BR-7.2. BIORETENTION INSTALLATION:

PER CHAPTER 4.2.3 OF THE WEST VIRGINIA STORMWATER MANAGEMENT & DESIGN GUIDANCE MANUAL.

THE FOLLOWING IS A TYPICAL CONSTRUCTION SEQUENCE TO PROPERLY INSTALL A BIORETENTION BASIN. THESE STEPS MAY BE MODIFIED TO REFLECT DIFFERENT BIORETENTION APPLICATIONS OR EXPECTED SITE CONDITIONS:

STEP 1. CONSTRUCTION OF THE BIORETENTION BASIN AREA MAY ONLY BEGIN AFTER THE ENTIRE CDA HAS BEEN STABILIZED WITH VEGETATION. IT MAY BE NECESSARY TO BLOCK CERTAIN CURB OR OTHER INLETS WHILE THE BIORETENTION AREA IS BEING CONSTRUCTED. THE PROPOSED SITE SHOULD BE CHECKED FOR EXISTING UTILITIES PRIOR TO ANY EXCAVATION.

STEP 2. THE DESIGNER AND THE INSTALLER SHOULD HAVE A PRE-CONSTRUCTION MEETING, CHECKING THE BOUNDARIES OF THE CDA AND ACTUAL INLET ELEVATIONS TO ENSURE THEY CONFORM TO ORIGINAL DESIGN. SINCE OTHER CONTRACTORS MAY BE RESPONSIBLE FOR CONSTRUCTING PORTIONS OF THE SITE, IT IS QUITE COMMON TO FIND SUBTLE DIFFERENCES IN SITE GRADING, DRAINAGE AND PAVING ELEVATIONS THAT CAN PRODUCE HYDRAULICALLY IMPORTANT DIFFERENCES FOR THE PROPOSED BIORETENTION AREA. THE DESIGNER SHOULD CLEARLY COMMUNICATE, IN WRITING, ANY PROJECT CHANGES DETERMINED DURING THE PRE-CONSTRUCTION MEETING TO THE INSTALLER AND THE PLAN REVIEW/INSPECTION AUTHORITY.

STEP 3. TEMPORARY APPROVED EROSION AND SEDIMENT CONTROLS ARE NEEDED DURING CONSTRUCTION OF THE BIORETENTION AREA TO DIVERT STORMWATER AWAY FROM THE BIORETENTION AREA UNTIL IT IS COMPLETED. SPECIAL PROTECTION MEASURES SUCH AS EROSION CONTROL FABRICS MAY BE NEEDED TO PROTECT VULNERABLE SIDE SLOPES FROM EROSION DURING THE CONSTRUCTION PROCESS. IN CASES WHERE THE BIORETENTION IS CO-LOCATED WITH EROSION AND SEDIMENT CONTROL PRACTICES (E.G., SEDIMENT TRAPS), THE CONDITIONS NOTED IN SECTION BR-7.1. OF THE WEST VIRGINIA STORMWATER MANAGEMENT & DESIGN GUIDANCE MANUAL MUST BE FOLLOWED.

STEP 4. ANY PRE-TREATMENT CELLS SHOULD BE EXCAVATED FIRST AND THEN SEALED TO TRAP SEDIMENTS.

STEP 5. EXCAVATORS OR BACKHOES SHOULD WORK FROM THE SIDES TO EXCAVATE THE BIORETENTION AREA TO ITS APPROPRIATE DESIGN DEPTH AND DIMENSIONS. EXCAVATING EQUIPMENT SHOULD HAVE SCOOPS WITH ADEQUATE REACH SO THEY DO NOT HAVE TO SIT INSIDE THE FOOTPRINT OF THE BIORETENTION AREA. CONTRACTORS SHOULD USE A CELL CONSTRUCTION APPROACH IN LARGER BIORETENTION BASINS, WHEREBY THE BASIN IS SPLIT INTO 500 TO 1,000 SQ. FT. TEMPORARY CELLS WITH A 10-15 FOOT EARTH BRIDGE IN BETWEEN, SO THAT CELLS CAN BE EXCAVATED FROM THE SIDE.

STEP 6. IT MAY BE NECESSARY TO RIP THE BOTTOM SOILS TO A DEPTH OF 6 TO 12 INCHES TO PROMOTE GREATER INFILTRATION.

