

BERETTA-SCOTT ROAD CUMBERLAND
3/14/2018

CATEGORY 1 B.S.F. PUMP CYCLE TIME INTERVALS

INPUT

NUMBER OF BEDROOMS 2

Ignore this line

OF ORIFICES PER DOSE (OR PUMP) 45 orifices from "BSF"

PUMP'S ACTUAL OPERATING POINT (FLOW) 28.6 gpm from pump

GALLONS PER ORIFICE PER DOSE (<=0.25) 0.15 gallon

OF ZONES 1

IS THERE A CHECK VALVE (with no weephole)? no choose INPUT TH

ALTERNATING PUMPS? no choose

PLEASE IGNORE THIS LINE 2 choose

LENGTH OF B.S.F. 13.5 feet from "BSF"

WIDTH OF B.S.F. 7.5 feet from "BSF"

LATERAL NOMINAL DIAMETER 3/4 inches choose

LATERAL LINE PIPE CLASS/SCHEDULE 40 choose

(per zone) LATERAL LENGTH 12.00 feet from "BSF"

(per zone) # OF LATERALS 5 laterals from "BSF"

PUMP BASIN DIAMETER 24 inches

OUTPUT

TOTAL NUMBER OF ORIFICES IN B.S.F. 45 orifices

(better if less than 2.4 hrs/day) RUN TIME 0.13 hrs/day

TIME THE PUMP RUNS DURING DRAWDOWN EVENT 0.30 minutes/dose

(approx.) TIME THE PUMP IS OFF AFTER A DRAWDOWN EVENT 41.95 minutes

GAL./DOSE NEEDED 8.50 gallons

PUMP BASIN GALLONS PER VERTICAL FOOT 23.50 gallons

DRAW DOWN 0.35 feet

CHECKS

TOTAL CYCLES PER PUMP (per day) 34.07 cycles O.K.II

TOTAL CYCLES PER ZONE (per day) (24÷X÷48) 34.07 cycles O.K.II

HYDRAULIC LOADING RATE (CHECK WITH YOUR DESIGN) 2.27 gal/sq.ft./day

INPUT THE PIPE INFORMATION IF EFFLUENT RETURNS TO PUMP TANK

DISCHARGE ASSEMBLY DIAMETER 1 1/4 inches

TRANSPORT LINE NOMINAL DIAMETER 1 1/4 inches

TRANSPORT LINE PIPE CLASS/SCHEDULE 40 choose

MANIFOLD NOMINAL DIAMETER 1 inches

MANIFOLD LINE PIPE CLASS/SCHEDULE 40 choose

DISCHARGE ASSEMBLY LENGTH 5 feet

TRANSPORT LINE LENGTH 15 feet

(per zone) MANIFOLD LENGTH 6 feet

VOLUME TO FILL-UP 1.75 gallons

TIME NEEDED FOR PIPE FILL-UP 0.06 minutes

TOTAL TIME PER DAY FOR FILL-UP 2.09 minutes

BERETTA-SCOTT ROAD CUMBERLAND
3/14/2018

BOTTOMLESS SAND FILTER SIZING

INPUT

PRETREATMENT CATEGORY 1 choose

(most restrictive) SOIL CATEGORY WITHIN 3 FEET OF BSF'S BOTTOM 6

NUMBER OF BEDROOMS 2 (enter 0 if designing by t) gallons/day

Ignore this line

DESIRED BSF LENGTH 13.5 feet LENGTH T

(enter 0 if you want program to calculate) DESIRED BSF WIDTH 7.5 feet O.K.II

(use same in pump calcs.) DESIRED ORIFICE SPACING 18 inches O.K.II

DESIRED LATERAL SPACING 18 inches

(from pump calculations) TOTAL NUMBER OF ORIFICES 45 orifices

OUTPUT

(approx.) MINIMUM LATERAL LENGTH FOR PUMP CALCULATIONS 12.00 feet

(approximate) MANIFOLD LENGTH FOR PUMP CALCULATIONS 6.00 feet

CHECK FOR LATERAL LENGTH O.K.II

(from Table 1 - Guidance Document) MAXIMUM LOADING RATE 2.30 gal/sq.ft./day

REQUIRED BSF AREA 100.00 sq.ft.

BSF AREA PROVIDED 101.25 sq.ft. O.K.II

BSF WIDTH 7.50 feet

CALCULATED NUMBER OF LATERALS 5.00 laterals

DISTANCE FROM BSF EDGE TO FIRST AND LAST LATERALS 9.00 inches O.K.II

(w/out fittings) DISTANCE FROM EDGE OF BSF TO LATERAL ENDS 4.50 inches O.K.II

NUMBER OF ORIFICES PER LATERAL 9.00 orifices O.K.II

DESIGNED LOADING RATE 2.27 gal/sq.ft./day

Pump Selection for a Pressurized System - Single Family Residence Project

BERETTA-SCOTT ROAD CUMBERLAND / BSF PUMP

Parameters

Discharge Assembly Size	1.25	inches
Transport Length	15	feet
Transport Pipe Class	40	
Transport Pipe Size	1.25	inches
Discharge Valve Model	None	
Manifold Length	4	feet
Manifold Pipe Class	40	
Manifold Pipe Size	1.00	inches
Number of Laterals per Cell	5	
Lateral Length	12	feet
Lateral Pipe Class	40	
Lateral Pipe Size	0.75	inches
Orifice Size	0.6	inches
Orifice Spacing	1.5	feet
Residual Head	10.7	feet
Flow Meter	None	inches
*Adv or Friction Losses	0	feet

Calculations

Minimum Flow Rate per Orifice	0.63	gpm
Number of Orifices per Zone	45	
Total Flow Rate per Zone	265	gpm
Number of Laterals per Zone	5	
% Flow Difference Total to Orifice	12	%
Transport Velocity	1.2	ft/s

Frictional Head Losses

Loss through Discharge	0.7	feet
Loss in Transport	1.5	feet
Loss through Valve	0.0	feet
Loss in Manifold	0.0	feet
Loss in Laterals	0.0	feet
Loss through Flow Meter	0.0	feet
*Adv or Friction Losses	0.0	feet

Pipe Volumes

Vol of Transport	12	gals
Vol of Manifold	0.3	gals
Vol of Laterals per Zone	17	gals
Total Volume	31	gals

Minimum Pump Requirements

Design Flow Rate	265	gpm
Total Dynamic Head	229	feet

Pump Data

PR2500 Super Pump
12HP/115V/18

Legend

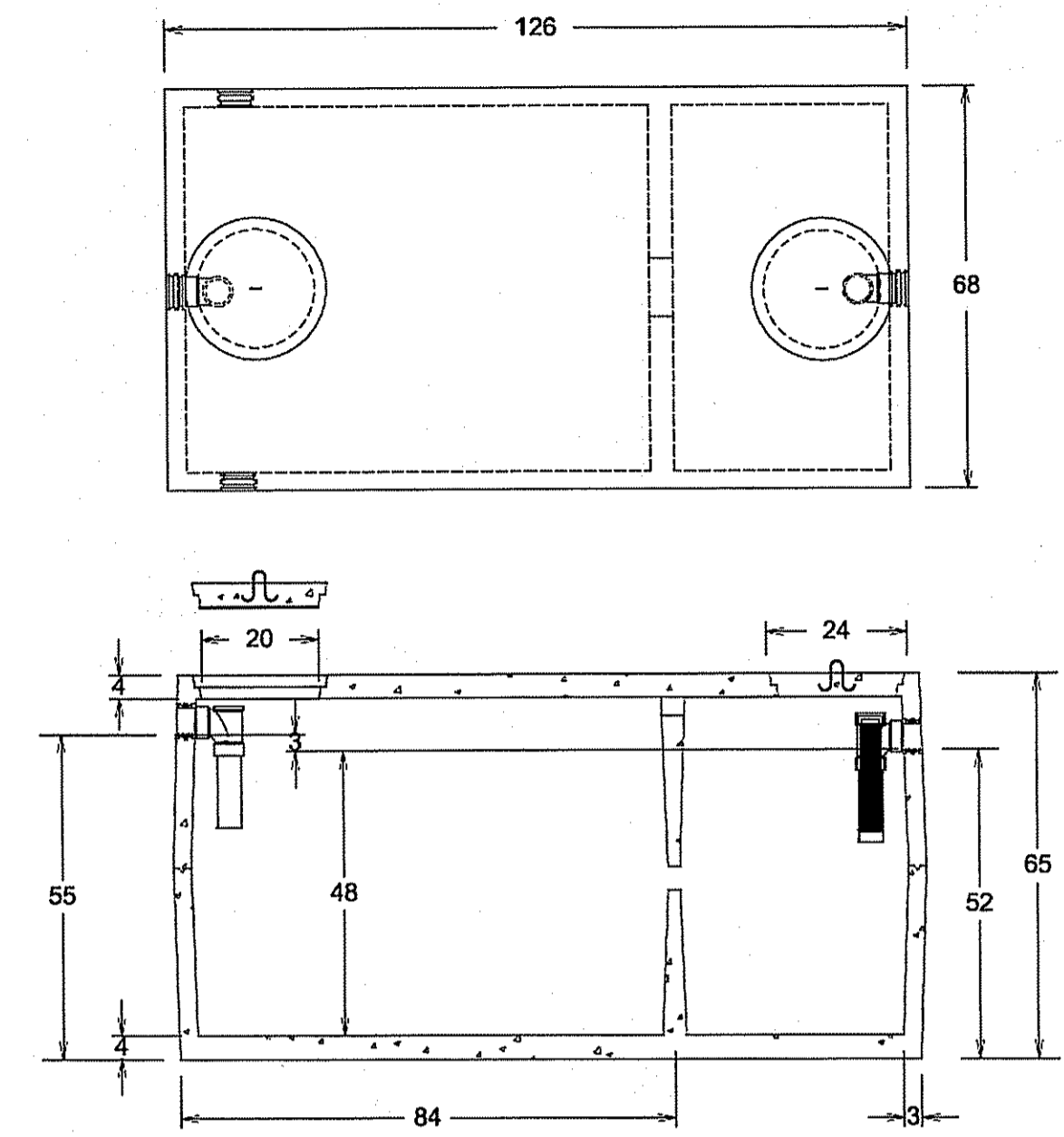
- System Curve
- Pump Curve
- Pump Optimal Range
- Operating Point
- Design Point

