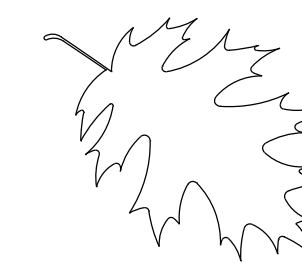
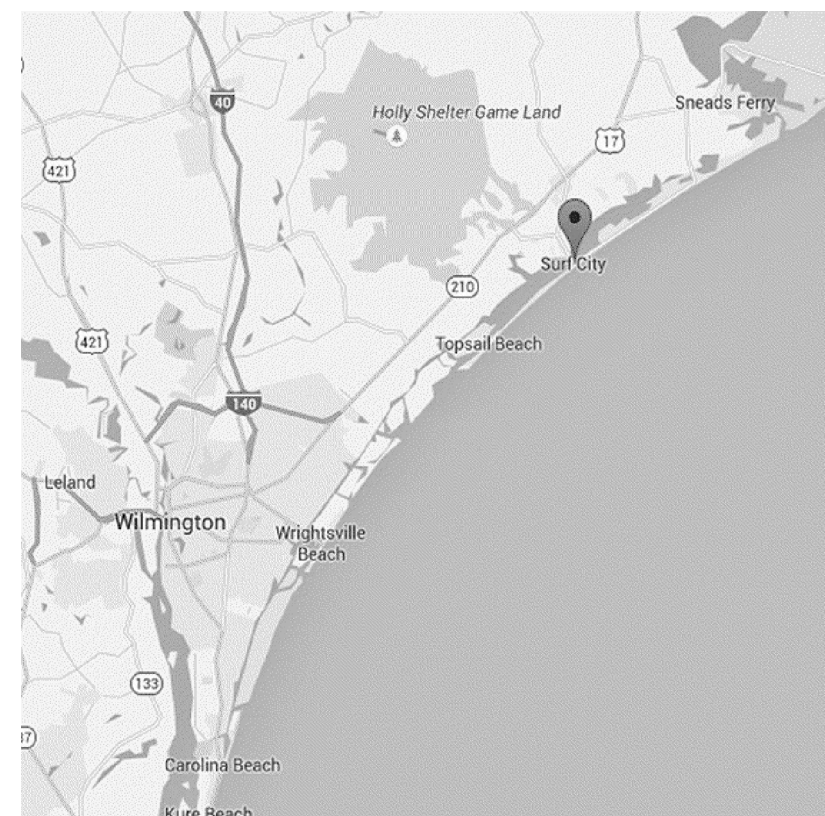


HIGHWAY LANDSCAPE DEVELOPMENT PROJECT



T.I.P. #	STATE PROJECT W.B.S. #	SHEET #	SHEET # TOTAL
B-4929(L)	40233.3.2	L 1	
FED. PROJ. #	DESCRIPTION	DIVISION	
-	LANDSCAPE	3	

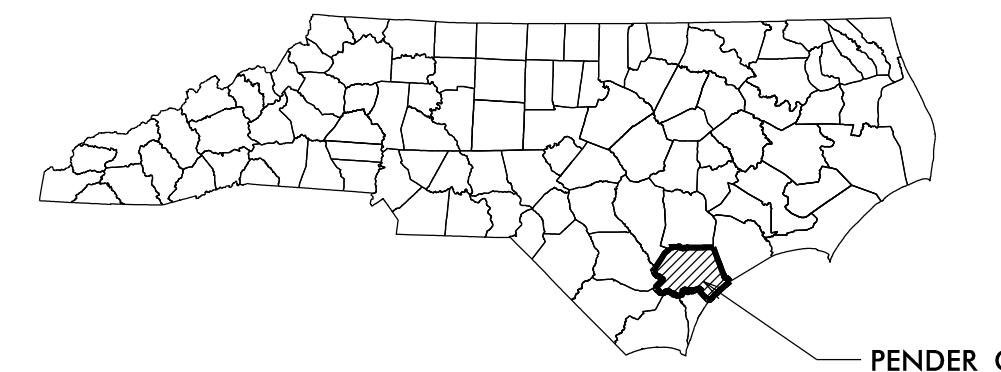


VICINITY MAP

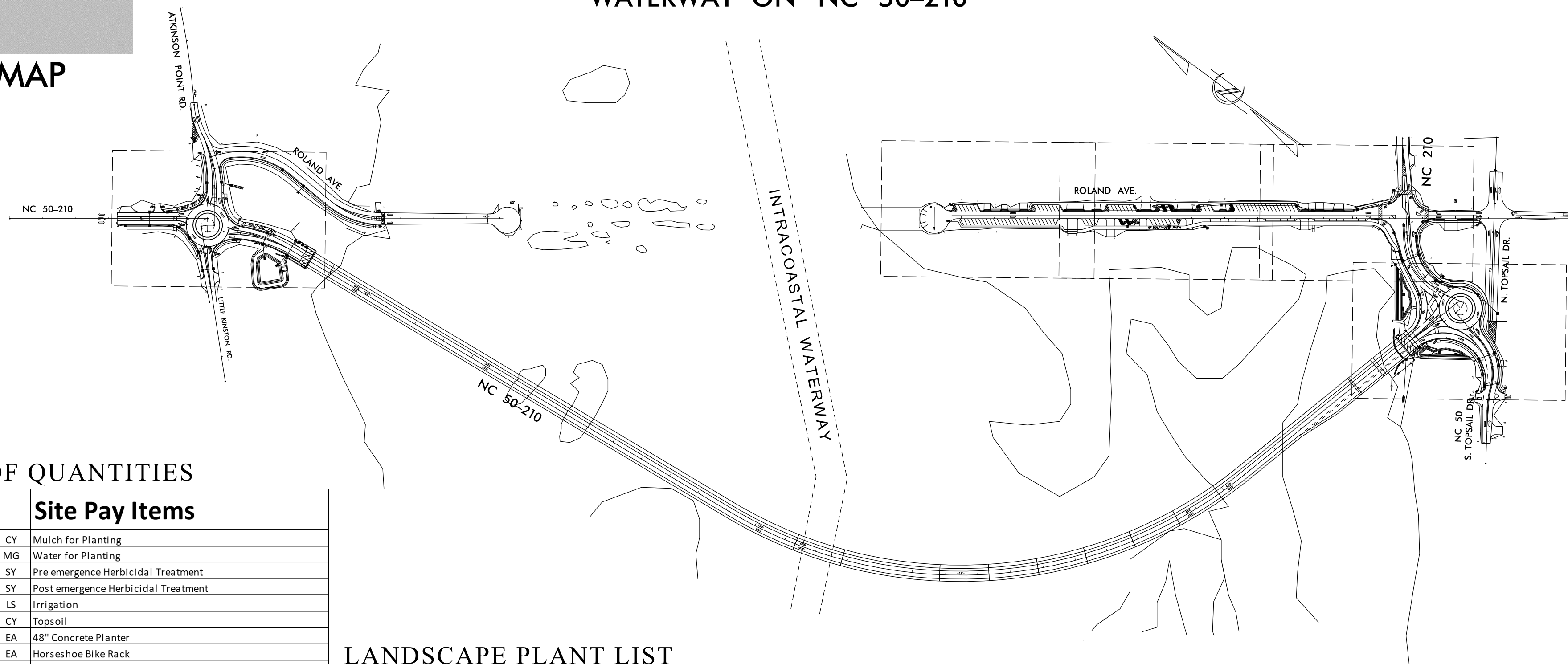
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PENDER COUNTY

LOCATION: BRIDGE NO. 16 OVER THE INTRACOASTAL WATERWAY ON NC 50-210



PENDER CO



SUMMARY OF QUANTITIES

Item #	Section	Quan	Site Pay Items
	1670-10	184	CY Mulch for Planting
	1670-11	10	MG Water for Planting
	1670-7	1,660	SY Pre emergence Herbicidal Treatment
	1670-7	1,660	SY Post emergence Herbicidal Treatment
	SP	1	LS Irrigation
	SP	230	CY Topsoil
	SP	9	EA 48" Concrete Planter
	SP	6	EA Horseshoe Bike Rack
	SP	18	EA 6' Gabion Bench
	SP	4	EA 6' Recycled Plastic Park Bench
	SP	1,150	SF Textured Concrete
	SP	6	EA Dual Waste Receptacle
	SP	1	EA 35' Nautical Flagpole
	SP	6	CY River Rock
5160000000-E	1409	70	LF ELECTRICAL DUCT, TYPE JA, SIZE ***** (3")
5205000000-E	1410	100	LF ** #8 W/G FEEDER CIRCUIT IN ***** CONDUIT (2, 1.5)
5230000000-E	1410	100	LF ***** FEEDER CIRCUIT IN** (2 #12 W/G, 1")
5240000000-N	1411	1	EA ELECTRICAL JUNCTION BOXES ***** (IG18)
5270000000-N	SP	2.00	EA GENERIC LIGHTING ITEM (R1S1 Foundation)
5270000000-N	SP	2.00	EA GENERIC LIGHTING ITEM (Flagpole Light)
	SP	16	EA Monthly Maintenance
	SP	48	LF Pedestrian Channel Devices
	SP	2	EA Audible Warnings
	SP	1	EA Temporary Curb Ramps
	SP	1	LS Temporary Traffic Control
	800	1	LS Mobilization

LANDSCAPE PLANT LIST

QTY.	UNIT	BOTANICAL NAME	COMMON NAME	FURNISH
Trees				
14	EA	<i>Juniperus virginiana</i>	E. Red Cedar	7-8', B&B
44	EA	<i>Quercus virginiana 'Darlington'</i>	Darlington Live Oak	10-12', 1 3/4" cal, B&B
58		total trees		
Shrubs				
38	EA	<i>Ilex vomitoria 'Shillings'</i>	Shillings Dwarf Yaupon Holly	#3 Cont, 12-15"
25	EA	<i>Myrica cerifera 'Don's Dwarf'</i>	Don's Dwarf Wax Myrtle	#3 Cont, 15-18"
48	EA	<i>Clethra alnifolia 'Ruby Spice'</i>	Ruby Spice Clethra	#3 Cont, 15-18"
12	EA	<i>Yucca filamentosa</i>	Adam's Needle	#3 Cont, 15-18"
13	EA	<i>Itea virginica 'Henry's Garnet'</i>	Henry's Garnet Sweetspire	#3 Cont, 15-18"
12	EA	<i>Sabal minor</i>	Dwarf Sabal Palm	2'-3', Hgt./Width
148		total shrubs		
Grasses, Groundcovers, & Perennials				
42	EA	<i>Echinacea 'PowWow Wild Berry'</i>	PowWow Coneflower	#1 Cont, 6-9" top growth
16	EA	<i>Muhlenbergia capillaris</i>	Pink Muhly Grass	#1 Cont, 9-12" top growth
295	EA	<i>Rudbeckia fulgida 'Goldsturm'</i>	Goldsturm Black-eyed Susan	#1 Cont, 6-9" top growth
215	EA	<i>Sporobolus heterolepis</i>	Prairie Dropseed	#1 Cont, 9-12" top growth
32	EA	<i>Spartina bakeri</i>	Sand Cordgrass	#1 Cont, 9-12" top growth
600		total Grasses, Groundcovers, & Perennials		

CONVENTIONAL SYMBOLS

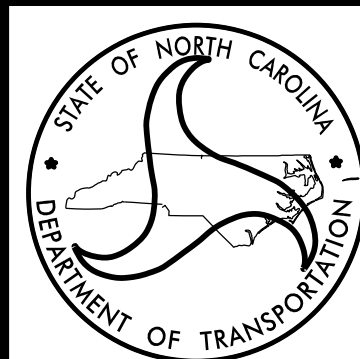
County Line	-----
City or Town Line	-----
Exist. Right of Way Line Marker	-----▲-----
Prop. Right of Way Line Marker (By Others)	-----▲-----
Prop Right of Way Line Marker (By Contract)	-----▲-----
Exist. Control of Access Line	-----○-----
Prop. Control of Access Line	-----○-----
Property Line	-----○-----
Easement Line	-----○-----
Slope Stake Line	-----○-----
Exist. Fence	-----○-----
Prop. Woven Wire Fence	-----○-----
Prop. Chain Link Fence	-----○-----
Exist. Road	=====
Prop. Road	=====
Guardrail	----- -----
Survey Line	----- -----
Denotes Line Equality	----- -----
Bridge	----- -----
Culvert	----- -----
Railroad	----- -----
Woods	----- -----
Exist. Telephone Pole	----- -----
Prop. Telephone Pole	----- -----
Tower Pole and Line	----- -----
Exist. Power Pole	----- -----
Prop. Power Pole	----- -----
Sanitary Sewer Line	----- -----
Water Line	----- -----
Gas Line	----- -----
Picnic Shelter	----- -----
Regeneration	----- -----
Reforestation	----- -----

INDEX OF SHEETS:

- L1 TITLE, DESCRIPTION, LOCATION & QUANTITIES
- L2 SITE PLAN.
- L3-L4 ... ROUNDABOUT PLANS
- L5-L7 ... ROLAND AVE PLAN A, B, C
- L8 ROLAND AVE DETAILS
- L9-L10... STREETSCAPE DETAILS
- L11 PAVEMENT DETAILS
- L12 PLANTING DETAILS
- L1i IRRIGATION SPECS
- L2i IRRIGATION DETAILS
- L3i-L7i.. IRRIGATION PLANS
- L8i IRRIGATION ROLAND DETAILS
- E1-E6... LIGHTING /ELECTRICAL PLANS

PREPARED BY: BK DATE: 9/2019

DATE	REVISION DESCRIPTION
5-4-20	LIGHTING PLAN & TITLE SHEET
9-16-20	REVISE ROW, LANDSCAPE & LIGHTING
3-1-21	PLAN REVIEW CORRECTIONS
5-5-21	REVISE WITH NATIVE PLANTS



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

LOCATION: SURF CITY NC

TYPE of WORK: LANDSCAPE DEVELOPMENT

COUNTY: PENDER COUNTY

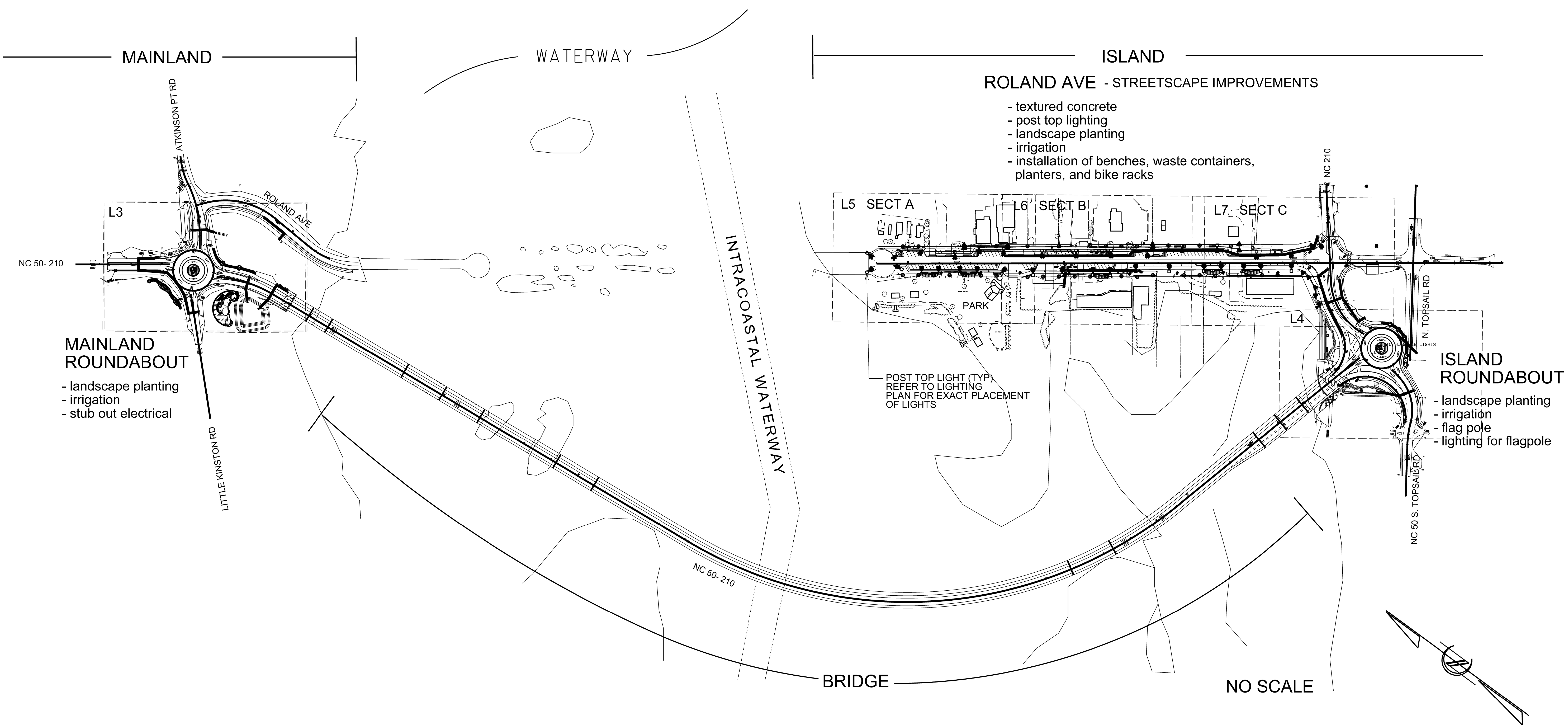
2014 American Standard for Nursery Stock

2018 NCDOT STANDARD SPECIFICATIONS

PREPARED IN THE OFFICE OF:
NCDOT- ROADSIDE ENVIRONMENTAL UNIT
LANDSCAPE DESIGN & DEVELOPMENT SECTION
1557 MAIL SERVICE CENTER
RALEIGH NC 27699 919-707-2920

\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$USERNAME\$\$\$\$\$

PROJECT: B-4929(L) SURF CITY NC



ROLAND AVE - STREETScape IMPROVEMENTS

- textured concrete
- post top lighting
- landscape planting
- irrigation
- installation of benches, waste containers, planters, and bike racks

MAINLAND ROUNDABOUT

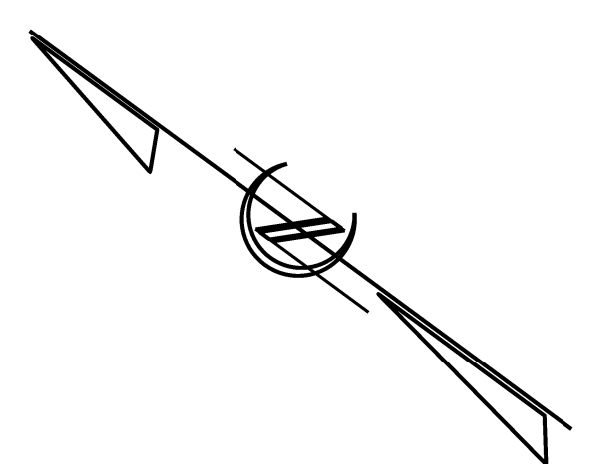
- landscape planting
- irrigation
- stub out electrical

ISLAND ROUNDABOUT

- landscape planting
- irrigation
- flag pole
- lighting for flagpole

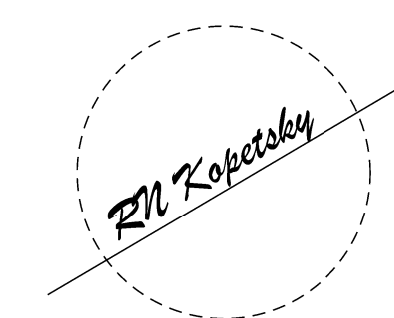
POST TOP LIGHT (TYP)
REFER TO LIGHTING
PLAN FOR EXACT PLACEMENT
OF LIGHTS

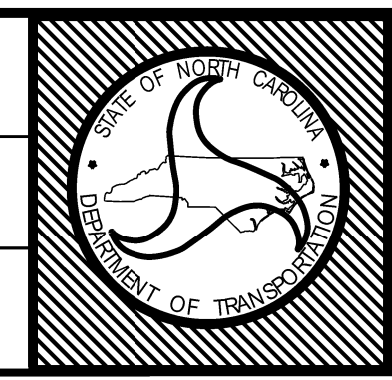
NO SCALE



NCDOT - Roadside Environmental Unit
Aesthetic Engineering Section
1557 Mail Service Center Raleigh NC 27699-1557
ph: 919-707-2920 fax: 919-715-2554
<https://www.ncdot.gov/initiatives-policies/environmental/roadside-beautification>

**B-4929(L) / Roland Ave
Landscape Development Plan
Surf City NC**



sheet description:	prel. design date :	Aug/2019	Landscape Enhancement		T.I.P. #	B-4929(L)	
	checked by & date :				WBS #	40233.3.2	
	final design date :		Site Plan		FED I.D. #		
				sheet no :	L2	total sheet no :	

ROUNDAABOUT PLANTING DETAIL

5- 'DARLINGTON' LIVE OAK (LIMB UP)

5- DWF YAUPON HOLLY

MULCHED PLANT BED

34- PRAIRIE DROPSEED (2' O.C.)

RIVER ROCK

RIVER ROCK

36- PRAIRIE DROPSEED (2' O.C.)

5- DWF YAUPON HOLLY

PLANTING AREA

ADD 40 CY OF TOPSOIL TO PLANTING AREA (MOUND UP TO 16" UNDER TREES)

ADD 4" OF TOPSOIL TO EACH PLANTING AREA (UNLESS OTHERWISE NOTED)

25- DON'S DWARF WAX MYRTLE (5' O.C.)

2- 'DARLINGTON' LIVE OAK (LIMB UP)

5' W PLANTBED PLACE ADJACENT TO SIDEWALK

ENTRANCE SIGN (BY OTHERS)

27- PRAIRIE DROPSEED (30" O.C.)

21- 'RUBY SPICE' CLETHRA (5' O.C.)

8 - E. RED CEDAR

PROVIDE ELECTRICAL AND WATER SERVICE PER TOWN'S REQUEST (APPROX. LOCATION)

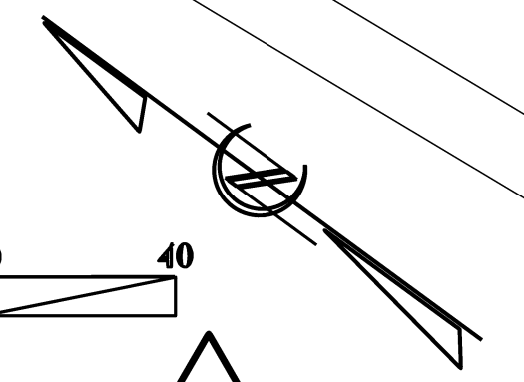
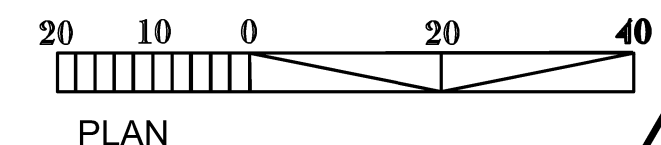
13- 'HENRY'S GARNET' SWEETSPIRE (5' O.C.)

295- GOLDSTURM BLACK-EYED SUSAN (18" O.C.)

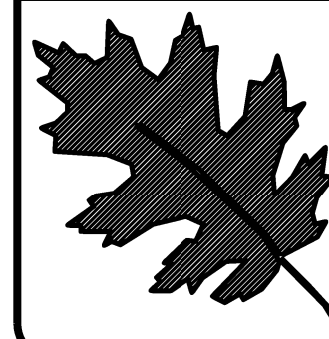
6 - E. RED CEDAR

5- 'DARLINGTON' LIVE OAK

BASIN

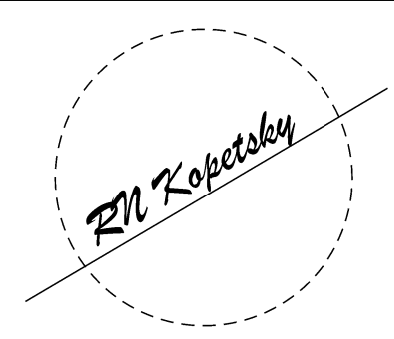


\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$USER\$\$\$\$\$



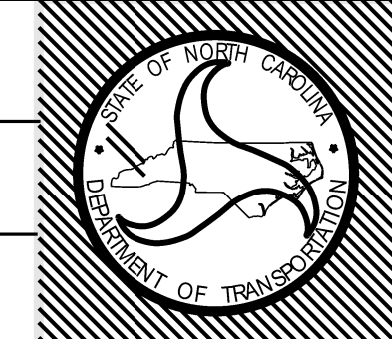
NCDOT - Roadside Environmental Unit
Aesthetic Engineering Section
1557 Mail Service Center Raleigh NC 27699-1557
ph: 919-707-2920 fax: 919-715-2554
<https://www.ncdot.gov/initiatives-policies/environmental/roadside-beautification>

B-4929(L) / Roland Ave
Landscape Development Plan
Surf City NC



prel. design date :	Sept/2019
checked by & date :	
final design date :	

Landscape Plan
Mainland Roundabout



T.I.P. #	B-4929(L)
WBS #	40233.3.2
FED I.D. #	
sheet no. :	total sheet no. :
L3	

MATCH SHEET L7

SPOT LGTS. (SEE LIGHTING PLAN)

NAUTICAL FLAG POLE (POSITIONED 90° TO BRIDGE)

ISLAND PLANTING DETAIL

34- PRAIRIE DROPSEED (2' O.C.)

8- ADAM'S NEEDLE (YUCCA)

36- PRAIRIE DROPSEED (2' O.C.)

MULCH PLANT BED (CURB TO CURB)

20- 'POWWOW WILD BERRY' CONEFLOWER (2' O.C.)

21- 'RUBY SPICE' CLETHRA (5' O.C.)

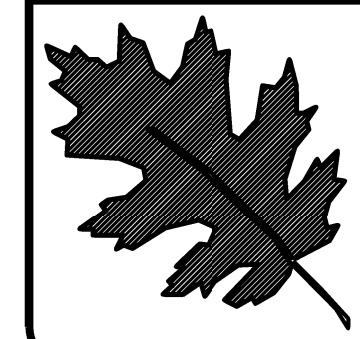
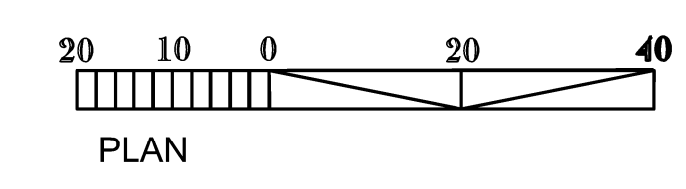
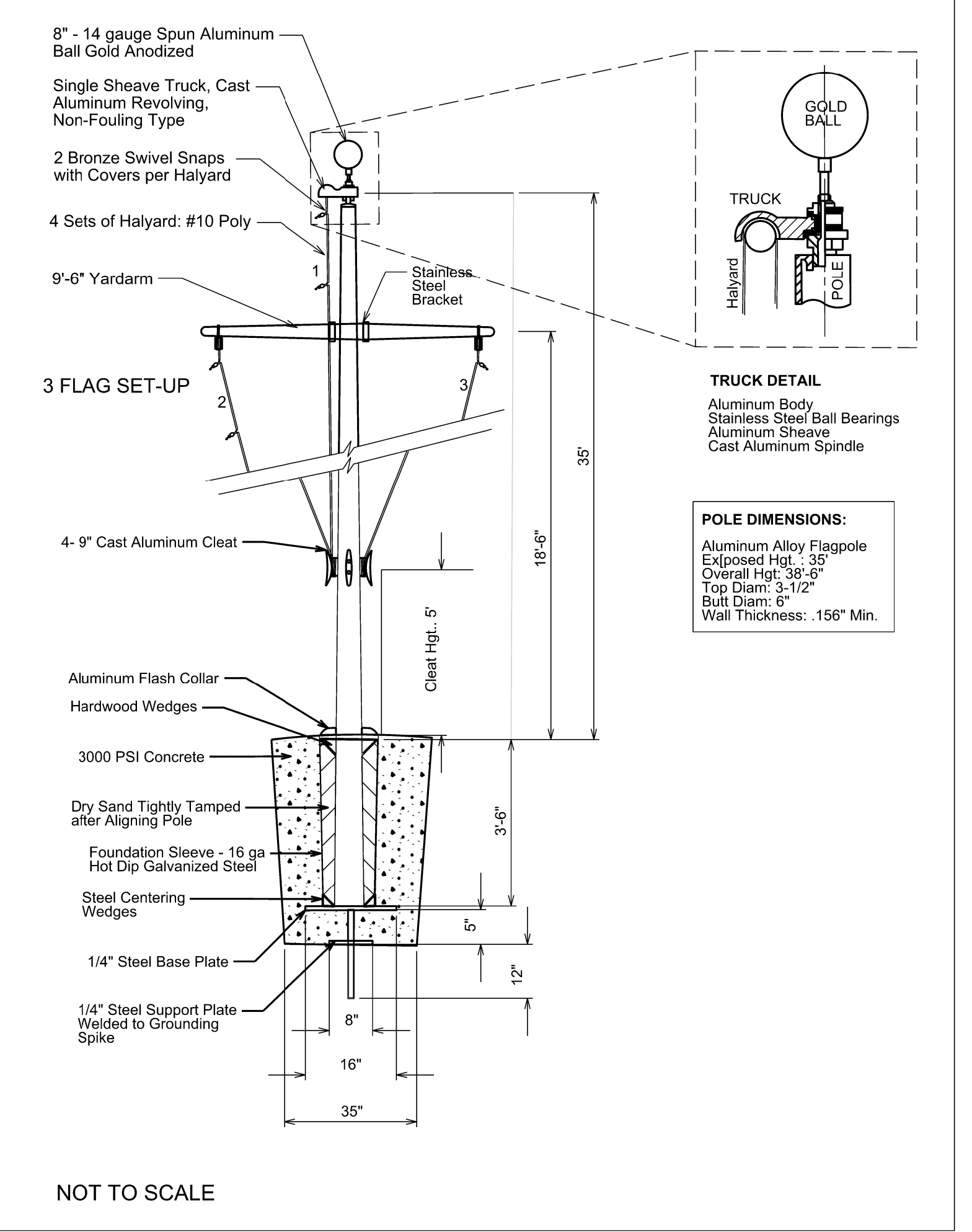
6- 'DARLINGTON' LIVE OAK (LIMB UP)

PLANTING AREA

ADD 40 CY OF TOPSOIL TO PLANTING AREA (MOUND UP TO 16"); MULCH PLANTING AND FLAG POLE AREAS.

