sheet 2** or **Sheet 3** depending on the conditions. Alternative seed mixes may be used with prior approval from the Department or Delegated Agency.
   b. Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
   c. Seed that has been broadcast should be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.
5. Mulching

   All mulching shall be done in accordance with detail **DE-ESC-3.4.5**.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 4 of 4 Effective FEB 2019

Standard Detail & Specifications
Compost Filter Log



NOTE: Manufacturer's recommendations supersede any installation details shown for this practice

Source:	Symbol:	Detail No.
Adapted from MD Stds & Specs for ESC & Filtrexx[SM] International	CFL	**DE-ESC-3.1.7** Sheet 1 of 2 Effective FEB 2019

Standard Detail & Specifications
Compost Filter Log

Construction Notes:

1. Prior to installation, clear bedding area of obstructions including rocks or debris larger than 1 inch and fill in any sharp depression areas.
2. If socks are prepared on-site, fill the sock fabric using a pneumatic blower so that the logs are rigid and do not deform. Terminate at the desired length.
3. For trenched applications, excavate 2 to 4 inches below grade along the width and length of the compost filter log.
4. Install the compost filter logs perpendicular to the flow direction and parallel to the slope with the beginning and end of the installation pointing up the slope a minimum of 1 foot elevation difference. On sites where this is not possible, upturn at a minimum length of 10' at a 30 degree angle to prevent runoff bypass.
5. For untrenched applications, blow or hand pack soil, mulch, or compost on the upslope side of the log, filling the bottom void area.
6. Stake the filled log every 10 feet maximum through the center of the sock for trenched applications, or every 8 feet for untrenched. The stake shall be a 2" by 2" hardwood. It should extend 12" below grade and protrude at least 3" above the top of the sock. If located on a slope greater than 8:1, the stake shall be angled downslope at a 45 degree angle to prevent the force of the water from dislodging to log.
7. When the length of the compost filter log needed exceeds the available compost filter sock length, the next sock shall be overlapped a minimum of 12" before being filled, and a stake placed through both socks at the overlap.
8. Remove accumulated sediment when it has reached half of the effective height of the log.
9. Inspect weekly and after rain event. If sock is degrading or the sock is failing, vegetate to secure the compost, replace the log, or reinforce with an additional log. If the log has been crushed due to construction equipment, it can be "fluffed" back to its effective height. If the effective height can no longer be restored, the log shall be replaced or reinforced with an additional compost filter log.

Source:	Symbol:	Detail No.
Adapted from MD Stds & Specs for ESC & Filtrexx[SM] International	CFL	**DE-ESC-3.1.7** Sheet 2 of 2 Effective FEB 2019

REVISION	DATE
JPP SUBMISSION	9.12.18
DESIGN DEVELOPMENT SUBMISSION	2.22.19
DFM COMMENTS	6.17.19
SWM SUBMISSION	9.13.19
PER DNREC COMMENTS	10.7.19
ISSUED FOR BID	10.14.19

CDA ENGINEERING INC.
CIVIL/SITE ENGINEERING AND LAND PLANNING
6 LARCH AVENUE
SUITE 401
WILMINGTON, DE 19804
Tel: 302 998 9202
Fax: 302 691 1314
cdaengineering.com

DRAWN BY:	PJM
CHECKED BY:	CD
PROJECT No.:	18.135.00
SCALE:	NO SCALE
DATE:	10.14.19
CAD FILE:	...\DWG\1813500 BASE.DWG

APPLICATION No. 2019-049

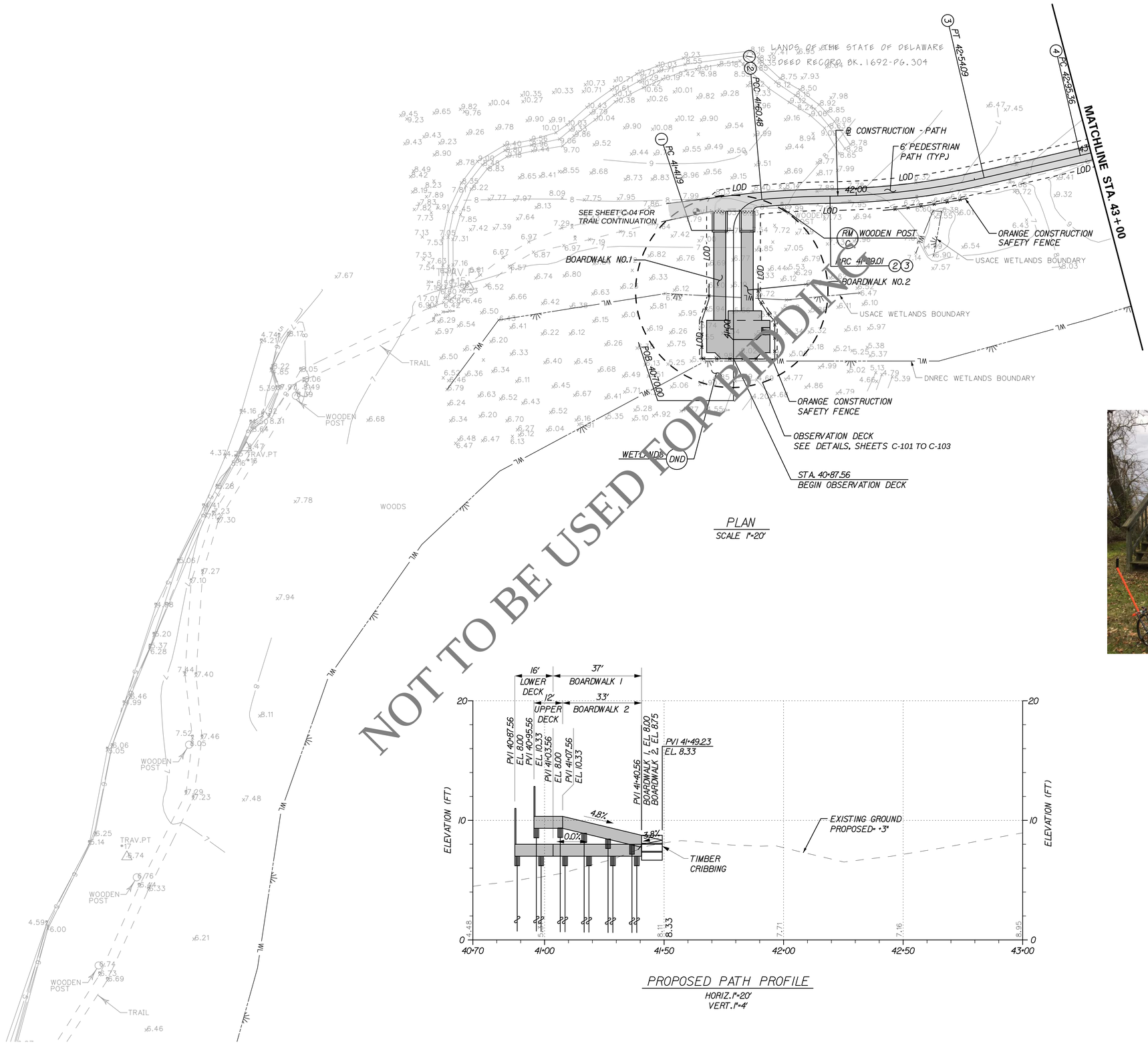
STATE OF DELAWARE

PEA PATCH ISLAND IMPROVEMENTS

RED LION HUNDRED NEW CASTLE COUNTY DELAWARE

DRAWING TITLE: **EROSION & SEDIMENTATION DETAILS**

DRAWING NUMBER: **C-10**



DEMOLISH IT ITS ENTIRETY THE EXISTING HERONRY OBSERVATION PLATFORM INCLUDING BULLETING BOARD AND STRUCTURE. REMOVE POSTS AND FILL HOLES.

EXISTING HERONRY

DATE: DESCRIPTION: BY:

DATE: DESCRIPTION: BY:

FORT DELAWARE STATE PARK
PEA PATCH ISLAND IMPROVEMENT
CONSTRUCTION PLAN - HERONRY

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ODD

DRAWN BY: ODD

BUILDING NO.: N/A

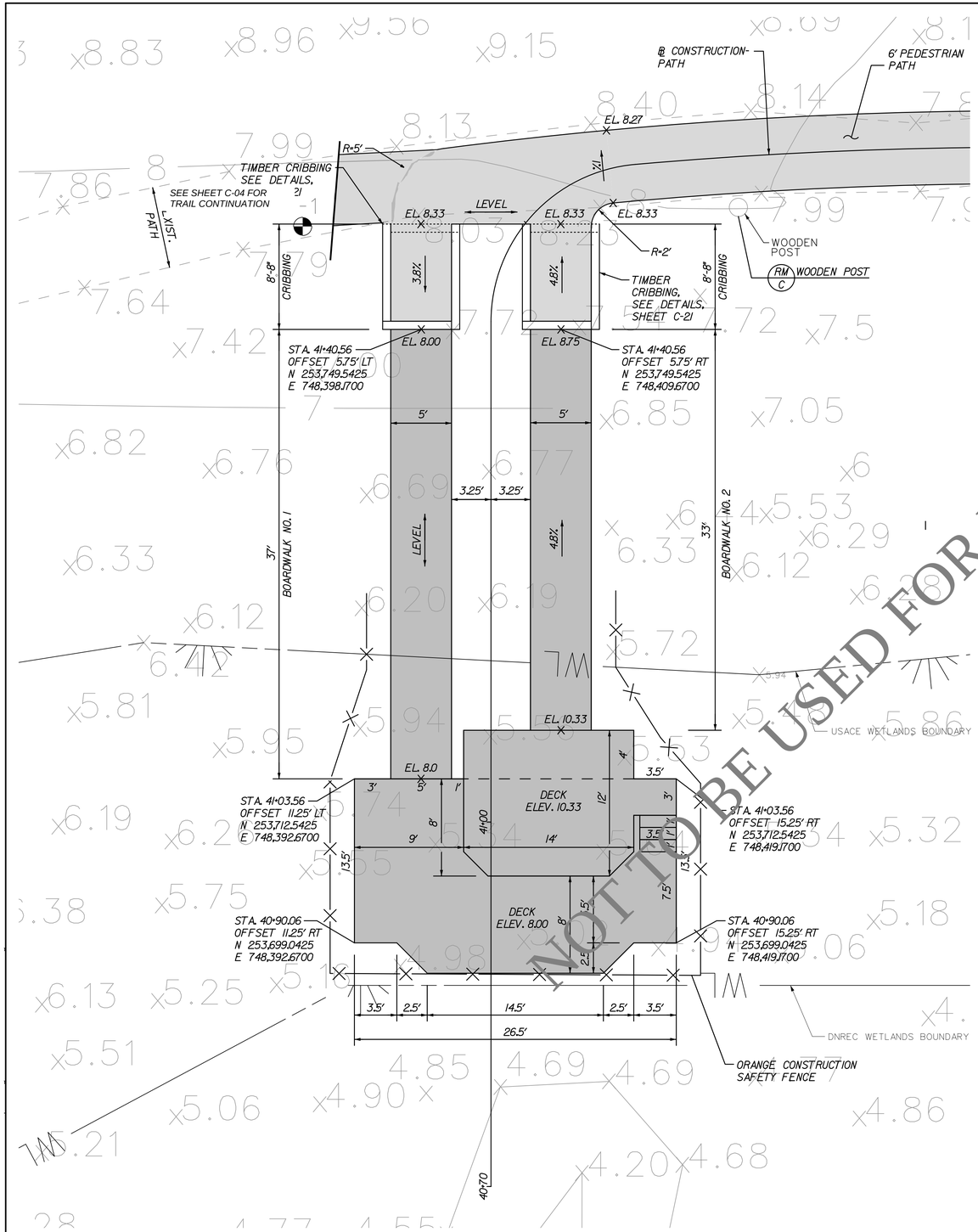
DATE: 06/14/2019

SCALE: 1"=20'