Environmental Management

AUG 8 2018

Office of Water Resources

1500 GALLON TWO COMPARTMENT SEPTIC TANK



DESIGN NOTES

- 1) ALL JOINTS SEALED WITH BUTYL RUBBER SEALANT.
- 2) ALL INLETS AND OUTLETS HAVE STATE-APPROVED SEALS.
- 3) AVAILABLE OUTLET FILTER SHOWN
- 4) MEETS ASTM C 1227-97A
- 5) CONCRETE STRENGTH 5000 PSI. MIN. 28 DAYS

JOLLEY PRECAST, INC.
860-774-9066

FILE: 15002c

BERETTA-SCOTT ROAD CUMBERLAND
3/14/2018

TEXTILE FILTER PUMP CYCLE TIME INTERVALS (RESIDENTIAL)

INPUT

COMMERCIAL OR RESIDENTIAL? residential choose

NUMBER OF BEDROOMS 2

TOTAL FLOW 230 gallons/day

PRETREATMENT UNIT USED AX-20 choose

PUMP'S ACTUAL OPERATING POINT (FLOW) 29.5 gpm from pump calculations

(30 seconds is standard) PUMP 'ON' TIME (every cycle) 25 seconds IGNORE THIS LINE. SEE

OF PRETREATMENT UNITS PER PUMP 1 units

RECIRCULATION RATIO 1: 5

IS THERE A CHECK VALVE (with no weep hole)? no choose INPUT THE SIZE

ALTERNATING PUMPS? no choose please ignore n

ore if single pump) HOW MANY ALTERNATING PUMPS? 2 ignore this line

OUTPUT

ACTUAL FLOW 150 gallons/day

OF ORIFICES PER DOSE 70 orifices

(better if less than 2.4 hrs/day) RUN TIME PER PUMP 0.42 hrs/day

PUMP ON 0.50 (min/dose) 0:30 min:sec

PUMP OFF 23.10 (minutes) 23:16 min:sec

OVERRIDE TIMER ON 0.42 (min/dose) 0:25 min:sec

OVERRIDE TIMER OFF 11.55 (minutes) 11:33 min:sec

CHECK

(per day) (-300) TOTAL CYCLES PER PUMP 61.02 cycles O.K.II

INPUT THE PIPE INFORMATION ONLY IF YOU HAVE WEEPHOLE ABOVE CHECK VALVE

DISCHARGE ASSEMBLY DIAMETER 1 inches

TRANSPORT LINE NOMINAL DIAMETER 1 inches

TRANSPORT LINE PIPE CLASS/SCHEDULE 40 choose

DISCHARGE ASSEMBLY LENGTH 5 feet

TRANSPORT LINE LENGTH 25 feet

VOLUME TO FILL-UP 2.32 gallons

TIME NEEDED FOR PIPE FILL-UP 0.08 minutes

TOTAL TIME PER DAY FOR FILL-UP 0.91 minutes

VOLUME PER DOSE REACHING UNIT 12.3 gallons O.K.II

BERETTA-SCOTT ROAD CUMBERLAND
3/14/2018

TWO COMPARTMENT PROCESSING TANK (3-FLOAT)

INPUT

TWO COMPARTMENT TANK VOLUME CAPACITY 1500 gallons O.K.I

INVERT INTO RECIRCULATING TANK 99.67

SURGE CAPACITY 225 gallons O.K.I

(inches) (24" typical) CARTRIDGE HEIGHT 24 choose

PUMP VAULT HEIGHT (57" typical) 57 inches O.K.I

STANCE FROM OUTSIDE TOP OF TANK TO FLOOR OF TANK 61 inches from t

DISTANCE FROM INVERT OF TANK TO OUTSIDE TOP OF TANK 10 inches from t

OUTPUT

TANKS CAPACITY 31.25 gal/inch

SURGE VOLUME PERCENTAGE 22.5 %

Elev.	Dist. from inv.-in (feet)	from floor of tank (feet)
99.67	0.00	4.25
99.50	0.17	4.08
99.49	0.18	4.07
99.34	1.33	2.92
99.07	0.80	3.65
98.65	1.02	3.23
	60% "X"	2.19
	70% "X"	2.55

CHECKS

Elev.	Dist. from inv.-in (feet)
98.50	1.17

MINIMUM ALLOWED ELEVATION OF LOW WATER ALARM

MINIMUM ELEVATIONS ARE MET! O.K.I

PUMP VAULT HEIGHT CHECK

PUMP VAULT FITS IN THE TANK! O.K.I

MINIMUM SURGE CAPACITY CHECK

SURGE VOLUME ACCEPTABLE! O.K.I

Pump Selection for a Pressurized System - Single Family Residence Project

BERETTA-SCOTT RD CUMBERLAND / AX20 PUMP

Parameters

Discharge Assembly Size	1.00	inches
Transport Length	25	feet
Transport Pipe Class	40	
Transport Pipe Size	1.00	inches
Discharge Valve Model	None	
Manifold Length	2	feet
Manifold Pipe Class	40	
Manifold Pipe Size	0.75	inches
Number of Laterals per Cell	5	
Lateral Length	6.5	feet
Lateral Pipe Class	40	
Lateral Pipe Size	0.75	inches
Orifice Size	0.6	inches
Orifice Spacing	0.5	feet
Residual Head	4.7	feet
Flow Meter	None	inches
*Adv or Friction Losses	0	feet

Calculations

Minimum Flow Rate per Orifice	0.42	gpm
Number of Orifices per Zone	70	
Total Flow Rate per Zone	285	gpm
Number of Laterals per Zone	5	
% Flow Difference Total to Orifice	1.6	%
Transport Velocity	1.03	ft/s

Frictional Head Losses

Loss through Discharge	0.61	feet
Loss in Transport	1.02	feet
Loss through Valve	0.0	feet
Loss in Manifold	0.2	feet
Loss in Laterals	0.2	feet
Loss through Flow Meter	0.0	feet
*Adv or Friction Losses	0.0	feet

Pipe Volumes

Vol of Transport	11	gals
Vol of Manifold	0.9	gals
Vol of Laterals per Zone	0.9	gals
Total Volume	21	gals

Minimum Pump Requirements

Design Flow Rate	285	gpm
Total Dynamic Head	629	feet

Pump Data

PR3500 High Head Super Pump
30GPM/120HP
1150V/1200V/1800V/3

Legend

- System Curve
- Pump Curve
- Pump Optimal Range
- Operating Point
- Design Point