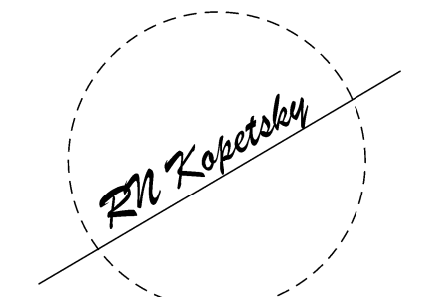
ADD 4" OF TOPSOIL TO EACH PLANTING AREA (UNLESS OTHERWISE NOTED)

35' NAUTICAL FLAG POLE DETAIL



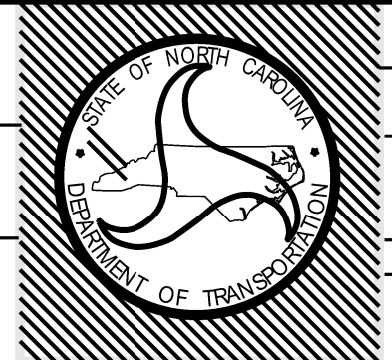
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B-4929(L) / Roland Ave
Landscape Development Plan
Surf City NC

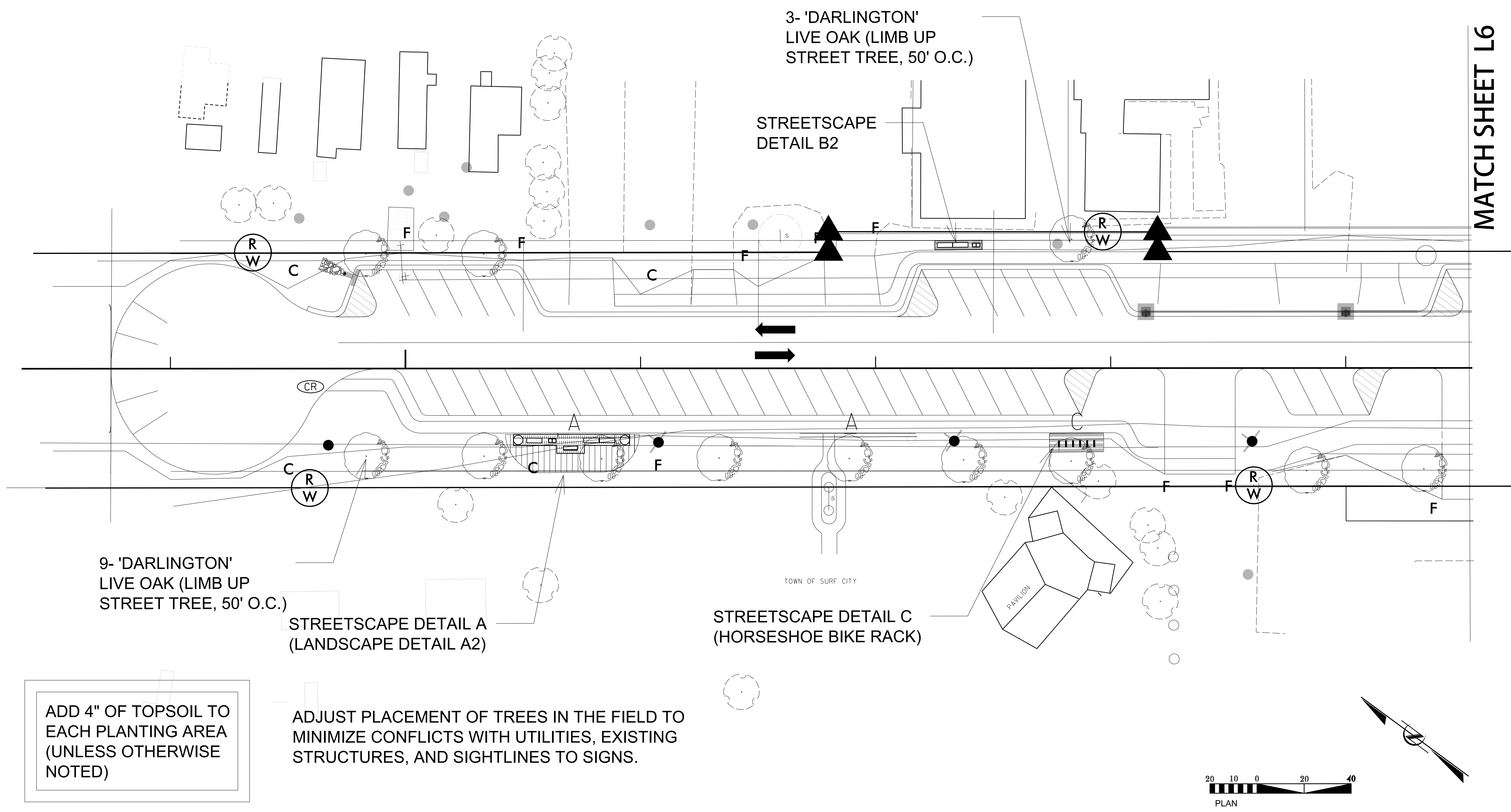


sheet description:
pref. design date : Sept/2019
checked by & date :
final design date :

Landscape Plan
Island Roundabout



T.I.P. # B-4929(L)
WBS # 40233.3.2
FED.I.D. #
sheet no : total sheet no :
L4

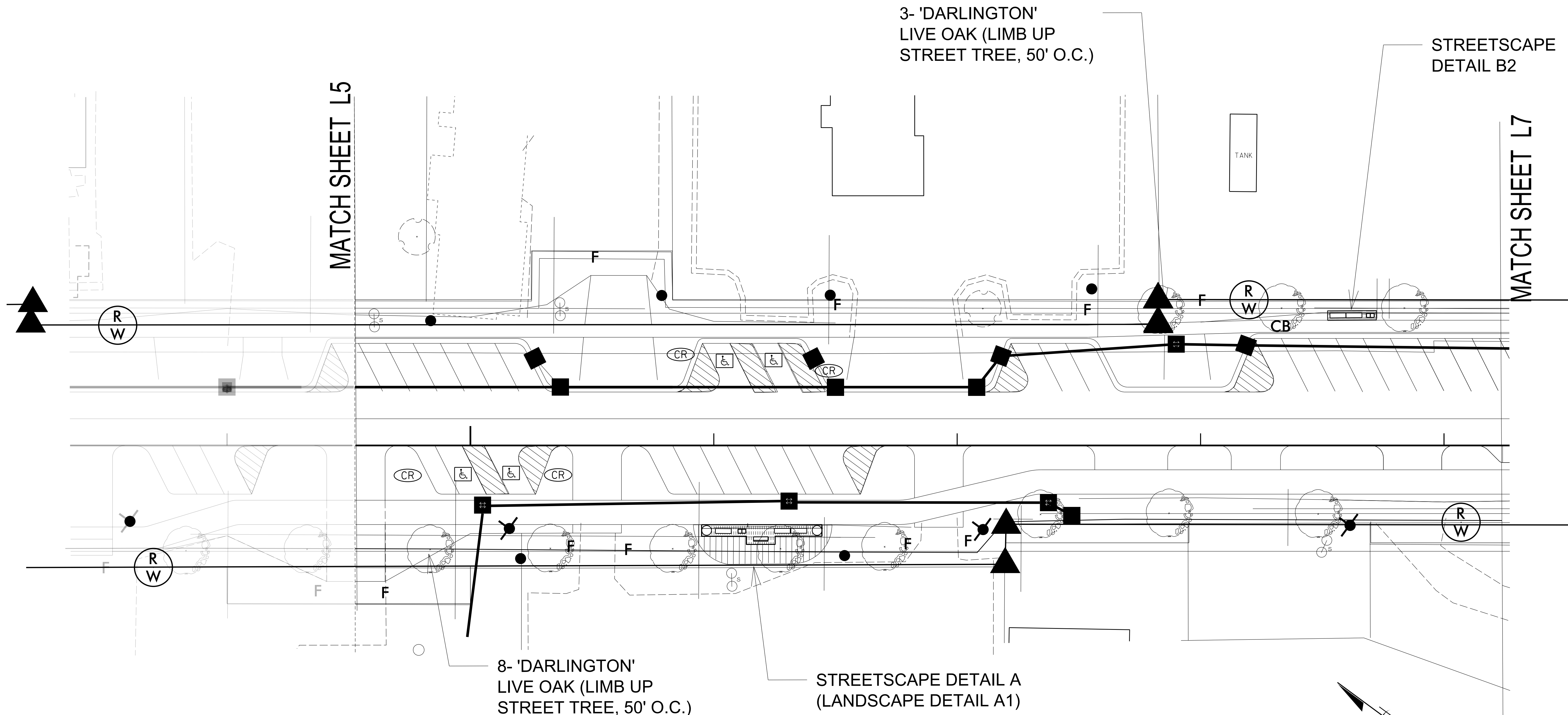


MATCH SHEET L5

MATCH SHEET L7

3- 'DARLINGTON'
LIVE OAK (LIMB UP
STREET TREE, 50' O.C.)

STREETSCAPE
DETAIL B2

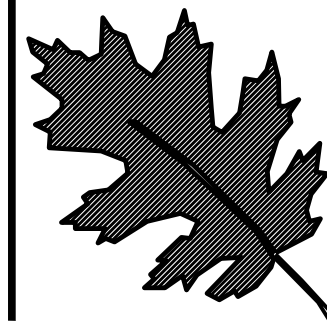
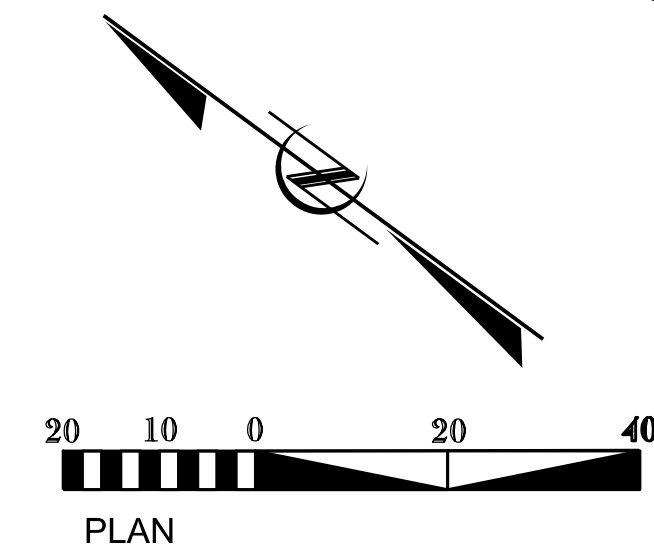


8- 'DARLINGTON'
LIVE OAK (LIMB UP
STREET TREE, 50' O.C.)

STREETSCAPE DETAIL A
(LANDSCAPE DETAIL A1)

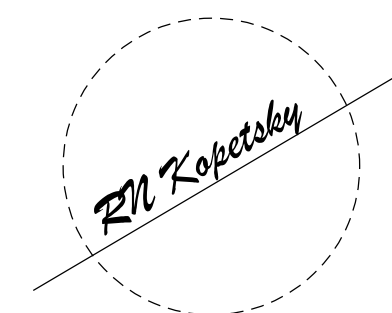
ADD 4" OF TOPSOIL TO
EACH PLANTING AREA
(UNLESS OTHERWISE
NOTED)

ADJUST PLACEMENT OF TREES IN THE FIELD TO
MINIMIZE CONFLICTS WITH UTILITIES, EXISTING
STRUCTURES, AND SIGHTLINES TO SIGNS.



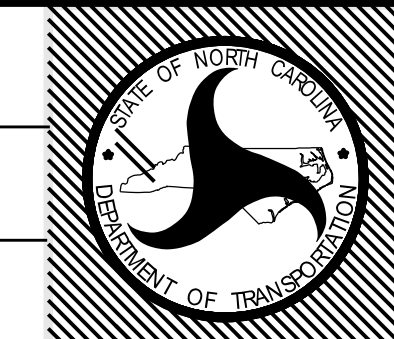
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B-4929(L) / Roland Ave
 Landscape Development Plan
 Surf City NC



sheet description:	prel. design date : Sept/2019
	checked by & date :
	final design date :

Landscape Plan
 ROLAND AVE SECT. B

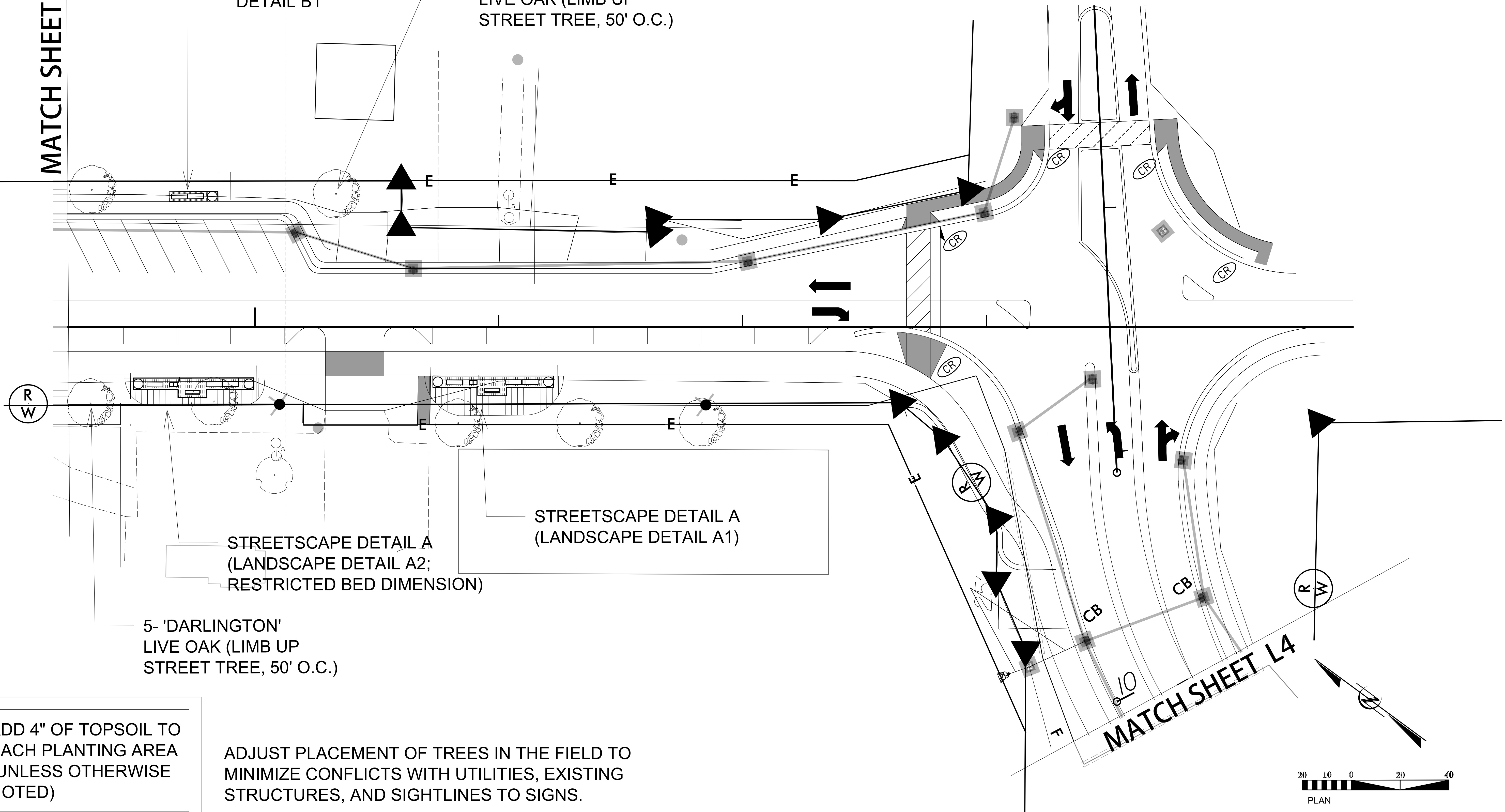


T.I.P. # B-4929(L)
 WBS # 40233.3.2
 FED I.D. #
 sheet no : total sheet no :
L6

MATCH SHEET L6

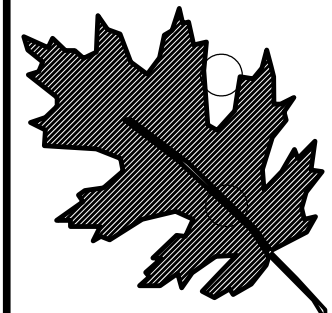
STREETSCAPE
DETAIL B1

2- 'DARLINGTON'
LIVE OAK (LIMB UP
STREET TREE, 50' O.C.)



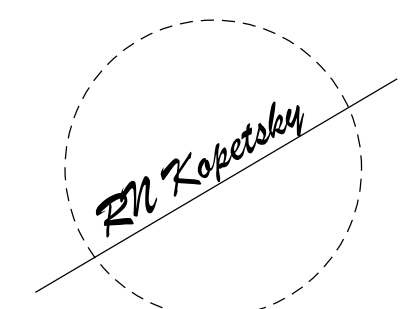
ADD 4" OF TOPSOIL TO
EACH PLANTING AREA
(UNLESS OTHERWISE
NOTED)

ADJUST PLACEMENT OF TREES IN THE FIELD TO
MINIMIZE CONFLICTS WITH UTILITIES, EXISTING
STRUCTURES, AND SIGHTLINES TO SIGNS.



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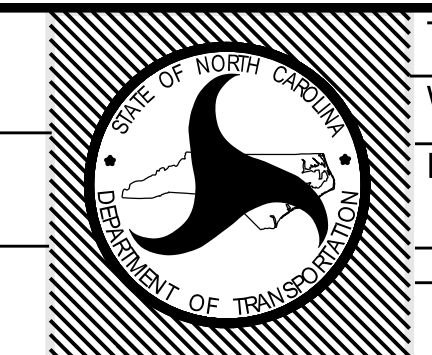
B-4929(L) / Roland Ave
Landscape Development Plan
Surf City NC



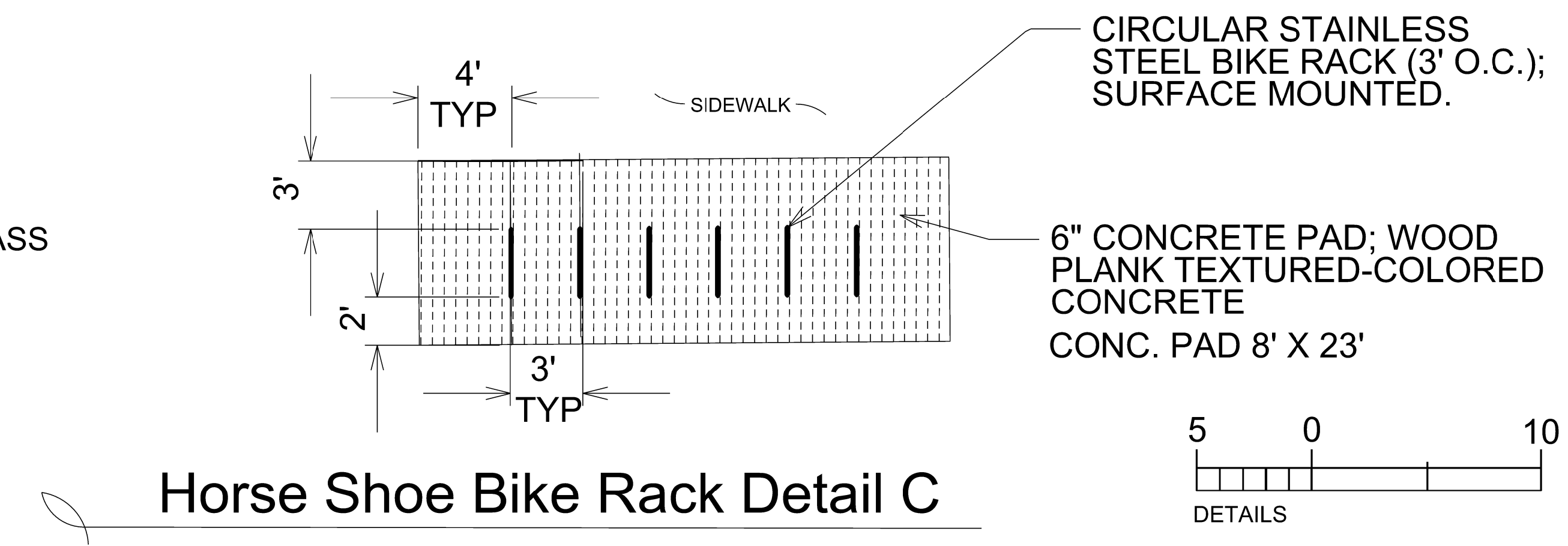
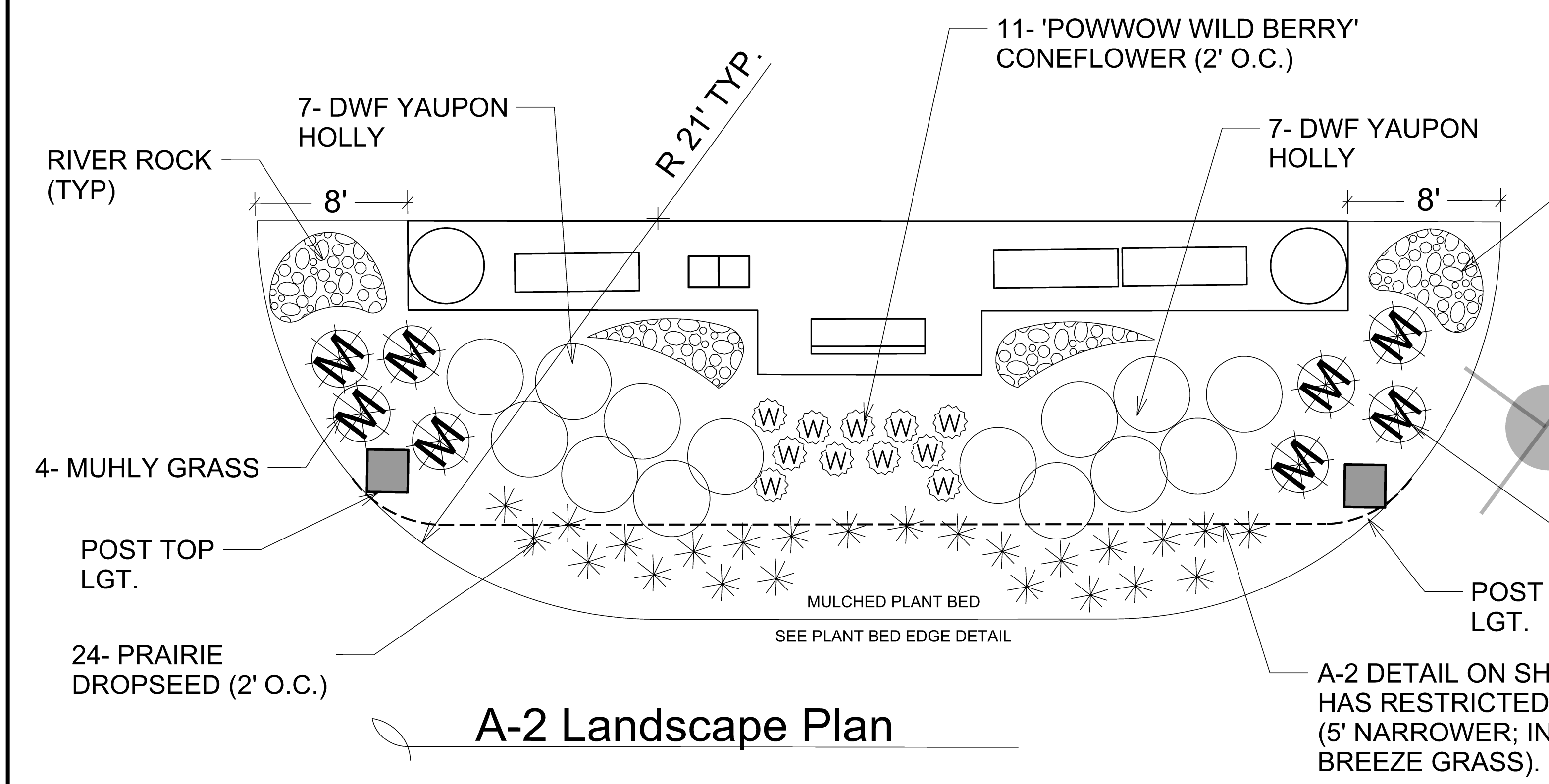
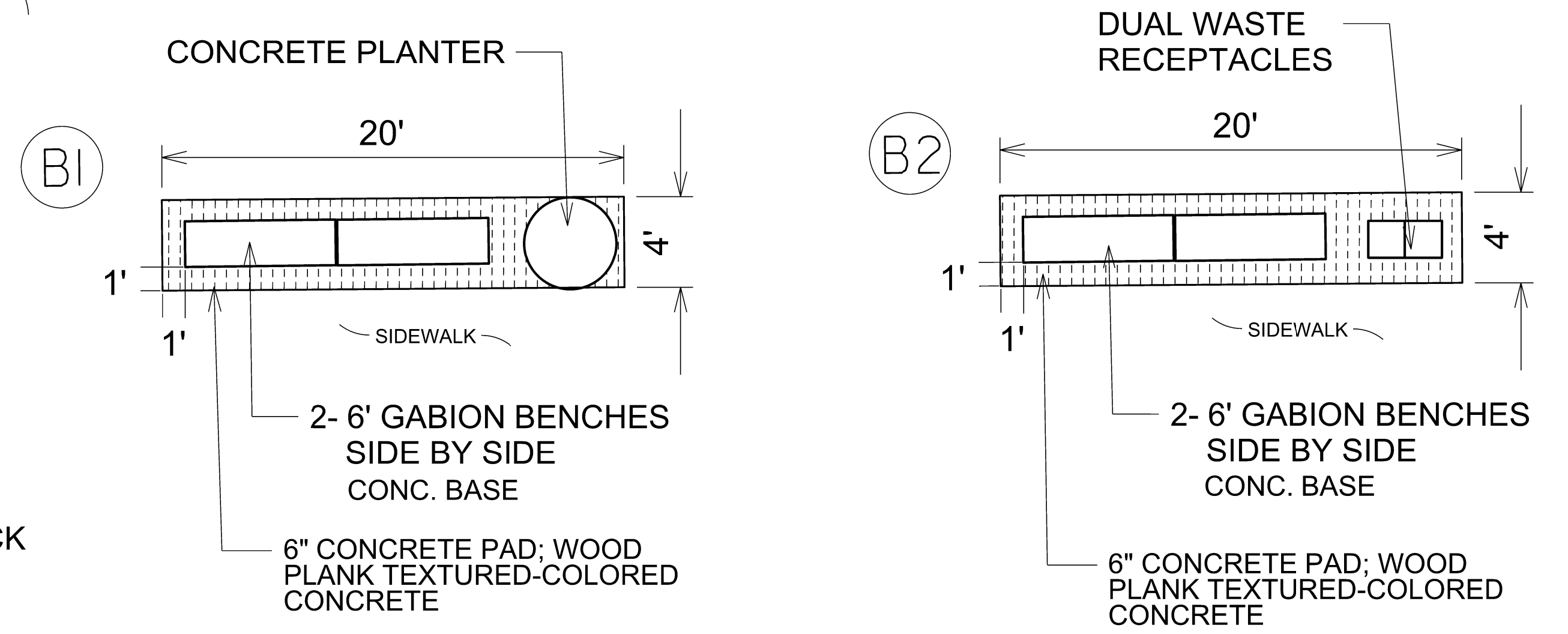
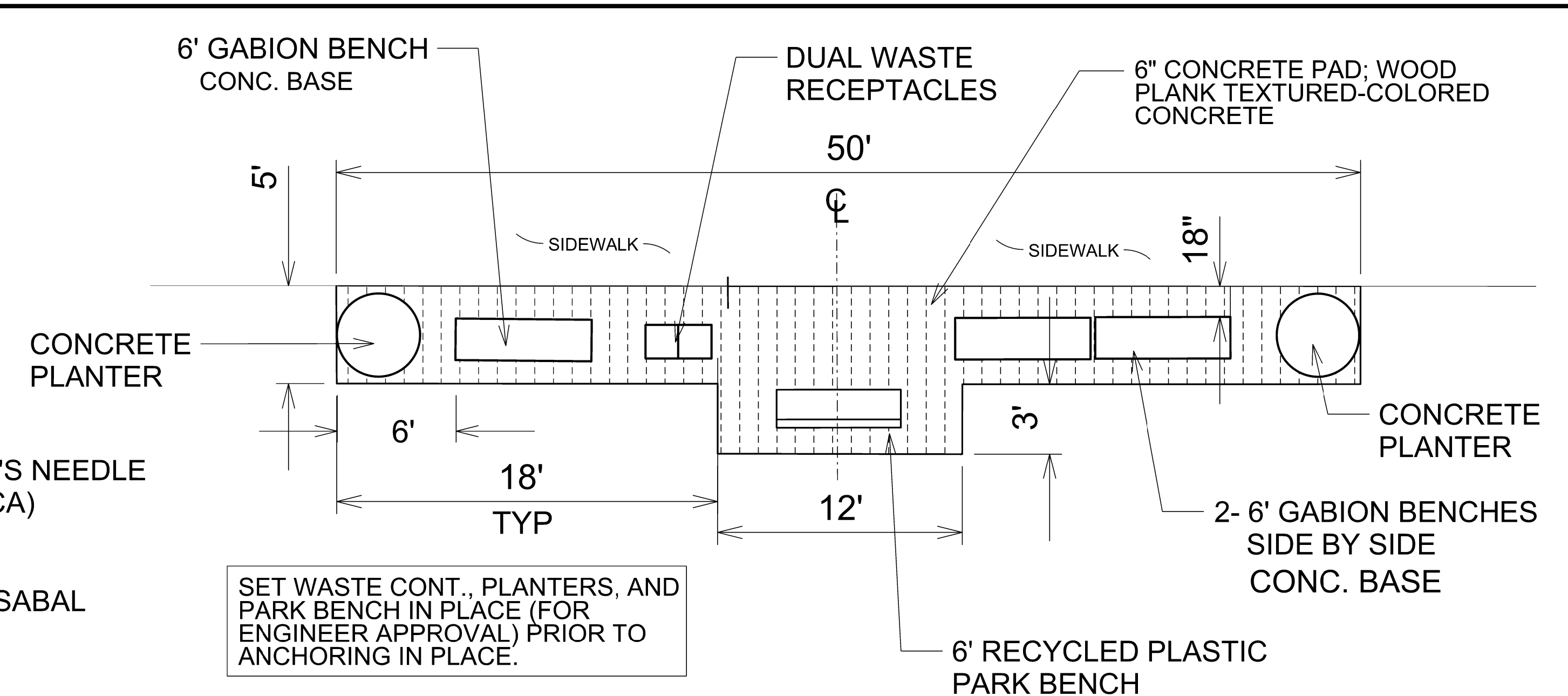
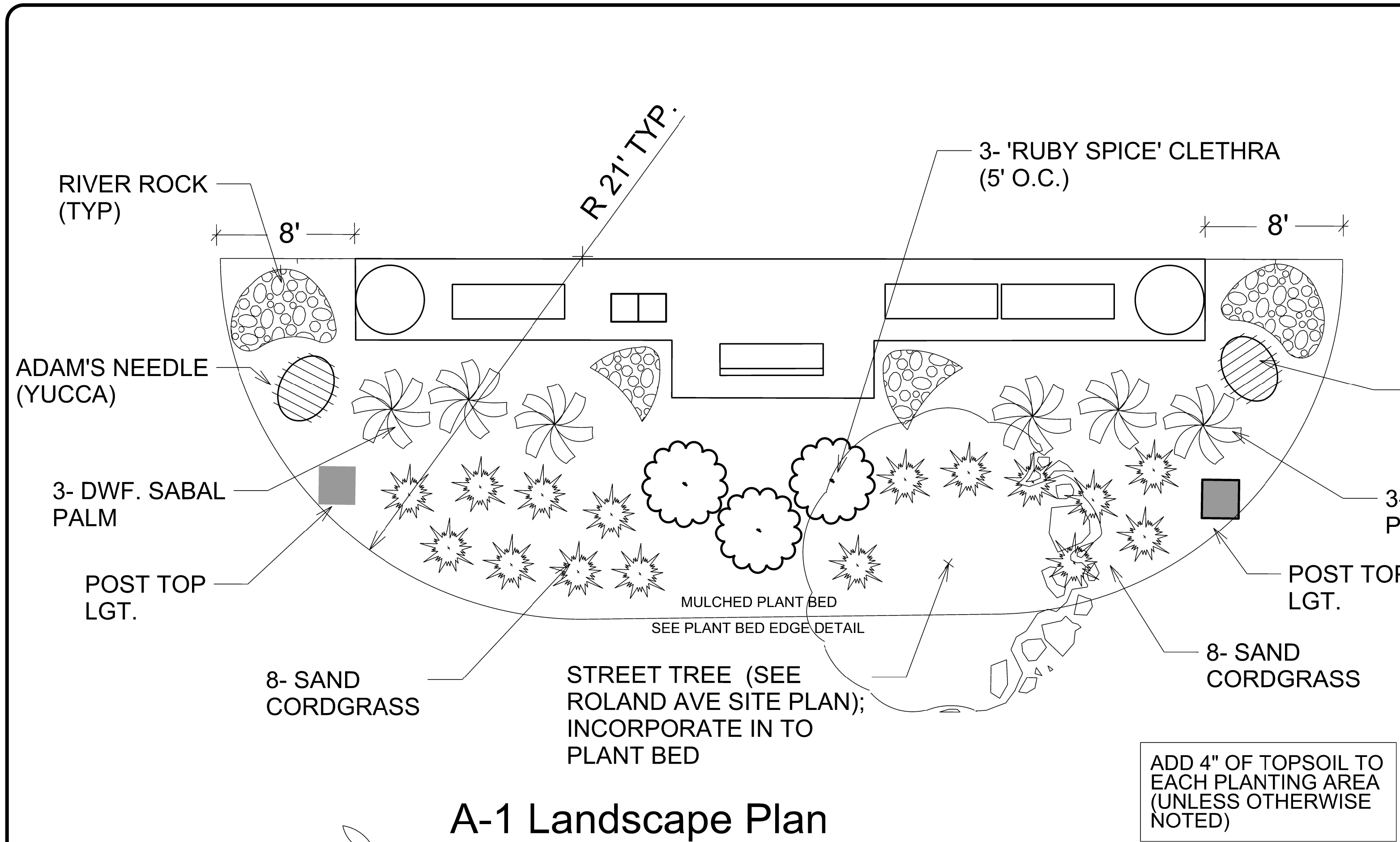
sheet description:

pref. design date : Sept/2019
checked by & date :
final design date :

Landscape Plan
ROLAND AVE SECT. C



T.I.P. # B-4929(L)
WBS # 40233.3.2
FED I.D. #
sheet no : total sheet no :
L7

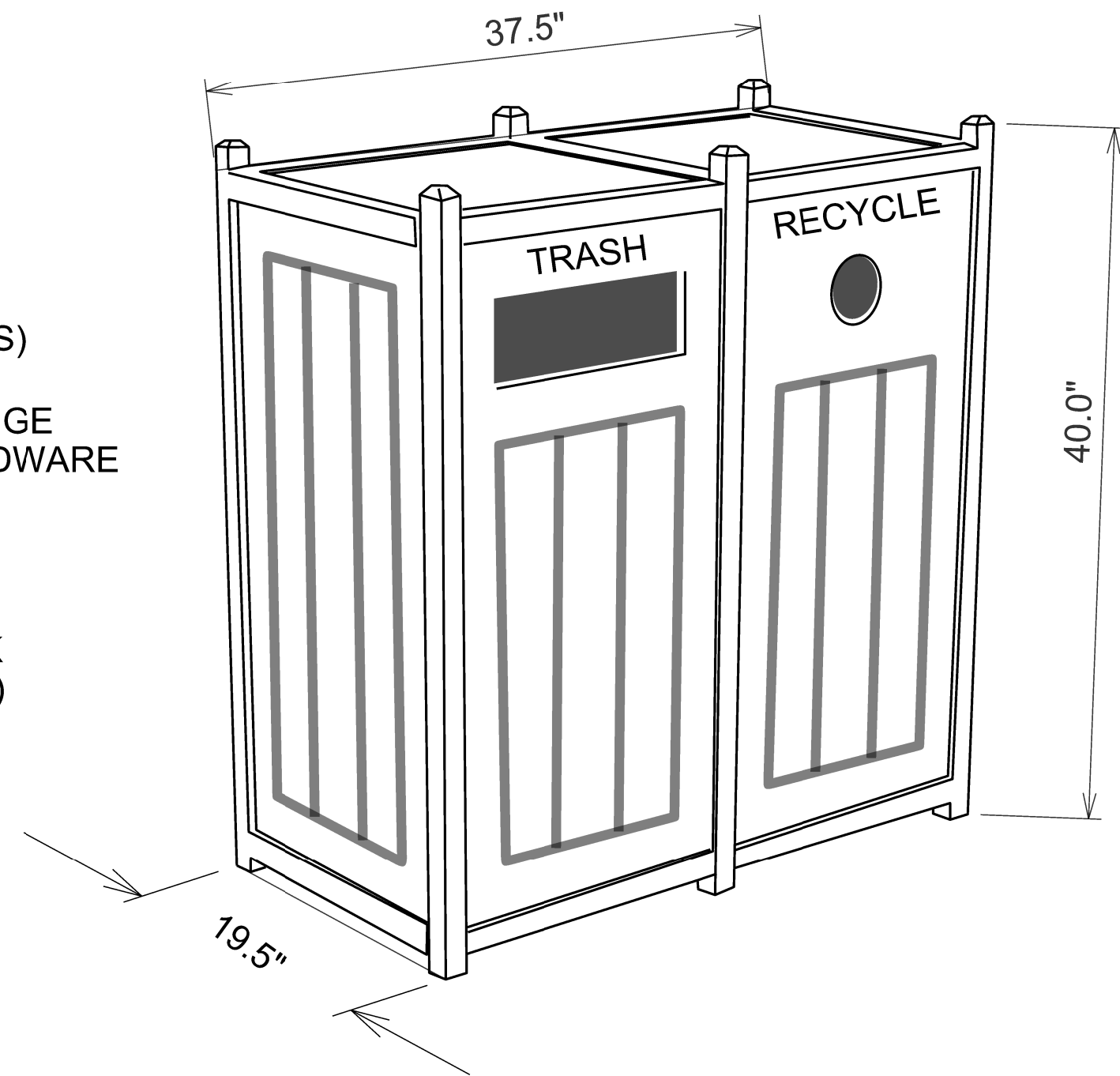


EXTERIOR GRADE
WATERPROOF
RECYCLED PLASTIC;
BLACK TRIM, GREY
BEADED SIDING
(MATCH BENCH COLORS)

INDUSTRIAL GRADE HINGE
AND DOOR LATCH HARDWARE

33 GAL. CAPACITY
EACH SIDE

MATCHING RIGID BLACK
PLASTIC LINER (INSERT)



SURFACE MOUNT EACH CORNER FOOT;
SUBMIT ATTACHMENT HARDWARE
FOR APPROVAL.

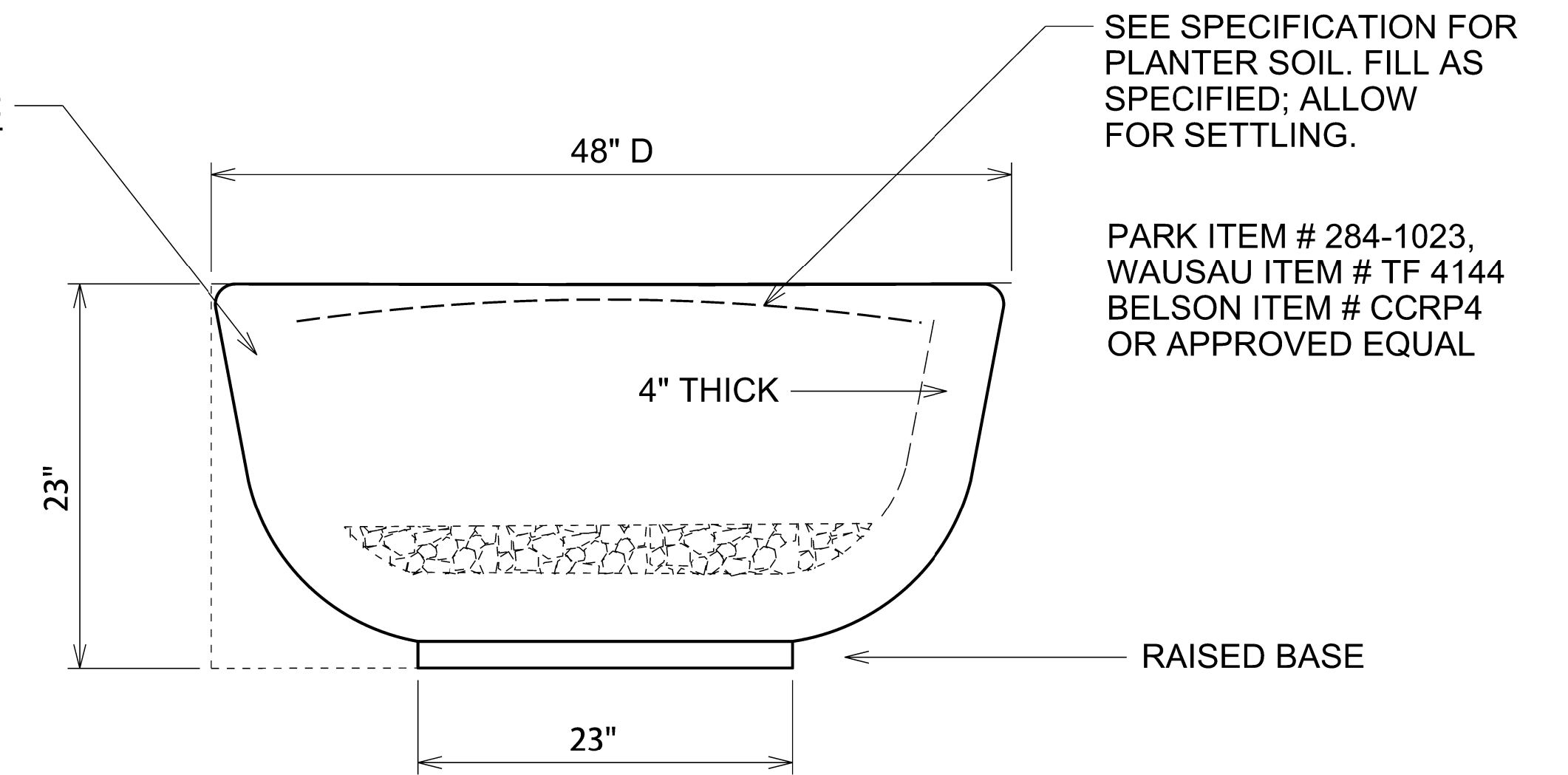
TREE TOP PRODUCTS # 4ZK4964-GY/BK,
KIRBY BUILT # KWR-63
TRASH CANS WAREHOUSE
N4B-19201926DP1
OR APPROVED EQUAL

PRECAST CONCRETE BOWL;
NATURAL LIGHT SANDBLAST
FINISH

WGT. APPROX. 1200 LBS.

TYPE 3 PORTLAND CEMENT
3/8" STEEL REBAR SUPPORT
ASTM C31

PLACE 2" OF CLEAN GRAVEL
IN BASE OF PLANTER FOR
DRAINAGE



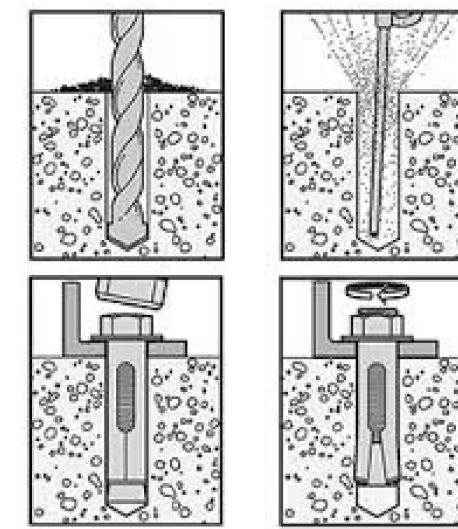
DUAL WASTE RECEPTACLES

NTS

48" CONCRETE PLANTER

NTS

TYPICAL ANCHOR BOLT ATTACHMENT

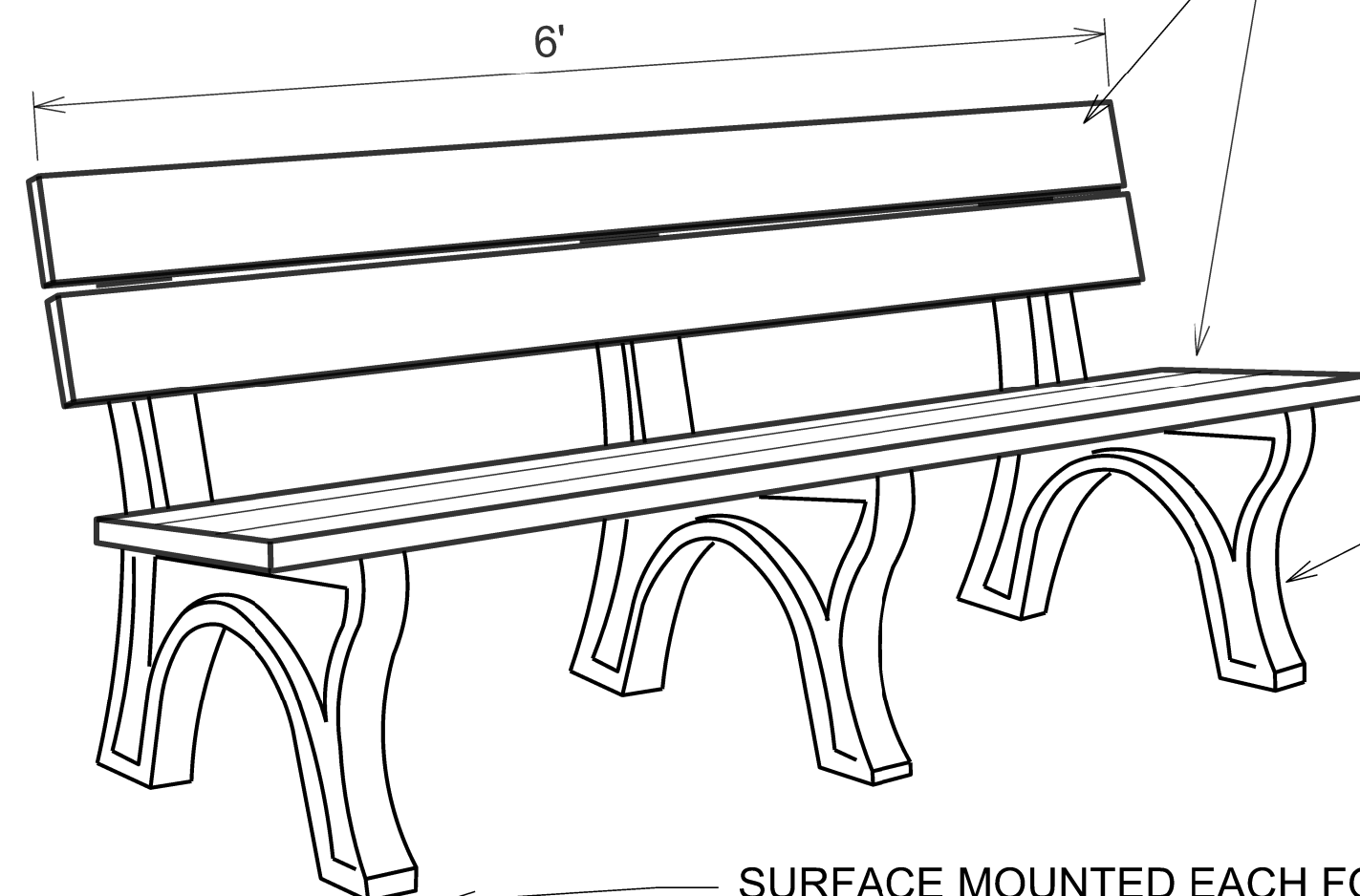


SUBMIT ATTACHMENT PROCESS
AND PRODUCT TO ENGINEER FOR
APPROVAL PRIOR TO INSTALLATION.

THE BENCH FACTORY SKU #TBN-71
OR, BELSON ITEM# PL6-P,
KIRBY BUILT SKU #KBN-71
OR APPROVED EQUAL

INSTALL PER MANUFACTURER
INSTRUCTIONS AND ACCORDING
TO PLANS/SPECS.

RECYCLED PLASTIC WOOD
SLATS; GREY PLANK COLOR



RECYCLED PLASTIC WOOD;
BLACK STRUCTURAL BASE.

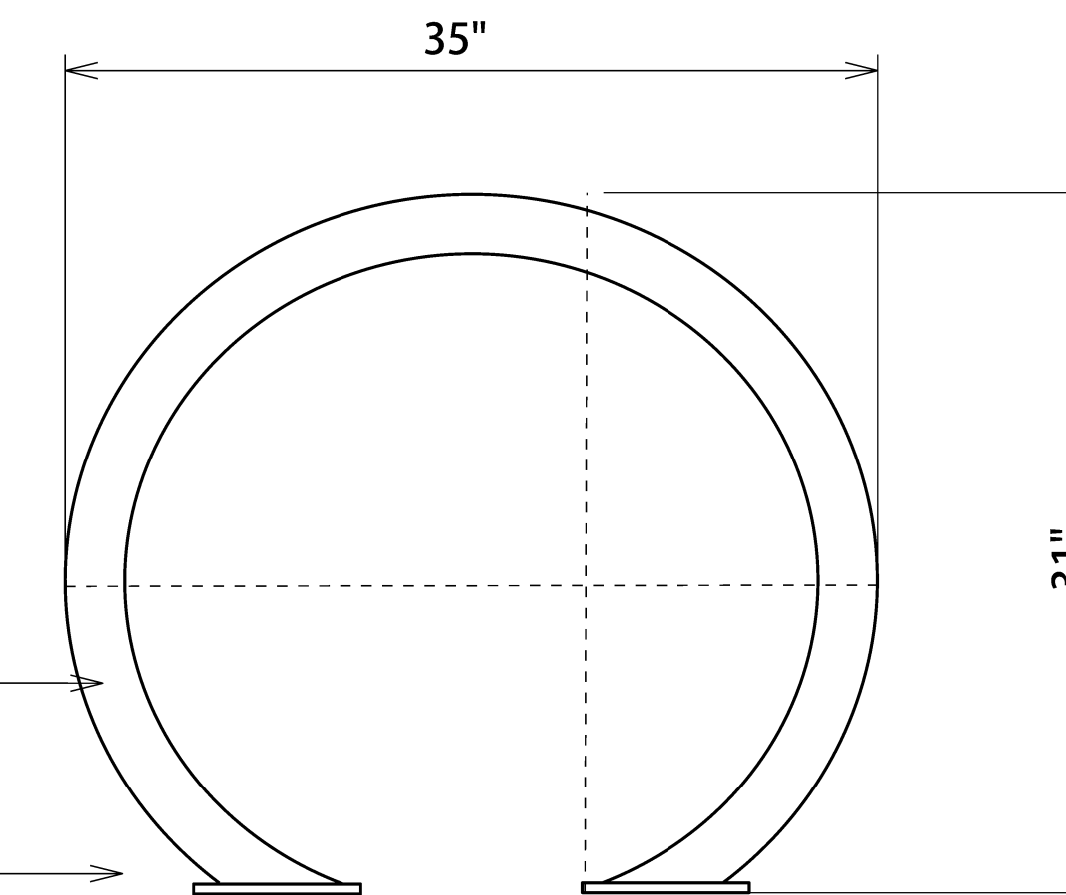
SURFACE MOUNTED EACH FOOT;
SUBMIT ATTACHMENT HARDWARE
FOR APPROVAL.

6' RECYCLE PLASTIC PARK BENCH

NTS

2-3/8" STAINLESS STEEL
ROUND TUBING

SURFACE ANCHOR
(TO CONCRETE)



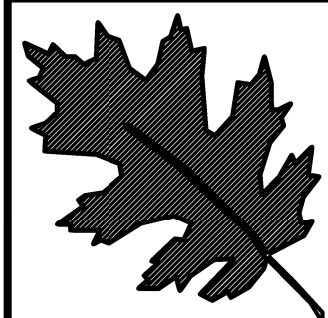
BELSON ITEM # CBBR-2CR-SS,
PARK ITEM # 509-2043,
ULINE ITEM # H-6572
OR APPROVED EQUAL

INSTALL PER MANUFACTURER
INSTRUCTIONS AND ACCORDING
TO PLANS/SPECS.

SUBMITTED SAMPLES OF FINISH
OPTIONS.