SHEET NO.: C-100

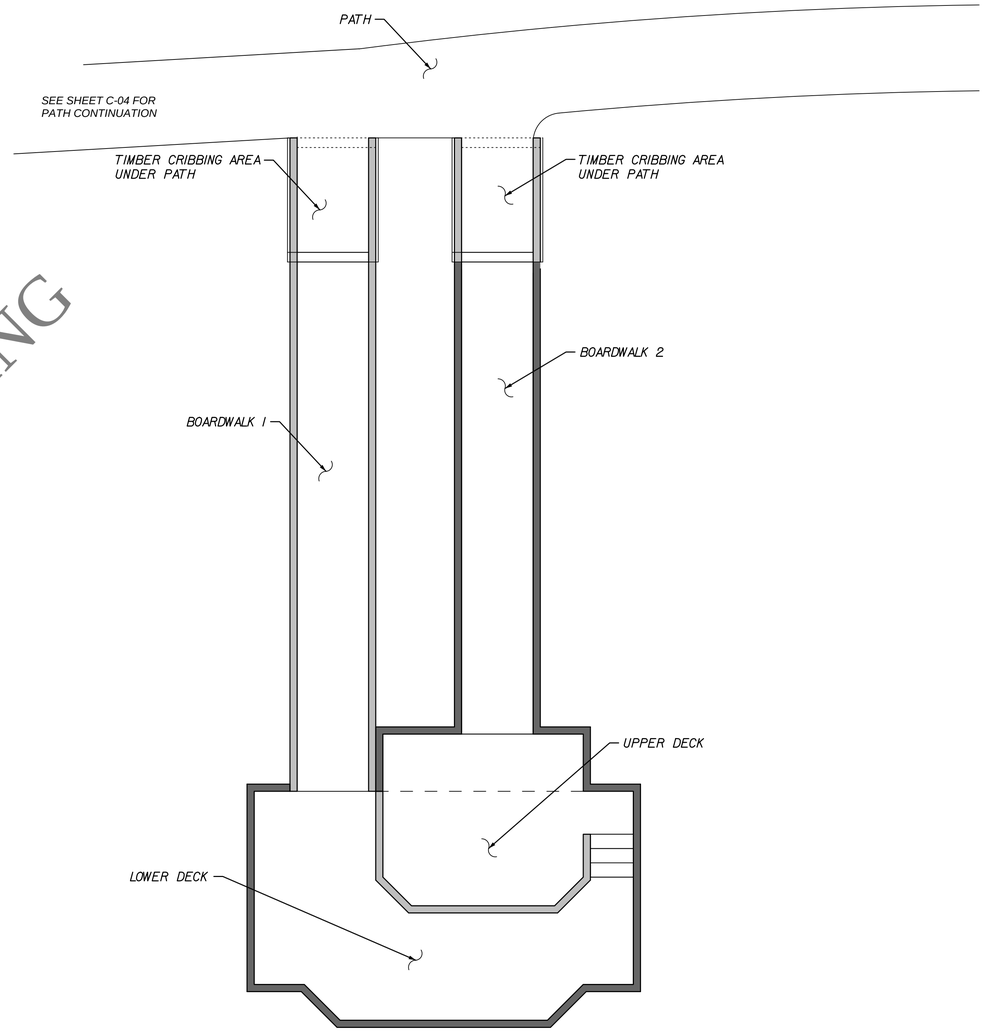
PARKS PROJECT #: FD-20

CONTRACT #: 2019-FD-100



OBSERVATION DECK - STAKEOUT PLAN

SCALE: 1"=5'



OBSERVATION DECK - RAILING HEIGHT PLAN

SCALE: 1"=5'

DATE: DESCRIPTION: BY:

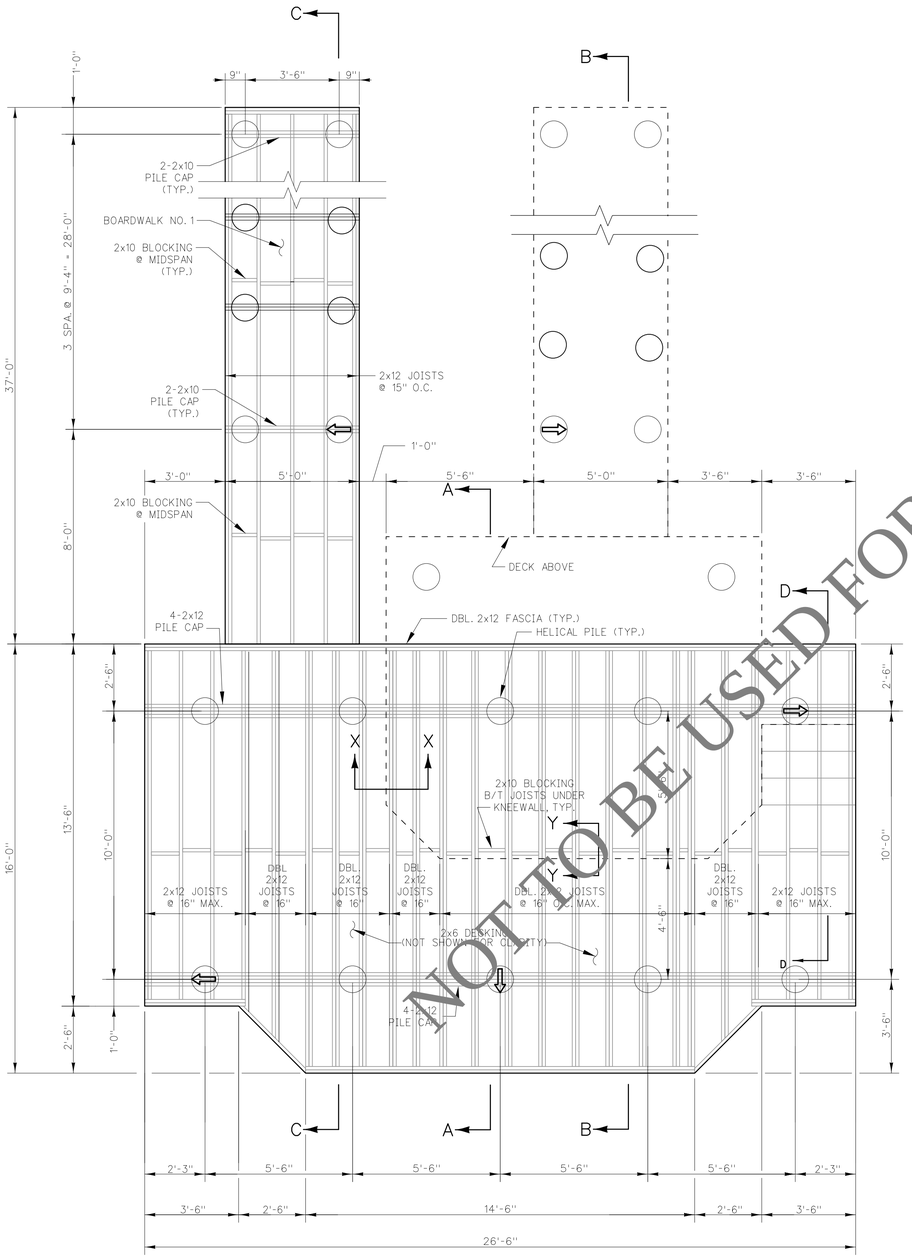
DATE: DESCRIPTION: BY:

FORT DELAWARE STATE PARK
PEA PATCH ISLAN IMPROVEMENT

OBSERVATION DECK STAKEOUT AND RAILING HEIGHT PLAN

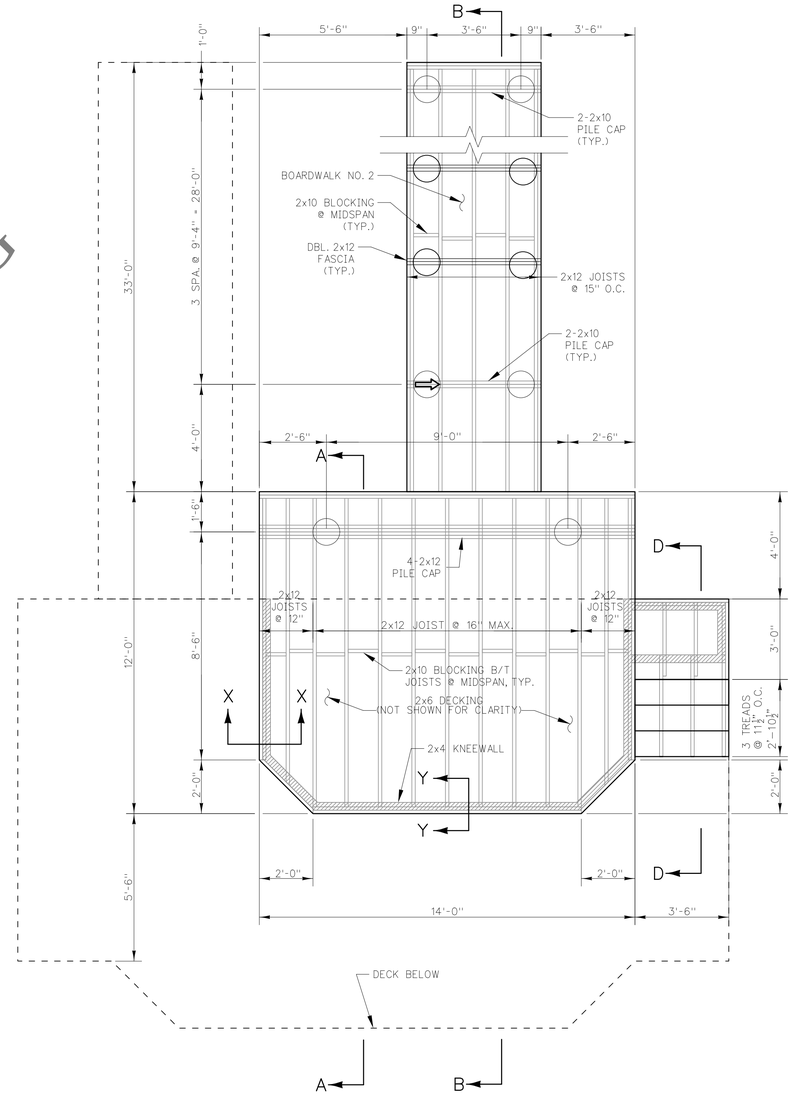
DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY:	ODD
DRAWN BY:	ODD
BUILDING NO.:	N/A
DATE:	06/14/2019
SCALE:	1"=5'
SHEET NO.:	C-101
PARKS PROJECT #:	FD-20
CONTRACT #:	2019-FD-100



LOWER DECK

SCALE: 3/8"=1'



UPPER DECK

SCALE: 3/8"=1'

NOTES:

1. FOR OBSERVATION DECK FRAMING DETAILS AND SECTIONS, SEE SHEET C-103
2. FOR BOARDWALKS 1 AND 2 TYPICAL SECTIONS, SEE SHEET C-107
3. FOR OBSERVATION DECK STAKEOUT AND RAILING HEIGHT PLAN, SEE SHEET C-101
4. FOR STRUCTURAL GENERAL NOTES AND RAILING DETAIL, SEE SHEET C-107
5. BLOCKING AT PILE CAPS NOT SHOWN FOR CLARITY.
6. DIAGONAL HELICAL PILES SHALL BE INSTALLED AT EVERY OTHER PIER. ALTERNATE PILE DIRECTION.

LEGEND

VERTICAL HELICAL PILE

DIAGONAL HELICAL PILE
TENSION OR COMPRESSION

DATE: DESCRIPTION: BY:

DATE: DESCRIPTION: BY:

FORT DELAWARE STATE PARK
PEA PATCH ISLAN IMPROVEMENT

OBSERVATION DECK FRAMING PLAN

DESIGNED BY: ODD

DRAWN BY: ODD

BUILDING NO.: N/A

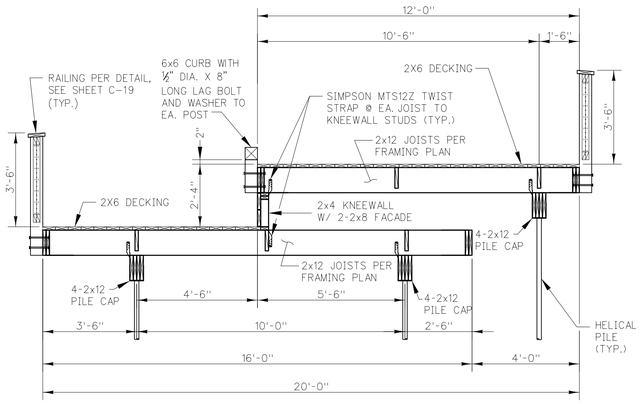
DATE: 10/14/2019

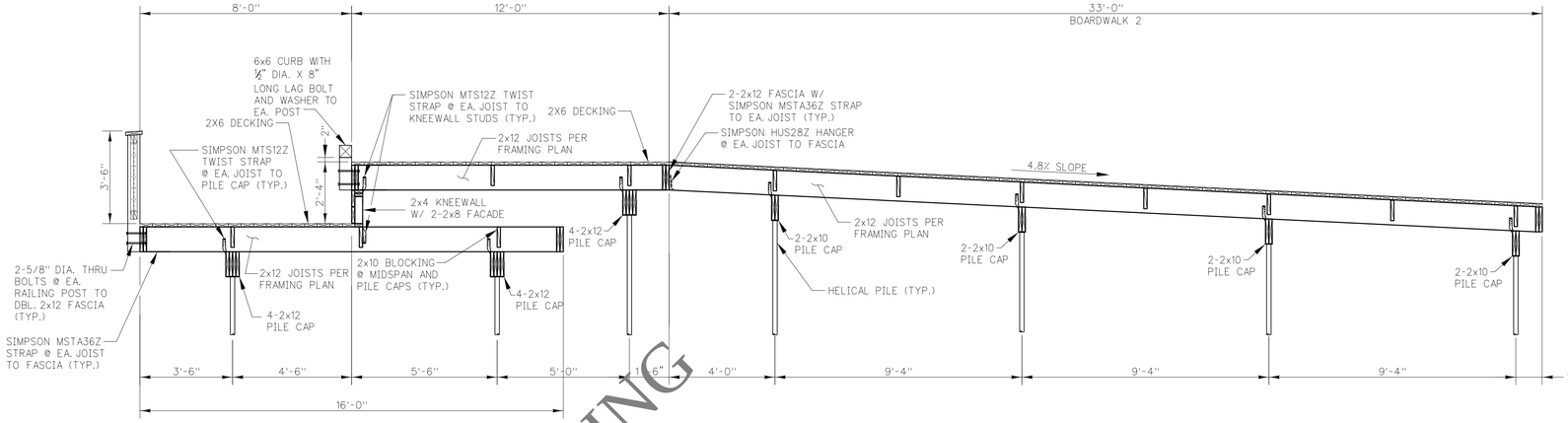
SCALE: AS NOTED

SHEET NO.: C-102

PARKS PROJECT #: FD-20

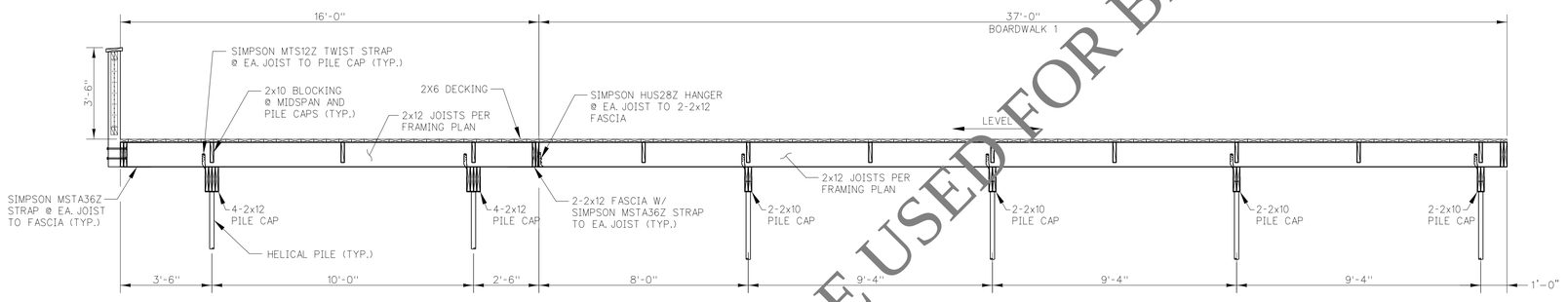
CONTRACT #: 2019-FD-100

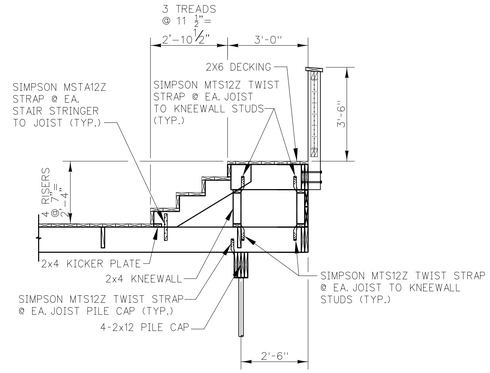




SECTION A-A
SCALE: ⅜"=1'

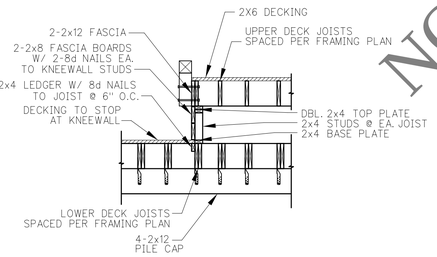
SECTION B-B
SCALE: ⅜"=1'



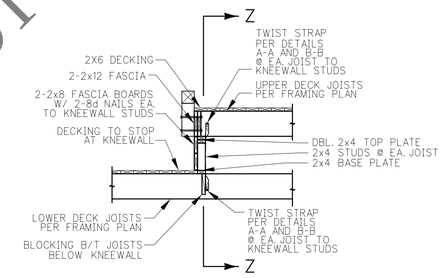


SECTION C-C
SCALE: ⅜"=1'

SECTION D-D
SCALE: ⅜"=1'



SECTION X-X
SCALE: ⅜"=1'



SECTION Y-Y
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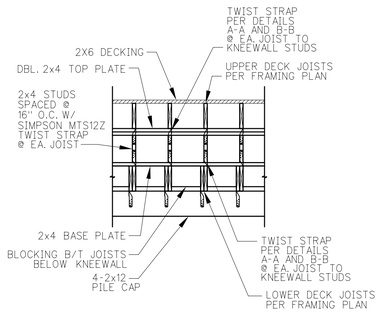

SECTION Z-Z
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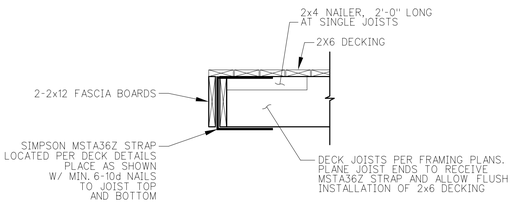


MSTA36Z DETAIL
SCALE: N.T.S.

NOTES:

1. FOR OBSERVATION DECK STAKEOUT AND RAILING HEIGHT PLAN, SEE SHEET C-101
2. FOR OBSERVATION DECK FRAMING PLAN, SEE SHEET C-102
3. FOR STRUCTURAL GENERAL NOTES AND RAILING DETAIL, SEE SHEET C-104
4. FOR BOARDWALK 1 AND 2 TYPICAL SECTIONS, SEE SHEET C-107
5. FOR BOARDWALKS 1 AND 2, INTERIOR STRINGERS SHALL BE LAPPED OVER THE PIERS AND FASCIA STRINGERS SHALL BE SCABBED OVER THE PIERS.

KNEEWALL DETAILS

DATE: DESCRIPTION: BY:
DATE: DESCRIPTION: BY:

FORT DELAWARE STATE PARK
PEA PATCH ISLAN IMPROVEMENT

OBSERVATION DECK FRAMING DETAILS

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ODD
DRAWN BY: ODD
BUILDING NO.: N/A
DATE: 10/14/2019
SCALE: AS NOTED
SHEET NO.: C-103
PARKS PROJECT #: FD-20
CONTRACT #: 2019-FD-100

STRUCTURAL GENERAL NOTES

DESIGN METHOD

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 5TH EDITION DATED 2010
NATIONAL DESIGN SPECIFICATION (NDS) FOR WOOD CONSTRUCTION, 2005 EDITION

LOADS

RAILING LOADS = GREATER OF 50 LBS/LF OR 200 LBS PER INTERNATIONAL BUILDING CODE, 2009

PEDESTRIAN LIVE LOAD = 90 PSF.

MATERIALS

WOOD FRAMING

ALL MEMBERS SHALL BE FRAMED, ANCHORED, TIED AND BRACED IN ACCORDANCE WITH GOOD CONSTRUCTION PRACTICE AND APPLICABLE CODES.

ALL WOOD FRAMING, INCLUDING PILE CAPS, JOISTS, AND BLOCKING, SHALL BE SOUTHERN YELLOW PINE, NO. 2 OR BETTER.

NAILED CONNECTIONS WILL BE PERMITTED EXCEPT WHERE NOTED OTHERWISE.

WOOD DECKING

ALL WOOD DECKING SHALL BE SOUTHERN YELLOW PINE, NO. 2 OR BETTER, 2X6s S4S. LAY DECKING CONTINUOUS EDGE TO EDGE UNLESS KILN DRIED AFTER PRESERVATIVE TREATMENT. PLACE WITH ⅛" GAP IF KILN DRIED.

DECKING BOARDS SHALL BE PLACED TIGHT AGAINST EACH OTHER UPON INITIAL INSTALLATION.

CONNECTIONS SHALL BE #10 X 4.5" LONG TYPE 316 STAINLESS STEEL SCREWS INSTALLED FLUSH WITH THE SURFACE OF THE DECKING. PREDRILL FOR SCREWS TO AVOID SPLITTING.

WOOD PRESERVATIVE TREATMENT

ALL TIMBER FRAMING SHALL BE TREATED IN ACCORDANCE WITH AWPA STD.U1. TIMBER CURBING SHALL BE TREATED IN ACCORDANCE WITH AWPA UC5B - MARINE USE CENTRAL WATERS. STRINGERS, BLOCKING, DECKING, ETC. SHALL BE TREATED IN ACCORDANCE WITH AWPA UC3B - ABOVE GROUND EXPOSED.

ALL HOLES, CUTS, AND INJURIES SUCH AS ABRASIONS OR HOLES FROM REMOVAL OF NAILS AND SPIKES WHICH MAY PENETRATE THE TREATED ZONE SHALL BE FIELD TREATED. AN AWPA ACCEPTED PRESERVATIVE SYSTEM SHALL BE USED FOR TREATMENT. FIELD TREATMENT PRESERVATIVES SHALL BE APPLIED IN ACCORDANCE WITH THE PRODUCT LABEL. THE APPLICATION METHOD SHALL COAT ANY SURFACE THAT IS EXPOSED BY DAMAGE OR FIELD FABRICATION WHILE NOT USING EXCESSIVE PRESERVATIVE. ANY EXCESS PRESERVATIVE NOT ABSORBED BY THE WOOD PRODUCT SHALL BE CLEANED FROM THE SURFACE PRIOR TO USE OF THE PRODUCT. CAREFUL ATTENTION SHOULD BE GIVEN TO MATERIALS PLACED INTO AQUATIC ENVIRONMENTS. THESE MATERIALS SHALL NOT BE USED UNLESS THE FIELD TREATED SURFACE IS CLEAN, DRY, AND FREE OF EXCESS PRESERVATIVE.

ALL TREATMENT SHALL BE DONE IN ACCORDANCE WITH THE LATEST AWPA STANDARDS.

STRUCTURAL STEEL AND MISCELLANEOUS METALS

STEEL FOR MISCELLANEOUS SHAPES, PLATES, AND ASSEMBLIES SHALL BE ASTM A36.

ELECTRODES FOR FIELD AND SHOP WELDING SHALL BE E70.

ALL BOLTS SHALL BE ASTM A307.

ALL STEEL, BOLTS, SPIKES, NAILS, AND OTHER HARDWARE SHALL BE HOT DIP GALVANIZED UNLESS NOTED OTHERWISE.

COMPOSITE RAILING BOARD

COMPOSITE RAILING BOARD TO BE BY ACT COMPOSITE TIMBERS, INC. IN COMMACK, NY. IN "WEATHERED WOOD" COLOR, OR APPROVED EQUAL.

DURAGRID DECKING

I-4000 DURAGRID DECKING AS MANUFACTURED BY STRONGWELL-CHATFIELD DIVISION, CHATFIELD, MINNESOTA. GRATING PANELS SHALL BE MADE OF 1½ INCH DEEP PULTRUDED I BARS SPACED AT 1 INCH ON CENTER. THE CROSS-RODS SHALL BE SPACED A MAXIMUM OF 12". RESIN SHALL BE POLYESTER. THE TOP OF THE PANELS SHALL BE COVERED WITH A BONDED GRIT ANTI SKID SURFACE WITH A UV RESISTANT URETHANE TOP COAT. COLOR SHALL BE MANUFACTURER'S STANDARD GRAY. INSERT HOLD DOWN FASTENERS PER MANUFACTURER'S RECOMMENDATIONS. ALL FASTENERS SHALL BE TYPE 316 STAINLESS STEEL. SUBMIT MANUFACTURER'S SAMPLE FOR APPROVAL BY OWNER.

BEAM SEAT BRACKETS

BEAM SEAT BRACKETS SHALL BE SIZED TO FIT THE PILE CAPS AND SHALL SITUATE THE PILE CAPS CONCENTRICALLY OVER THE PILES. BEAM SEATS MAY EITHER BE MANUFACTURER'S STOCK OR FABRICATED TO FIT. FABRICATED BEAM SEAT BRACKETS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER LICESNSED IN THE STATE OF DELAWARE. SIGNED AND SEALED SHOP DRAWINGS SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL. THE FABRICATED BEAM SEAT BRACKETS SHALL BE MANUFACTURED BY AN AISC CERTIFIED FABRICATOR. FABRICATED BEAM SEATS SHALL MEET THE REQUIREMENTS FOR MISCELLANEOUS METALS.

STRAPS AND HANGERS

STRAPS AND HANGERS SHALL BE ZMAX COATING HOT DIP GALVANIZED. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. ALL FASTENERS SHALL BE HOT DIP GALVANIZED, SIZE AND NUMBER PER MANUFACTURER'S RECOMMENDATIONS. SIMPSON PRODUCT CALLED OUT ON THE PLANS MAY BE REPLACED WITH APPROVED EQUAL.

GENERAL

FOR AN ITEM TO BE AN APPROVED EQUAL, IT MUST BE SUBMITTED BY THE BIDDER AND APPROVED BY THE OWNER PRIOR TO BID OPENING IN ACCORDANCE WITH SECTION 01600, 6.3 SUBSTITUTIONS.