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

OFFICE OF WATER RESOURCES

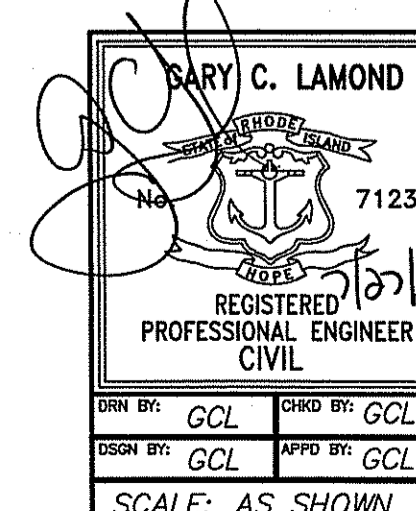
FRESHWATER WETLANDS PROGRAM

REVIEWED SITE PLAN APPLICATION NO.: 18-0209

DATED OCT 19 2018

SEE LETTER OF SAME DATE

ED	ELEVATION
BUILDING SEWER ELEV	99.87
INTO TANK	99.67
TOP OF TANK	100.50
BOT OF TANK	95.08
COVER ELEV OVER TANK	102.00
RSV INV	99.84
INV OUT ADV. PUMP	100.75
INV INTO PUMP BASIN	99.50
INV OUT PUMP BASIN	99.50
COVER ELEV OVER PUMP BASIN	102.00
BSF PUMP HW ALARM ELEV	99.25
BSF PUMP ON ELEV	99.00
BSF PUMP OFF ELEV	98.84
BOT OF PUMP BASIN	96.00
TOP OF ADV. UNIT	102.60
ADV. UNIT INV IN	102.10
ADV. UNIT INV OUT	100.10
EX GRADE AT BSF	100.00
GWIT ELEV AT BSF	98.20
IMPERVIOUS ELEV	95.87
BOT OF BSF ELEV	99.85
TOP OF SAND ELEV	101.85
BSF LATERAL INV ELEV	102.18
TOP OF P-STONE/BSF ELEV	102.60
INV INTO BSF BOX	99.75
PR. GRADE AT BFS	102.00



TITLE: **OWTS DESIGN PLAN**

PROJECT: **A.P. 66 LOT 90 & 91 SCOTT ROAD CUMBERLAND, RHODE ISLAND**

CLIENT: **NORMAN BERETTA**

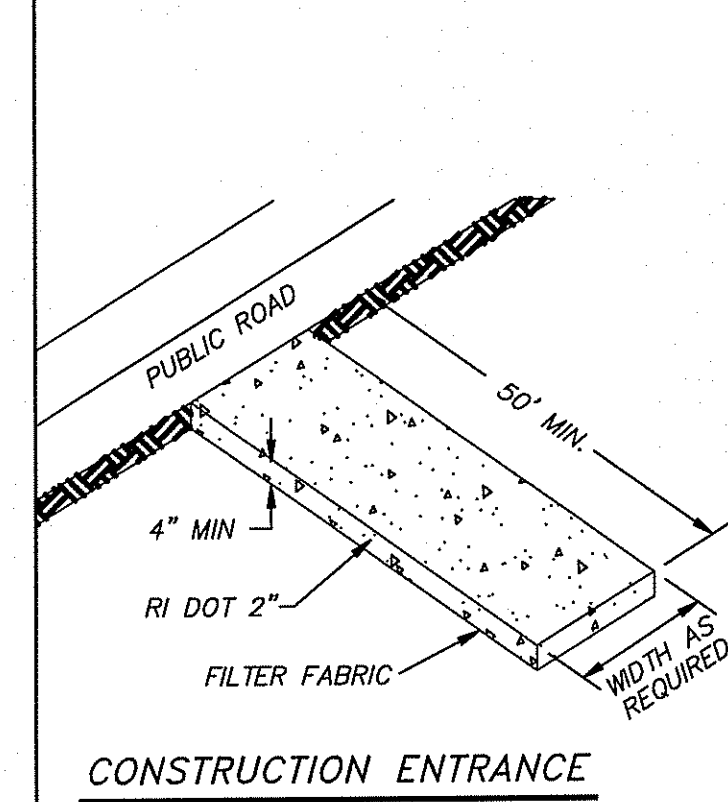
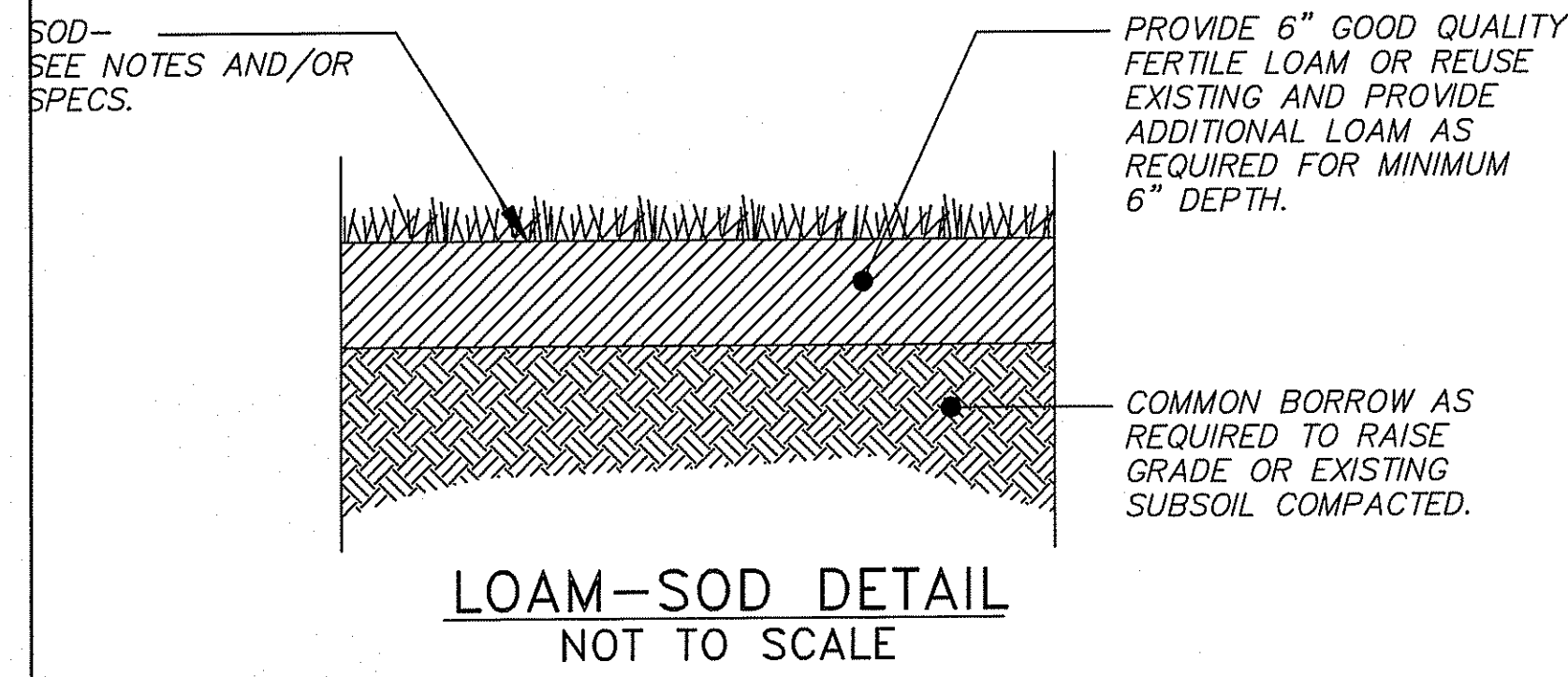
GARY C. LAMOND, PE, LLC
194 HATCHERY ROAD
NORTH KINGSTOWN, RI 02852