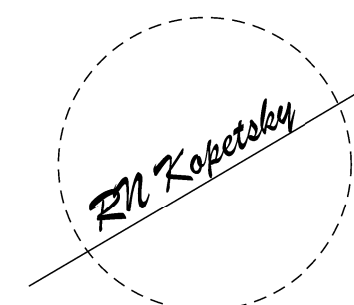
HORSESHOE BIKE RACK

NTS



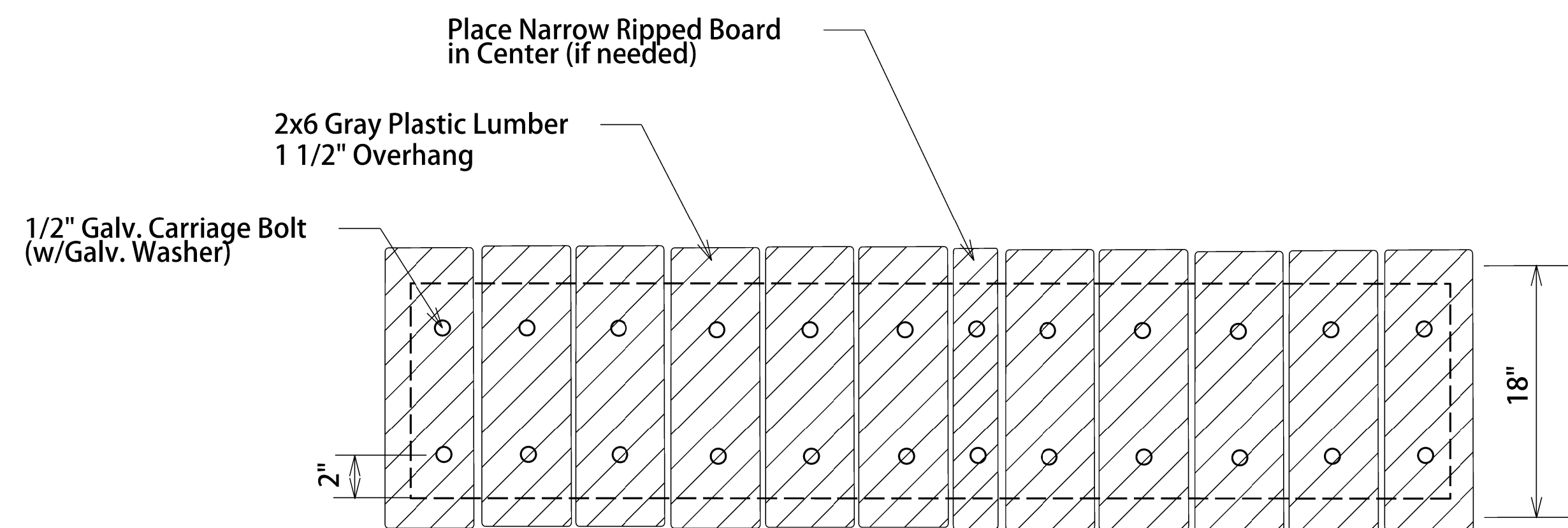
NCDOT - Roadside Environmental Unit
Aesthetic Engineering Section
1557 Mail Service Center Raleigh NC 27699-1557
ph: 919-707-2920 fax: 919-715-2554
<https://www.ncdot.gov/initiatives-policies/environmental/roadside-beautification>

B-4929(L) / Roland Ave
Landscape Development Plan
Surf City NC



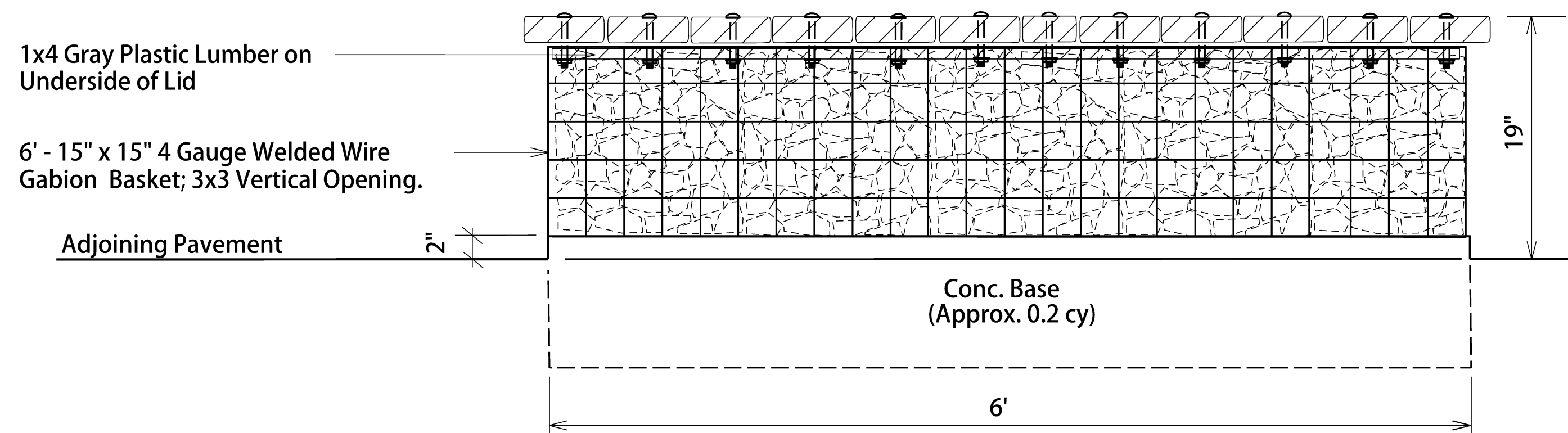
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	checked by & date:				Streetscape Details	WBS #
	final design date:				FED I.D. #	
					sheet no:	L9

6' GABION BENCH DETAIL



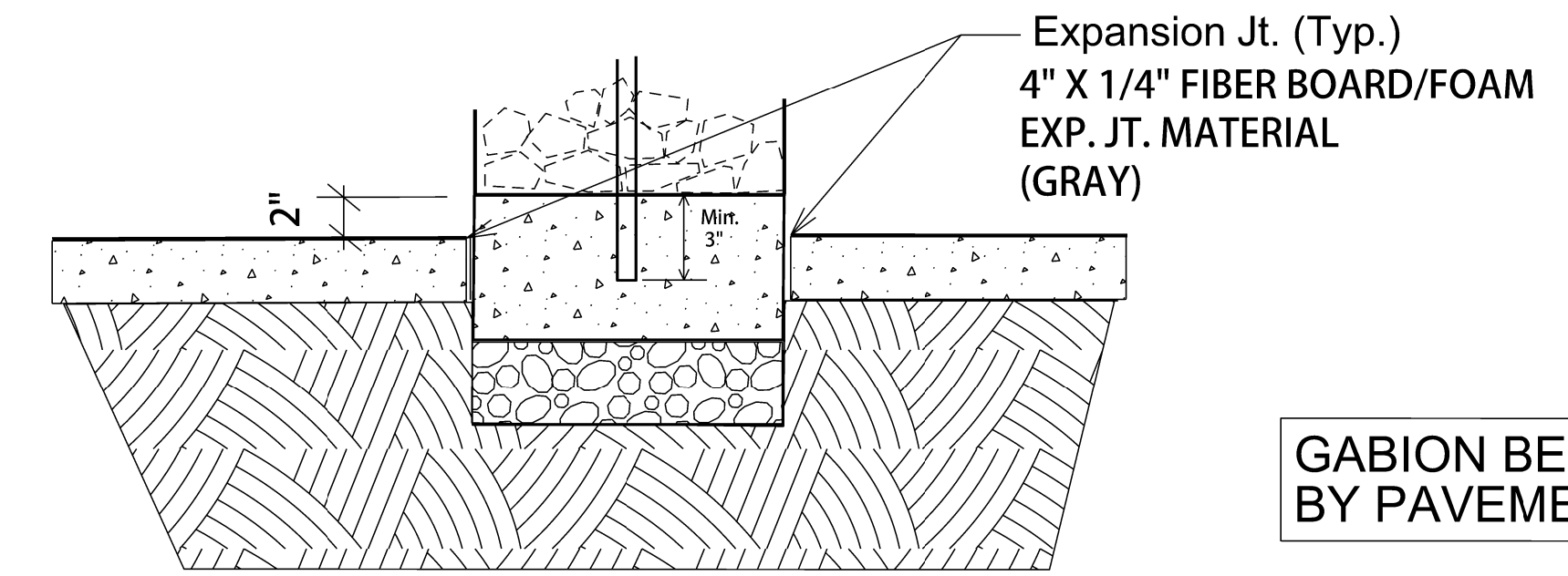
PLAN

NTS

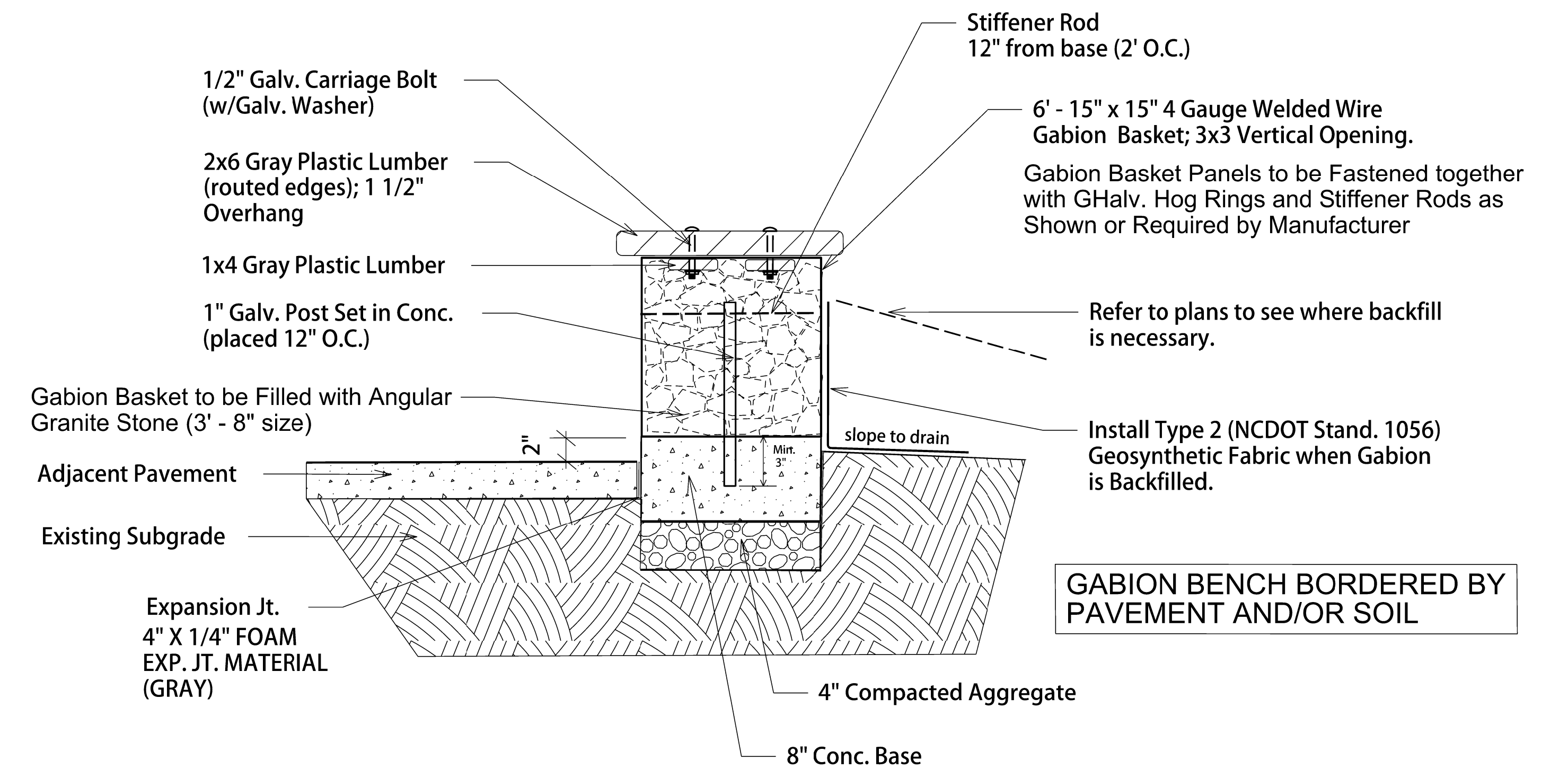


ELEVATION

NTS



GABION BENCH BORDERED BY PAVEMENT



SECTION

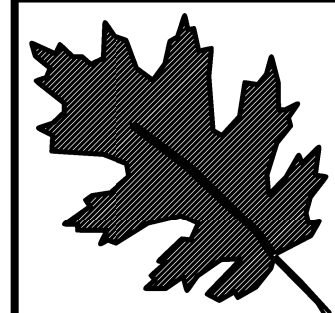
NTS

NOTES

Hand Place Stones in Basket; Use Larger Flat Stone on Outside of the Basket.

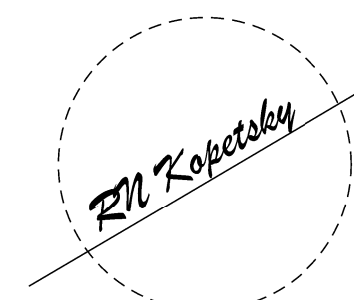
Attach Wooden Plank Seat to Gabion Lid/Top prior to Wiring Lid Closed

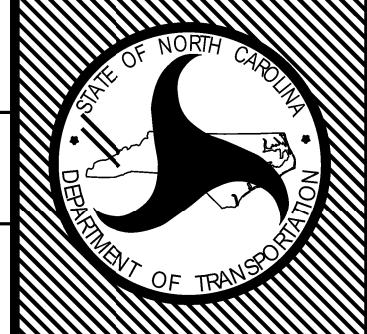
There Shall be No Sharp Edges Corners or Exposed Points

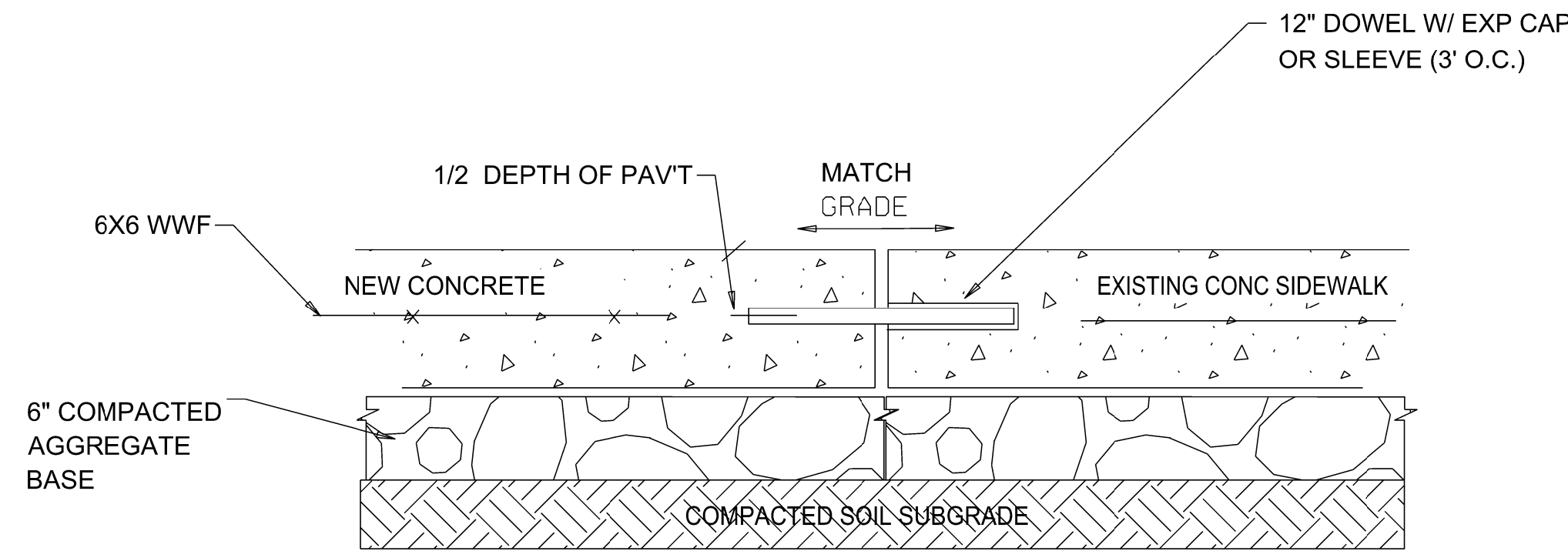


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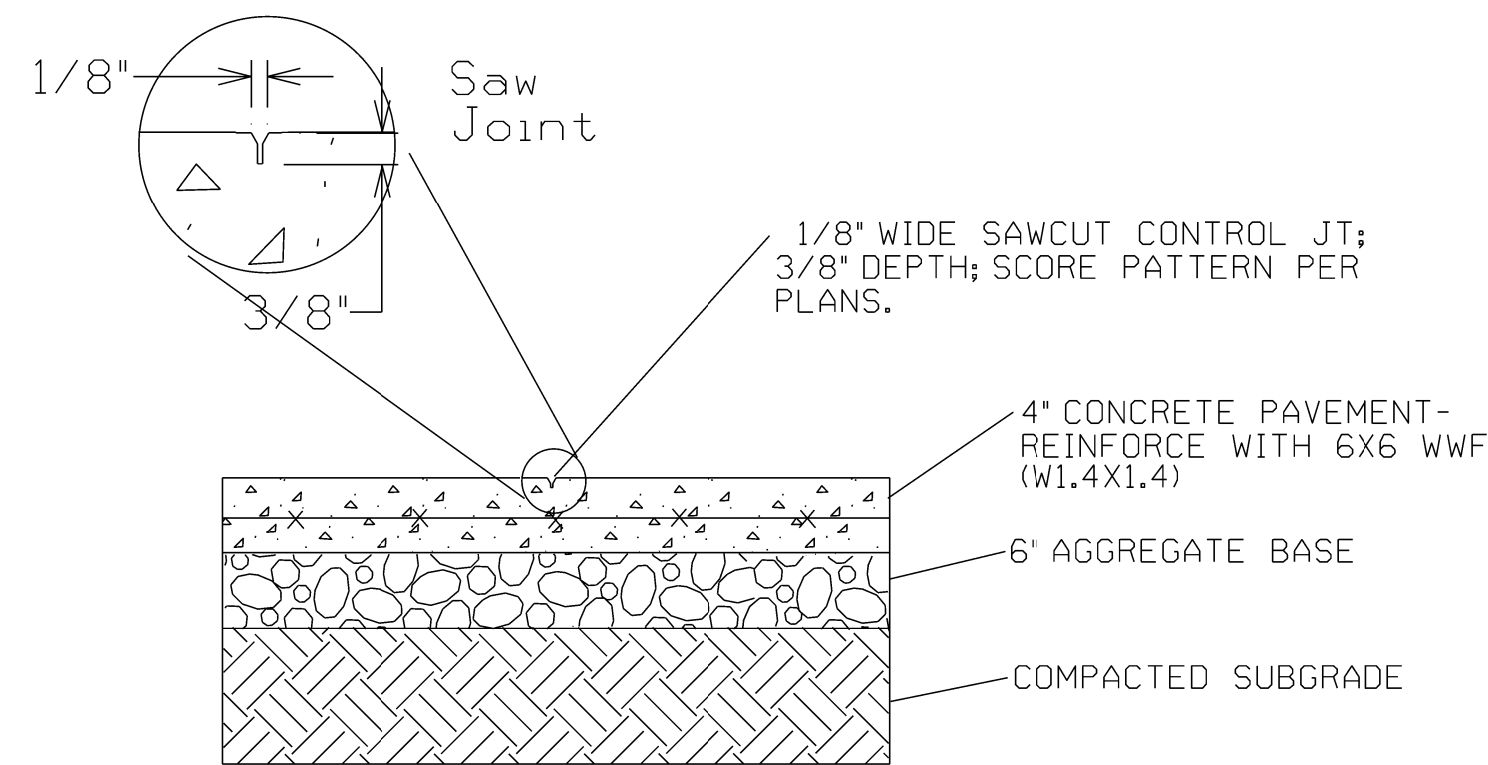


sheet description:	pref. design date :	Aug/2019	Landscape Enhancement		T.I.P. #	B-4929(L)
	checked by & date :				Streetscape Details	WBS #
	final design date :		Gabion Bench		FED I.D. #	
					sheet no :	L10



New Concrete Adjoining Old Concrete Walk

NTS



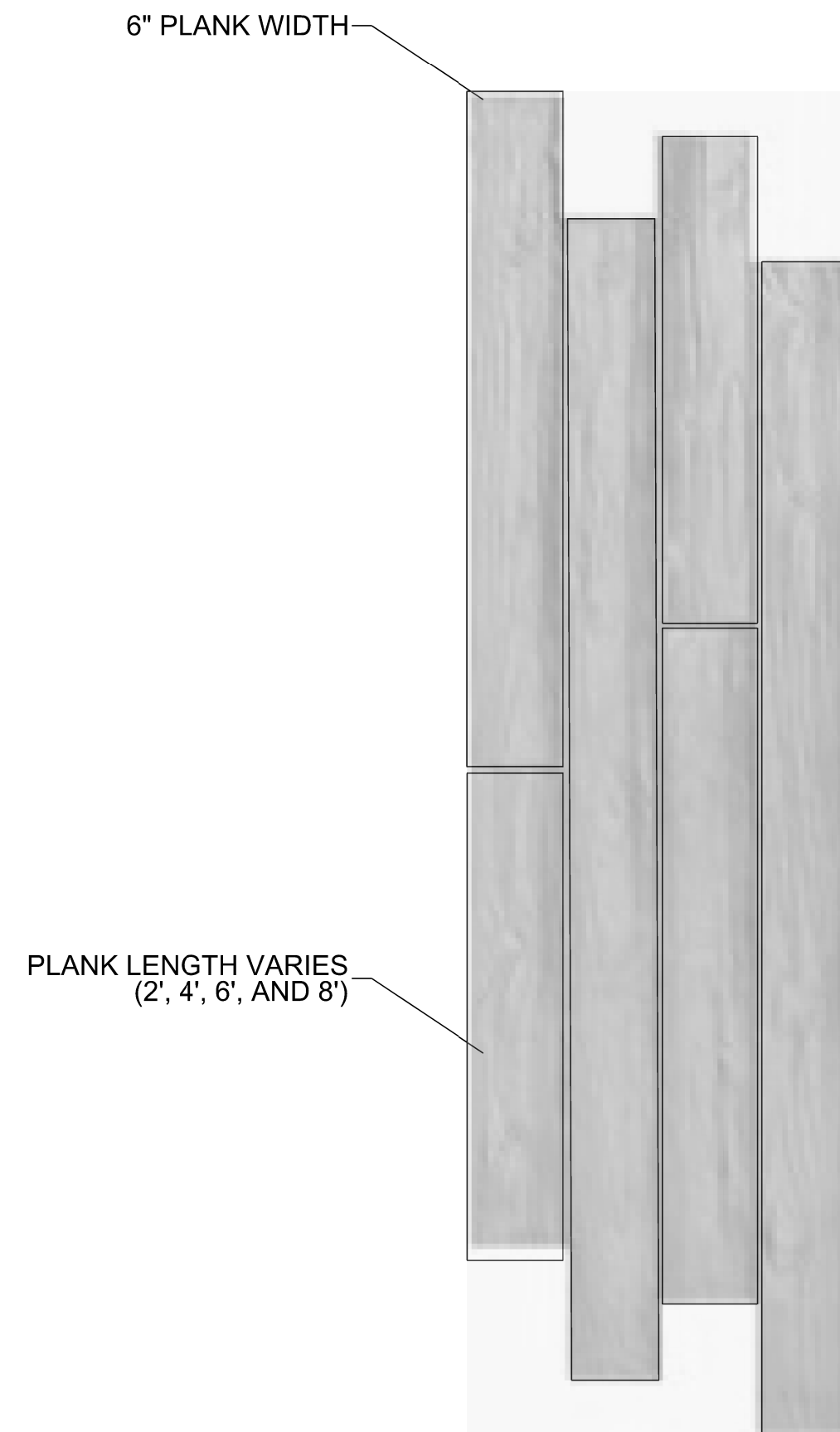
CONCRETE SIDEWALK - CONTROL JOINT

NTS

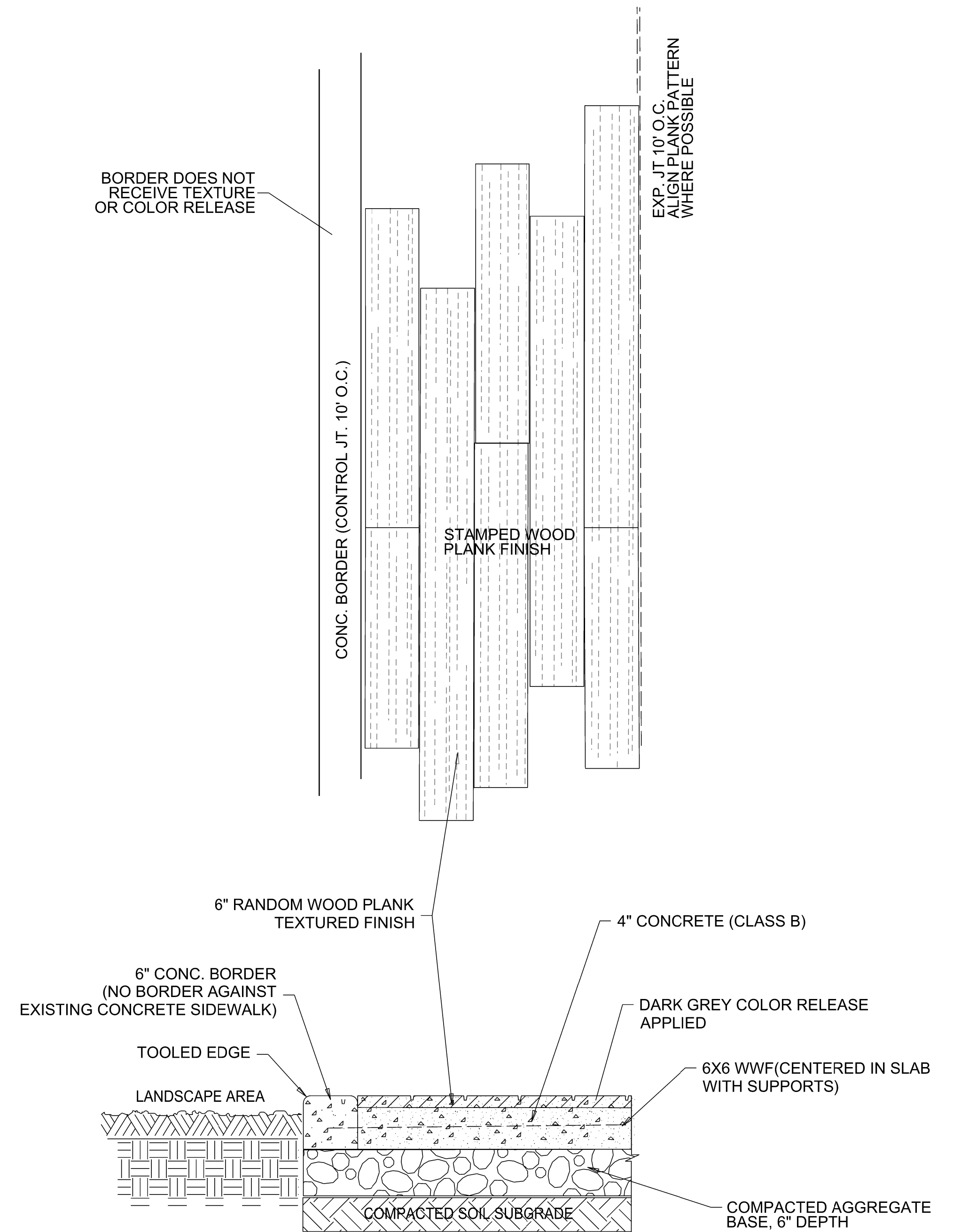
GENERAL NOTES:

- 1) REFERENCE SITE PLAN FOR BY SPECIFIC HARDSCAPE PLACEMENT.
- 2) COVER/PROTECT CONCRETE BORDER WHILE APPLYING TEXTURE AND COLOR RELEASE.
- 3) 4" THICK CONCRETE SIDEWALK; APPLY EXP. & CONTROL JTS. AS NOTED.
- 4) PROVIDE COLOR AND TEXTURE SAMPLES, FOR ENGINEER APPROVAL, PRIOR TO CONSTRUCTION.
- 5) RUN BOARD PLANK PATTERN PERPENDICULAR TO EXISTING SIDEWALK.
- 6) 8' X 8' SAMPLE AREA TO BE COMPLETED, REVIEWED, AND APPROVED (BY NCDOT) PRIOR TO COMPLETION OF WORK.