STEP 7. IF USING A FILTER FABRIC, PLACE THE FABRIC ON THE SIDES OF THE BIORETENTION AREA WITH A 6 INCH OVERLAP ON THE SIDES. IF AN UNDERDRAIN STONE STORAGE LAYER WILL BE USED, PLACE APPROPRIATE DEPTH OF NO. 57 STONE ON THE BOTTOM, INSTALL THE PERFORATED UNDERDRAIN PIPE, PACK NO. 57 STONE TO 3 INCHES ABOVE THE UNDERDRAIN PIPE. ON TOP OF THE NO. 57 STONE, ADD 2 INCHES OF CHOKER STONE (NO. 8 OR NO. 89 STONE) AND THEN 2 TO 4 INCHES OF CONSTRUCTION SAND AS A FILTER BETWEEN THE UNDERDRAIN AND THE SOIL MEDIA LAYER. IF NO STONE STORAGE LAYER IS USED, START WITH 6 INCHES OF NO. 57 STONE ON THE BOTTOM, AND PROCEED WITH THE LAYERING AS DESCRIBED ABOVE.

STEP 8. DELIVER THE SOIL MEDIA FROM AN APPROVED VENDOR, AND STORE IT ON AN ADJACENT IMPERVIOUS AREA OR PLASTIC SHEETING. APPLY THE MEDIA IN 12 INCH LIFTS UNTIL THE DESIRED TOP ELEVATION OF THE BIORETENTION AREA IS ACHIEVED. WAIT A FEW DAYS TO CHECK FOR SETTLEMENT, AND ADD ADDITIONAL MEDIA, AS NEEDED, TO ACHIEVE THE DESIGN ELEVATION.

STEP 9. PREPARE PLANTING HOLES FOR ANY TREES AND SHRUBS, INSTALL THE VEGETATION, AND WATER ACCORDINGLY. INSTALL ANY TEMPORARY IRRIGATION.

STEP 10. PLACE THE SURFACE COVER IN BOTH CELLS (MULCH, RIVER STONE OR TURF), DEPENDING ON THE DESIGN. IF COIR OR JUTE MATTING WILL BE USED IN LIEU OF MULCH, THE MATTING WILL NEED TO BE INSTALLED PRIOR TO PLANTING (STEP 9), AND HOLES OR SLITS WILL HAVE TO BE CUT IN THE MATTING TO INSTALL THE PLANTS.

STEP 11. INSTALL THE PLANT MATERIALS AS SHOWN IN THE LANDSCAPING PLAN, AND WATER THEM DURING WEEKS OF NO RAIN FOR THE FIRST TWO MONTHS.

STEP 12. IF CURB CUTS ARE BLOCKED DURING BIORETENTION INSTALLATION, UNBLOCK THESE AFTER THE DRAINAGE AREA AND SIDE SLOPES HAVE GOOD VEGETATIVE COVER. IT IS RECOMMENDED THAT UNBLOCKING CURB CUTS AND INLETS TAKE PLACE AFTER TWO TO THREE STORM EVENTS IF THE DRAINAGE AREA INCLUDES NEWLY INSTALLED ASPHALT, SINCE NEW ASPHALT TENDS TO PRODUCE A LOT OF FINES AND GRIT DURING THE FIRST SEVERAL MONTHS.

STEP 13. CONDUCT THE FINAL CONSTRUCTION INSPECTION (SEE APPENDIX A OF THE WEST VIRGINIA STORMWATER MANAGEMENT & DESIGN GUIDANCE MANUAL), THEN LOG THE GPS COORDINATES FOR EACH BIORETENTION FACILITY AND SUBMIT THEM FOR ENTRY INTO THE LOCAL MAINTENANCE TRACKING DATABASE.

BIORETENTION LANDSCAPING SPECIFICATION

LANDSCAPING FOR BIORETENTION SURFACE SHALL BE TURF COVER AS FOLLOWS:

SEED MIX:

SEED	APPLICATION RATE
KENTUCKY BLUEGRASS	20 LB/AC
CREEPING RED FESCUE	30 LB/AC
CHEWINGS FESCUE	30 LB/AC

TOPSOIL: LOAMY SAND OR SANDY LOAM TEXTURE WITH LESS THAN 5% CLAY CONTENT, PH CORRECTED TO BETWEEN 6 & 7, AND AN ORGANIC MATTER CONTENT OF AT LEAST 3%. TOPSOIL SHALL BE TILLED INTO THE TOP 3" OF THE BIORETENTION MEDIA.

BIORETENTION LINER NOTES:

1. THE SEDIMENT FOREBAYS & BIORETENTION MEDIA SHALL BE LINED IN ONE OF THE FOLLOWING TWO WAYS:
    1.1. A 12" CLAY LINER WITH A MAXIMUM HYDRAULIC CONDUCTIVITY OF 1 x 10^{2}-7 CM/SEC
    1.2. A 30 MIL PVC LINER.