PROJ. NO: 2017041

DATE: 03/14/18

2/4

REVISED: 7/27/18



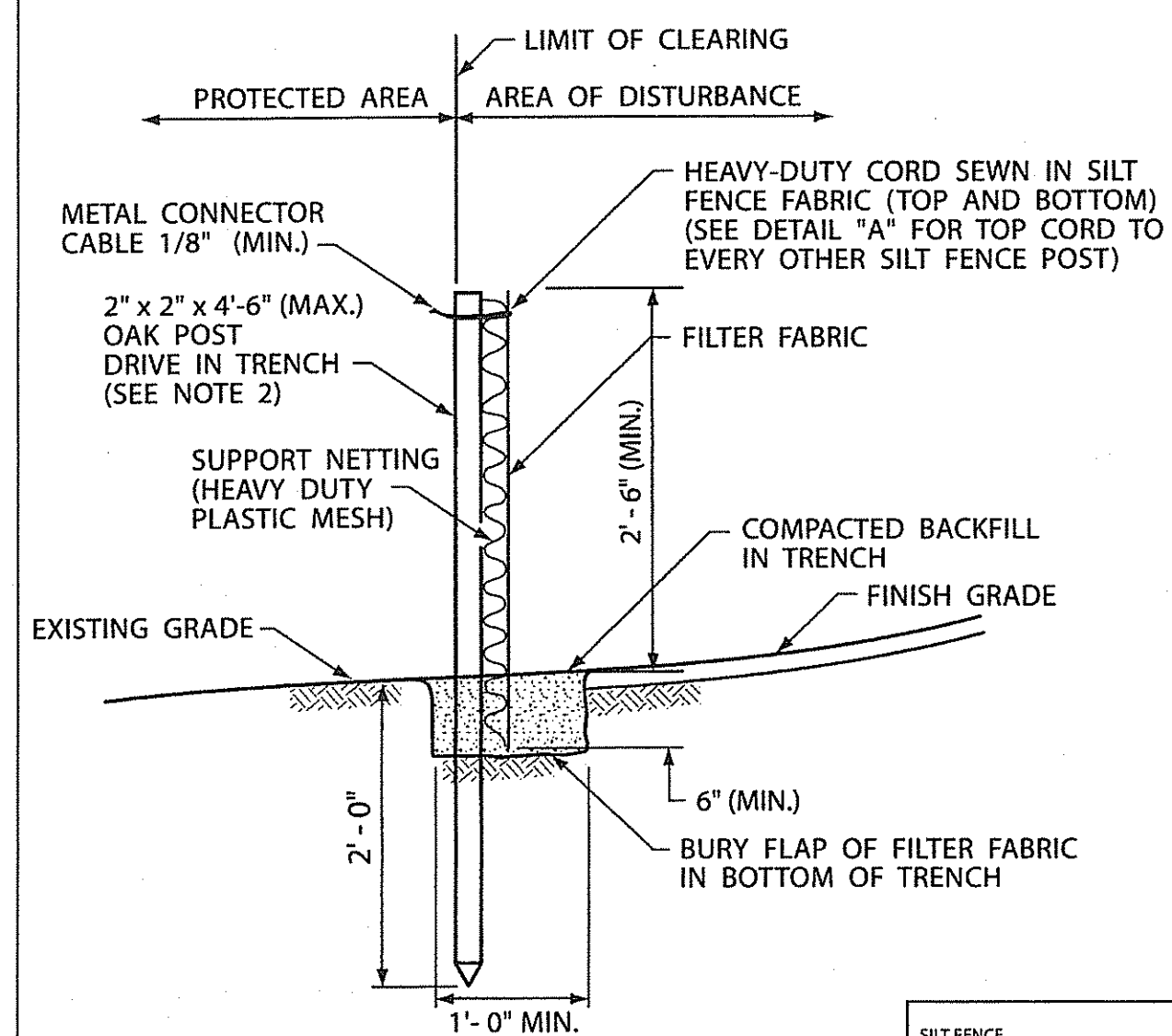
MATERIALS SIZE			
SQUARE MESH SIEVES (INCHES)	RIDOT 2" CRUSHED STONE OR GRAVEL % FINER	ASTM C-33 NO. 2 % FINER	ASTM C-33 NO. 3 % FINER
2-1/2	100	90-100	100
2	95-100	35-70	90-100
1-1/2	30-55	0-15	35-70
1-1/4	0-25	0-25	—
1	0-5	—	0-15
3/4	—	0-5	—
1/2	—	—	0-5
3/8	—	—	—

INSTALLATION REQUIREMENTS
THE AREA OF THE ENTRANCE SHOULD BE CLEARED OF ALL VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL. A STABILIZATION FILTER CLOTH CAN BE PLACED ON THE SUBGRADE PRIOR TO THE GRAVEL PLACEMENT TO PREVENT PUMPING. THE GRAVEL SHALL BE PLACED TO THE SPECIFIED DIMENSIONS. ANY DRAINAGE FACILITIES REQUIRED BECAUSE OF WASHING SHOULD BE CONSTRUCTED ACCORDING TO SPECIFICATIONS. IF WASH RACKS ARE USED, THEY SHOULD BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

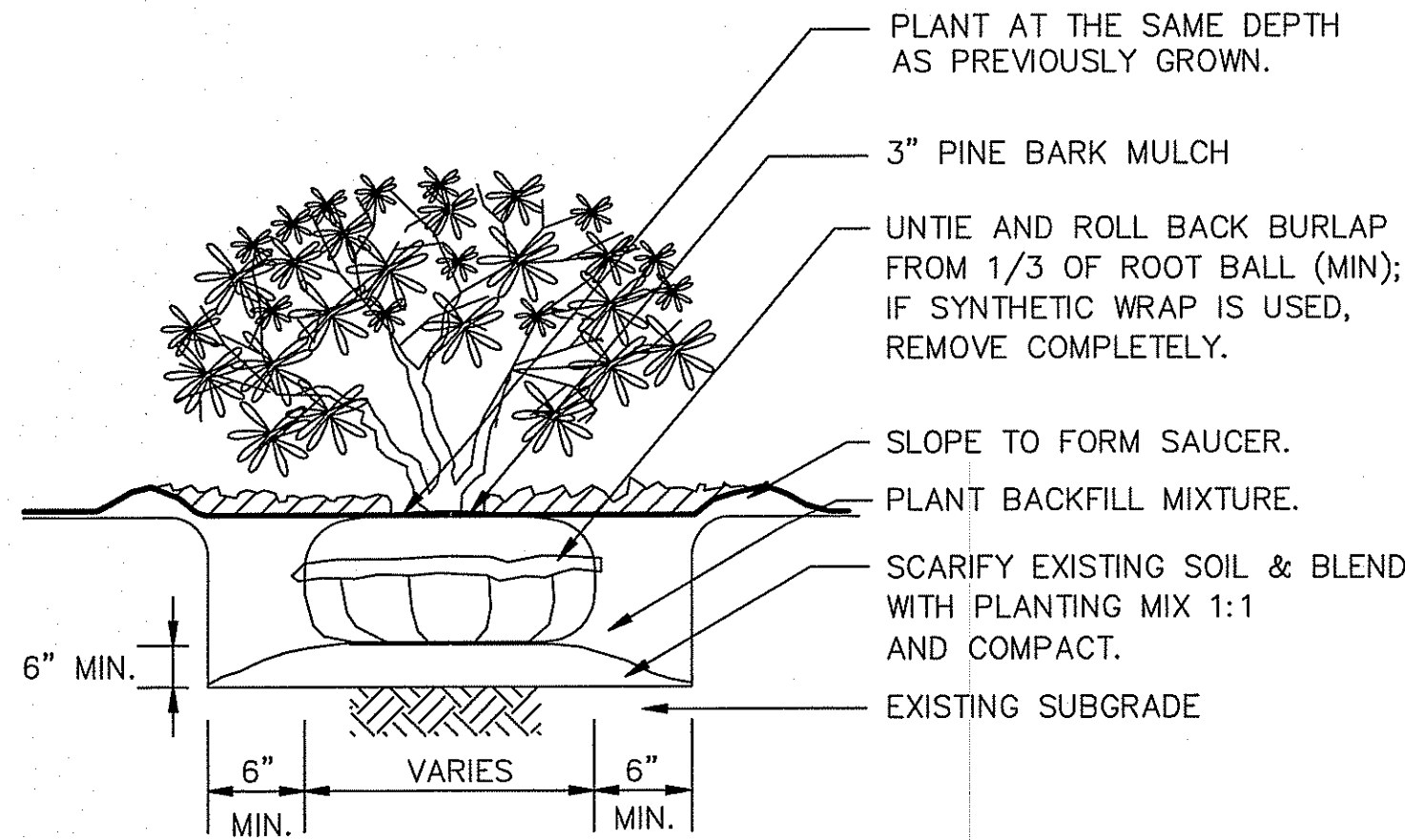
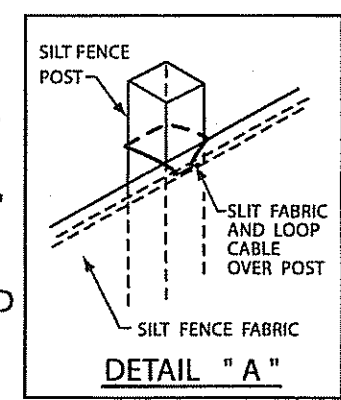
MAINTENANCE
THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAYS MUST BE REMOVED IMMEDIATELY.

CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE

Installation of Silt Fence



- NOTES:
- SHALL BE IN ACCORDANCE WITH SECTION 206 OF THE R.I. STANDARD SPECIFICATIONS.
 - 2" x 2" x 4'-6" (MAX.) OAK POSTS FOR SILT FENCE SHALL BE LOCATED 8'-0" (MAX.) O.C. IN WETLAND AREAS AND 4'-0" (MAX.) O.C. IN WETLAND RAVINE, GULLY OR DROP-OFF AREAS AS SHOWN ON PLANS.
 - 1" x 1" x 4'-6" (MIN.) POSTS PERMITTED FOR PRE-FABRICATED SILT FENCE.
 - SILT FENCE SHALL BE INSTALLED BEFORE ANY GRUBBING OR EARTH EXCAVATION TAKES PLACE.



TYPICAL SHRUB PLANTING DETAIL
NOT TO SCALE

EROSION CONTROL PROGRAM

PRIOR TO START OF CONSTRUCTION, HAYBALES, SILT FENCES AND ALL OTHER SPECIFIED EROSION CONTROL FENCES SHALL BE IN PLACE.