**BOARDWALK
TEXTURED CONCRETE STAMP**



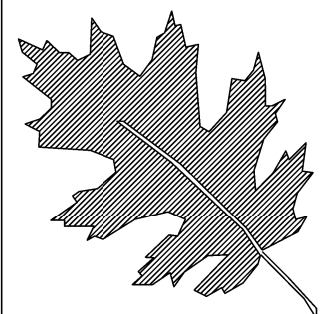
BORDER DOES NOT RECEIVE TEXTURE OR COLOR RELEASE



CONCRETE PATTERN DETAIL

NTS

\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$USER\$\$\$\$\$



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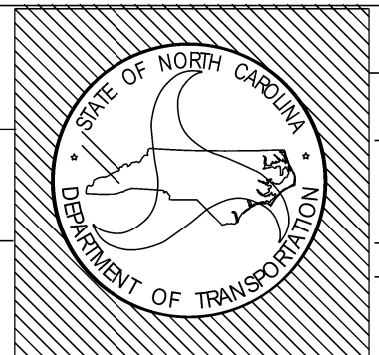
**B-4929(L) / Roland Ave
Landscape Development Plan
Surf City NC**

RN Kobetsky

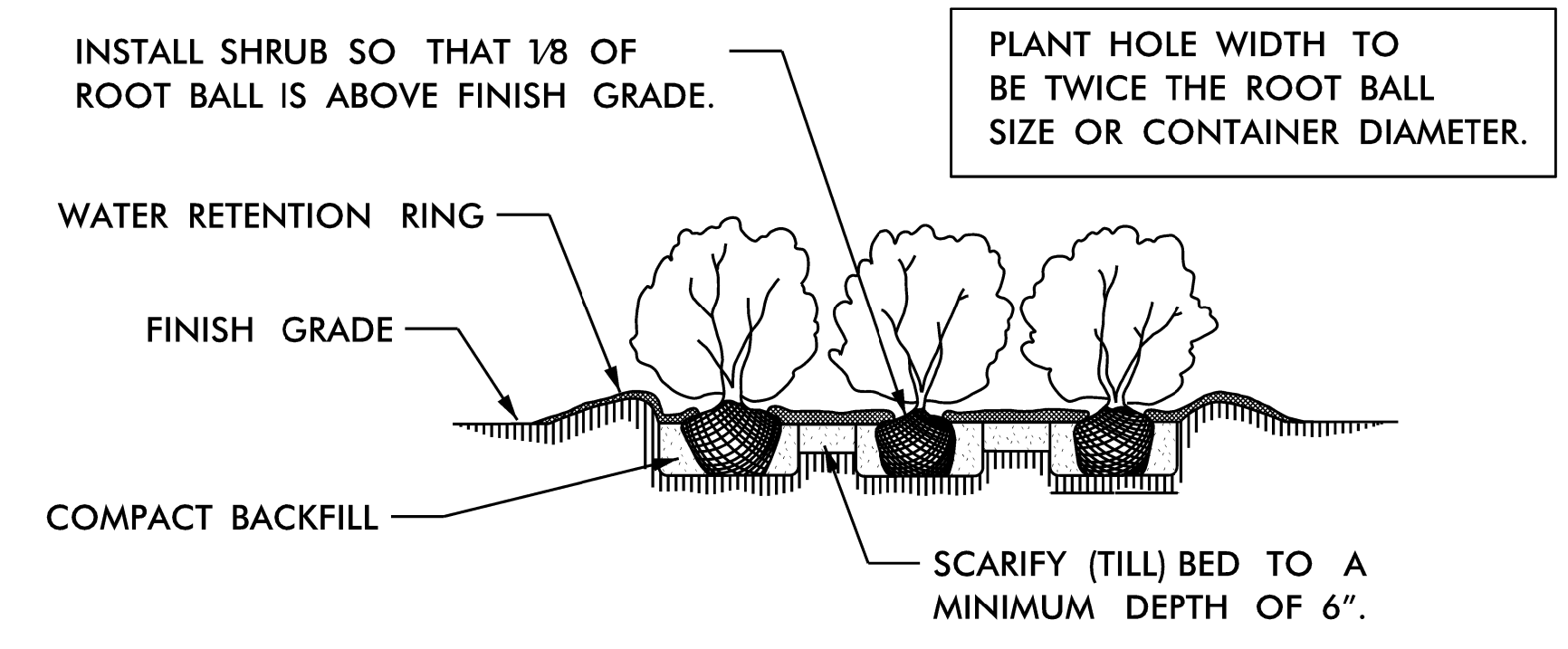
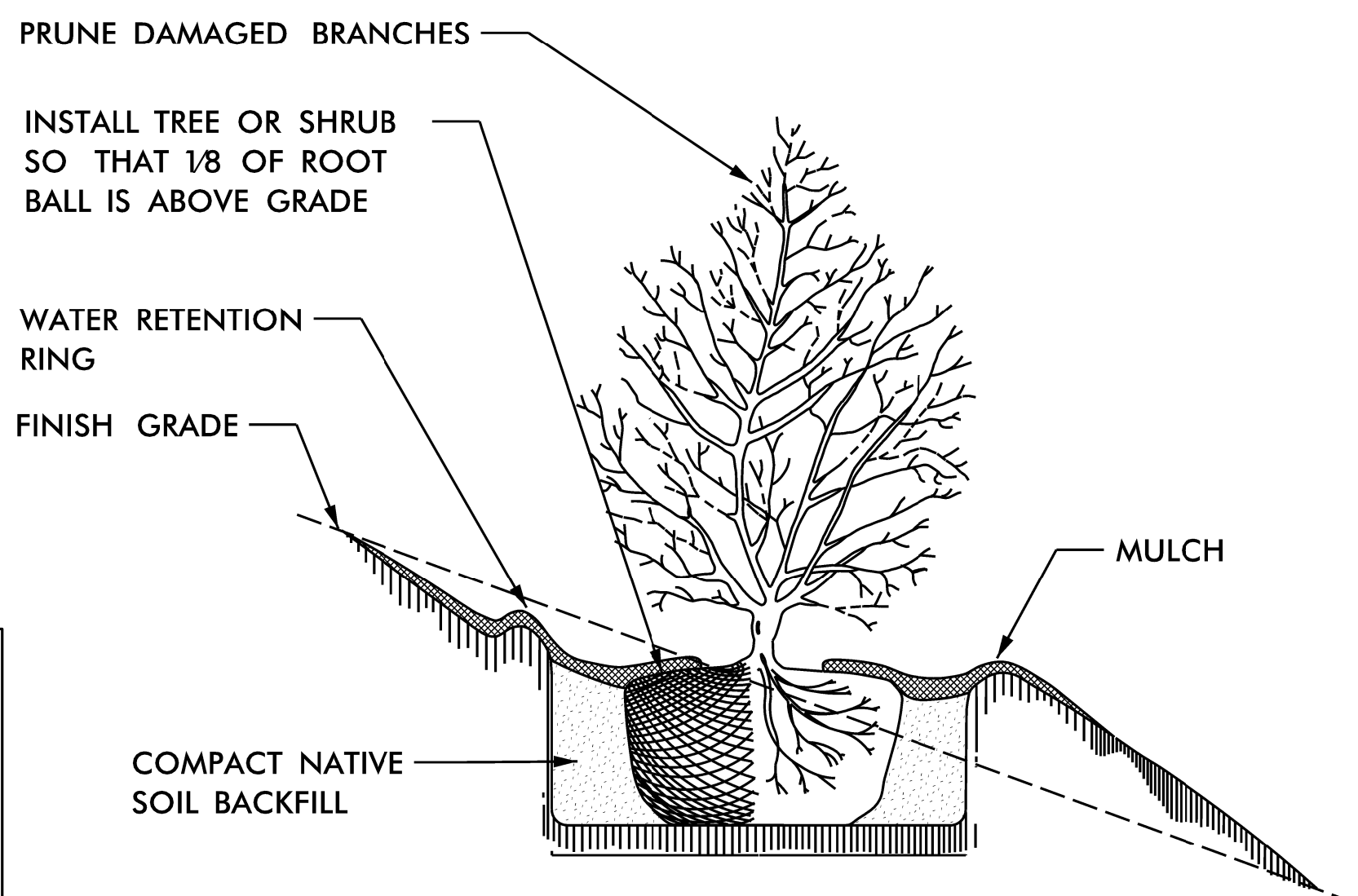
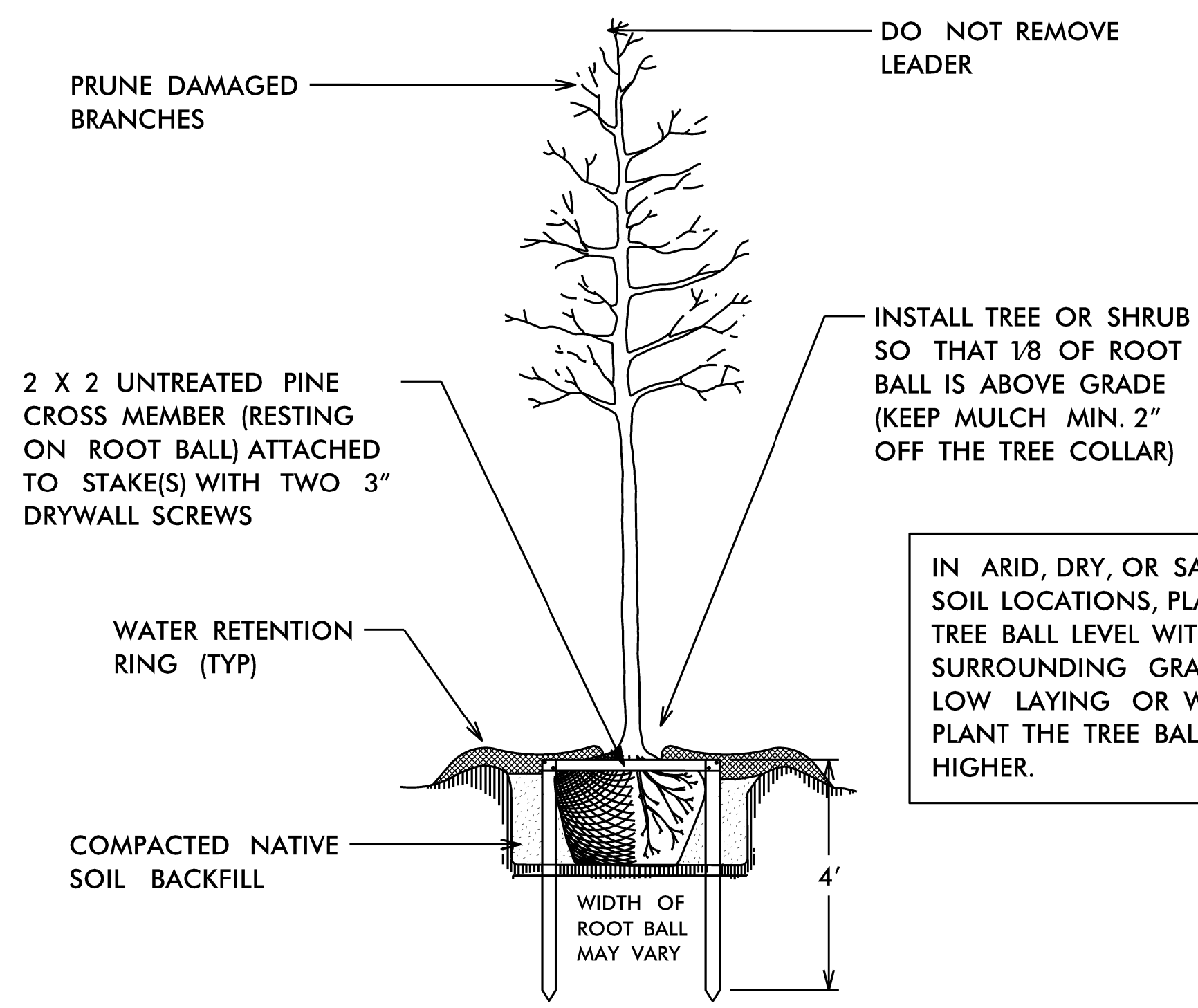
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prel. design date : Aug/2019
checked by & date :
final design date :

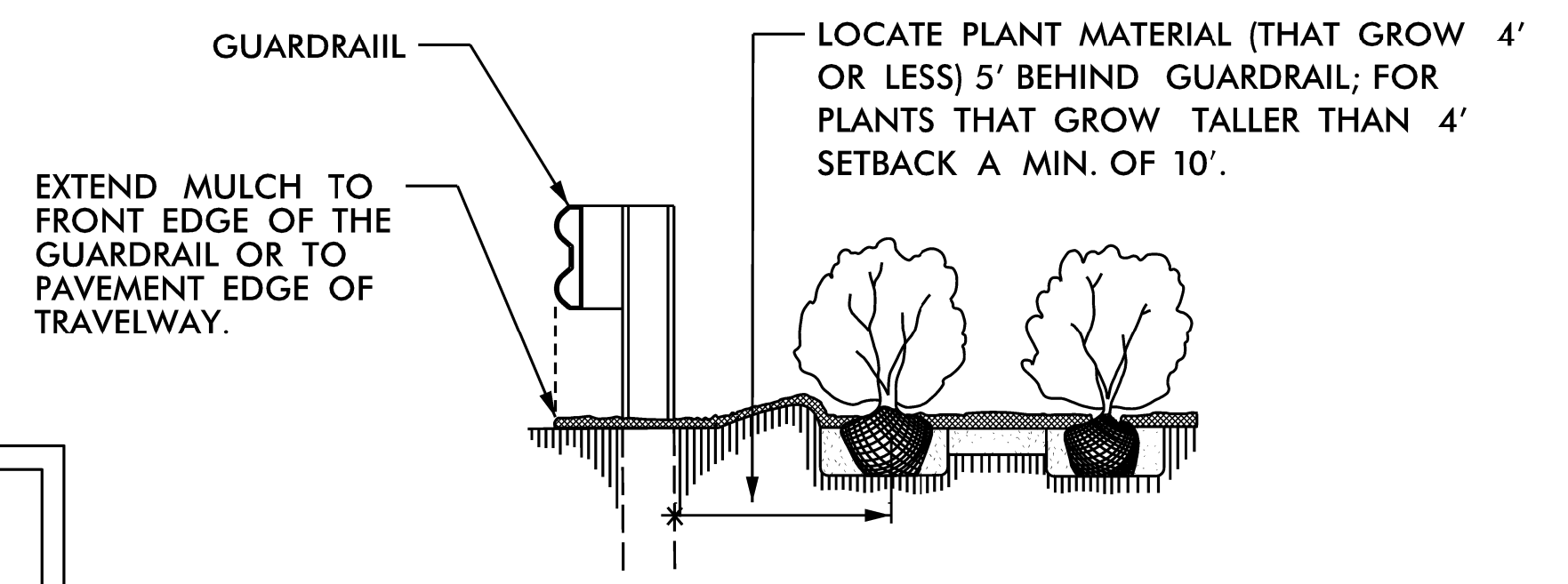
Landscape Enhancement
PAVEMENT DETAILS



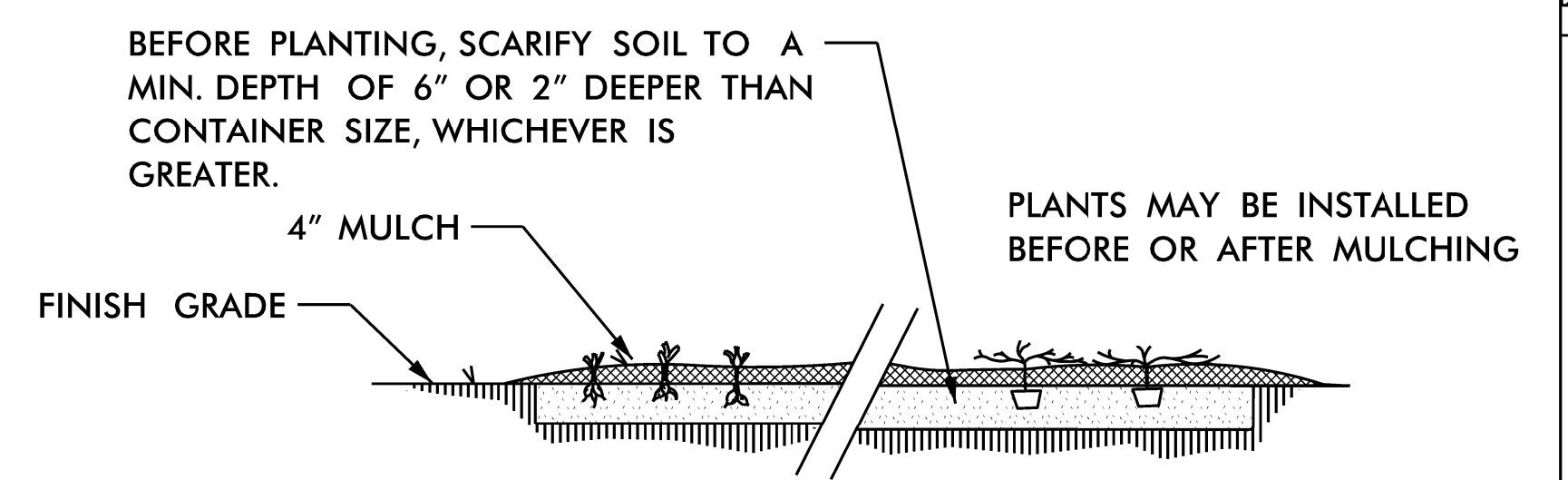
T.I.P. # B-4929(L)
WBS # 40233.3.2
FED I.D. #
sheet no : L11 total sheet no :



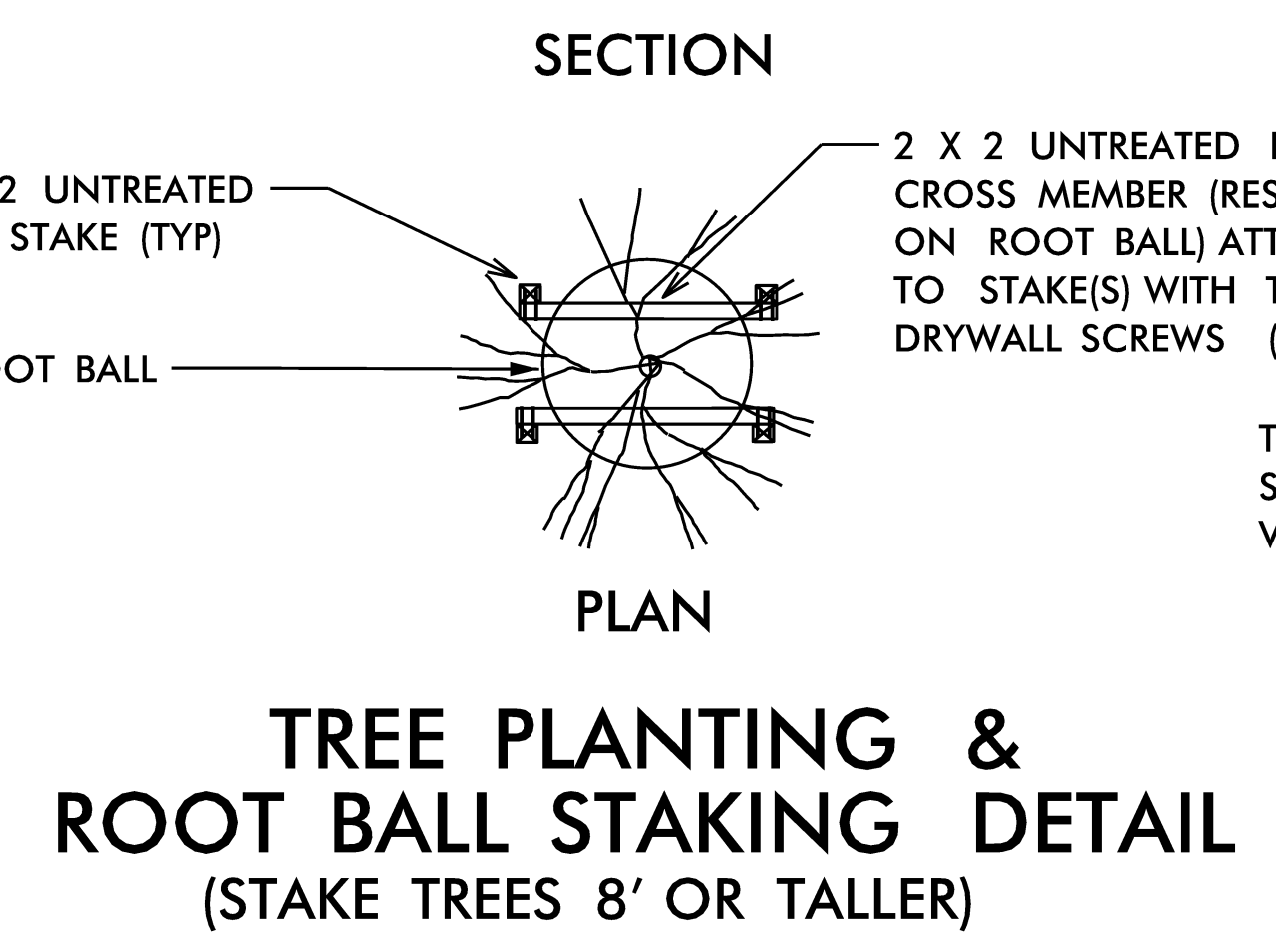
SHRUB BED PLANTING DETAIL



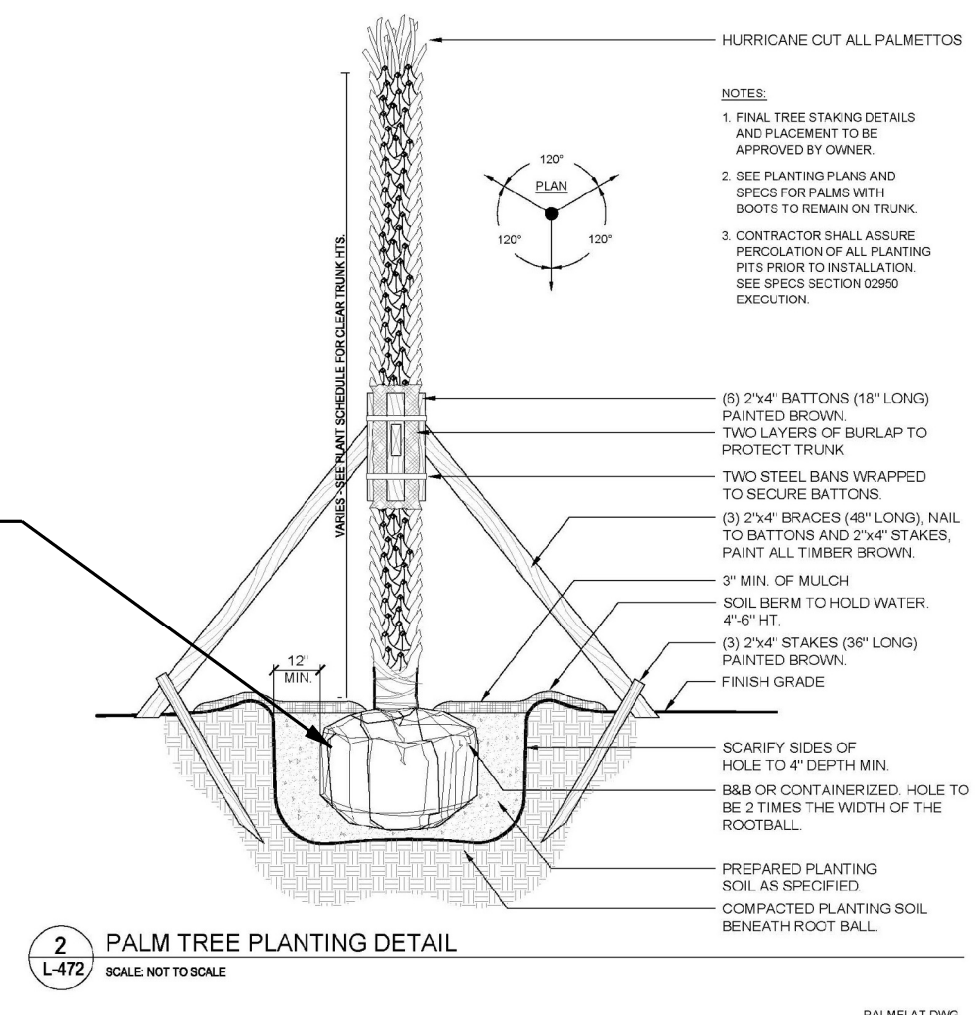
GUARDRAIL MULCHING DETAIL
USE AS DIRECTED BY FIELD ENGINEER



GROUND COVER/BEDDING PLANT DETAIL



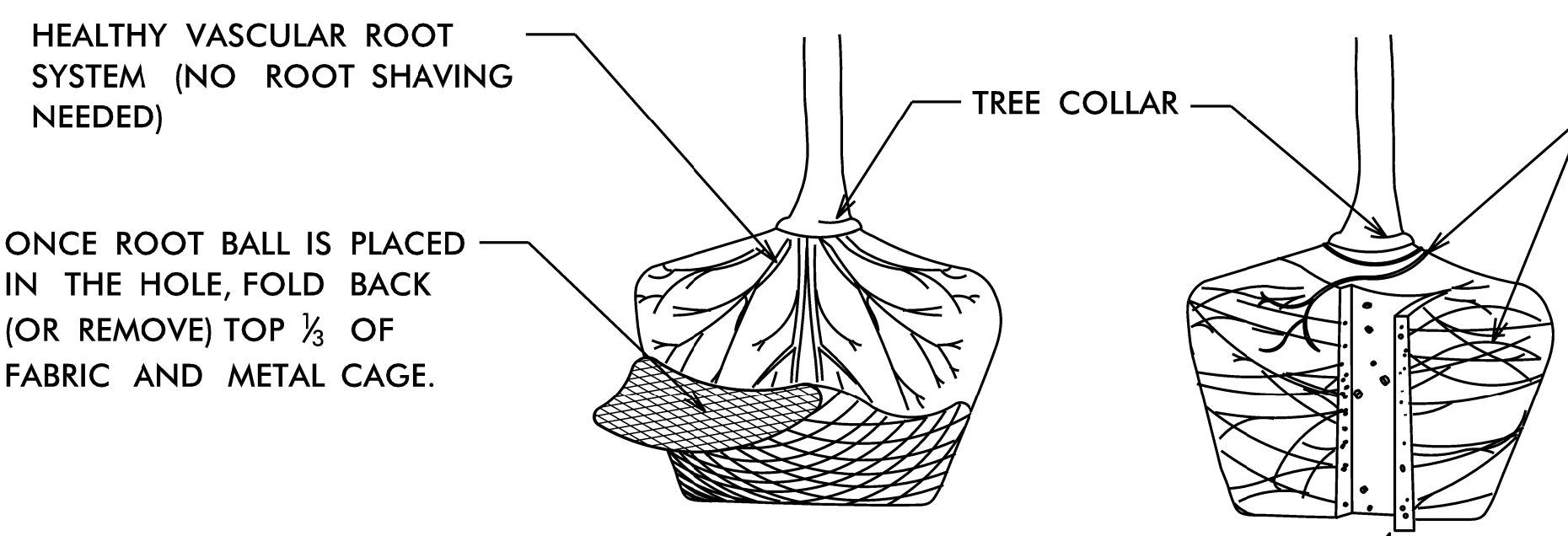
TREE PLANTING & ROOT BALL STAKING DETAIL
(STAKE TREES 8\' OR TALLER)



PALM TREE PLANTING DETAIL
SCALE: NOT TO SCALE

NOTES:

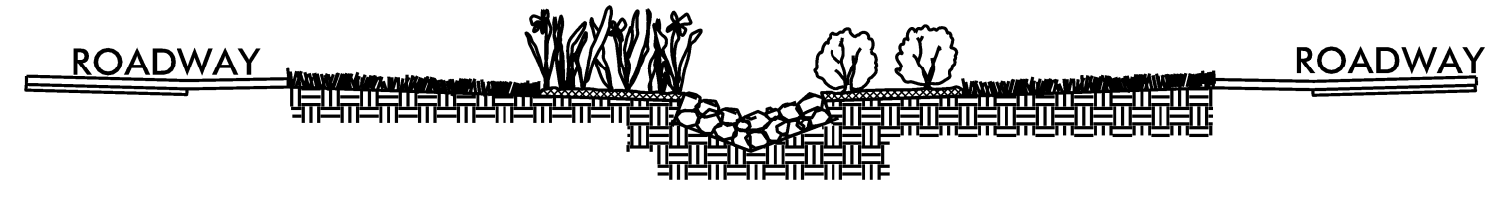
- PLANT HOLE WIDTH TO BE TWICE THE ROOT BALL SIZE OR CONTAINER DIAMETER.
- APPLY HERBICIDES A MIN. OF 7 DAYS PRIOR TO PLANTING, BY LABEL INSTRUCTIONS, OR AS DIRECTED BY THE NCDOT ENGINEER.
- APPLY FERTILIZER AT PLANTING TIME IN THE FORM OF A SLOW RELEASE PELLET OR TABLET. APPLY AT RATE RECOMMENDED BY MANUFACTURER. BOTH RATE AND FORMULATION MUST BE APPROVED BY FIELD ENGINEER PRIOR TO APPLICATION.
- ALL PRUNING TO FOLLOW STANDARD ARBORICULTURAL PRACTICES AS SPECIFIED BY INTERNATIONAL SOCIETY OF ARBORICULTURE.
- DO NOT ATTEMPT TO STRAIGHTEN A TREE THAT HAS BEEN PLANTED AT AN ANGLE WITH THE USE OF STAKING OR GUYING. DIG TREE AND REPLANT TO UPRIGHT POSITION.



ROOT BALL SHAVING CAN BE PERFORMED JUST PRIOR TO PLANTING OR AFTER PLACING IN THE HOLE.

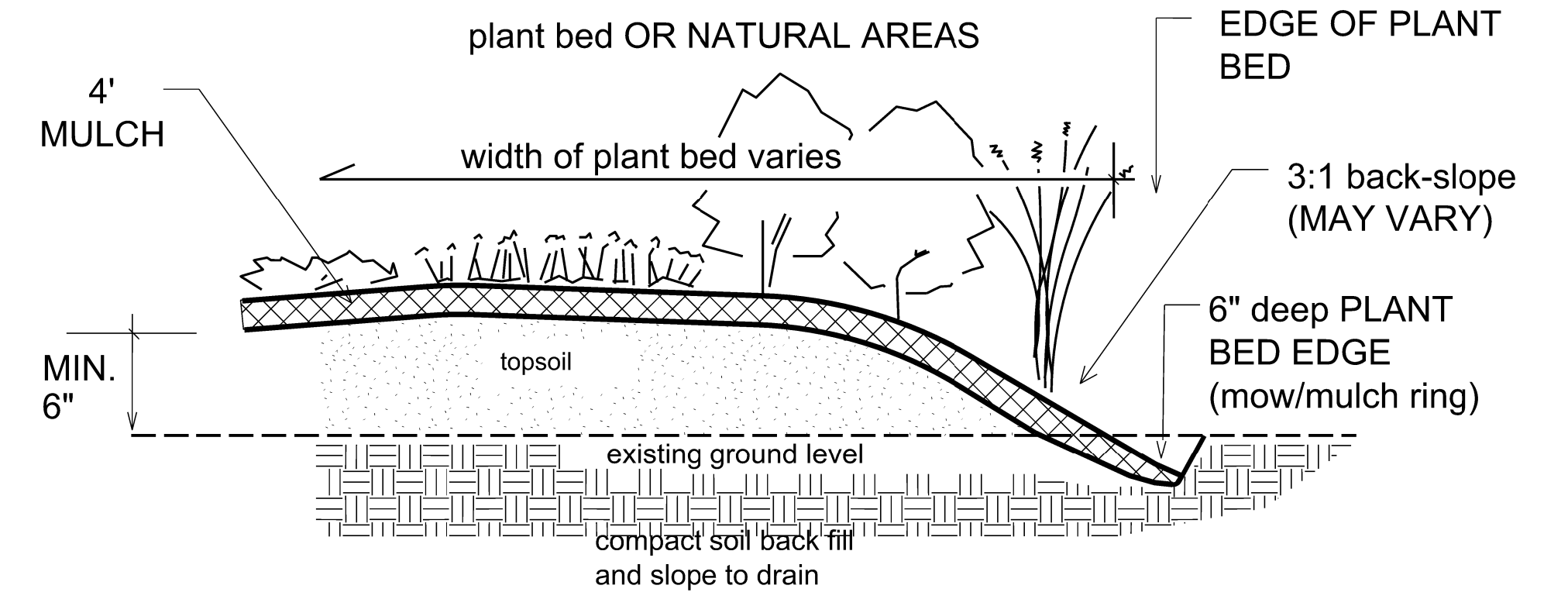
SHAVE OUTER PERIPHERY OF ROOT BALL (MAX. 2") WITH SHARP SPADE SHOVEL (OR HAND SAW) TO REMOVE GIRDLING ROOTS.