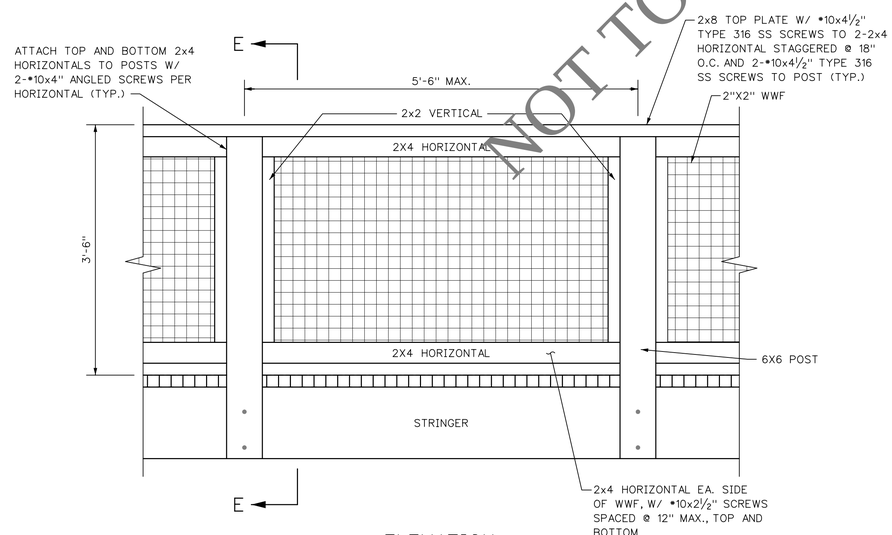
FOUNDATION

BOARDWALKS AND OBSERVATION DECK TO BE SUPPORTED BY HELICAL PILES. HELICAL ANCHORS SHALL BE CHANCE ANCHORS, OR APPROVED EQUAL, AND BE IN ACCORDANCE WITH SPECIAL PROVISION T-618500 AND THE INFORMATION PROVIDED ON SHEET C-105

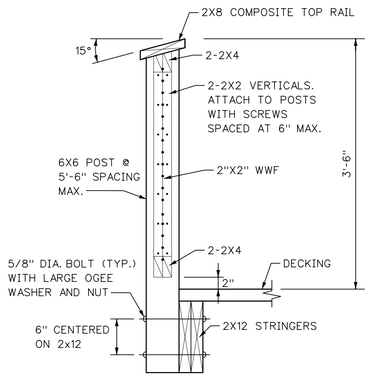
VERTICAL PILE DESIGN LOADS (SERVICE):
OBSERVATION DECK- 11.5 kips
BOARDWALK NO. 1 & 2- 3.5 kips

DIAGONAL PILE LATERAL DESIGN LOADS (SERVICE):
OBSERVATION DECK- 3.8 kips
BOARDWALK NO. 1 & 2- 1.0 kip

DESIGN OF HELICAL PILES/ANCHORS IS A DELEGATED DESIGN. A GEOTECHNICAL REPORT HAS BEEN PROVIDED FOR REFERENCE ONLY. THIS REPORT WAS UNDERTAKEN FOR (2) OTHER AREAS AWAY FROM HERONRY OBSERVATION PLATFORM. THE CONTRACTOR SHALL HIRE A LICENSED ENGINEER IN THE STATE OF DELAWARE WHO SHALL BE RESPONSIBLEFOR THE DESIGN AND DOCUMENTATION OF THE HELICAL PILE/ANCHOR SYSTEM. DESIGN LOADS ARE PROVIDED. CONTRACTOR IS RESPONSIBLE FOR PERFORMING THEIR OWN DUE DILIGENCE FOR SOIL BORONGS/INVESTIGATIONS.



ELEVATION



SECTION E-E

RAILING NOTES:

1. THE WIRE MESH SHALL BE 2"x2" WWF WITH 0.12 WIRE DIAMETER AND SHALL BE HOT-DIP GALVANIZED. 2"X2" WWF TO EXTEND TO OUTER EDGES OF HORIZONTALS AND VERTICALS TO ENGAGE SCREWS.
2. THE WIRE MESH SHALL BE ATTACHED TO THE HORIZONTAL 2x4 TOP AND BOTTOM WITH HOT-DIP GALVANIZED 18 GAUGE WIRE STAPLES WITH MINIMUM ½" LEGS AT 12" CENTER TO CENTER.
3. 2x8 COMPOSITE TOP RAIL ALIGNED FLUSH WITH INSIDE FACE OF 6X6 POST ON BOARDWALK 3 ONLY.

TYPICAL RAILING DETAIL
SCALE: NTS

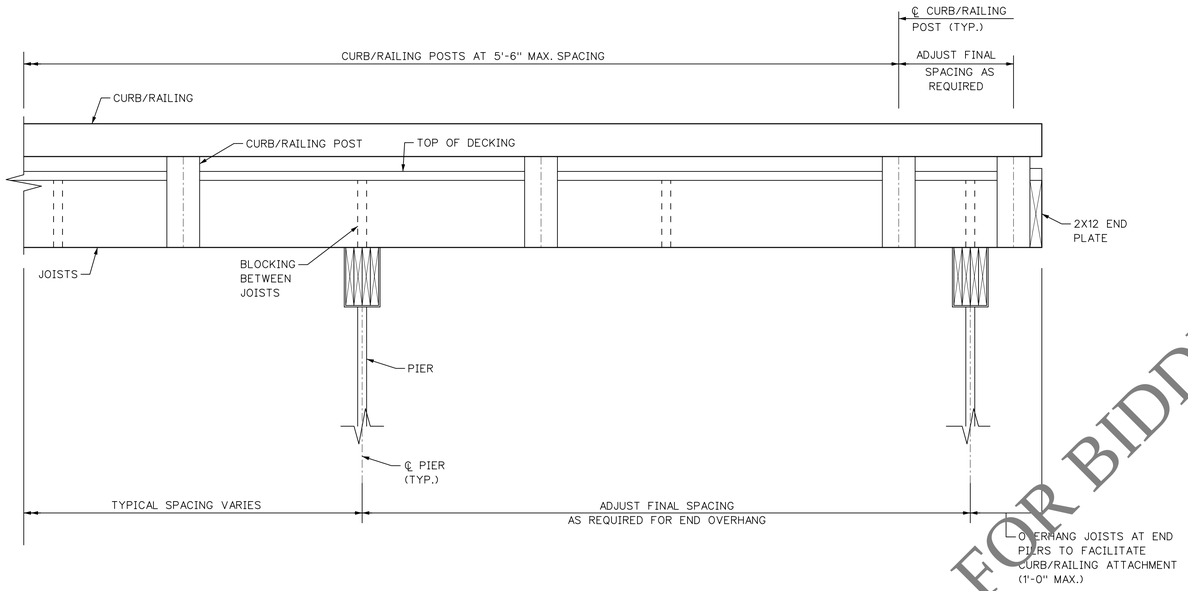
DATE: DESCRIPTION: BY:
DATE: DESCRIPTION: BY:

FORT DELAWARE STATE PARK
PEA PATCH ISLAN IMPROVEMENT

BOARDWALK DETAILS - HERONRY

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

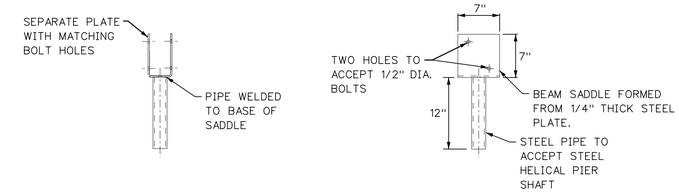
DESIGNED BY: ODD
DRAWN BY: ODD
BUILDING NO.: N/A
DATE: 10/14/2019
SCALE: AS NOTED
SHEET NO.: C-104
PARKS PROJECT #: FD-20
CONTRACT #: 2019-FD-100



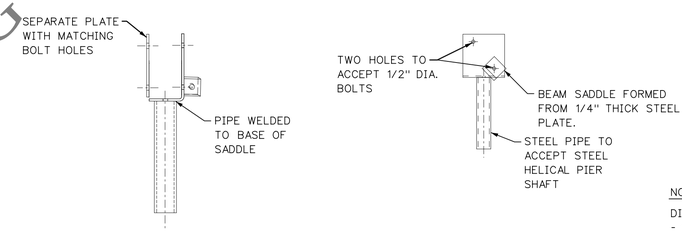
NOTE: APPLIES TO CURB AND RAILING THOUGH ONLY CURB IS SHOWN.

CURB/RAILING SUPPORT LAYOUT

SCALE: 1" = 1'



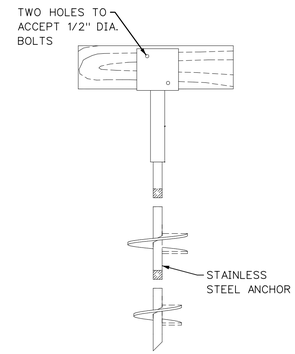
STANDARD BEAM BRACKET



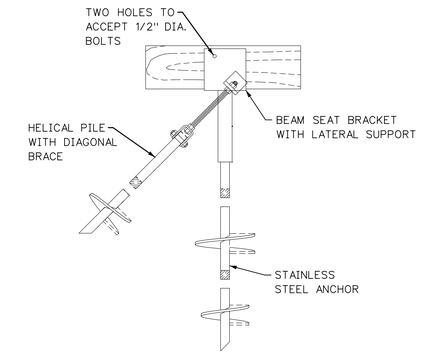
NOTES:

DIAGONAL ASSEMBLY INCLUDES:
- 1 LOOSE ANGLE
- 1 EA. ALL THREAD BOLT
- 4 EA. HH NUTS
- 1 EA. YOKE ASSEMBLY & HARDWARE
- ALL ELEMENTS SIZED BY HELICAL PILE MANUFACTURER

BEAM SEAT BRACKET AT DIAGONAL CONNECTION



TYPICAL PILE AND BEAM SEAT BRACKET



PILE WITH DIAGONAL BRACE AND BEAM SEAT BRACKET

CONNECTION BRACKET DETAILS

SCALE: 1" = 1'

NOTES:

1. FOR STRUCTURAL GENERAL NOTES, SEE SHEET C-104

DATE: DESCRIPTION: BY:

DATE: DESCRIPTION: BY:

FORT DELAWARE STATE PARK
PEA PATCH ISLAN IMPROVEMENT

BOARDWALK DETAILS - HERONRY

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ODD

DRAWN BY: ODD

BUILDING NO.: N/A

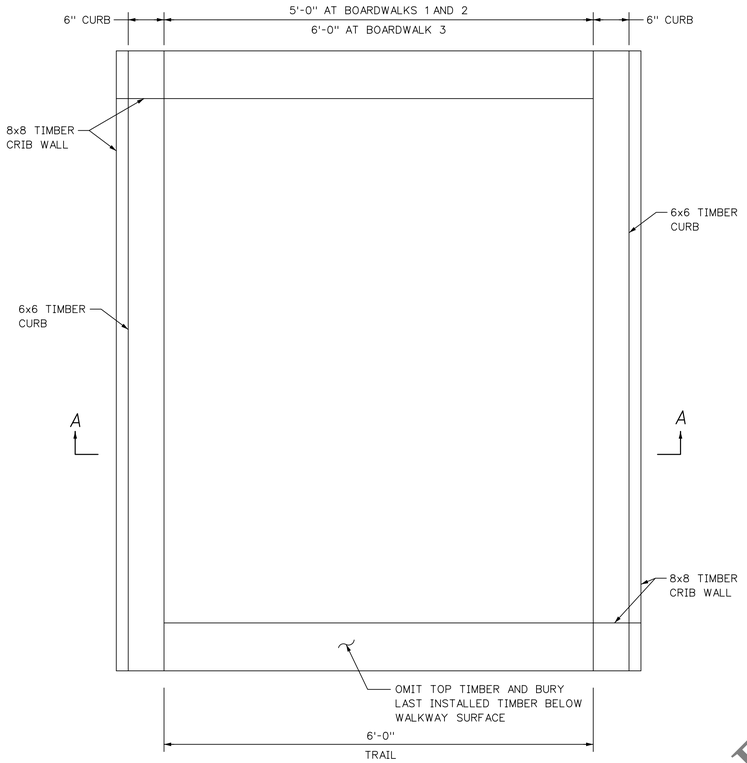
DATE: 10/14/2019

SCALE: AS NOTED

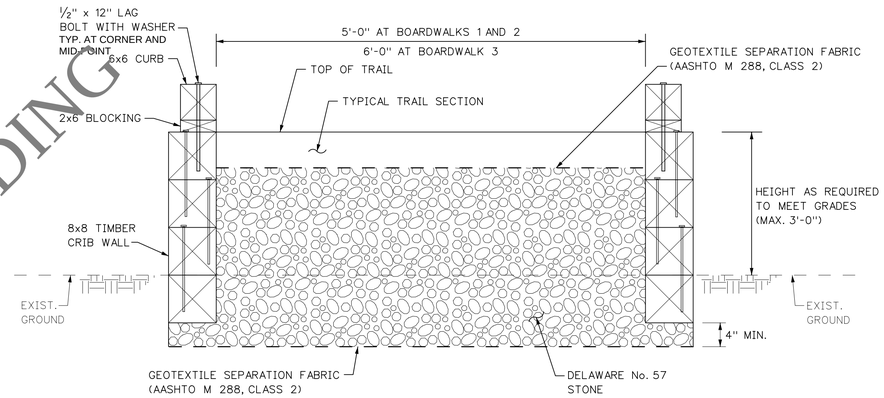
SHEET NO.: C-105

PARKS PROJECT #: FD-20

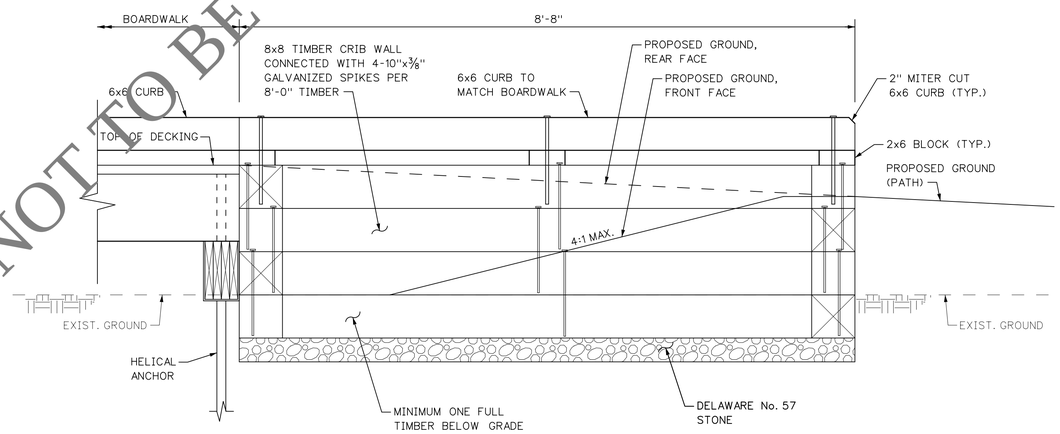
CONTRACT #: 2019-FD-100



PLAN



SECTION A-A



ELEVATION

NOTES:

1. STABILIZE DISTURBED AREA WITH SALVAGED PINE NEEDLES AND LEAVES.

TYPICAL ABUTMENT AT BOARDWALKS

SCALE: 1" = 1'

DATE: DESCRIPTION: BY:

DATE: DESCRIPTION: BY:

FORT DELAWARE STATE PARK
PEA PATCH ISLAN IMPROVEMENT

BOARDWALK CRIBBING DETAILS - HERONRY

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ODD

DRAWN BY: ODD

BUILDING NO.: N/A

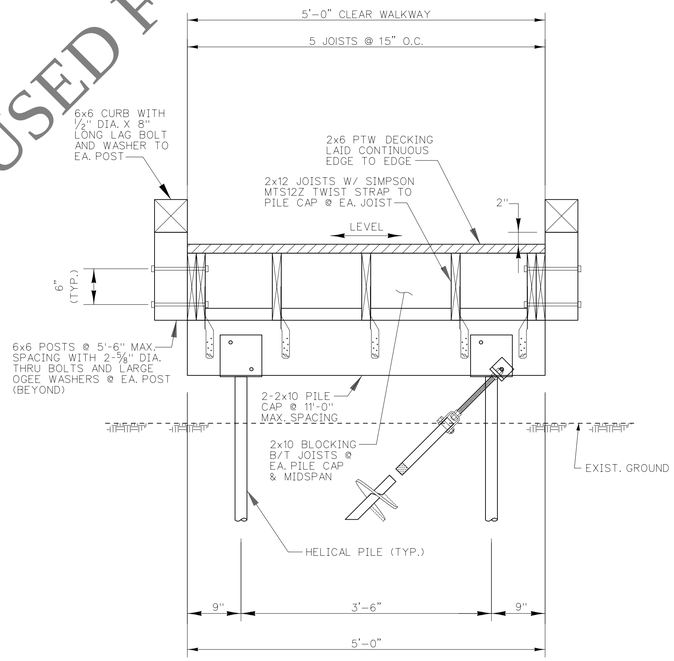
DATE: 10/14/2019

SCALE: AS NOTED

SHEET NO.: C-106

PARKS PROJECT #: FD-20

CONTRACT #: 2019-FD-100

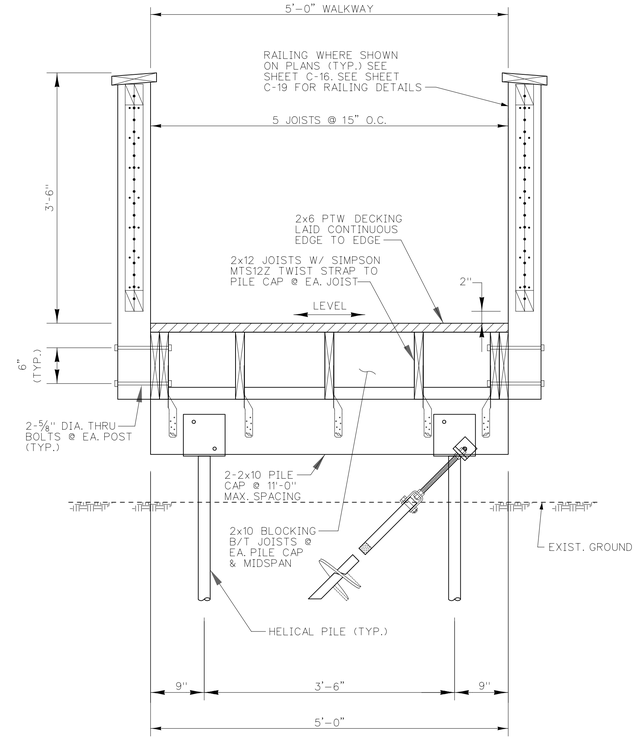


NOTES:

1. DIAGONAL HELICAL PILES SHALL BE INSTALLED AT EVERY OTHER PIER. ALTERNATE PILE DIRECTION.
2. HELICAL ANCHORS SHALL BE CHANCE ANCHORS, OR APPROVED EQUAL, AND BE IN ACCORDANCE WITH SPECIAL PROVISION T-618500 AND THE INFORMATION PROVIDED IN APPENDIX A.
3. FOR STRUCTURAL GENERAL NOTES, SEE SHEET C-104
4. TWIST STRAPS TO BE 16-GAUGE, Z-MAX. GALVANIZED, INSTALLED WITH 14 HOT-DIP GALVANIZED 10d 1½" NAILS PER MANUFACTURER'S RECOMMENDATIONS.

TYPICAL SECTION - BOARDWALK 1

OBSERVATION DECK TO STA. 41+40.56
SCALE: 1"=1'



NOTES:

1. DIAGONAL HELICAL PILES SHALL BE INSTALLED AT EVERY OTHER PIER. ALTERNATE PILE DIRECTION.
2. HELICAL ANCHORS SHALL BE CHANCE ANCHORS, OR APPROVED EQUAL, AND BE IN ACCORDANCE WITH SPECIAL PROVISION T-618500 AND THE INFORMATION PROVIDED IN APPENDIX A.
3. FOR STRUCTURAL GENERAL NOTES, SEE SHEET C-104
4. TWIST STRAPS TO BE 16-GAUGE, Z-MAX. GALVANIZED, INSTALLED WITH 14 HOT-DIP GALVANIZED 10d 1½" NAILS PER MANUFACTURER'S RECOMMENDATIONS.

TYPICAL SECTION - BOARDWALK 2

OBSERVATION DECK TO STA. 41+40.56
SCALE: 1"=1'

DATE:	DESCRIPTION:	BY:
DATE:	DESCRIPTION:	BY:

FORT DELAWARE STATE PARK
PEA PATCH ISLAN IMPROVEMENT
BOARDWALK DETAILS - HERONRY

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY:	ODD
DRAWN BY:	ODD
BUILDING NO.:	N/A
DATE:	10/14/2019
SCALE:	1"=1'
SHEET NO.:	C-107
PARKS PROJECT #:	FD-20
CONTRACT #:	2019-FD-100

GENERAL NOTES

1. IF DURING THE PROGRESS OF THE WORK THE CONTRACTOR MAY DISCOVER ANY ERROR, INCONSISTENCY OR OMISSION IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL AT ONCE SO REPORT TO THE ARCHITECT/ENGINEER. EXTRAS WILL NOT BE ALLOWED FOR CORRECTION OF PROBLEMS THAT COULD HAVE BEEN AVOIDED BY CAREFUL REVIEW AND THE MINOR ADJUSTMENT OF SIZE AND/OR LOCATION OF VARIOUS ITEMS FOR PROPER FIT. THIS CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF HIS WORK WITH THE OTHER CONTRACTORS.

2. ANY ITEM NOT SPECIFICALLY LISTED OR SHOWN ON THE CONTRACT DOCUMENTS BUT IS INCIDENTAL TO THE COMPLETION OF THE PROJECT OR PACKAGE WILL BE CONSIDERED AS PART OF THE CONTRACT SCOPE OF WORK.

3. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO APPROVAL BY THE ENGINEER.

4. ALL APPLICABLE FEDERAL, STATE AND MUNICIPAL REGULATIONS SHALL BE FOLLOWED, INCLUDING THE FEDERAL DEPARTMENT OF LABOR OCCUPATIONAL SAFETY AND HEALTH ACT.

5. THE ENGINEER HAS NO ONGOING PRESENCE ON THE SITE, NO CONTROL OF ACTIVITIES ON THE SITE, NO SUPERVISORY ROLE AND NO FIELD RESPONSIBILITY FOR SITE SAFETY. THE CONTRACTOR IS RESPONSIBLE FOR SUPERVISION OF THE WORK INCLUDING PERSONNEL PROTECTION IN ACCORDANCE WITH OSHA AND OTHER APPLICABLE REGULATIONS AND PUBLIC PROTECTION IN ACCORDANCE WITH THE REQUIREMENTS OF THE JURISDICTION IN WHICH THE PROJECT IS BEING CONSTRUCTED.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ALL CONDITIONS AND MATERIALS WITHIN THE PROPOSED CONSTRUCTION AREA. THE CONTRACTOR SHALL HAVE THE SOLE RESPONSIBILITY FOR ANY DAMAGE OR INJURIES BY OR DURING THE EXECUTION OF THE WORK.

7. CONTRACTOR SHALL VERIFY DIMENSIONS AND FIELD CONDITIONS PRIOR TO STARTING WORK. THE ENGINEER SHALL BE NOTIFIED BY THE CONTRACTOR PROMPTLY OF ANY DEVIATION FROM THE PLAN, UNEXPECTED CONDITIONS, OR INCIDENTS INVOLVING INJURY, COLLAPSE, PROPERTY DAMAGE OR VIOLATIONS ISSUED BY GOVERNMENT ENTITIES.

*** THE ARCHITECT/ENGINEER OF RECORD IS NOT AND SHALL NOT BE HELD LIABLE FOR SITE SAFETY ISSUES ***

CONCRETE NOTES

1. ALL CONCRETE WORK SHALL CONFORM TO ACI 318 (LATEST EDITION).

2. CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS SHALL BE:

a. SLABS ON GRADE: 4000 PSI
ALL CONCRETE SUBJECT TO FREEZE/THAW CYCLE SHALL BE AIR-ENTRAINED.

3. CONCRETE SHALL NOT BE PLACED IN WATER OR ON FROZEN GROUND.

4. REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60 DEFORMED BARS AND SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH ACI 315, LATEST EDITION. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185 AND BE PROVIDED IN FLAT SHEETS.

5. ALL REINFORCING BARS SHALL BE EPOXY CATED PER ASTM A775.

6. REINFORCEMENT SHALL BE CONTINUOUS AROUND CORNERS AND AT INTERSECTIONS. PROVIDE CLASS "A" TENSION LAP SPLICES FOR ALL HORIZONTAL WALL REINFORCING UNLESS OTHERWISE SHOWN ON PLAN.

7. CLEARANCES FOR REINFORCEMENT:

a. CONCRETE PLACED DIRECTLY ON EARTH, FOOTINGS: 3"
b. SLABS, FROM TOP UNLESS OTHERWISE NOTED: 2"
c. FORMED SURFACES EXPOSED TO WEATHER OR EARTH:
#5 BAR OR SMALLER: 1 1/2"
#6 BAR OR LARGER: 2"

8. CONTROL JOINTS IN SLABS ON GRADE:

a. CONTROL JOINTS SHALL BE LOCATED AS SHOWN ON SLAB ON GRADE PLAN.
b. CONTROL JOINTS SHALL BE SAW CUT (1/3 THE SLAB DEPTH) AND FILLED WITH JOINT SEALER. CUT JOINTS AS SOON AS POSSIBLE WITHOUT FRAYING THE CONCRETE SURFACE.