CRITICAL AREAS SUCH AS WETLAND AREAS, SLOPES AND STREAMS SHALL BE PROTECTED AS PER PLAN AND, IN THE PRESENCE OF WETLANDS, THE CONDITIONS OF ANY ISSUED PERMIT SHALL BE ADHERED TO.

THE CONTRACTOR SHALL BE REQUIRED TO ESTABLISH AND FULLY MAINTAIN ALL REQUIRED EROSION AND SEDIMENTATION CONTROLS.

SEDIMENTATION CONTROL PROGRAM

ALL EXPOSED SLOPES, INCLUDING STOCKPILES OF MATERIAL, SHALL RECEIVE TEMPORARY SEDIMENTATION AND EROSION CONTROLS. THIS WILL INCLUDE LOAMING AND SEEDING, MULCHING, HAYMATS, ETC., TO STABILIZE THE AREA.

ALL DRAINAGE STRUCTURES SHALL BE SURROUNDED BY HAYBALES TO PREVENT INFILTRATION OF SEDIMENTS.

DRYWELLS, GALLEYS, RAIN GARDENS, AND OTHER LEACHING FACILITIES SHALL BE THOROUGHLY PROTECTED FROM SEDIMENTATION DURING CONSTRUCTION. IF SEDIMENTS ENTER FACILITIES DURING CONSTRUCTION, THE STRUCTURES SHALL BE CLEARED AND, IF NECESSARY, REMOVED AND REINSTALLED WITH ALL EXPENSE TO BE BORNE BY CONTRACTOR.

SHOULD SEDIMENTS ENTER A CRITICAL AREA, (WETLAND, BUFFER ZONE, ABUTTING PROPERTY) THE CONTRACTOR SHALL IMMEDIATELY CLEAN AND RESTORE THE EFFECTED AREA.

SLOPE PROTECTION TO BE INSTALLED ON ANY DISTURBED AREAS SUBJECT TO EROSION.

EXTREME CARE SHALL BE TAKEN TO PREVENT SEDIMENT OR UNSUITABLE MATERIAL FROM ENTERING WETLANDS, ROADWAYS AND/OR DRAINAGE STRUCTURES.

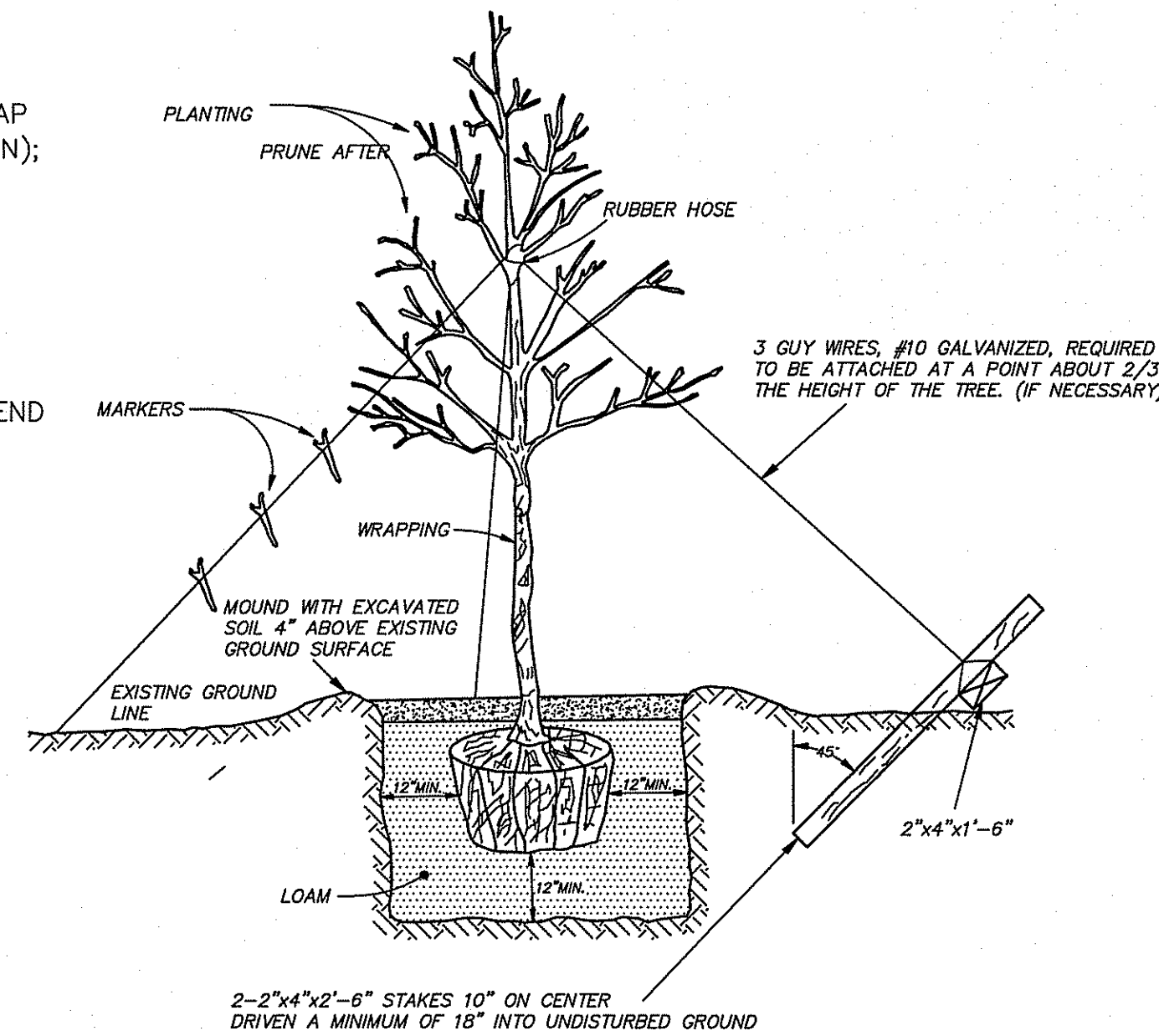
THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSPECTING AND MAINTAINING ALL EROSION CONTROL MEASURES PROMPTLY AFTER EACH RAINFALL AND TO ENSURE THAT RUNOFF FLOW PATTERNS ARE NOT INHIBITED DURING RAINFALL AND/OR SNOWMELT.

REMOVED SEDIMENTS SHALL NOT BE STOCKPILED IN AREAS WHERE POTENTIAL EXISTS FOR TRANSPORT OF THESE SEDIMENTS VIA STORM FLOW TO WETLANDS OR OTHER UNDESIRABLE LOCATIONS.

SILT FENCE SHALL BE PLACED AS DESIGNATED ON PLAN AS WELL AS ANY AREAS WHERE CONDITIONS WARRANT DURING CONSTRUCTION.

ACCUMULATED SEDIMENTS SHALL BE REMOVED AS DIRECTED BY THE OWNER, ENGINEER, BIOLOGIST, APPLICANT, LOCAL OR STATE OFFICIALS.

THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE CONSTRUCTION ENTRANCE. AT A MINIMUM THE ENTRANCE SHALL BE SWEEPED FREE OF SEDIMENT AND DEBRIS AT THE END OF EACH WORK DAY.



TYPICAL TREE PLANTING DETAIL
NOT TO SCALE

SOIL STABILIZATION & PLANTING PROGRAM

ACCEPTABLE PLANTING MATERIALS:

LOAM - THE MATERIAL TO BE FURNISHED SHALL CONSIST OF LOOSE, FRIABLE, SANDY LOAM OR LOAM TOPSOIL FREE OF A MIXTURE OF SUBSOIL, REFUSE, STUMPS, ROOTS, ROCKS, BRUSH, WEEDS AND OTHER MATERIAL WHICH WILL PREVENT THE FORMATION OF A SUITABLE SEED BED.

SEED MIXTURES - ALL LEGUME SEED SHALL BE INOCULATED WITHIN 24 HOURS BEFORE MIXING AND PLANTING WITH THE APPROPRIATE INOCULUM FOR EACH VARIETY. ALL INOCULA SHALL BE FRESH AND SHALL BE USED WITHIN THE DATE LIMIT PRESCRIBED BY THE MANUFACTURER.