TREE PLANTING INSTRUCTIONS
(FOR CONTAINER OR BALLED & BURLAPPED TREES)



MIN. 12" DEEP CLASS "A" STONE ON FILTER FABRIC LINER IN DITCH. PLACE STONE FLUSH WITH DITCH GRADE FOR MAXIMUM WATER FLOW.

CLASS "A" STONE DITCH LINING DETAIL



PLANT BED EDGE DETAIL

North Carolina Department of Transportation Roadside Environmental Unit Aesthetic Engineering Section		
	PROJECT TITLE : B-4929(L) ROLAND AVE. SURF CITY NC PENDER CO	Plans Drawn By: BK Scale Date 9 / 13 / 2019 Sheet Description Planting Details T.I.P. # B-4929(L) Sheet # L 12

IRRIGATION NOTES & LEGEND

*Irrigation contractor must be licensed by the NCICLB under chapter (2008-177, S.1; 2013-383, S.3).

*All materials may be of comparable manufacture and performance to the brand listed.

GENERAL NOTES

- The irrigation design provided in the plans is schematic in nature, and the irrigation contractor may be required to make minor adjustments in the field as necessary. These adjustments shall be made at no additional cost to the owner and shall be made only after notification is made to the owner (NCDOT).

- The contractor(s) shall familiarize themselves with the site so that they are aware of any special conditions that may exist that could affect their bid proposal and shall hereafter be responsible for all cost incurred by themselves in relation to the installation.

- Place valves & boxes in plant beds where-ever possible.

- The contractor is to minimize disturbance in sod areas (cut and replace sod when necessary).

- Place pressure reducing valves in discreet locations.

- All irrigation products are to be Hunter or comparable brand (as approved by the Division Roadside Environmental Engineer).

- If there is an existing system in place, be sure to use irrigation heads that are consistent with the existing system.

- The contractor is responsible for providing 'as built' plans to the owner (NCDOT) at the time of project approval. The plans shall be clear, concise, and show all elements of the irrigation system, the location of all equipment, irrigation lines, numbered zones, controller(s), heads and valves.

BACKFLOW PREVENTION

 The backflow preventer shall be the owner's/town's responsibility.

- The reduced pressure backflow preventer assembly shall be the responsibility of the irrigation contractor. The backflow shall be 1.5" in size. The backflow assembly shall be installed downstream of the irrigation meter. The unit must be installed in accordance with all local and state code requirements and shall have an approved cover.


ESTIMATED IRRIGATION QUANTITIES

METER LOCATIONS - 10 (PROVIDED BY SURF CITY)
BACK FLOW PREVENTERS - 10 (PROVIDED BY SURF CITY)
IRRIGATION CONTROLLERS- 10
SPRAY ZONE VALVES - 3
MAIN LINE PIPE - 480'
LATERIAL PIPE - 1055'
SPRAY HEADS - 31
DRIP VALVE ASSEMBLY- 16
LENGTH OF DRIPLINE- 2700'

Quantities are estimated based on design drawings. Refer to plans for any discrepancies. Plans take priority over these estimated quantities. Estimated quantities do not cover all materials necessary for installation. Quantities may be adjusted slightly due to site conditions, specific irrigation equipment and implementation, or as directed by the NCDOT Engineer.

IRRIGATION CONTROLLER

Preferred Controller Type

 Controller may be of comparable manufacture and performance to the brand named.

Battery Powered - Lid Mount -Waterproof Controller

-The controller shall be a Rainbird DDCWP-8-9V unit. Submersible to 6.5'; IP-68 waterproof rated. Matched with comparable DC latching solenoid.

- The battery operated controller is to be placed in Carson valve boxes model #910-1 with #910-2 covers. Location must be approved by the NCDOT Environmental Roadside Engineer.

Cabinet Mounted- 24 VAC Controller

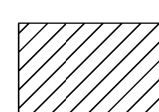
-The controller shall be a Hunter I-Core unit. The controller shall incorporate a 24 VAC valve wiring. Controller location and pedestal mounting must be approved by the NCDOT Environmental Roadside Engineer.


- All 120 VAC wiring shall be installed in accordance with all applicable electrical code requirements.

Rain Sensor

The contractor shall install a wired Hunter rain sensor that is compatible with the make and model of the controller. Placement of rain sensor to be approved by the NCDOT Engineer.

DRIP IRRIGATION



 **Dripline Assembly**
PCZ-101 remote control valve with flow control feature, an inline emitter Dripline /Techline 200 mesh filter and pressure regulator. The flow control valves shall be noted on boxes with lids mounted at grade level.

PLANT BEDS

- Drip irrigation is to be drip tubing with embedded emitters within the line. Dripline emitters to include an integral check valve to negate backflow in to the line. Netafim Techline CV tubing (or comparable manufacture and performance) with emitters spaced at 18" intervals at 0.9 gpm. The approved inline emitter drip line is to be installed under mulch in landscape areas, as shown on the irrigation plan, and held in place with dripline wire staples.


Install drip line before mulch is installed.


- 3 emitters per shrub (within 30" of trunk) and 5 emitters per tree (within 48" of trunk) shall be installed to distribute water evenly over root zone. Place lines for perennials and grasses as noted in plans or as directed by the NCDOT Engineer.

PLANTERS

- Drip irrigation for planters shall be 1/4" polyethylene tubing with a min. flow rate of 0.5 GPH. Layout of poly line shall form a loop to encompass the interior of the planter. Emitters shall be 9" O.C. or as noted in the plans/details. The emitters shall be self cleaning/flushing. The approved drip line is to be installed under mulch and held in place with dripline wire staples.

HEADS

 - Hunter MP Rotator series pop-up sprinkler head fitted with nozzles adjustable 90° - 210°. The rotating spray nozzles shall cover the following radii: 8' - 24'. Match pro-series spray body to the nozzle.

 - All heads with a 3"- 4" pop-up stroke; installed with less than 1/3 of the sprinkler body exposed above grade. Sprinklers shall be installed on polyethylene flex swing joint poly pipe fitted with elbows (3/8" insert by 1/2" M.P.T. and/or 3/8" insert by 3/4" M.P.T.)

-For shrubs beds 1/3 of the sprinkler body is exposed, then the 6"-12" pop-up head shall be mounted on a schedule 40 PVC pipe riser as described below in relation to mounting shrub head models. In mounting 6"-12" pop-up heads on shrub type risers, care shall be taken to install the head in such a manner that the surrounding plant material (planned or existing) will hide the body of the sprinkler.

- All pop-up irrigation heads designed adjacent to curbs or pavement shall be installed with a clearance of 1 1/2" from the edges of all paved areas to provide for edging and maintenance operations. Heads installed on shrub risers or with the top of the head more than 1 1/2" above the grade shall be installed with a minimum 6" clearance from paved areas.

- All threaded pipe connections shall be assembled using Teflon thread sealing tape.

PIPE

 **PR 200 PVC Lateral Piping**

- Size of pipe to be a minimum of 1"
- Minimum depth of cover over lateral piping to be 12". Lateral pipe sizing schedule and summation of gallonage demand on a particular branch of pipe within a control section shall be determined by using the gpm for a nozzle based on a 50 psi base of head pressure and full radius at that pressure as reported in the Toro irrigation products' catalog. Pipe sizes for the lateral lines shall be as follows:


- For 0 to 15 gpm accumulated flow use 3/4" PR 200 PVC pipe.
- For 15 up to 35 gpm use 1" PVC pipe.
- Allow for friction loss.

 **PR 200 Main Line Piping**

- Size of pipe to be a minimum of 1 1/2"
- Depth of cover of mainline piping to be 18"
- Piping shall be PR 200 solvent weld PVC pipe with schedule 40 PVC solvent weld fittings unless otherwise noted.

- The contractor shall take all precautions necessary to avoid damaging existing plantings and their roots during the installation of the irrigation system and shall coordinate their efforts with the landscape contractor to optimize the efficiency and the aesthetic quality of the installation.

SLEEVES

 - Sleeves shall be 4" PVC. The irrigation contractor shall coordinate with the landscape contractor to insure proper installation of the irrigation system with the landscape and hardscape.

Electric control valve

- Valves may be of comparable manufacture and performance to the brand named.

- Location of electric 24 VAC remote control valve with flow control feature (Hunter PGV-ASV valves).

- All in-line remote control valves shall be installed in Carson valve boxes with lids mounted at grade level. Single valves may be installed in a Carson model #910-1 valve box with cover, while multiple valves (up to, 2 - 1" valves or 1 - 1 1/2") shall be installed in Carson model #1419-1 box with #1419-2 cover.

WATER SUPPLY/METER

The meter shall be the owner's/town's responsibility.

- The meter is 1.5" in size. Since the water supply for the system will be potable water, the contractor will be required to install a backflow prevention device which will be located downstream of the irrigation meter.

- This irrigation system shall be capable of delivering 33 gpm minimum with one control station operating at a time at 60 psi at the base of the head for optimum performance of the irrigation system.

24 VAC CONTROLLER WIRING

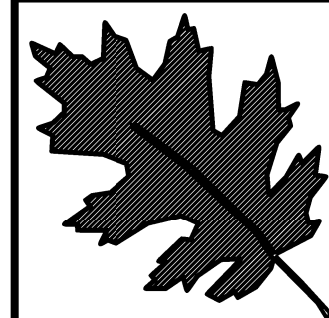
- All 24 VAC control wiring shall be single strand copper wire with Polyethylene PE direct burial insulation rated for 300 VAC valve "common" wires shall have white insulation while valve "hot" wires shall have red insulation. Both the "common" and "hot" wires shall be #14 AWG. Valve wiring shall follow mainline piping where feasible and shall be laid in the bottom of the trench line with the mainline piping. Wiring shall be "bundled" and taped at intervals of approximately ten feet. All wiring shall be installed in accordance with local code requirements.

- Wire splices shall be kept to an absolute minimum. Where major concentrations of splices are necessary, they shall be placed in a approved valve box, with #910-2 cover installed at grade level. Splices at valve locations shall be made inside of the valve box. All splice locations shall be noted on the as built plan.

- Wire runs shall be installed with enough slack and/or expansion loops to prevent excessive strain due to thermal contraction.

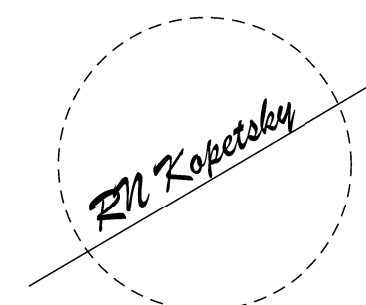
- All wire splices shall be made using UL approved direct burial connectors and waterproof materials. All electrical work shall be installed according to code.

\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$USERNAME\$\$\$\$\$



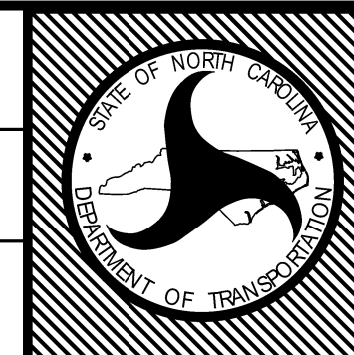
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B-4929(L) / Roland Ave
Landscape Development Plan
Surf City NC

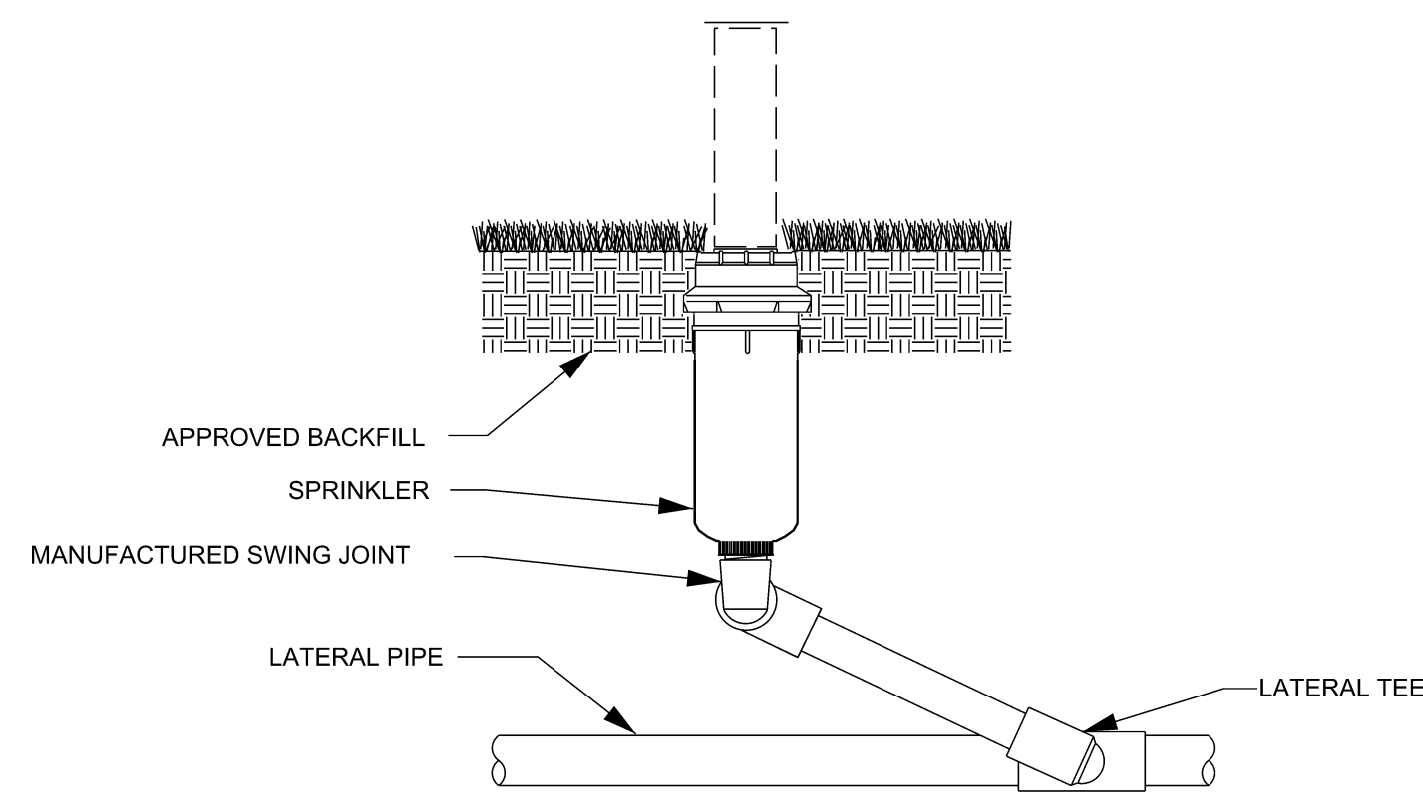


sheet description:		
pref. design date :	Aug/2019	Landscape Enhancement
checked by & date :		Irrigation Specifications
final design date :		& Estimated Quantities

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WBS #	40233.3.2
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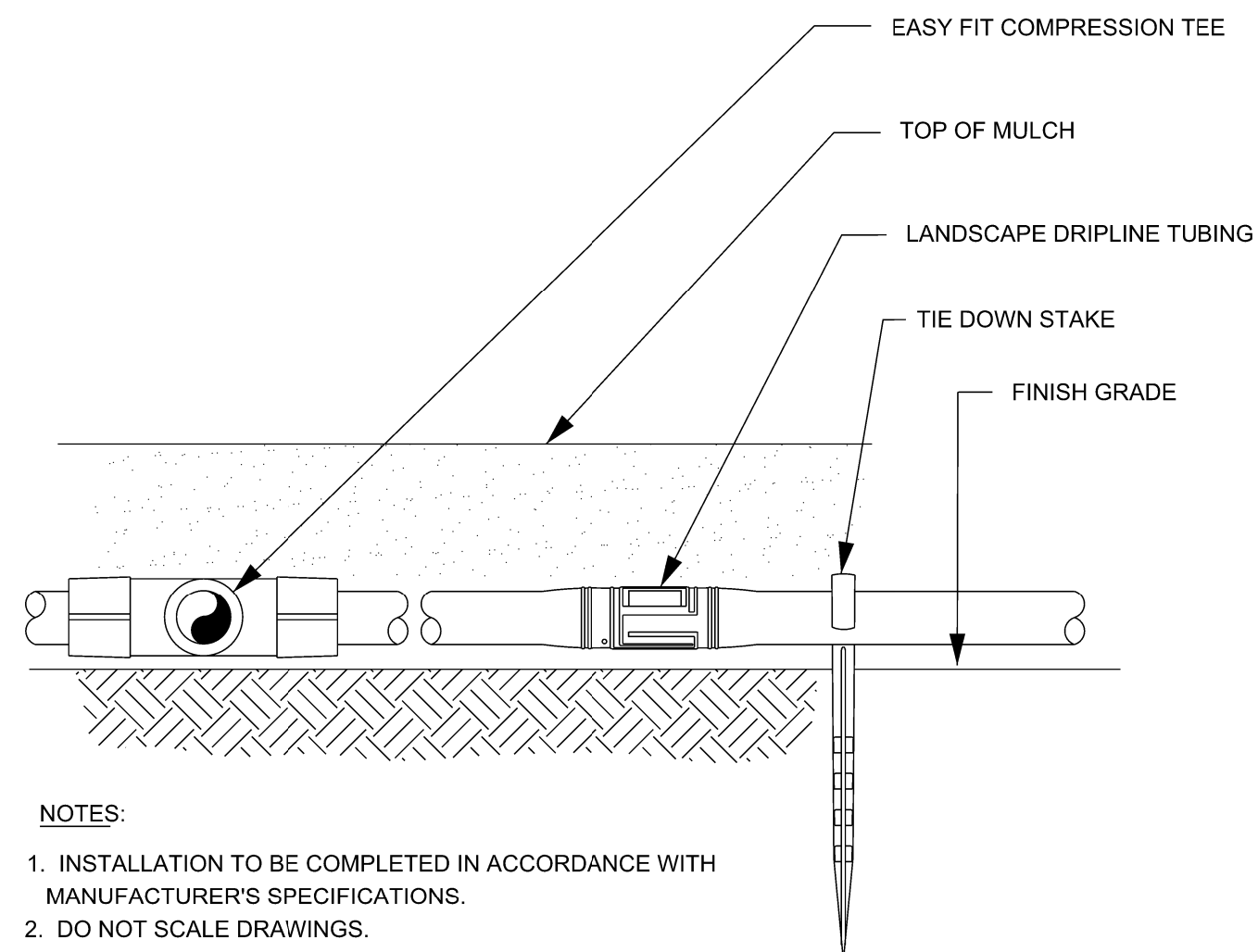


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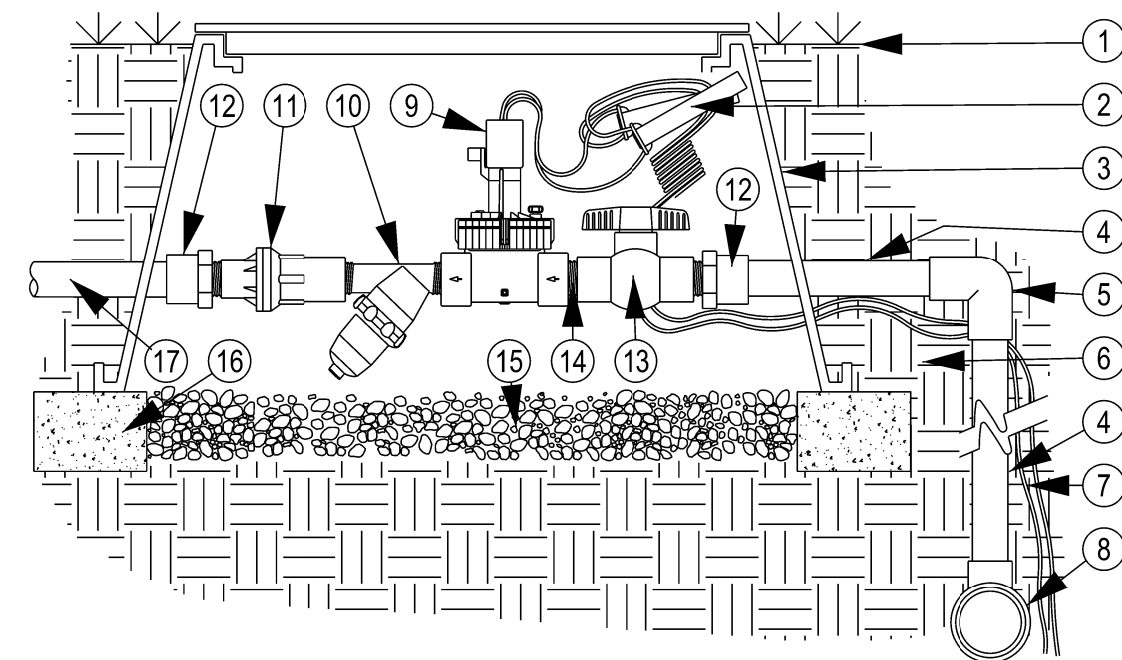
NOTES:
 1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
 2. DO NOT SCALE DRAWINGS.
 3. INSTALL SPRINKLER AT FINISHED GRADE.

POP-UP SPRAY HEADS
 SINGLE-STREAM SPRINKLER, SWING JOINT (NOT TO SCALE)



NOTES:
 1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
 2. DO NOT SCALE DRAWINGS.

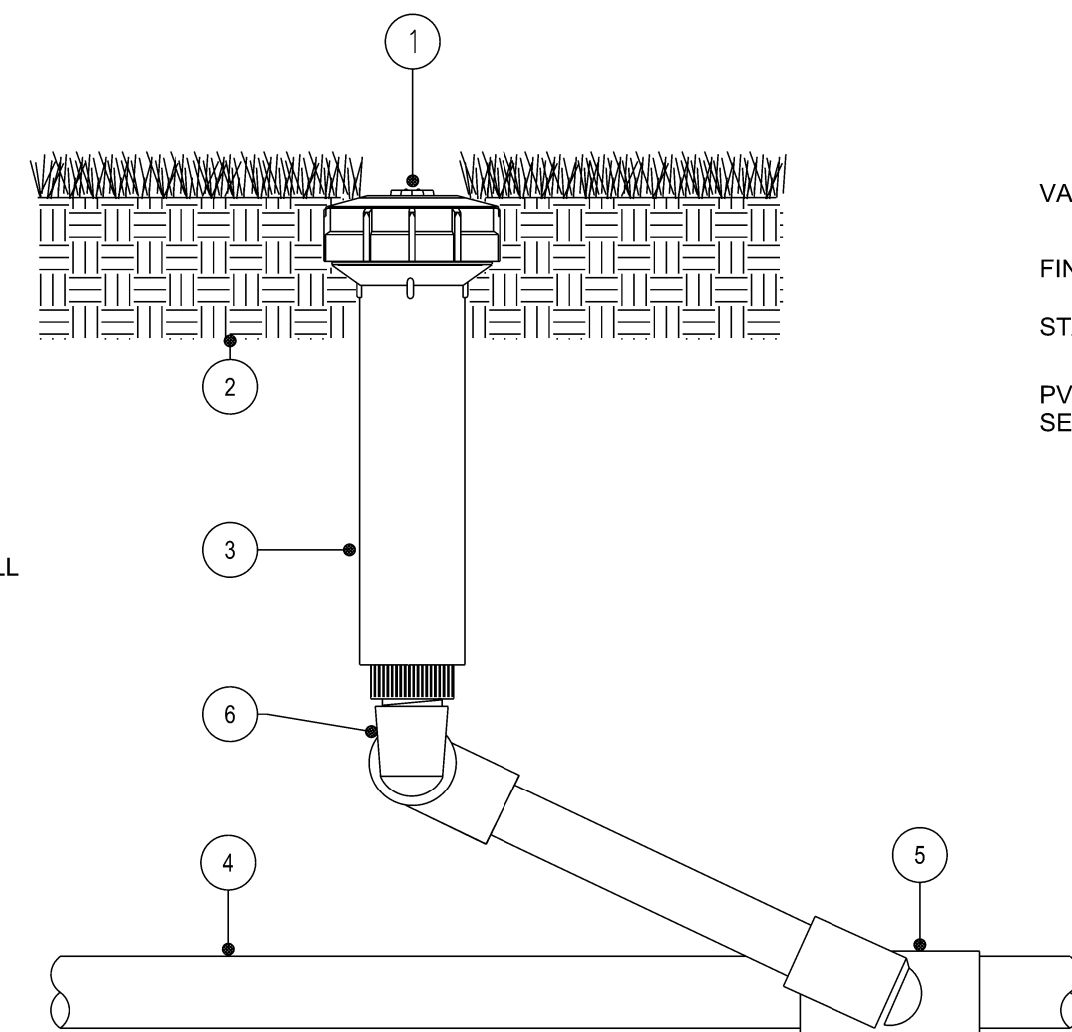
LANDSCAPE DRIPLINE ON GRADE
 POTABLE SYSTEM (NOT TO SCALE)



DRIPLINE ASSEMBLY
 VALVE ASSEMBLY (NOT TO SCALE)

- LEGEND**
- 1. FINISHED GRADE
 - 2. WATERPROOF DRY SPLICE CONNECTORS
 - 3. 12" VALVE BOX WITH COVER
 - 4. PVC LATERAL LINE
 - 5. SCH 40 PVC 90° ELL JOINT
 - 6. NATIVE SOIL PER SPECIFICATIONS.
 - 7. CONTROL WIRES TO CONTROLLER.
 - 8. PVC MAINLINE FITTING.
 - 9. REMOTE CONTROL VALVE
 - 10. MESH SCREEN FILTER WITH FLUSH CAP
 - 11. ADJUSTABLE PRESSURE REGULATOR
 - 12. PVC SCH 40 FEMALE ADAPTER
 - 13. MANUAL VALVE
 - 14. PVC SCH 40 TRANSITION NIPPLE
 - 15. WASHED GRAVEL SUMP (MIN. 3")
 - 16. BRICK SUPPORTS
 - 17. LATERAL LINE TO DRIP SYSTEM.

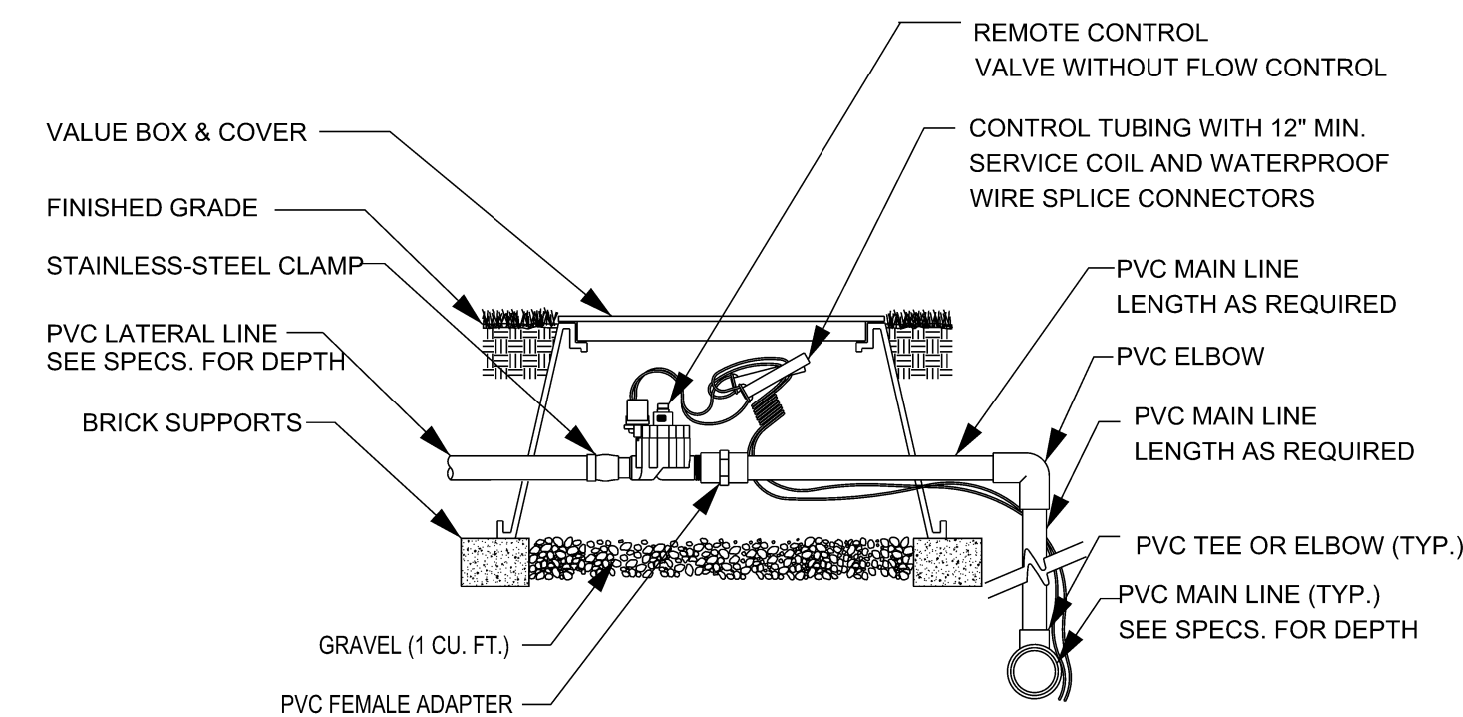
NOTES:
 1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
 2. DO NOT SCALE DRAWINGS.