TABLE BR-9 RECOMMENDED MAINTENANCE TASKS FOR BIORETENTION PRACTICES

PER CHAPTER 4.2.3 OF THE WEST VIRGINIA STORMWATER MANAGEMENT & DESIGN GUIDANCE MANUAL

MAINTENANCE TASKS	FREQUENCY
- For the first 6 months following construction, the practice and CDA should be inspected at least twice after storm events that exceed 1/2 in. of rainfall. Conduct any needed repairs or stabilization	Upon establishment
- Inspectors should look for bare or eroding areas in the CDS or around the Bioretention area, and make sure they are immediately stabilized with grass cover - One-time, spot fertilization may be needed for initial plantings. - Watering is needed once a week during the first 2 months, and then as needed during first growing season (April-October), depending on rainfall. - Remove and replace dead plants. Up to 10% of the plant stock may die off in the first year, so construction contracts should include a care and replacement warranty to ensure that vegetation is properly established and survives during the first growing season following construction.	
- Mowing of grass filter strips and Bioretention with turf cover - Check curb cuts and inlets for accumulated grit, leaves, and debris that may block inflow	At least 4 times a year
- Spot weeding, trash removal, and mulch raking	Twice during growing season
- Add reinforcement planting to maintain desired the vegetation density - Remove invasive plants using recommended control methods - Remove any dead or diseased plants - Stabilize the CDA to prevent erosion	As needed
- Conduct a maintenance inspection - Supplement mulch in devoid areas to maintain a 3 inch layer - Prune trees and shrubs - Remove sediment in pre-treatment cells and inflow points	Annually
- Remove sediment in pre-treatment cells and inflow points - Remove and replace the mulch layer Once every 2 to 3 years	Once every 2 to 3 year

TABLE BR-5. SOIL MEDIA CRITERIA AND TESTING FOR BIORETENTION

PER CHAPTER 4.2.3 OF THE WEST VIRGINIA STORMWATER MANAGEMENT & DESIGN GUIDANCE MANUAL

SOIL MEDIA CRITERION	DESCRIPTION	STANDARD(S)		
GENERAL COMPOSITION	SOIL MEDIA MUST HAVE THE PROPER PROPORTIONS SAND, FINES, AND ORGANIC MATTER TO PROMOTE PLANT GROWTH, DRAIN AT THE PROPER RATE, AND FILTER POLLUTANTS.	70% TO 88% SAND 8% TO 26% TOP SOIL; AND 3% TO 5% ORGANIC MATTER (AGED COMPOST)		
SAND	SILICA BASED COARSE AGGREGATE[1]	SIEVE	SIZE	% PASSING
		3/8 IN.	9.50 MM.	100
		NO. 4	4.75 MM.	95 TO 100
	LOCALLY-APPROVED PULVERIZED GLASS MAY BE SUBSTITUTED IF THE LOCAL AUTHORITY UNDERTAKES TESTING TO VERIFY COMPLIANCE WITH THE SPECIFICATION AND ALSO LACK OF HEAVY METALS	NO. 8	2.36 MM.	80 TO 100
		NO. 16	1.18 MM	45 TO 85
		NO. 30	0.6 MM	15 TO 60
		NO. 50	0.3 MM	3 TO 15
		NO. 100	0.15 MM	0 TO 4
		EFFECTIVE PARTICLE SIZE (D10) > 0.3 MM UNIFORMLY COEEFICIENT (D60/D10) < 4.0		
TOP SOIL	LOAMY SAND OR SANDY LOAM	USDA TEXTURAL TRIANGLE		
ORGANIC MATTER	WELL AGED, CLEAN COMPOST	APPENDIX D		
P-INDEX OR PHOSPOROUS (P) CONTENT	SOIL MEDIA WITH HIGH P LEVELS WILL EXPORT P THROUGH THE MEDIA AND POTENTIALLY TO DOWNSTREAM CONVEYANCE OR RECEIVING WATERS	P CONTENT = 7 TO 23 MG/KG		
CATION EXCHANGE CAPACITY (CEC)	THE CEC IS DETERMINED BY THE AMOUNT OF HUMUS OR ORGANIC MATTER. HIGHER CEC WILL PROMOTE POLLUTANT REMOVAL.	CEC > 10 MILLIEQUIVALENTS PER 100 GRAMS		
INFILTRATION RATE	THIS REFERS TO THE INFILTRATION RATE OF THE SOIL MEDIA, AND NOT THE UNDERLYING SOIL. A MINIMUM RATE IS REQUIRED TO ALLOW THE SOIL MEDIA TO PROPERLY DRAIN	MINIMUM INFILTRATION RATE = 1 - 2 INCHES/HOUR (MOST SOIL MEDIA WILL HAVE MUCH HIGHER RATES)		
SOIL MEDIA DEPTH	THE DEPTH OF SOIL MEDIA FOR VARIOUS APPLICATIONS	SOIL MEDIA DEPTHS FOR LEVEL 1 AND LEVEL 2 DESIGN ARE SPECIFIED IN **TABLE BR-1**. IF TREES ARE INCLUDED IN THE BIORETENTION PLANTING PLAN, TREE PLANTING HOLES IN THE FILTER BED MUST BE AT LEAST 4 FEET DEEP TO PROVIDE ENOUGH SOIL VOLUME FOR THE ROOT STRUCTURE OF MATURE TREES. IN ADDITION, HIGHER PROPORTIONS OF TOPSOIL (30%) AND AGED COMPOST (20%) SHOULD BE ADDED TO THESE PLANTING HOLES COMPARED TO THE REST OF THE SOIL TURF, PERRENIALS OR SHRUBS SHOULD BE USED INSTEAD OF TREES TO LANDSCAPE SHALLOWER FILTER BEDS.		