FOR RELATIVELY FLAT SLOPES:

MIX	% BY WEIGHT
RED FESCUE - CHEWING'S PENNLAWN OR CREEPING	70
KENTUCKY BLUEGRASS	15
COLONIAL BENTGRASS - ASTORIA OR EXETER	5
PERENNIAL RYEGRASS	10

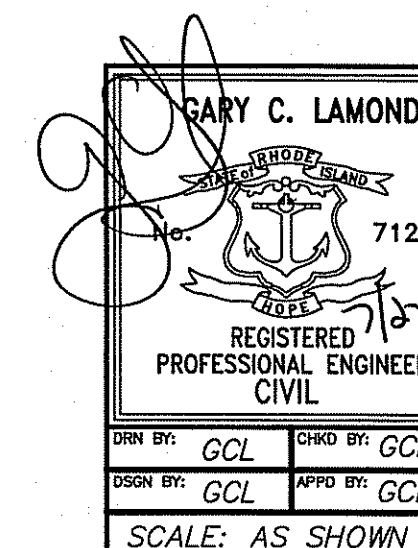
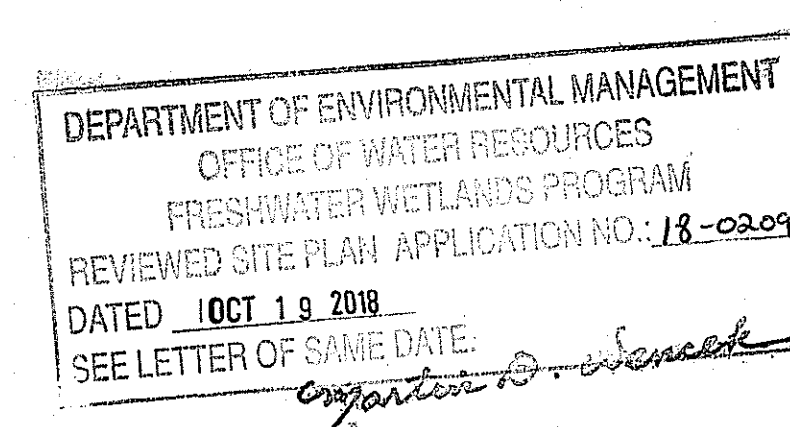
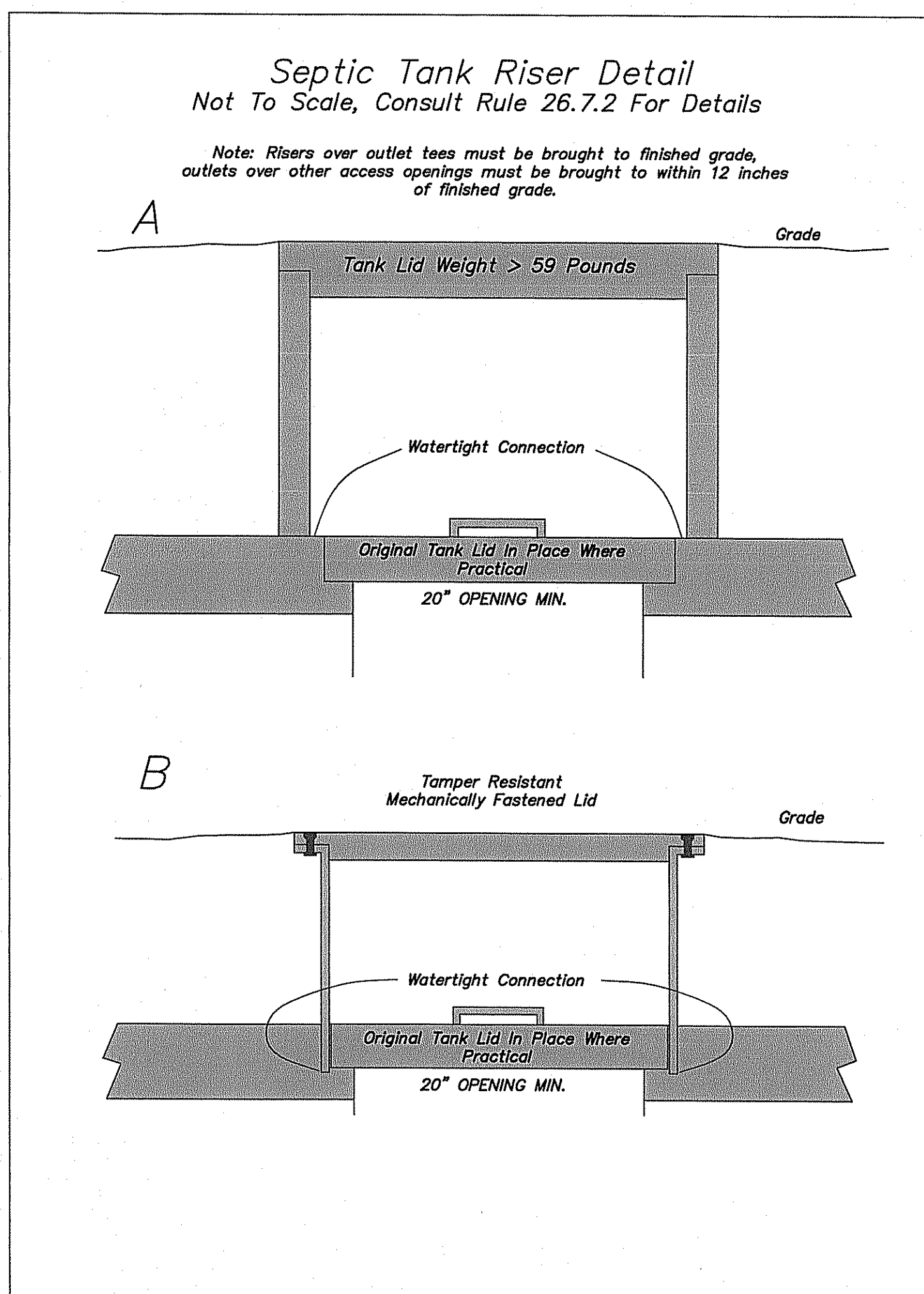
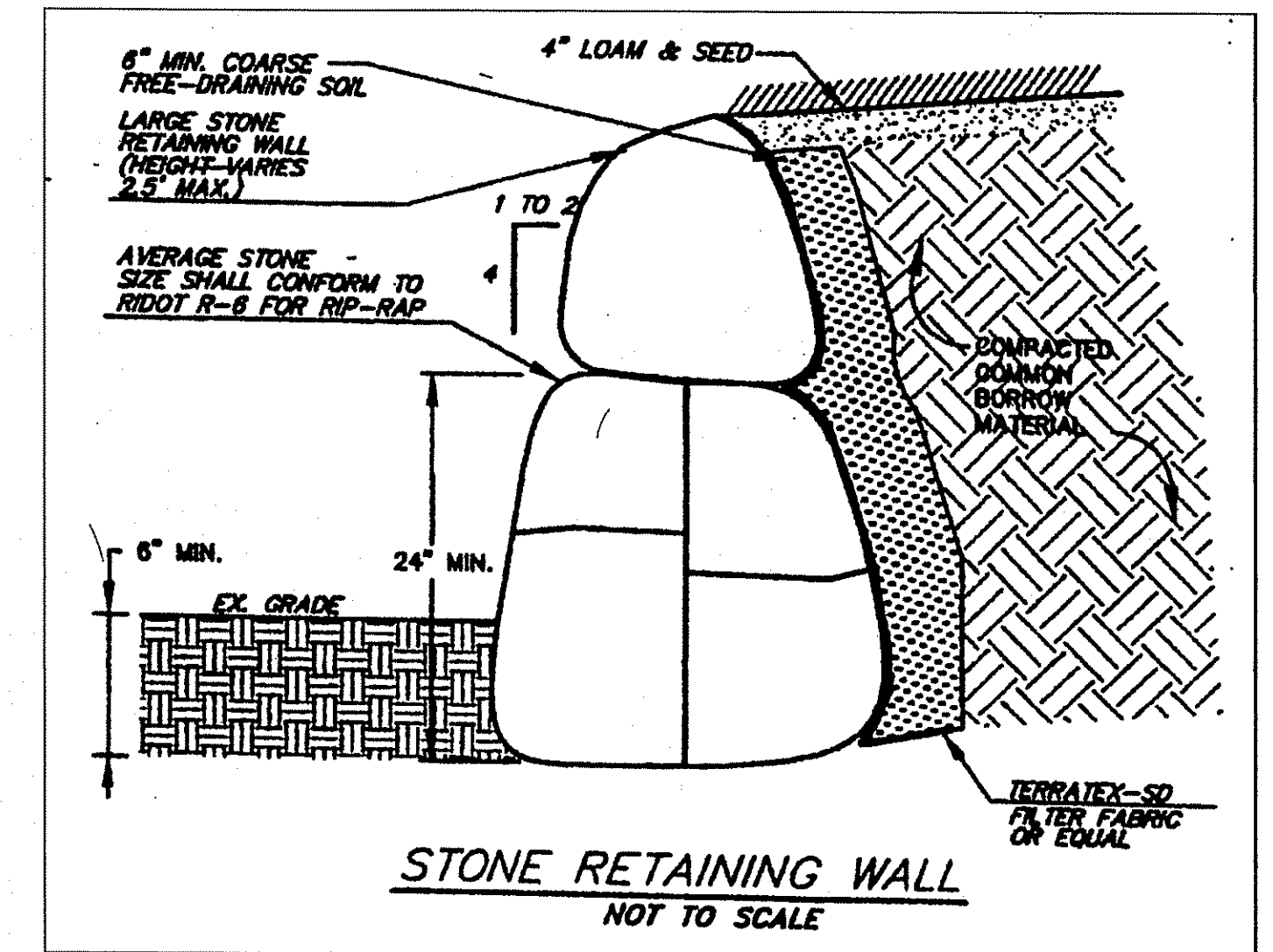
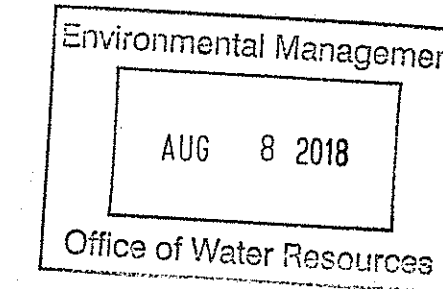
- SEEDING RATE = 100 LBS. PER ACRE