- LEGEND**
- 1. NOZZLE (SIZE PER PLAN)
 - 2. APPROVED BACKFILL
 - 3. SPRINKLER
 - 4. LATERAL PIPE
 - 5. LATERAL TEE
 - 6. MANUFACTURED SWING JOINT

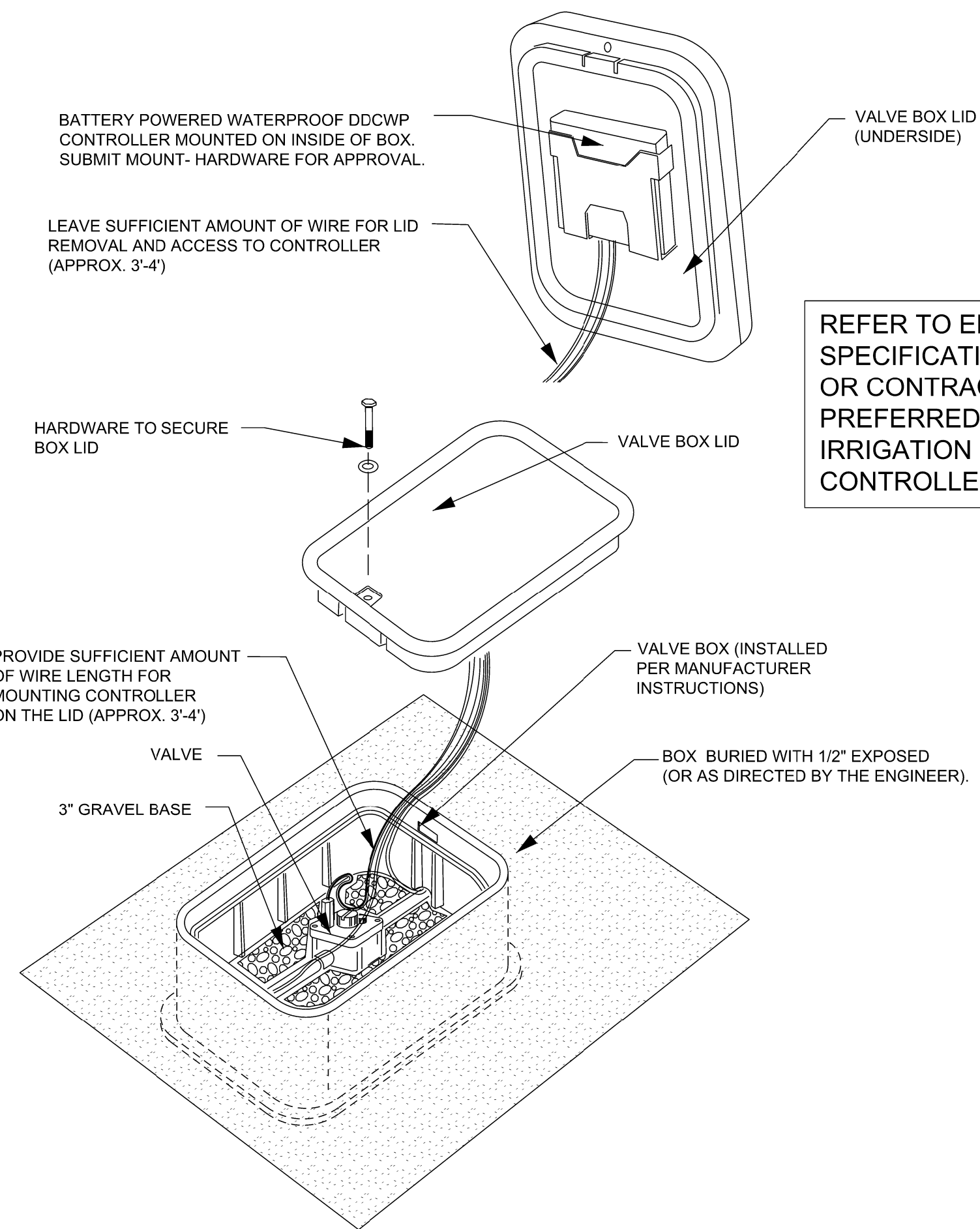
NOTES:
 1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
 2. DO NOT SCALE DRAWINGS.
 3. INSTALL SPRINKLERHEAD AT FINISHED GRADE

ROTOR SPRINKLER
 4 INCH POP-UP (SWING JOINT) (NOT TO SCALE)



NOTES:
 1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
 2. DO NOT SCALE DRAWINGS.

VALVES & BOX
 1" PLASTIC VALVE (NOT TO SCALE)



BATTERY POWERED WATERPROOF DDCWP CONTROLLER MOUNTED ON INSIDE OF BOX. SUBMIT MOUNT- HARDWARE FOR APPROVAL.

LEAVE SUFFICIENT AMOUNT OF WIRE FOR LID REMOVAL AND ACCESS TO CONTROLLER (APPROX. 3'-4')

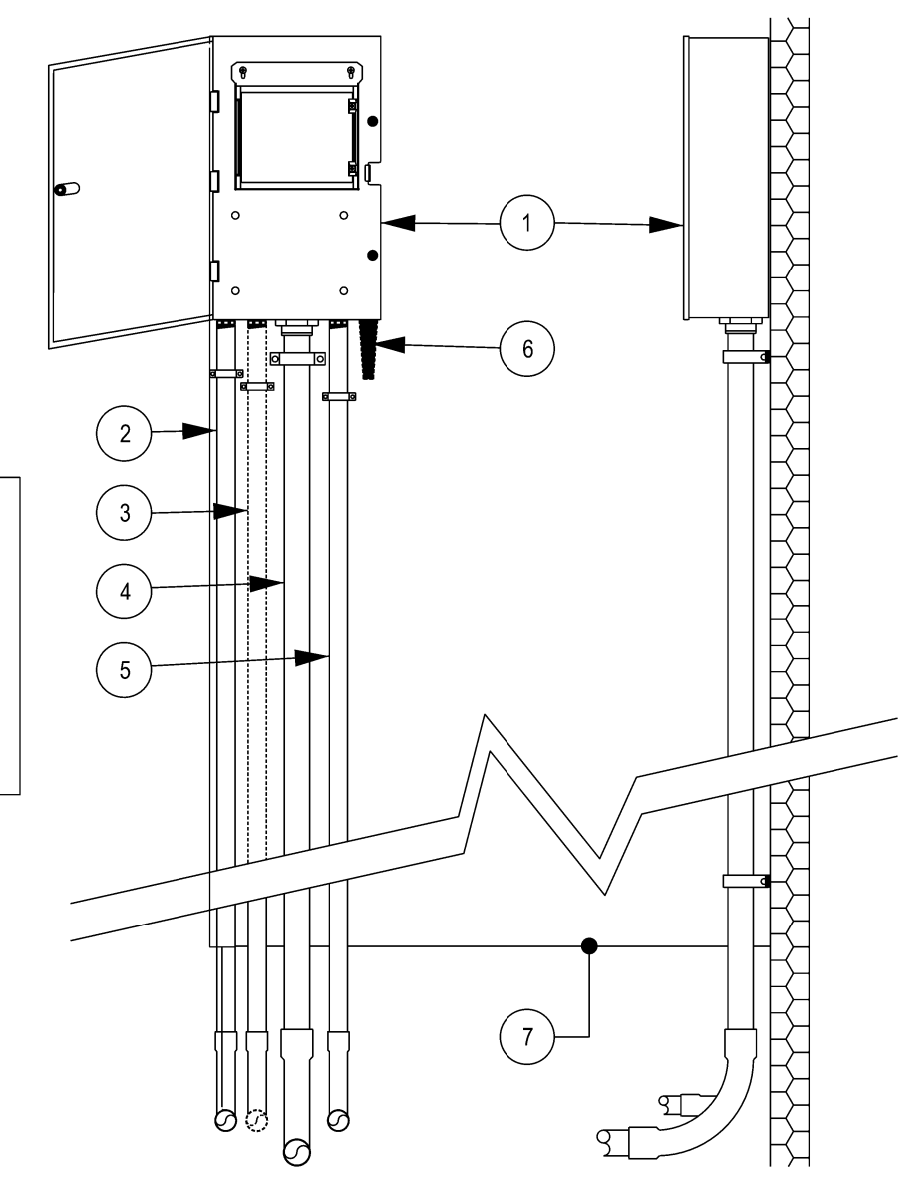
REFER TO ENGINEER, SPECIFICATIONS AND/OR CONTRACT FOR PREFERRED TYPE OF IRRIGATION CONTROLLER.

PROVIDE SUFFICIENT AMOUNT OF WIRE LENGTH FOR MOUNTING CONTROLLER ON THE LID (APPROX. 3'-4')

VALVE BOX (INSTALLED PER MANUFACTURER INSTRUCTIONS)

BOX BURIED WITH 1/2" EXPOSED (OR AS DIRECTED BY THE ENGINEER).

DDCWP CONTROLLER BOX LID MOUNT
 BATTERY POWERED CONTROLLER (NOT TO SCALE)



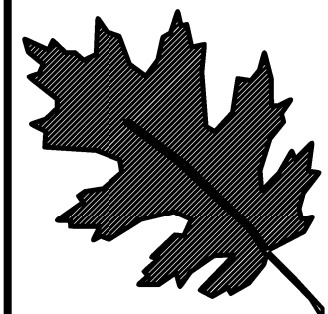
- 1. SMALL METAL CABINET WALL MOUNT IRRIGATION CONTROLLER SEE PLAN FOR NUMBER OF STATIONS.
- 2. 1/2" CONDUIT FOR ELECTRICAL POWER PER LOCAL AND NATIONAL ELECTRICAL CODES. OPTIONAL 3/4" KNOCK-OUT IF LARGER CONDUITS ARE USED.
- 3. OPTINOAL 1/2" KNOCK-OUT FOR RAIN SENSOR WIRE.
- 4. 2" CONDUIT FOR REMOTE CONTROL WIRES AND MV OR PUMP START WIRES. OPTIONAL 3" KNOCK-OUT IF LARGER WIRES ARE USED. SECURE TO WALL WITH APPROPRIATE PIPE CLAMPS.
- 5. 3/4" KNOCKOUT FOR EARTH GROUND WIRES.
- 6. MOUNTED NARROWBAND ANTENNA
- 7. FINISHED GRADE

NOTES:
 1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
 2. MOUNT CONTROLLER ON EXISTING POST NEW PRESSURE TREATED POST, OR AS DIRECTED BY THE NCDOT ENGINEER.
 3. DRAWING NOT TO SCALE.

CONTROLLER WALL MOUNT
 WALL-MOUNT CONTROLLER, METAL (NOT TO SCALE)

SUBMIT ALL PROPOSED IRRIGATION MATERIALS FOR APPROVAL PRIOR TO INSTALLATION

\$\$\$\$\$SYTIME\$\$\$\$\$
 \$\$\$USERNAMESS\$\$\$



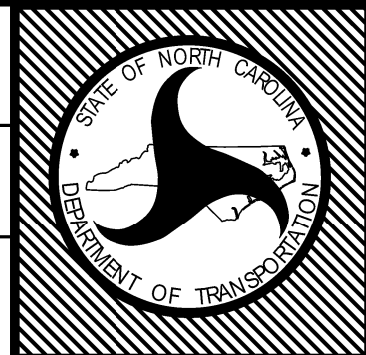
NCDOT - Roadside Environmental Unit
 Aesthetic Engineering Section
 1557 Mail Service Center Raleigh NC 27699-1557
 ph: 919-707-2920 fax: 919-715-2554
<https://www.ncdot.gov/initiatives-policies/environmental/roadside-beautification>

**B-4929(L) / Roland Ave
 Landscape Development Plan
 Surf City NC**

RN Kobetsky

sheet description:	prel. design date:	Aug/2019
	checked by & date:	
	final design date:	

Landscape Enhancement
 Irrigation Details

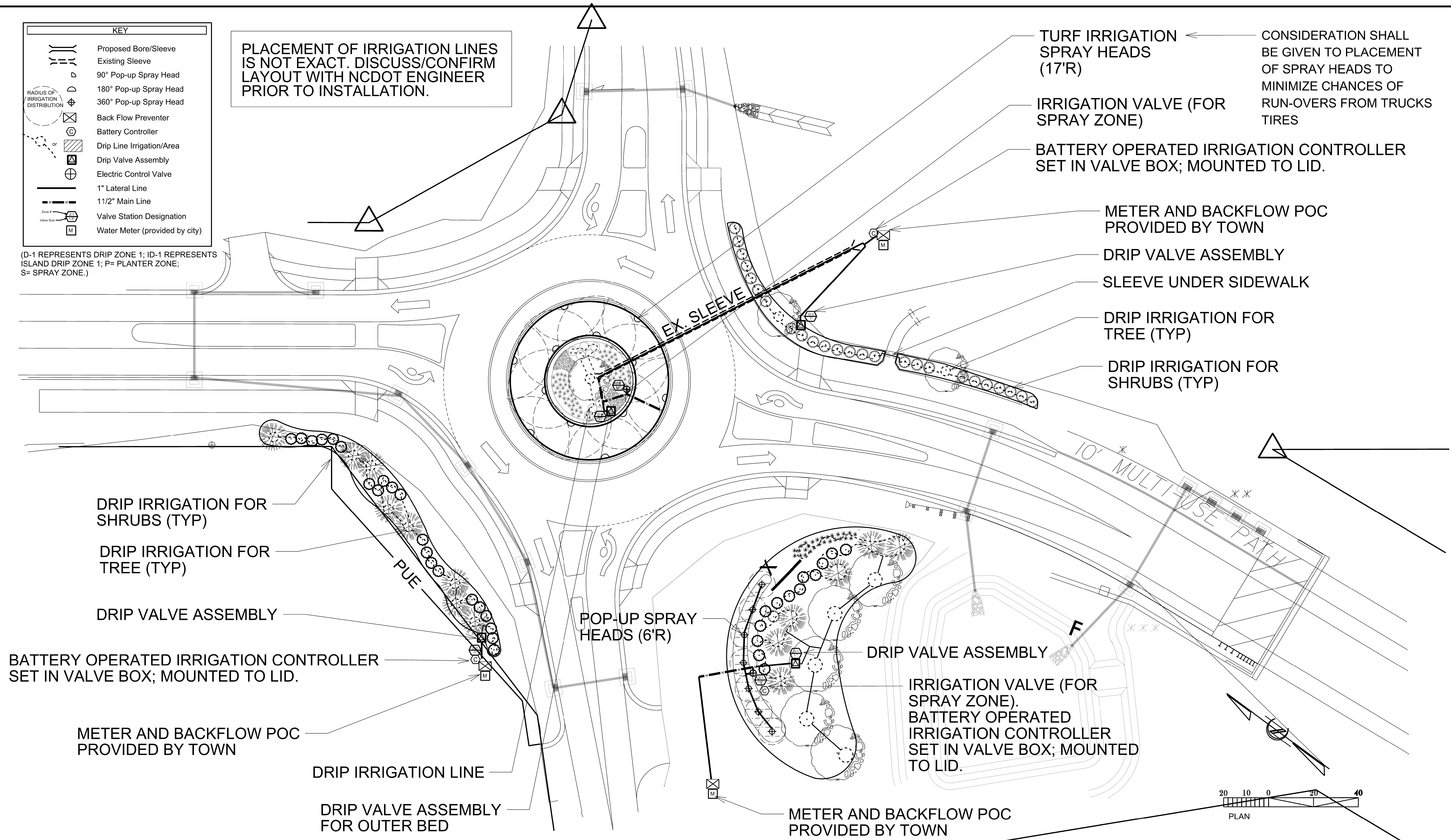


T.I.P. # B-4929(L)
 WBS # 40233.3.2
 FED I.D. #
 sheet no: total sheet no:
 L-2i

KEY	
	Proposed Bore/Sleeve
	Existing Sleeve
	90° Pop-up Spray Head
	180° Pop-up Spray Head
	360° Pop-up Spray Head
	Back Flow Preventer
	Battery Controller
	Drip Line Irrigation/Area
	Drip Valve Assembly
	Electric Control Valve
	1" Lateral Line
	1 1/2" Main Line
	Valve Station Designation
	Water Meter (provided by city)

(D-1 REPRESENTS DRIP ZONE 1; ID-1 REPRESENTS ISLAND DRIP ZONE 1; P= PLANTER ZONE; S= SPRAY ZONE.)

PLACEMENT OF IRRIGATION LINES IS NOT EXACT. DISCUSS/CONFIRM LAYOUT WITH NCDOT ENGINEER PRIOR TO INSTALLATION.



TURF IRRIGATION SPRAY HEADS (17'R)

IRRIGATION VALVE (FOR SPRAY ZONE)

BATTERY OPERATED IRRIGATION CONTROLLER SET IN VALVE BOX; MOUNTED TO LID.

CONSIDERATION SHALL BE GIVEN TO PLACEMENT OF SPRAY HEADS TO MINIMIZE CHANCES OF RUN-OVERS FROM TRUCKS TIRES

METER AND BACKFLOW POC PROVIDED BY TOWN

DRIP VALVE ASSEMBLY

SLEEVE UNDER SIDEWALK

DRIP IRRIGATION FOR TREE (TYP)

DRIP IRRIGATION FOR SHRUBS (TYP)

DRIP IRRIGATION FOR SHRUBS (TYP)

DRIP IRRIGATION FOR TREE (TYP)

DRIP VALVE ASSEMBLY

BATTERY OPERATED IRRIGATION CONTROLLER SET IN VALVE BOX; MOUNTED TO LID.

METER AND BACKFLOW POC PROVIDED BY TOWN

DRIP IRRIGATION LINE

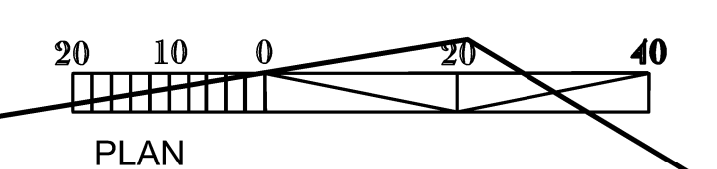
DRIP VALVE ASSEMBLY FOR OUTER BED

POP-UP SPRAY HEADS (6'R)

DRIP VALVE ASSEMBLY

IRRIGATION VALVE (FOR SPRAY ZONE), BATTERY OPERATED IRRIGATION CONTROLLER SET IN VALVE BOX; MOUNTED TO LID.

METER AND BACKFLOW POC PROVIDED BY TOWN



\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$USER\$\$\$\$\$

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Aesthetic Engineering Section
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ph: 919-707-2920 fax: 919-715-2554
<https://www.ncdot.gov/initiatives-policies/environmental/roadside-beautification>

B-4929(L) / Roland Ave
Landscape Development Plan
Surf City NC

RN Kobersky

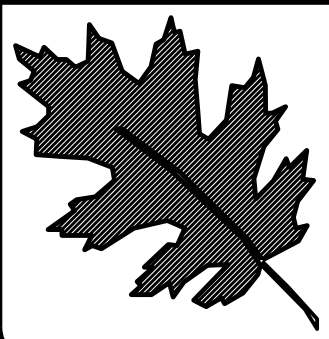
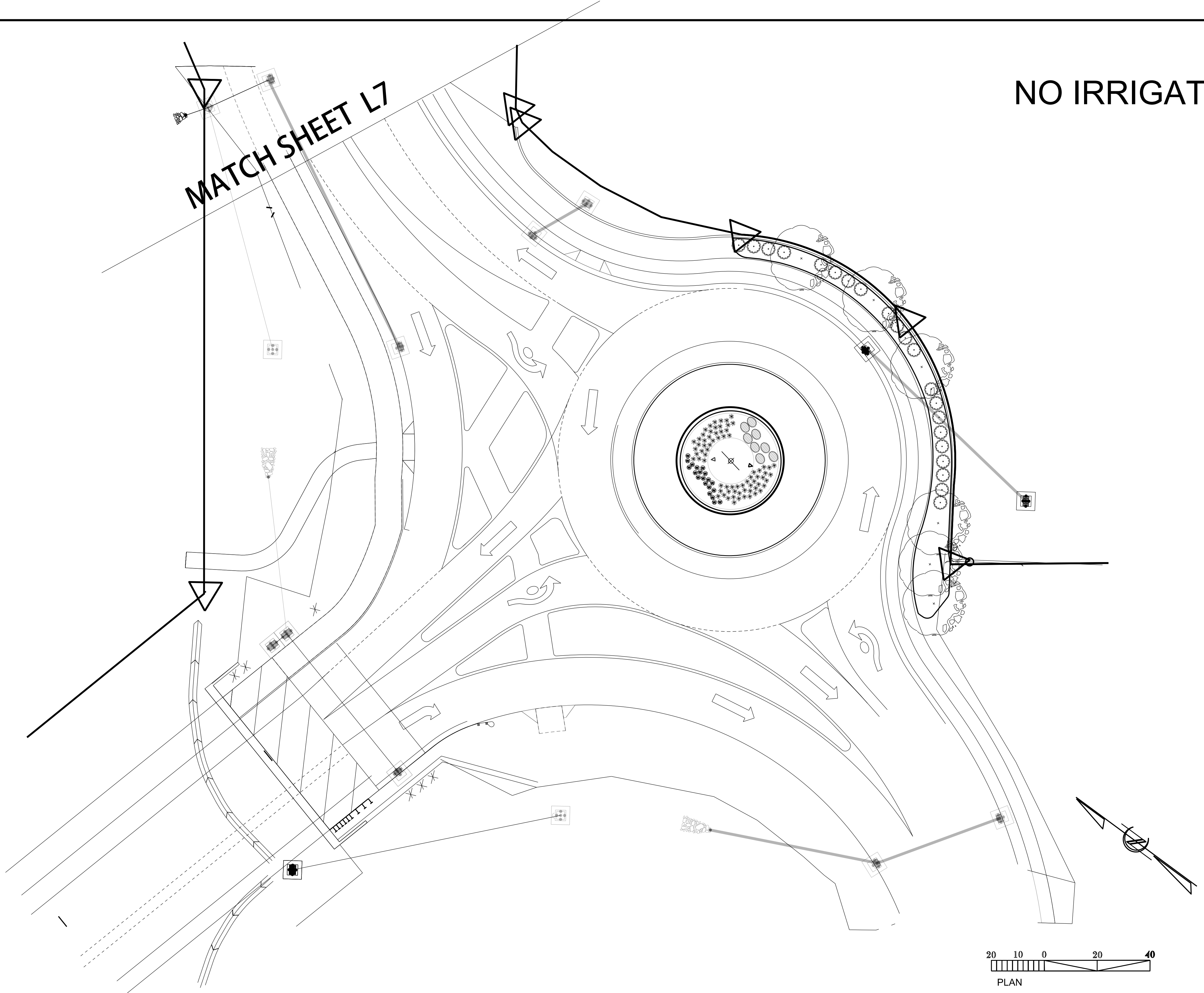
prel. design date :	Sept/2019
checked by & date :	
final design date :	

Landscape Plan
Mainland Roundabout

T.I.P. #	B-4929(L)
WBS #	40233.3.2
FED I.D. #	
sheet no. :	total sheet no. :
L3i	

NO IRRIGATION ON THIS SHEET

MATCH SHEET L7



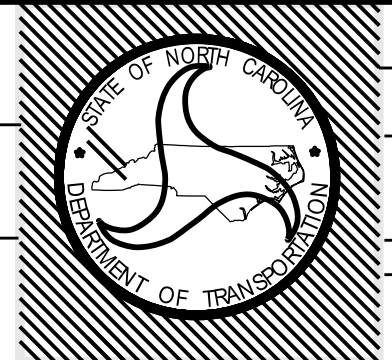
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<https://www.ncdot.gov/initiatives-policies/environmental/roadside-beautification>

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 Landscape Development Plan
 Surf City NC

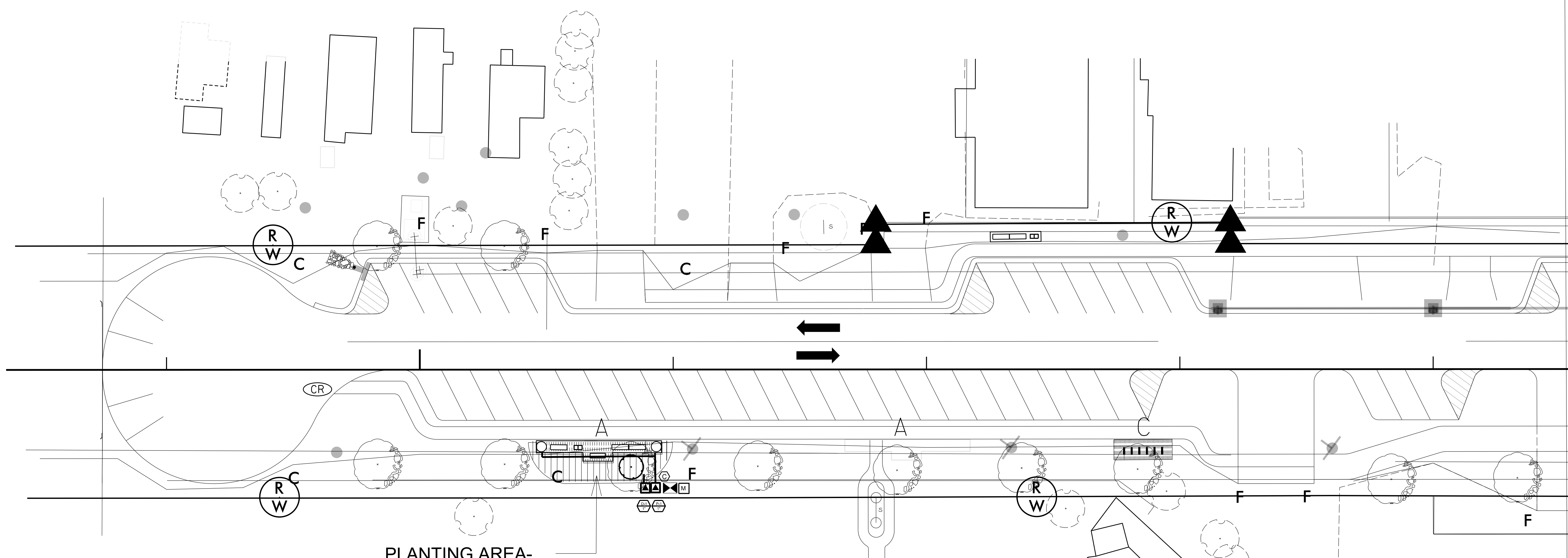
RM Kobetsky

sheet description:	pref. design date : Sept/2019
	checked by & date :
	final design date :

Landscape Plan
 Island Roundabout



T.I.P. #	B-4929(L)
WBS #	40233.3.2
FED I.D. #	
sheet no :	total sheet no :
L4i	



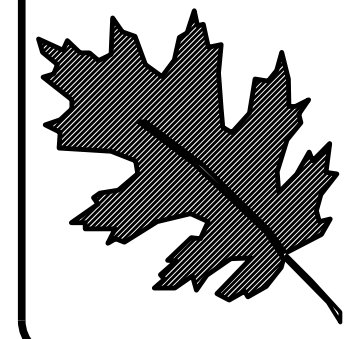
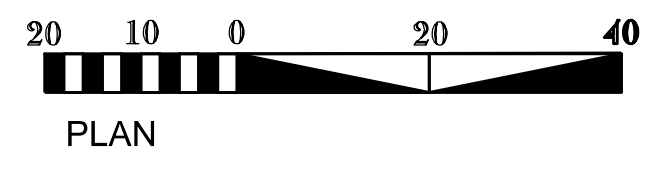
PLANTING AREA-
DRIP IRRIGATION
& PLANTERS (TYP)

PLACEMENT OF IRRIGATION LINES
IS NOT EXACT. DISCUSS/CONFIRM
LAYOUT WITH NCDOT ENGINEER
PRIOR TO INSTALLATION.

KEY

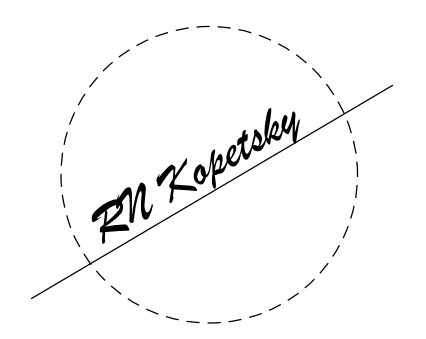
- Proposed Bore/Sleeve
- Existing Sleeve
- 90° Pop-up Spray Head
- 180° Pop-up Spray Head
- 360° Pop-up Spray Head
- Back Flow Preventer
- Battery Controller
- Drip Line Irrigation/Area
- Drip Valve Assembly
- Electric Control Valve
- 1" Lateral Line
- 1 1/2" Main Line
- Valve Station Designation
- Water Meter (provided by city)

(D-1 REPRESENTS DRIP ZONE 1; ID-1 REPRESENTS ISLAND DRIP ZONE 1; P= PLANTER ZONE; S= SPRAY ZONE.)