CONTROL JOINTS SHALL BE LOCATED BY CONTRACTOR IN ACCORDANCE WITH ACI CRITERIA, MAXIMUM SPACINGS AS PER TYPICAL SLAB ON GRADE DETAILS AND TYPICAL CONTROL JOINT LOCATION DETAILS (U.N.O.). MINIMUM CONTROL JOINT DEPTHS ARE INDICATED ON TYPICAL CONTROL JOINT DETAILS. CONTROL JOINTS WHICH ARE NOT PROMPTLY OR PROPERLY CUT AND ARE NOT FUNCTIONING SHALL BE RECUT BY THE CONCRETE CONTRACTOR. RECUTS OF JOINTS WHICH WERE NOT PROMPTLY OR PROPERLY CUT SHALL BE 3" DEEP MINIMUM.

FOUNDATION NOTES

1. THE SLAB ON GRADE AND COLUMN FOUNDATION ARE DESIGNED IN ACCORDANCE WITH THE RECOMMENDATIONS PER GEOTECHNICAL REPORT PREPARED BY JOHN D. HYNES & ASSOCIATES, INC. DATED MAY 28, 2019.

2. THE CONTRACTOR SHALL PREPARE THE SUBGRADE FOR PAVILION BUILDING FOUNDATION AND SLAB ON GRADE PER GEOTECHNICAL REPORT RECOMMENDATIONS.

3. FOUNDATION DESIGN IS BASED ON DEEP PILE FOUNDATION AND THE DEPTH OF THE PILES SHALL BE DETERMINED BY GEOTECHNICAL ENGINEER FOR SUITABLE BEARING LAYERS AND ADEQUATE BEARING CAPACITY.

4. THE SLAB ON GRADE SHALL BEAR ON SUITABLE NEW COMPACTED STRUCTURAL FILL PER RECOMMENDATION OF GEOTECHNICAL REPORT.

5. PRIOR TO THE CONSTRUCTION OF FOUNDATIONS AND GROUND SLABS, OR THE PLACEMENT OF FILL IN ANY STRUCTURAL AREAS, ALL ORGANIC MATERIALS INCLUDING TREE STUMPS AND ROOT MATS, FROZEN OR WET SOILS, EXCESSIVELY SOFT OR LOOSE SOILS, MISCELLANEOUS DEBRIS, AND OTHER DELETERIOUS MATERIALS SHALL BE REMOVED AND WASTED FROM STRUCTURAL AREAS. VVOIDS CREATED BY THE REMOVAL OF ORGANIC MATTER, STUMPS, DEBRIS, ETC. SHOULD BE BACKFILLED IN ACCORDANCE WITH THE STRUCTURAL FILL SPECIFIED PER GEOTECHNICAL REPORT.

6. PROOF ROLL ALL SUBGRADES, UNDER THE OBSERVATION OF THE GEOTECHNICAL ENGINEER. UNSUITABLE AREAS SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE GEOTECHNICAL ENGINEER. NO FILL FOR BUILDING SUPPORT SHALL BE PLACED UNTIL SUBGRADES AND FILL MATERIAL HAVE BEEN OBSERVED AND APPROVED BY THE GEOTECHNICAL ENGINEER.

7. AREAS REQUIRING UNDERCUT AND FILL MATERIAL DUE TO THE PRESENCE OF UNSUITABLE MATERIAL SHALL BE BACKFILLED TO THE DESIGN FOOTING SUBGRADE WITH NEW COMPACTED STRUCTURAL FILL.

8. THE STRUCTURAL FILL SHALL BE PLACED IN LIFTS OF 8 INCHES OR LESS. THE FILL COMPACTION OPERATIONS AND FILL LIMITS SHALL BE EXTENDED AT LEAST 5 FEET BEYOND THE EDGE OF SLAB ON GRADE.

9. COMPACTED STRUCTURAL FILL FOR BUILDING SUPPORT UTILIZING MATERIAL APPROVED FOR USE BY THE GEOTECHNICAL ENGINEER INCLUDE: ON-SITE GRANULAR SOILS INCLUDING GW, GP, GM, SW, SP AND SM CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM (USCS). FURTHERMORE, THE MATERIAL TO BE UTILIZED AS STRUCTURAL FILL SHOULD HAVE A PLASTICITY INDEX (PI) LESS THAN 20 SUBJECT TO FINAL APPROVAL BY GEOTECHNICAL ENGINEER.

10. MATERIAL TRANSPORTED FROM OFF-SITE SHALL MEET THE REQUIREMENTS OF GEOTECHNICAL REPORT.

HELICAL ANCHOR NOTES

1. HE FOUNDATION SYSTEM DESIGN IS BASED ON EACH HELICAL ANCHOR SYSTEM DEVELOPING THE THRUST OR UPLIFT LOADS INDICATED ON THE FOUNDATION PLAN AND IN THE GEOTECHNICAL REPORT PREPARED BY JOHN D. HYNES & ASSOCIATES, INC. DATED MAY 28, 2019. THESE CAPACITIES ARE TO BE FIELD VERIFIED DURING INSTALLATION.

SCHEDULE OF STRUCTURAL SPECIAL INSPECTIONS

1. SPECIAL INSPECTIONS / TESTING
"SPECIAL STRUCTURAL INSPECTION" SHALL NOT RELIEVE THE OWNER OR THEIR AGENT FROM REQUESTING THE JURISDICTION BUILDING DEPARTMENT INSPECTIONS REQUIRED BY SECTION 109 OF THE IBC2012.

2. REPORTING FOR SPECIAL INSPECTION -
SPECIAL INSPECTION AND TESTING REPORTS SHALL BE COMPLETED AND DISTRIBUTED AT THE COMPLETION OF EACH TASK. IF A TASK IS TO TAKE LONGER THAN (3) DAYS, PROVIDE REPORTS FOR EACH DAY. PROVIDE COPIES OF REPORTS TO: CONTRACTOR, OWNER, ARCHITECT AND STRUCTURAL ENGINEER OF RECORD. SPECIAL INSPECTOR TO KEEP A NON-COMPLIANCE LIST DOCUMENTING ITEMS INSPECTED NOT MEETING APPROVED CONSTRUCTION DOCUMENTS AND WHEN / HOW RESOLVED.

3. SEE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING CONSTRUCTION DOCUMENTS FOR ADDITIONAL NON-STRUCTURAL SPECIAL INSPECTION ITEMS.

IN ACCORDANCE WITH IBC CHAPTER 17, THE FOLLOWING TYPES OF WORK REQUIRE SPECIAL INSPECTIONS AND TESTING:

SPECIAL INSPECTION AND VERIFICATION OF CONCRETE CONSTRUCTION

SPECIAL INSPECTION REQUIRED Y/N	VERIFICATION AND INSPECTION	FREQUENCY OF INSPECTION		REFERENCE FOR CRITERIA	
		CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED	IBC SECTION	REFERENCED STANDARD
Y	1. INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS AND PLACEMENT.	-----	X	1913.4	ACI 318: 3.5, 7.1-7.7
N	2. INSPECTION OF REINFORCING STEEL WELDING IN ACCORDANCE WITH TABLE 1704.3, ITEM 5b.	-----	-----	-----	AWS D1.4, ACI 318: 3.5.2
Y	3. INSPECTION OF BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE WHERE ALLOWABLE LOADS HAVE BEEN INCREASED OR WHERE STRENGTH DESIGN IS USED.	X	-----	1911.5, 1912.1	ACI318: 8.1.3, 21.2.8
Y	4. INSPECTION OF ANCHORS INSTALLED IN HARDENED CONCRETE.	-----	X	1912.1	ACI 318: 3.8.6, 8.1.3, 21.2.8
Y	5. VERIFYING USE OF REQUIRED DESIGN MIX.	-----	X	1904.2.2, 1913.2, 1913.3	ACI 318: CH. 4, 5.2-5.4
Y	6. AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	-----	1913.10	ASTM C 172, ASTM C 31, ACI 318: 5.6, 5.8
Y	7. INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	-----	1913.6, 1913.7, 1913.8	ACI 318: 5.9, 5.10
Y	8. INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	-----	X	1913.9	ACI 318: 5.11- 5.13
	9. INSPECTION OF PRESTRESSED CONCRETE:				
N	a. APPLICATION OF PRESTRESSING FORCES.	-----	-----	-----	ACI 318: 18.20, ACI 318: 18.18.4
N	b. GROUTING OF BONDED PRESTRESSING TENDONS IN THE SEISMIC-FORCE-RESISTING-SYSTEM.	-----			
N	10. ERECTION OF PRECAST CONCRETE MEMBERS.	-----	-----	-----	ACI 318: CH. 16
N	11. VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	-----	-----	-----	ACI 318: 6.2
Y	12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	-----	X	-----	ACI 318: 6.1.1

SPECIAL INSPECTION AND VERIFICATION OF SOILS

SPECIAL INSPECTION REQUIRED Y/N	VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED	IBC REFERENCE
Y	1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	-----	X	1704.7
Y	2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	-----	X	1704.7
Y	3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	-----	X	1704.7
Y	4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	-----	1704.7
Y	5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	-----	X	1704.7

SPECIAL INSPECTION AND VERIFICATION OF DEEP DRIVEN ELEMENTS

SPECIAL INSPECTION REQUIRED Y/N	VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED	IBC REFERENCE
Y	1. VERIFY ELEMENT MATERIALS, SIZES AND LENGTHS COMPLY WITH THE REQUIREMENTS.	X	-----	1704.8
Y	2. DETERMINE CAPACITIES OF TEST ELEMENTS AND CONDUCT ADDITIONAL LOAD TESTS, AS REQUIRED.	X	-----	1704.8
Y	3. OBSERVE DRIVING OPERATIONS AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH ELEMENT.	X	-----	1704.8
Y	4. VERIFY PLACEMENT LOCATIONS AND PLUMBNESS, CONFIRM TYPE AND SIZE OF HAMMER, RECORD NUMBER OF BLOWS PER FOOT OF PENETRATION, DETERMINE REQUIRED PENETRATIONS TO ACHIEVE DESIGN CAPACITY, RECORD TIP AND BUTT ELEVATIONS AND DOCUMENT ANY DAMAGE TO FOUNDATION ELEMENT.	X	-----	1704.8
Y	5. FOR STEEL ELEMENTS, PERFORM ADDITIONAL INSPECTIONS IN ACCORDANCE WITH SECTION 1704.3.	-----	-----	1704.8
N	6. FOR CONCRETE ELEMENTS AND CONCRETE-FILLED ELEMENTS, PERFORM ADDITIONAL INSPECTIONS IN ACCORDANCE WITH SECTION 1704.4.	-----	-----	1704.8
N	7. FOR SPECIALTY ELEMENTS, PERFORM ADDITIONAL INSPECTIONS AS DETERMINED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE.	-----	-----	1704.8

DNREC

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ORNDORF & ASSOCIATES, INC.
STRUCTURAL ENGINEERS

138.028

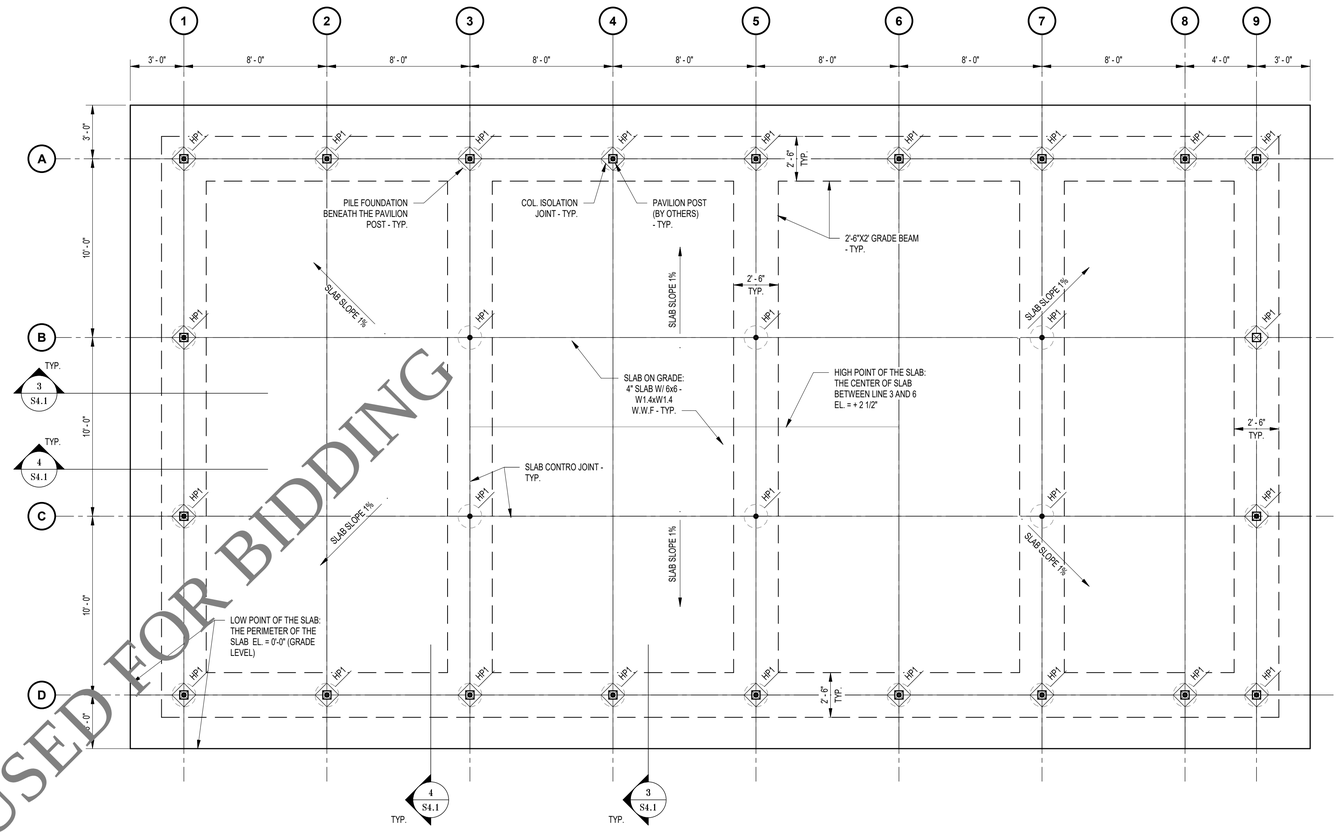
PROJECT TYPE
FORT DELAWARE STATE PARK
PEA PATCH ISLAND IMPROVEMENTS

STRUCTURAL NOTES & SPECIAL INSPECTION SCHEDULES

PROJECT NO:
138.028
Issue Date:
10/14/2019
Drawn By:
Author
Checked By:
Checker
Sheet No.
S4.0