FOR STEEP SLOPES 3:1 OR GREATER

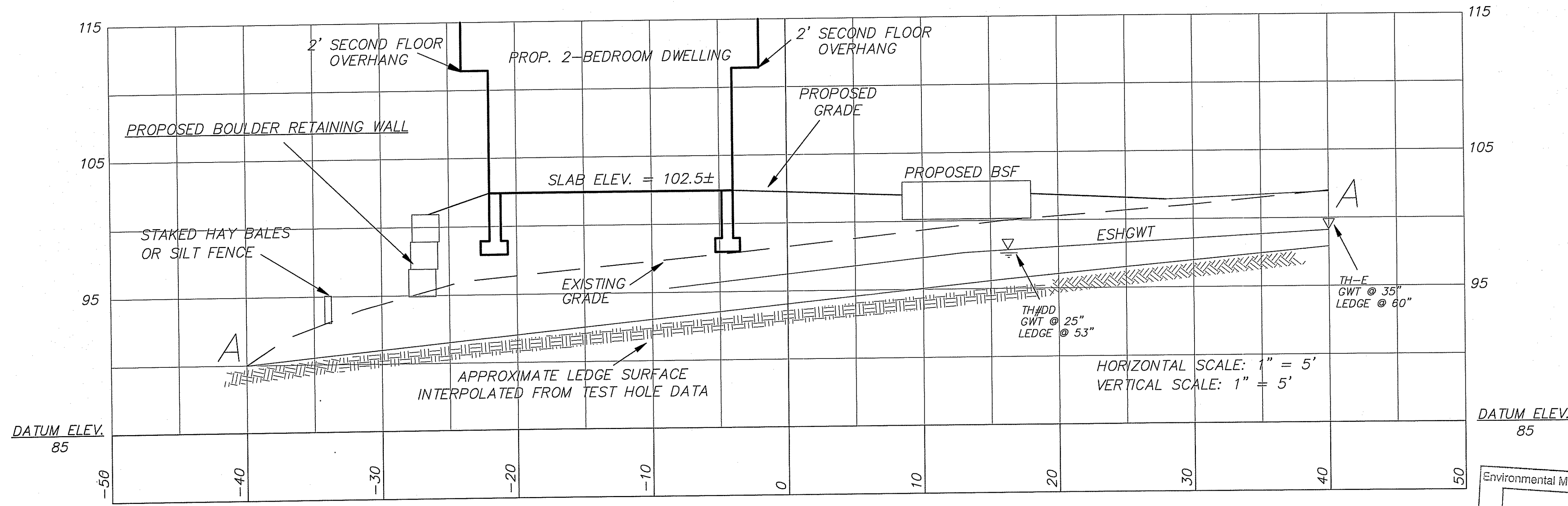
MIX	% BY WEIGHT
RED FESCUE - PENNLAWN OR CREEPING	75
PERENNIAL RYEGRASS	5
COLONIAL BENTGRASS - ASTORIA OR EXETER	5
BIRDSFOOT TREFOIL - EMPIRE	15

- SEEDING RATE: 100 LBS. PER ACRE

THE ACCEPTED PLANTING SEASON SHALL BE BETWEEN APRIL 1ST AND OCTOBER 15TH. CONTRACTOR SHOULD COORDINATE ON ALL DISTURBED AREAS. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF FOUR (4) INCHES OF LOAM ON AREAS UP TO 10% IN GRADE. ALL AREAS OVER 10% SHALL RECEIVE A MINIMUM OF SIX (6) INCHES.



TITLE: OWTS DESIGN PLAN	PROJ. NO: 2017041
PROJECT: A.P. 66 LOT 90 & 91 SCOTT ROAD CUMBERLAND, RHODE ISLAND	DATE: 03/14/18
CLIENT: NORMAN BERETTA	3/4
GARY C. LAMOND, PE, LLC 194 HATCHERY ROAD NORTH KINGSTOWN, RI 02852	REVISED: 7/27/18



SECTION A-A

Environmental Management
AUG 8 2018
Office of Water Resources

MULCH
THE MULCH LAYER SHALL CONSIST OF WELL AGED (OVER 6 MONTHS) SHREDDED HARDWOOD THAT IS UNIFORM IN COLOR AND FREE OF OTHER MATERIALS (SUCH AS WEED SEEDS, SOIL, ROOTS, ETC.). GRASS CLIPPINGS SHOULD NOT BE USED AS MULCH MATERIAL. THE MAXIMUM DEPTH OF THE MULCH LAYER SHALL BE 3 INCHES.

- RAIN GARDEN AREA PLANTING**
- LAYOUT PLANTS IN THE DESIRED PATTERN KEEPING THEM IN CONTAINERS UNTIL PLANTING.
 - DIG HOLE APPROXIMATELY TWICE THE WIDTH OF THE CONTAINER AND DEEP ENOUGH FOR THE CROWN OF THE PLANT TO BE LEVEL WITH GRADE AFTER PLANTING. TAMP LIGHTLY AROUND ROOTS TO ELIMINATE AIR VOIDS.
 - PLACE 3" OF MULCH, EVENLY SPREAD, OVER PLANTED AREA TAKING CARE NOT TO BURY THE CROWN OF THE NEW PLANTS.
 - LABEL PLANT GROUPS TO HELP IDENTIFY WEEDS DURING MAINTENANCE OF THE VEGETATED AREA.
 - WATER IMMEDIATELY AFTER PLANTING. CONTINUE TO WATER UNTIL PLANTS ARE ESTABLISHED. PLANTS NEED APPROXIMATELY 1" OF WATER PER WEEK. MONITOR RAINFALL AND SUPPLEMENT WITH MANUAL WATERING AS NEEDED. ONCE ESTABLISHED, THE BIORETENTION AREA WILL NORMALLY NOT REQUIRE MANUAL WATERING.
 - GENERALLY, PLANTING SHOULD BE CONDUCTED IN EARLY SPRING OR FALL, HOWEVER PLANTING MAY OCCUR ANYTIME DURING THE GROWING SEASON AS LONG AS THE PLANTS ARE PROVIDED SUFFICIENT WATERING.

- RAIN GARDEN AREA MAINTENANCE**
- REMOVE WEEDS (BY HAND) FOR THE FIRST TWO GROWING SEASONS OR UNTIL VEGETATION IS WELL ESTABLISHED. CONTINUE TO REMOVE ISOLATED WEED PATCHES AS NEEDED.
 - LEAVE STEMS AND SEED HEADS THROUGH WINTER AS A FOOD SOURCE FOR BIRDS AND COVER FOR WILDLIFE.
 - CUT BACK PLANTS IN SPRING TIME AFTER NEW GROWTH REACHES 4-6". REMOVE DEAD PLANT MATERIAL AND COMPOST IF DESIRED.
 - RAIN GARDEN AREA SHOULD BE INSPECTED FREQUENTLY UNTIL PLANTS ARE ESTABLISHED. PLANTS THAT DO NOT SURVIVE SHOULD BE REPLACED.
 - RAIN GARDEN AREA SHOULD BE RE-MULCHED ANNUALLY.

EROSION CONTROL PROGRAM
PRIOR TO START OF CONSTRUCTION, HAYBALES, SILT FENCES AND/OR ALL OTHER SPECIFIED EROSION CONTROL FENCES SHALL BE IN PLACE.

CRITICAL AREAS SUCH AS WETLAND AREAS, SLOPES AND STREAMS SHALL BE PROTECTED AS PER PLAN AND, IN THE PRESENCE OF WETLANDS, THE CONDITIONS OF ANY ISSUED PERMIT SHALL BE ADHERED TO.