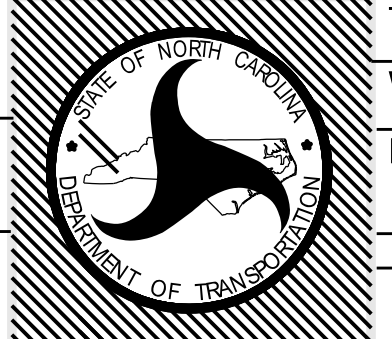
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B-4929(L) / Roland Ave
Landscape Development Plan
Surf City NC



prel. design date :	Sept/2019
checked by & date :	
final design date :	

Irrigation Plan
ROLAND AVE SECT. A

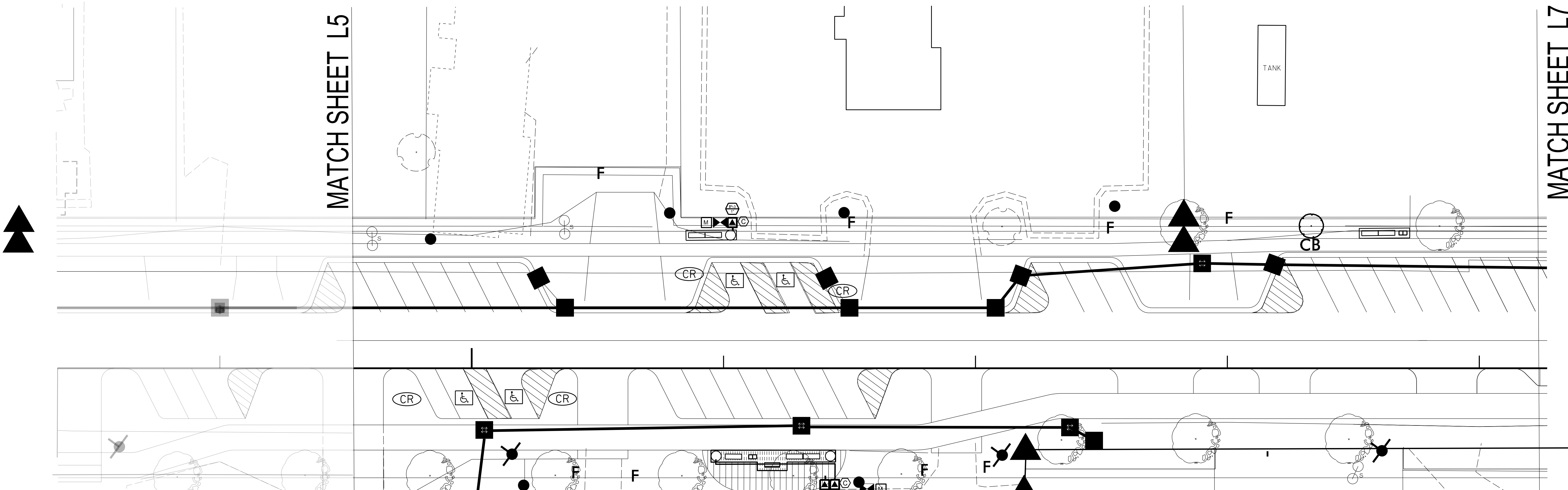


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WBS #	40233.3.2
FED I.D. #	
sheet no :	total sheet no :
L5i	

PLACEMENT OF IRRIGATION LINES IS NOT EXACT. DISCUSS/CONFIRM LAYOUT WITH NCDOT ENGINEER PRIOR TO INSTALLATION.

MATCH SHEET L5

MATCH SHEET L7

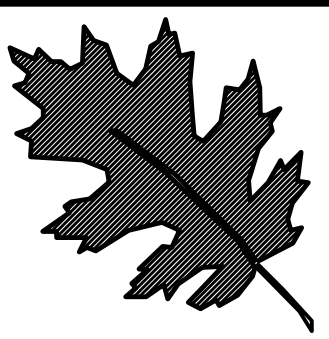
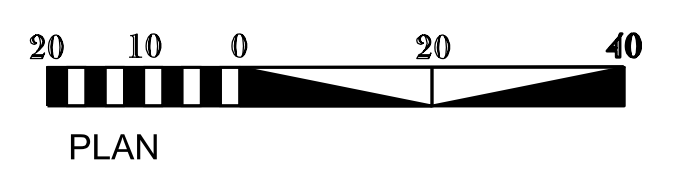


KEY

- Proposed Bore/Sleeve
- Existing Sleeve
- 90° Pop-up Spray Head
- 180° Pop-up Spray Head
- 360° Pop-up Spray Head
- Back Flow Preventer
- Battery Controller
- Drip Line Irrigation/Area
- Drip Valve Assembly
- Electric Control Valve
- 1" Lateral Line
- 1 1/2" Main Line
- Valve Station Designation
- Water Meter (provided by city)

PLANTING AREA-
DRIP IRRIGATION
& PLANTERS (TYP)

(D-1 REPRESENTS DRIP ZONE 1; ID-1 REPRESENTS ISLAND DRIP ZONE 1; P= PLANTER ZONE; S= SPRAY ZONE.)



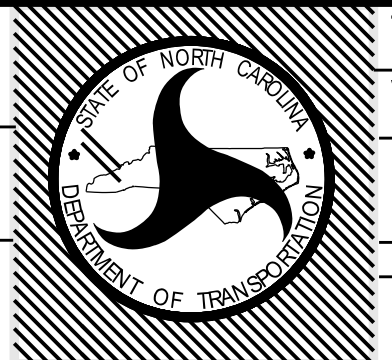
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B-4929(L) / Roland Ave
Landscape Development Plan
Surf City NC

R. Kobetsky

sheet description:	prel. design date : Sept/2019
	checked by & date :
	final design date :

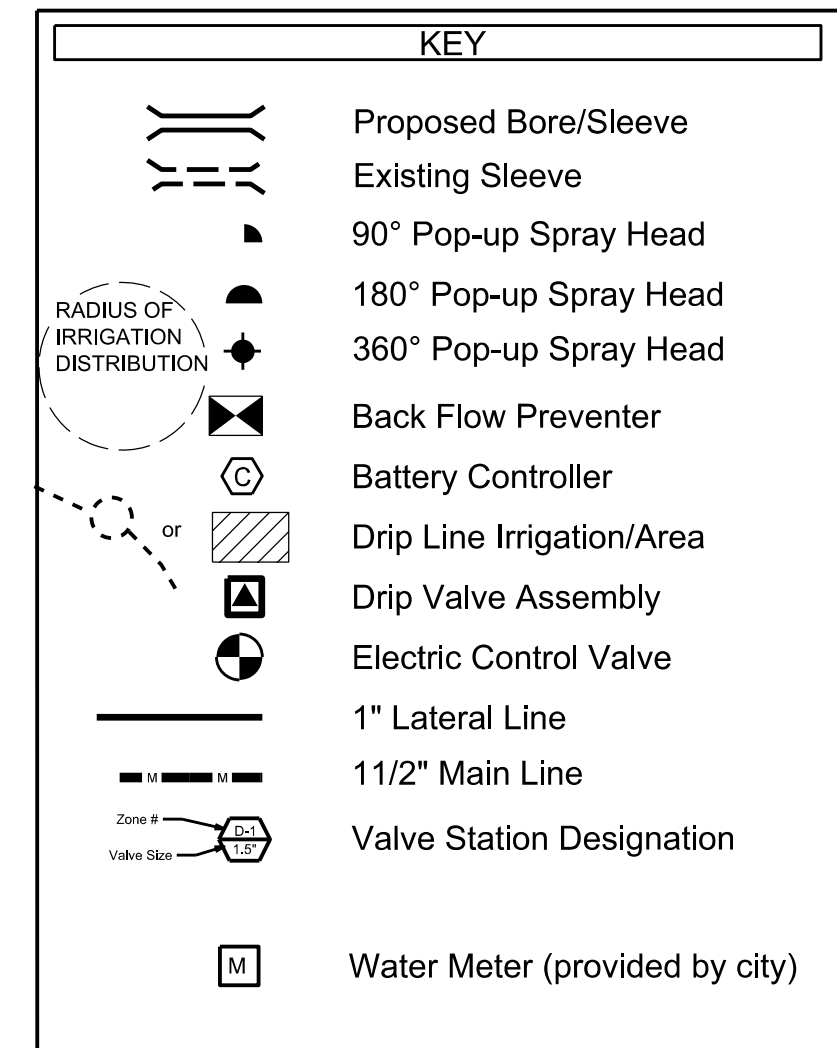
Irrigation Plan
ROLAND AVE SECT. B



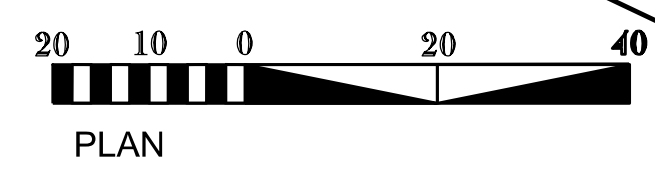
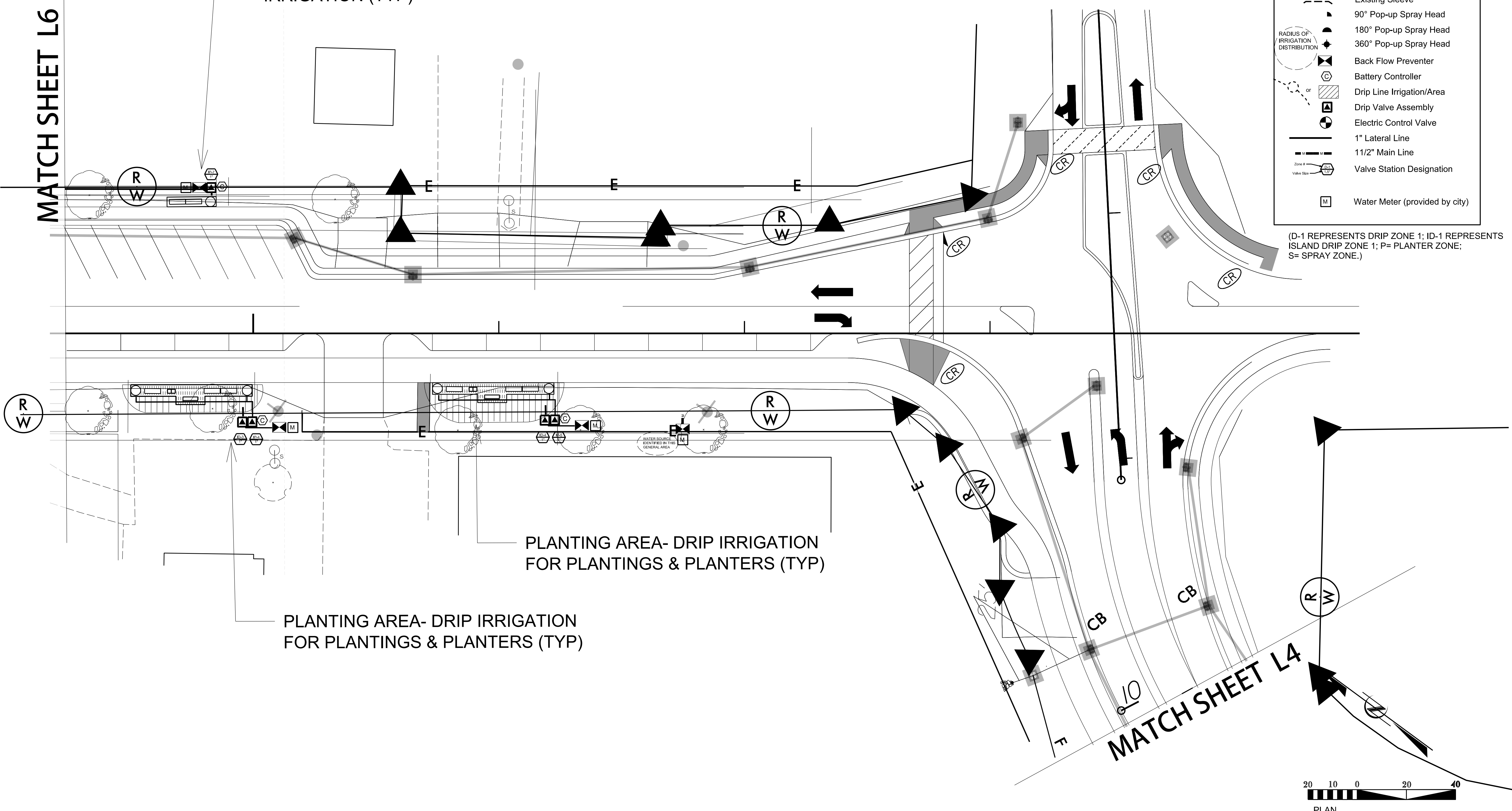
T.I.P. #	B-4929(L)
WBS #	40233.3.2
FED I.D. #	
sheet no :	total sheet no :
L6i	

MATCH SHEET L6

DETAIL B- PLANTER IRRIGATION (TYP)



(D-1 REPRESENTS DRIP ZONE 1; ID-1 REPRESENTS ISLAND DRIP ZONE 1; P= PLANTER ZONE; S= SPRAY ZONE.)



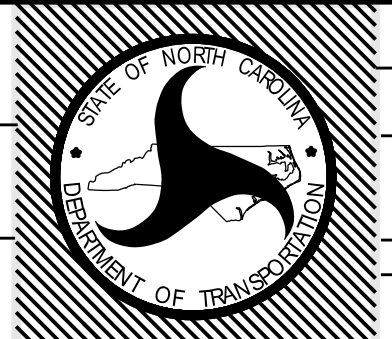
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B-4929(L) / Roland Ave
 Landscape Development Plan
 Surf City NC

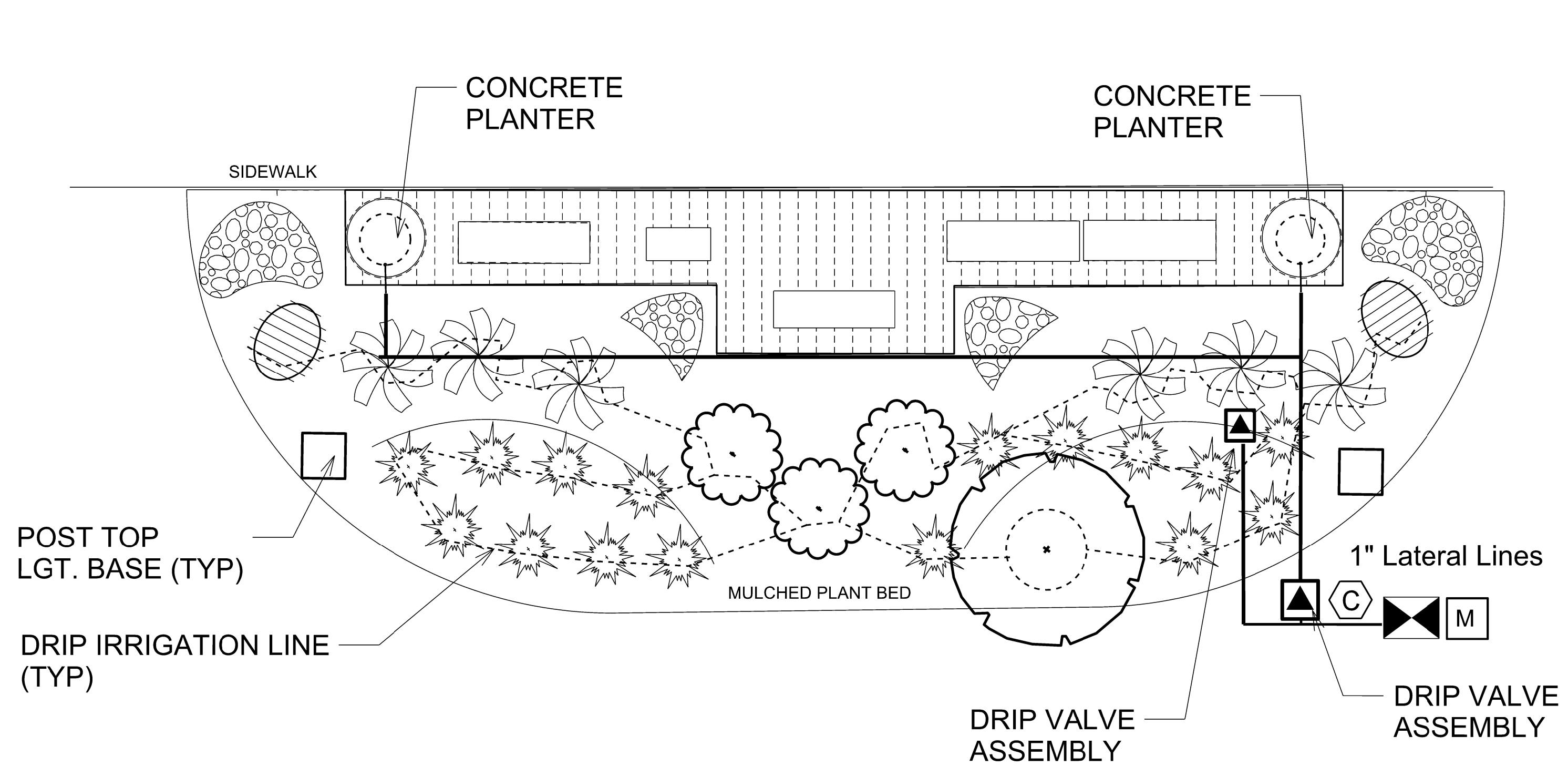
RN Kobersky

sheet description:	pref. design date : Sept/2019
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	final design date :

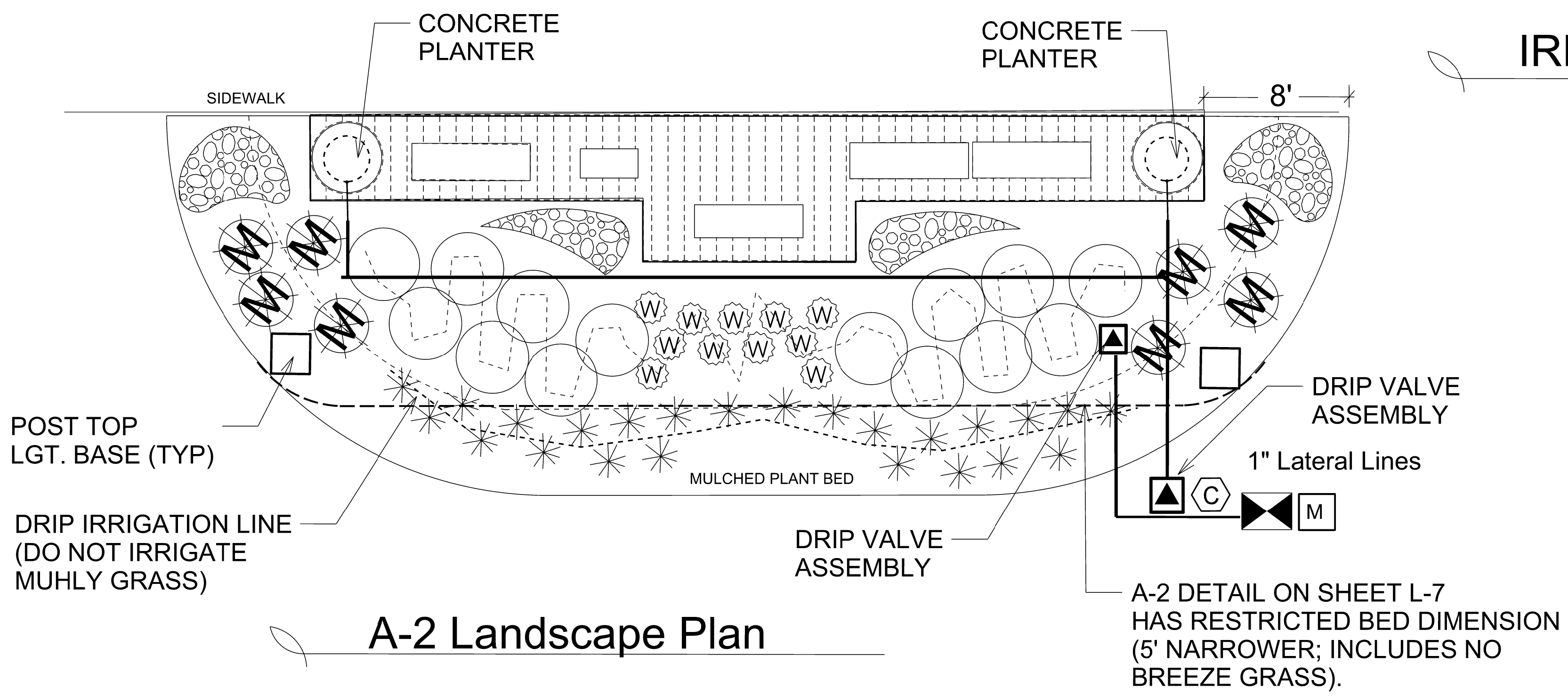
Irrigation Plan
 ROLAND AVE SECT. C



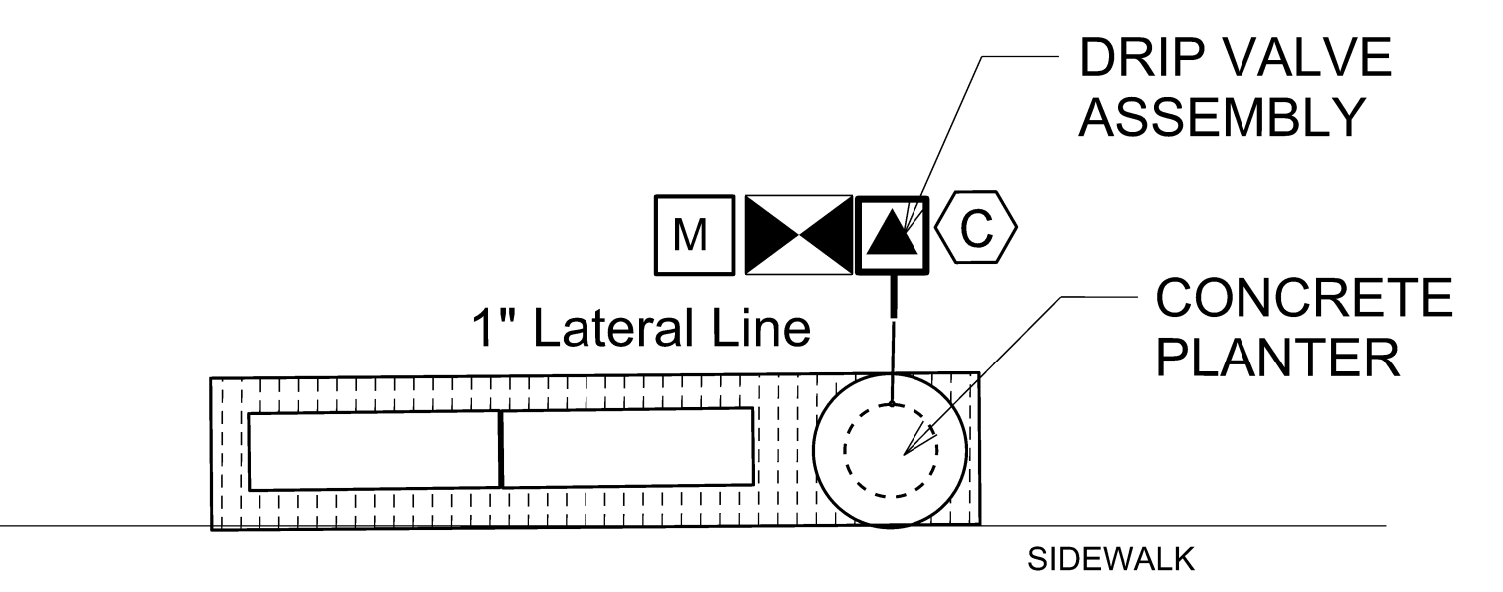
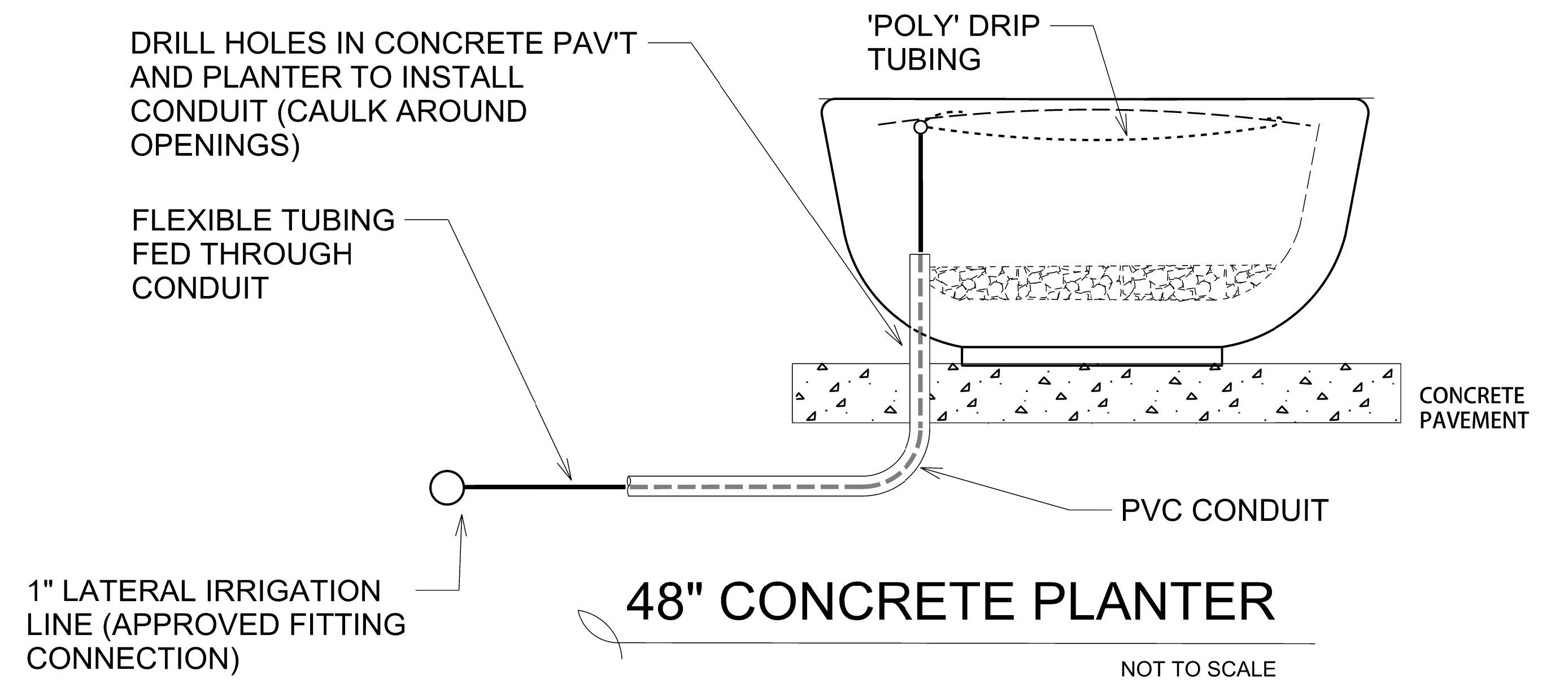
T.I.P. #	B-4929(L)
WBS #	40233.3.2
FED I.D. #	
sheet no :	total sheet no :
L7i	



A-1 Landscape Plan



A-2 Landscape Plan

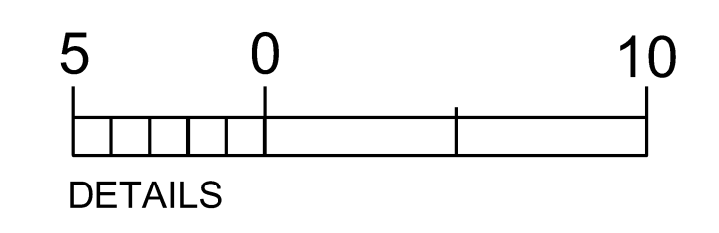


IRRIGATION DETAIL B2

DETAIL B1 DOES NOT RECEIVE IRRIGATION

NOTES

- METERS AND BACKFLOWS TO BE SET BY THE TOWN OF SURF CITY.
- PLACEMENT OF IRRIGATION LINES IS NOT EXACT. DISCUSS/CONFIRM LAYOUT WITH NCDOT CHECK ENGINEER PRIOR TO INSTALLATION.
- PLACE VALVE ASSEMBLY IN PLANT BEDS WHENEVER POSSIBLE.



KEY	
	Proposed Bore/Sleeve
	Existing Sleeve
	90° Pop-up Spray Head
	180° Pop-up Spray Head
	360° Pop-up Spray Head
	Back Flow Preventer
	Battery Controller
	Drip Line Irrigation/Area
	Drip Valve Assembly
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	Valve Station Designation
	Water Meter (provided by city)