1 / S4.1 SITE MAP - PAVILION @ FORT DELAWARE

3" = 1'-0"



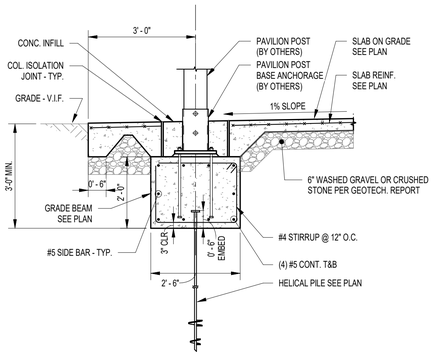
2 / S4.1 PAVILION FOUNDATION PLAN - FORT DELAWARE

1/4" = 1'-0"

HELICAL PILE SCHEDULE

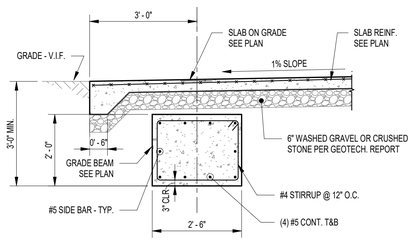
MARK	SHAFT ODxTHKS (in)	HELICAL PLATE DIAMETER (in)	PILE LENGTH (ft)	REQD CAPACITY (kips)
HP1	*	*	**	COMPRESSIVE: 10; TENSILE: 5

NOTE: * HELICAL PILE SELECTION SHALL BE PER RECOMMENDATION BY GEOTECHNICAL REPORT BY JOHN D. HYNES & ASSOCIATES, INC.
** HELICAL PILES SHALL BE INSTALLED TO APPROPRIATE DEPTH IN SUITABLE BEARING STRATUM AS DETERMINED BY THE GEOTECHNICAL ENGINEER.



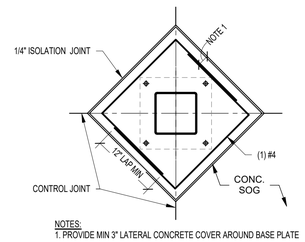
3 / S4.1 TYPICAL SECTION AT PAVILION POST & PILE

1/2" = 1'-0"



4 / S4.1 TYPICAL SECTION THRU SLAB AND GRADE BEAM

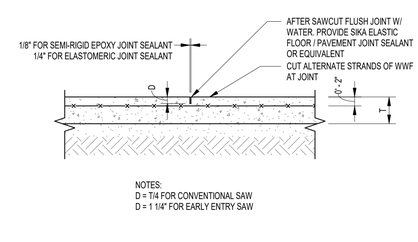
1/2" = 1'-0"



NOTES:
1. PROVIDE MIN 3" LATERAL CONCRETE COVER AROUND BASE PLATE

5 / S4.1 TYPICAL DETAIL FOR COL. ISOLATION JOINT

1/2" = 1'-0"



NOTES:
D = T/4 FOR CONVENTIONAL SAW
D = 1 1/4" FOR EARLY ENTRY SAW

6 / S4.1 TYPICAL CONTROL JOINT DETAIL FOR SLAB ON GRADE

3/4" = 1'-0"

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ORNDORF & ASSOCIATES, INC.
STRUCTURAL ENGINEERS

138.028

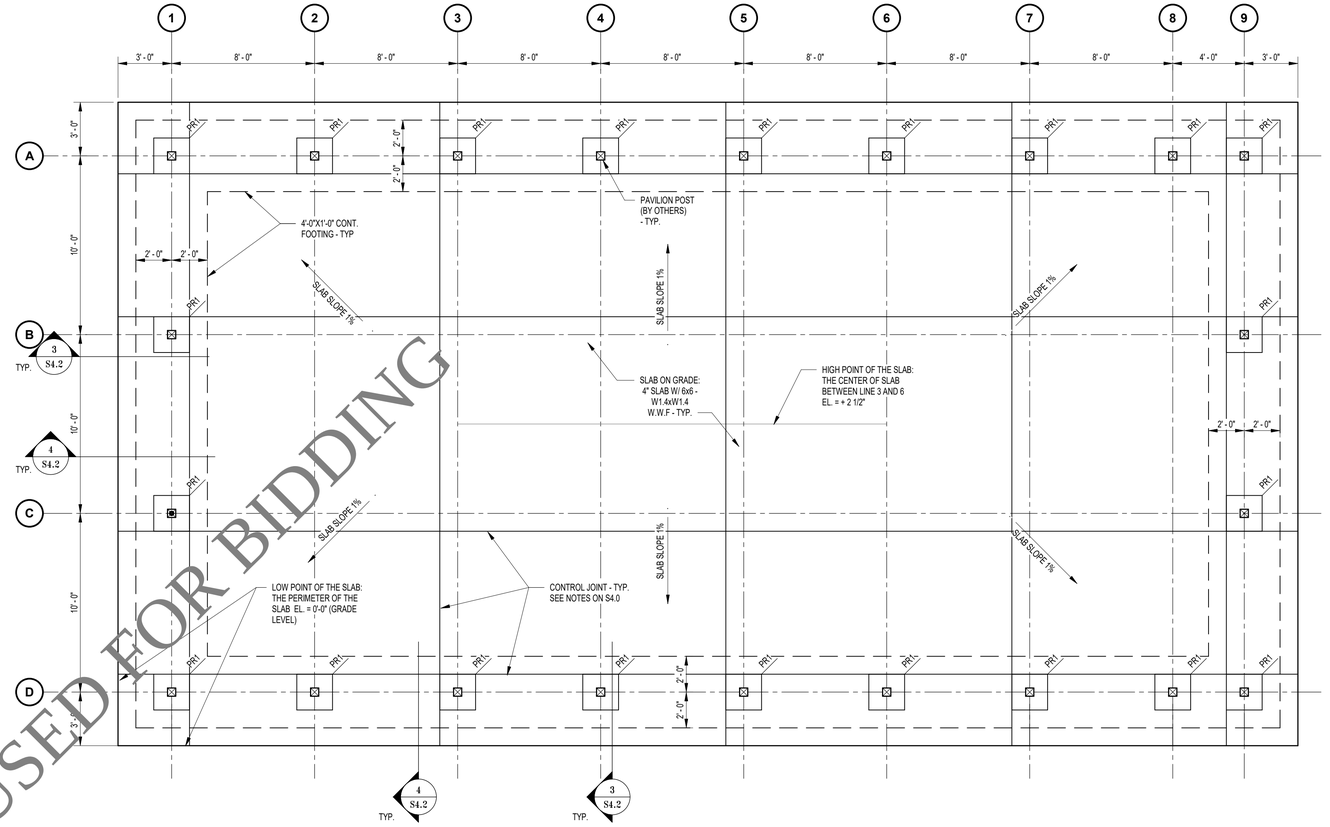
PROJECT TYPE
FORT DELAWARE STATE PARK
PEA PATCH ISLAND IMPROVEMENTS

PAVILION SLAB & FOUNDATION

PROJECT NO:
138.028
Issue Date:
10/14/2019
Drawn By:
JW
Checked By:
KRO
Sheet No.
S4.1

1 / S4.2 — SITE MAP - PAVILION @ FORT DELAWARE

3" = 1'-0"



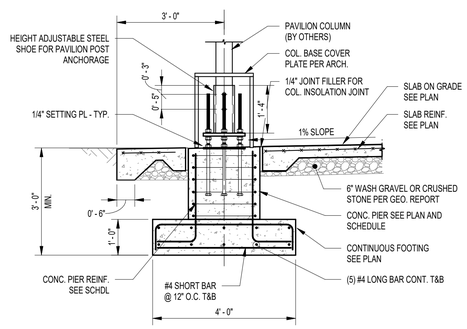
2 / S4.2 — PAVILION FOUNDATION PLAN - FORT DELAWARE - ALTERNATE

1/4" = 1'-0"

DESIGN STATEMENT:
THIS ALTERNATE FOUNDATION DESIGN IS FOR REVIEW AND CONSIDERATON ONLY. THE SETTLEMENT OF THE FOUNDATION IS NOT EVALUATED BY GEOTECHNICAL AGENCY. THE STRUCTURAL ENGINEER IS NOT RESPONSIBLE FOR ANY STRUCTURAL ISSUES RELATED TO THE FOUNDATION SETTLEMENT IF THE FOUNDATION IS CONSTRUCTED BASED ON THIS DESIGN.

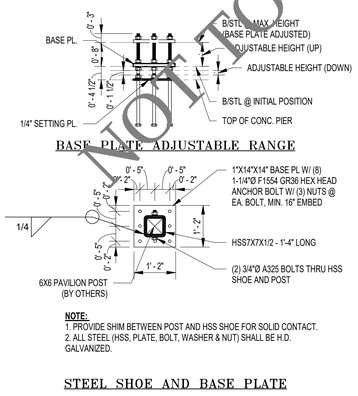
CONC. PIER SCHEDULE

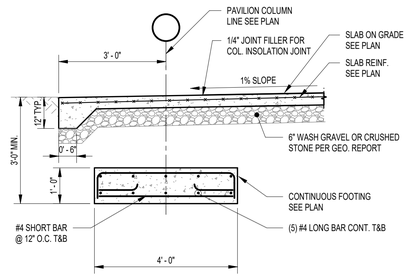
MARK	SIZE	VERT. REINF.	Horiz. Ties
PR1	24" x 24"	(8) #5 BARS	#4 BARS @ 4" O.C.



3 / S4.2 — TYP. DETAIL OF PAVILION POST BASE ANCHORAGE AT CONC. PIER

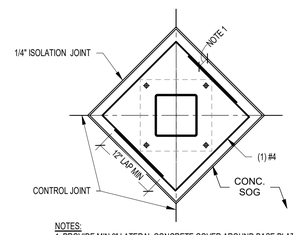
1/2" = 1'-0"





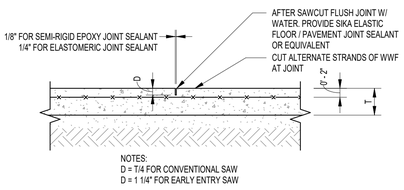
4 / S4.2 — TYP. SECTION THRU FOOTING & SLAB

1/2" = 1'-0"



5 / S4.2 — TYPICAL DETAIL FOR COL. ISOLATION JOINT

1/2" = 1'-0"



6 / S4.2 — TYPICAL CONTROL JOINT DETAIL FOR SLAB ON GRADE

3/4" = 1'-0"