THE CONTRACTOR SHALL BE REQUIRED TO ESTABLISH AND FULLY MAINTAIN ALL REQUIRED EROSION AND SEDIMENTATION CONTROLS.

SEDIMENTATION CONTROL PROGRAM
ALL EXPOSED SLOPES, INCLUDING STOCKPILES OF MATERIAL, SHALL RECEIVE TEMPORARY SEDIMENTATION AND EROSION CONTROLS. THIS WILL INCLUDE LOAMING AND SEEDING, MULCHING, HAYMATS, ETC., TO STABILIZE THE AREA.

ANY DRAINAGE STRUCTURES SHALL BE SURROUNDED BY HAYBALES TO PREVENT INFILTRATION OF SEDIMENTS.
SHOULD SEDIMENTS ENTER A CRITICAL AREA (WETLAND, BUFFER ZONE, ABUTTING PROPERTY) THE CONTRACTOR SHALL IMMEDIATELY CLEAN AND RESTORE THE AFFECTED AREA.

SLOPE PROTECTION TO BE INSTALLED ON ANY DISTURBED AREAS SUBJECT TO EROSION.
EXTREME CARE SHALL BE TAKEN TO PREVENT SEDIMENT OR UNSUITABLE MATERIAL FROM ENTERING WETLANDS, ROADWAYS AND/OR DRAINAGE STRUCTURES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSPECTING AND MAINTAINING ALL EROSION CONTROL MEASURES PROMPTLY AFTER EACH RAINFALL AND TO ENSURE THAT RUNOFF FLOW PATTERNS ARE NOT INHIBITED DURING RAINFALL AND/OR SNOWMELT.
ACCUMULATED SEDIMENTS SHALL BE REMOVED AS DIRECTED BY THE OWNER, ENGINEER, BIOLOGIST, APPLICANT, LOCAL OR STATE OFFICIALS.

RAIN GARDEN DESIGN CALCULATIONS

PROPOSED ROOF AREA = 824 SF
FROM TABLES 7 AND 8 OF THE RIDEM/CRMC GUIDELINES FOR SINGLE FAMILY RESIDENTIAL DEVELOPMENT AN 8" DEEP RAIN GARDEN CONSTRUCTED IN SANDY SOILS REQUIRES A BOTTOM AREA OF 72 SF WHEN SIZED BASED ON 900 SF OF IMPERVIOUS SURFACE... THE PROPOSED 8" DEEP RAIN GARDEN PROVIDES A BOTTOM AREA OF 75 SF AND THEREFORE EXCEEDS THE CAPACITY REQUIRED BY THE RIDEM/CRMC GUIDELINES.

NOTE: RAIN GARDEN AREA LOCATED AT LEAST 15 FT FROM OWTS AND 25 FT FROM ANY WELL OR WATER SUPPLY.

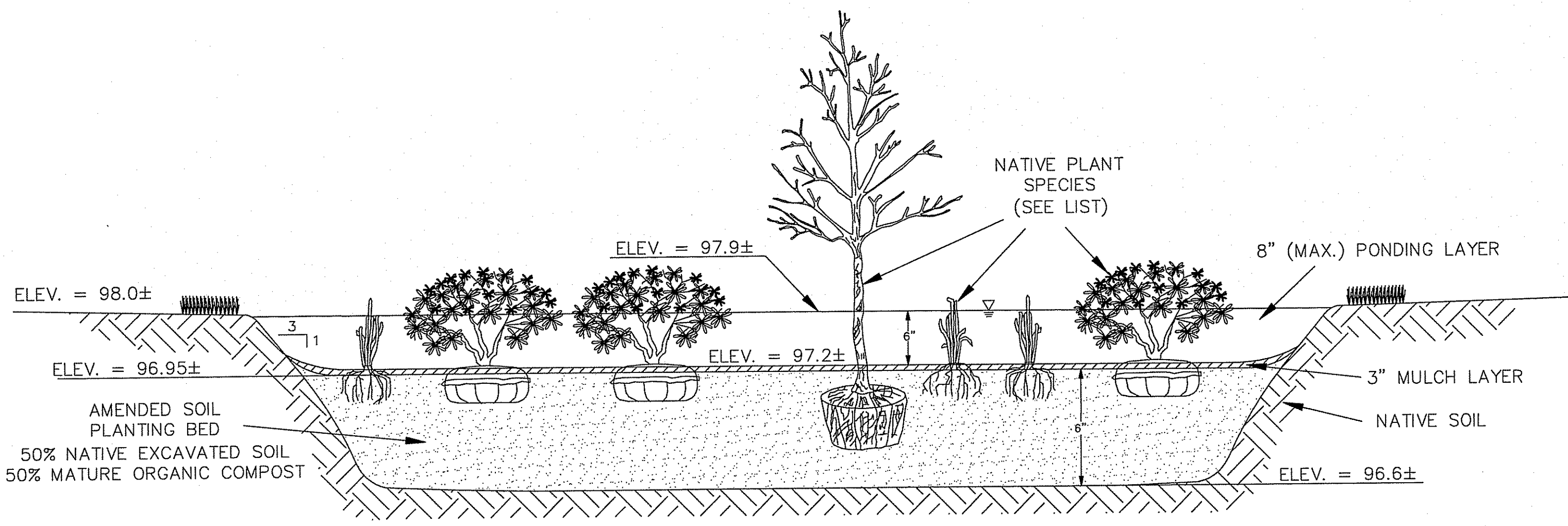
ROOF GUTTER DOWNSPOUTS SHALL DIRECT WATER TO RAIN GARDEN VIA UNDERGROUND PIPING OR OVERLAND WHERE UNDERGROUND PIPING IS UNFEASIBLE OR NOT PERMISSIBLE.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
REVIEWED SITE PLAN APPLICATION NO.: 18-0289
DATED OCT 19 2018
SEE LETTER OF SAME DATE.
Christopher B. Wemek

SUGGESTED RAIN GARDEN PLANT LIST

SPECIES	COMMON NAME	PLANT TYPE
Amelanchier arborea	SERVICEBERRY	TREE
Amelanchier canadensis	SHADBUSH	SHRUB
Amelanchier laevis	ALLEGHENY SERVICEBERRY	TREE
Arctostaphylos uva-ursi	BEARBERRY	SHRUB
Asclepias tuberosa	BUTTERFLY MILKWEEED	PERENNIAL
Carex stricta	TUSSOCK SEDGE	GRASS
Clethra alnifolia	SWEET PEPPERBUSH	SHRUB
Comptonia peregrina	SWEET FERN	SHRUB
Cornus amomum	SILKY DOGWOOD	SHRUB
Cornus racemosa	GRAY DOGWOOD	SHRUB
Cornus sericea	REDOSIER DOGWOOD	SHRUB
Eupatorium purpureum	JOE PYE WEED	PERENNIAL
Ilex glabra	INKBERRY HOLLY	SHRUB
Ilex opaca	AMERICAN HOLLY	TREE
Ilex verticillata	WINTERBERRY HOLLY	SHRUB
Morella (Myrica) pensylvanica	BAYBERRY	SHRUB
Panicum virgatum	SWITHGRASS	GRASS
Photinia melanocarpa	BLACK CHOKEBERRY	SHRUB
Photinia pyrifolia	RED CHOKEBERRY	SHRUB
Symphotrichum novae-angliae	NEW ENGLAND ASTER	PERENNIAL
Vaccinium corymbosum	HIGHBUSH BLUEBERRY	SHRUB
Vernonia noveboracensis	NEW YORK IRONWEED	PERENNIAL
Viburnum dentatum	ARROWOOD	SHRUB

PLANT SPECIES WERE SELECTED FROM THE RHODE ISLAND COASTAL PLANT GUIDE PREPARED BY THE URI CELS AND RI CRMC. ONLY THOSE NATIVE PLANTS THAT ARE SUITABLE FOR RAIN GARDENS AND ARE TOLERANT OF FULL SUN AND DROUGHT ARE SHOWN HERE.
TREES SHALL BE PLANTED WITH A DENSITY OF NO MORE THAN ONE PER 250 SF, SPACED 15 FT ON CENTER. SHRUBS SHALL BE PLANTED 5-10 FT ON CENTER AND HERBACEOUS VEGETATION PLANTED 2.5 FT ON-CENTER.



RAIN GARDEN - TYPICAL CROSS-SECTION
NOT TO SCALE

	TITLE: OWTS DESIGN PLAN	PROJ. NO: 2017041
	PROJECT: A.P. 66 LOT 90 & 91 SCOTT ROAD CUMBERLAND, RHODE ISLAND	DATE: 03/14/18
CLIENT: NORMAN BERETTA	<p style="text-align: center;">4/4</p>	
GARY C. LAMOND, PE, LLC 194 HATCHERY ROAD NORTH KINGSTOWN, RI 02852		
SCALE: AS SHOWN	REVISED: 7/27/18	