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ORNDORF & ASSOCIATES, INC.
STRUCTURAL ENGINEERS
138.028

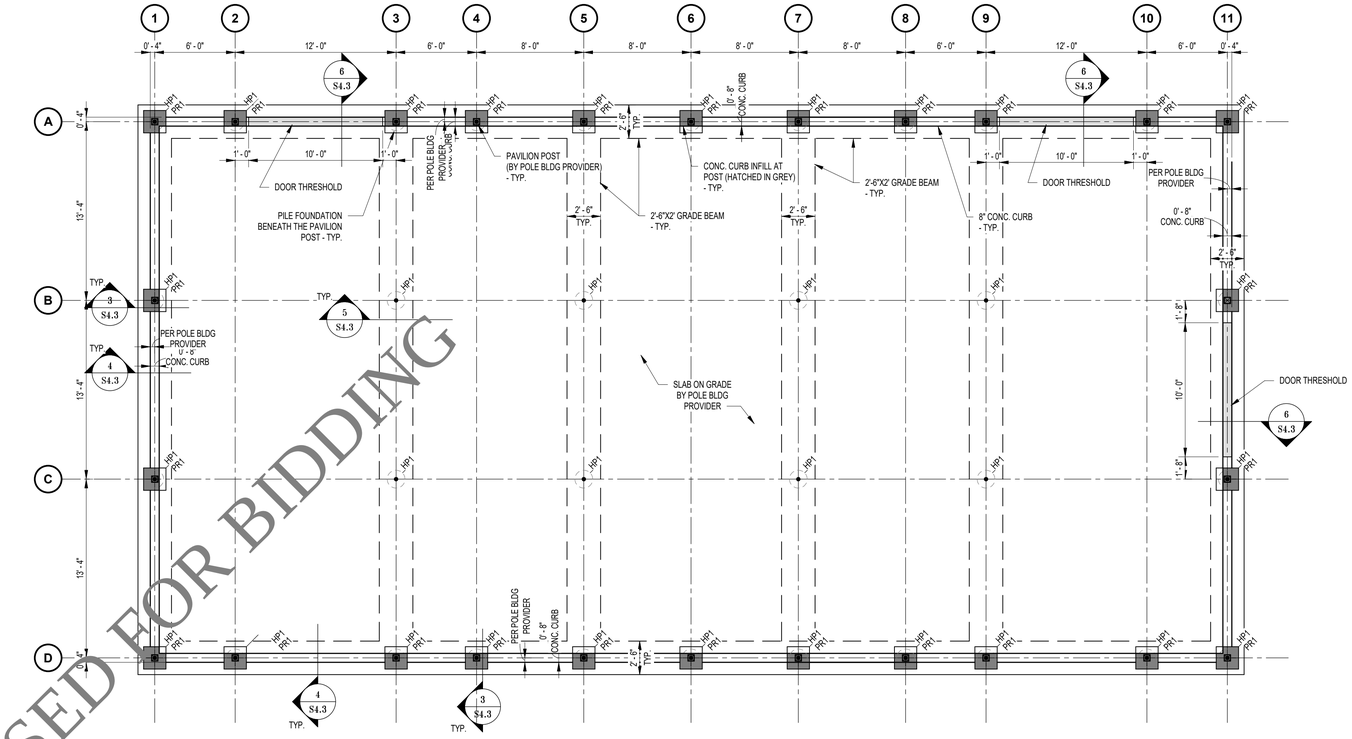
PROJECT TYPE
FORT DELAWARE STATE PARK
PEA PATCH ISLAND IMPROVEMENTS

PAVILION FOUNDATIONS & SLAB ON GRADE - ALTERNATE

PROJECT NO:
138.028
Issue Date:
10/14/2019
Drawn By:
Author
Checked By:
Checker
Sheet No.
S4.2

1/S4.3 SITE MAP - MAINTENANCE BUILDING @ FORT DELAWARE

3" = 1'-0"



2/S4.3 MAINTENANCE BUILDING FOUNDATION PLAN

3/16" = 1'-0"

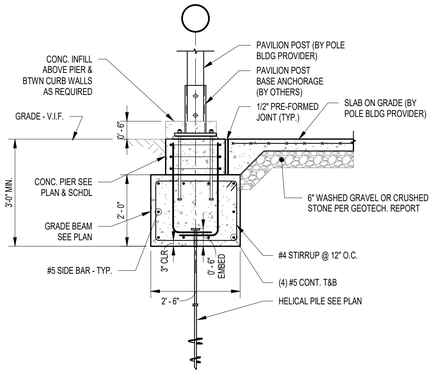
HELICAL PILE SCHEDULE

MARK	SHAFT ODxTHKS (in)	HELICAL PLATE DIAMETER (in)	PILE LENGTH (ft)	REQD CAPACITY (kips)
HP1	*	*	**	COMPRESSIVE: 13; TENSILE: 5

NOTE: * HELICAL PILE SELECTION SHALL BE PER RECOMMENDATION BY GEOTECHNICAL REPORT BY JOHN D. HYNES & ASSOCIATES, INC.
** HELICAL PILES SHALL BE INSTALLED TO APPROPRIATE DEPTH IN SUITABLE BEARING STRATUM AS DETERMINED BY THE GEOTECHNICAL ENGINEER.

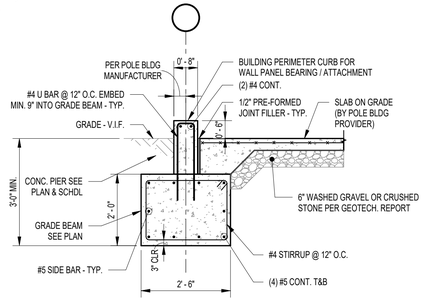
CONC. PIER SCHEDULE...

MARK	SIZE	VERT. REINF.	Horiz. Ties
PR1	20" x 20"	(8) #5 BARS	#4 BARS @ 4" O.C.
PR2	24" x 24"	(8) #5 BARS	#4 BARS @ 4" O.C.



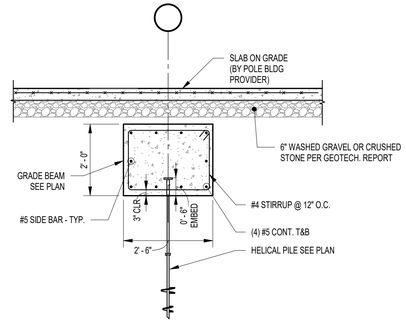
3/S4.3 TYPICAL SECTION AT BUILDING POST & PILE

1/2" = 1'-0"



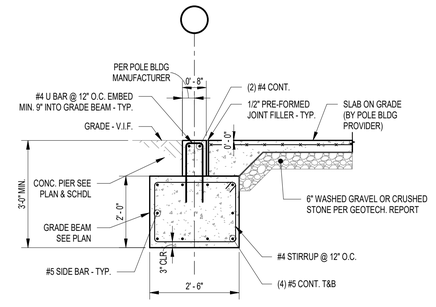
4/S4.3 TYPICAL CONC. CURB & GRADE BEAM

1/2" = 1'-0"



5/S4.3 TYPICAL SECTION THRU INT. GRADE BEAM

1/2" = 1'-0"



6/S4.3 SECTION AT DOOR ENTRANCE

1/2" = 1'-0"

DNREC
DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

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ORNDORF & ASSOCIATES, INC.
STRUCTURAL ENGINEERS
138.028

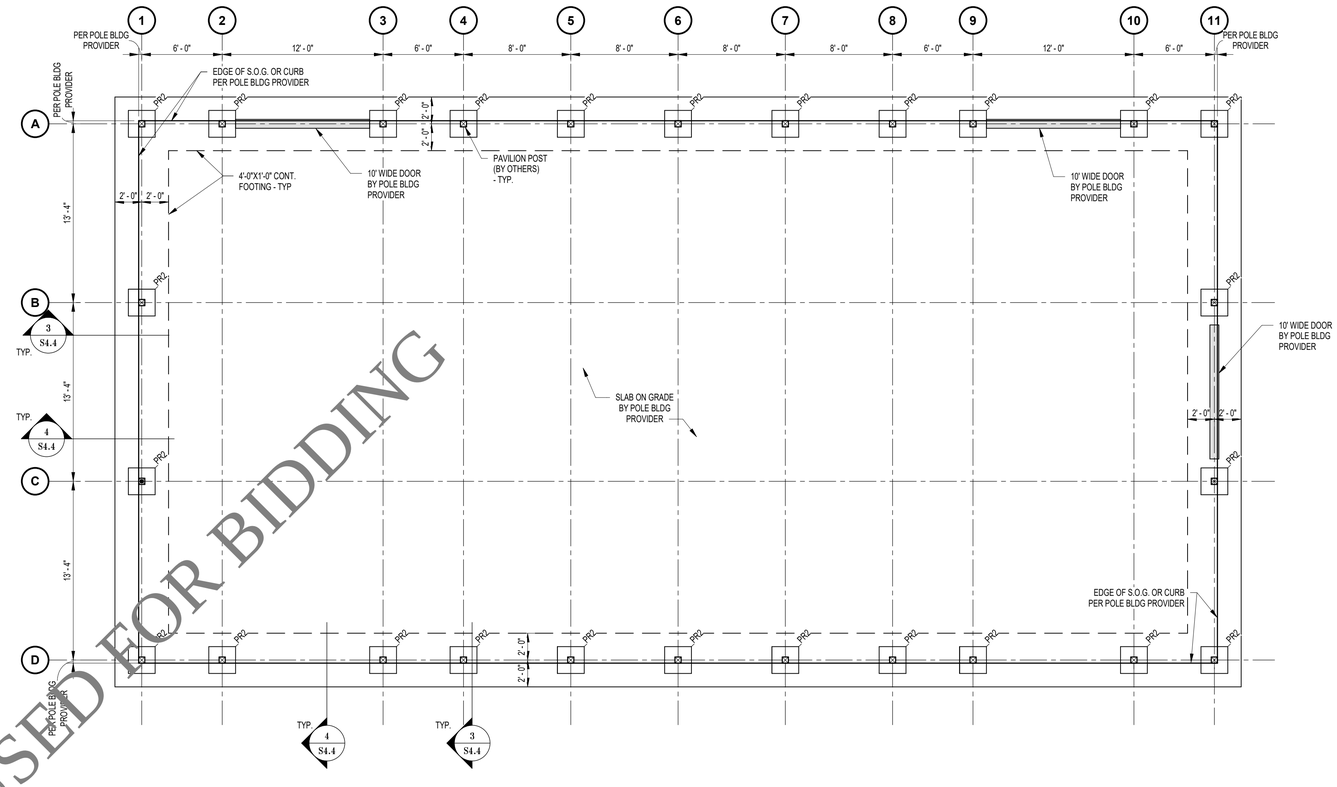
PROJECT TYPE
FORT DELAWARE STATE PARK
PEA PATCH ISLAND IMPROVEMENTS

MAINTENANCE BUILDING FOUNDATION

PROJECT NO:
138.028
Issue Date:
10/14/2019
Drawn By:
JW
Checked By:
KRO
Sheet No.
S4.3

1 / S4.4 SITE MAP - MAINTENANCE BUILDING @ FORT DELAWARE

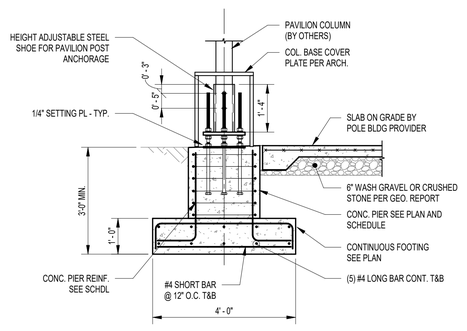
3" = 1'-0"



2 / S4.4 MAINTENANCE BUILDING FOUNDATION PLAN - ALTERNATE

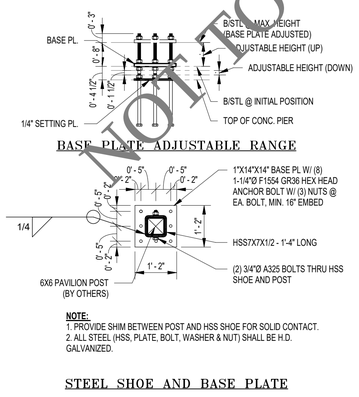
3/16" = 1'-0"

CONC. PIER SCHEDULE			
MARK	SIZE	VERT. REINF.	Horiz. Ties
PR1	20" x 20"	(8) #5 BARS	#4 BARS @ 4" O.C.
PR2	24" x 24"	(8) #5 BARS	#4 BARS @ 4" O.C.



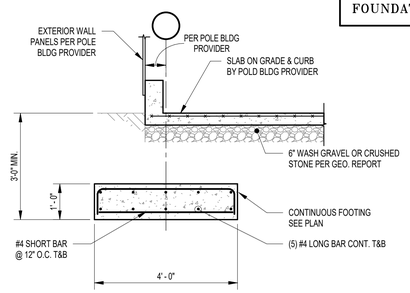
3 / S4.4 TYP. DETAIL OF BUILDING POST BASE ANCHORAGE AT CONC. PIER

1/2" = 1'-0"



NOTE:
1. PROVIDE SHIM BETWEEN POST AND HSS SHOE FOR SOLID CONTACT.
2. ALL STEEL (HSS, PLATE, BOLT, WASHER & NUT) SHALL BE H.D. GALVANIZED.

STEEL SHOE AND BASE PLATE



4 / S4.4 TYP. SECTION THRU FOOTING & SLAB

1/2" = 1'-0"

DESIGN STATEMENT:
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STRUCTURAL ENGINEERS
138.028

PROJECT TYPE
FORT DELAWARE STATE PARK
PEA PATCH ISLAND IMPROVEMENTS

MAINTENANCE BUILDING FOUNDATION - ALTERNATE

PROJECT NO:
138.028
Issue Date:
10/14/2019
Drawn By:
Author
Checked By:
Checker
Sheet No.
S4.4