[1] MANY SPECIFICATIONS FOR SAND REFER TO ASTM C-33. THE ASTM C-33 SPECIFICATION ALLOWS A PARTICLE SIZE DISTRIBUTION THAT CONTAINS A LARGE FRACTION OF FINES (SILT AND CLAY SIZED PARTICLES <0.05 MM). THE SMALLER FINES FILL THE VOIDS BETWEEN THE LARGER SAND SIZED PARTICLES RESULTING IN SMALLER AND MORE CONVULATED PORE SPACES. WHILE THIS CONDITION PROVIDES A HIGH DEGREE OF TREATMENT, IT ALSO ENCOURAGES CLOGGING OF THE REMAINING VOID SPACES WITH SUSPENDED SOLIDS AND BIOLOGICAL GROWTH, RESULTING IN A GREATER CHANCE OF A RESTRICTIVE BIOMAT FORMING. BY LIMITING THE FINE PARTICLES ALLOWED IN THE SAND COMPONENT, THE COMBINED MEDIA RECIPE OF SAND AND THE FINES ASSOCIATED WITH THE SOIL AND ORGANIC MATERIAL WILL BE LESS PRONE TO CLOGGING, WHILE ALSO PROVIDING AN ADEQUATE LEVEL OF FILTRATION AND RETENTION.

TABLE BR-7. BIORETENTION MATERIAL SPECIFICATIONS

PER CHAPTER 4.2.3 OF THE WEST VIRGINIA STORMWATER MANAGEMENT & DESIGN GUIDANCE MANUAL

MATERIAL	SPECIFICATION	NOTES
FILTER MEDIA	·70%-88% SAND ·8%-26% TOP SOIL ·3%-5% ORGANIC MATTER IN THE FORM OF LEAF COMPOST ·SUPPLIED BY QUALIFIED VENDOR ·REFER TO **TABLE BR-5** FOR SPECIFIC MEDIA MATERIAL COMPOSITION	MINIMUM DEPTH OF 24 IN.; 36 IN. RECOMMENDED; (18 IN. IF AN INFILTRATION SUMP IS USED) THE VOLUME OF FILTER MEDIA USED SHOULD BE BASED ON 110% OF THE PLAN VOLUME, TO ACCOUNT FOR SETTLING OR COMPACTION.
FILTER MEDIA TESTING	BETWEEN 7 AND 21 MG./KG. OF P IN THE SOIL MEDIA. CEC'S GREATER THAN 10.	QUALIFIED VENDORS SHOULD TEST MEDIA IN BATCHES.
ALTERNATIVE SURFACE COVER	USE TURF COVER.	
TOP SOIL FOR TURF COVER	LOAMY SAND OR SANDY LOAM TEXTURE, WITH LESS THAN 5% CLAY CONTENT, PH CORRECTED TO BETWEEN 6 AND 7, AND AN ORGANIC MATTER CONTENT OF AT LEAST 2%.	3 INCHES TILLED INTO SURFACE LAYER.
FILTER FABRIC (OPTIONAL)	WOVEN MONOFILAMENT FABRIC OR NON-WOVEN GEOTEXTILE AS PER AASHTO M-288 (DO NOT USE SILT FENCE).	APPLY ONLY TO THE SIDE SLOPES
CHOKING LAYER	LAYER OF CHOKER STONE (TYPICALLY NO. 8 OR NO. 89 WASHED GRAVEL), WHICH IS LAID OVER THE UNDERDRAIN STONE.	
UNDERDRAIN STONE	1 IN. DIAMETER STONE SHOULD BE DOUBLE-WASHED AND CLEAN AND FREE OF ALL FINES (E.G., ASTM D448 NO. 57 STONE).	SEE DETAILS FOR DEPTH
IMPERMEABLE LINER (OPTIONAL)	SEE LINER NOTE THIS SHEET	
UNDERDRAINS, CLEANOUTS, AND OBSERVATION WELLS	USE 4 IN OR 6 IN. RIGID SCHEDULE 40 PVC PIPE WITH 3/8 IN. PERFORATIONS AT 6 IN. ON CENTER; EACH UNDERDRAIN SHOULD BE LOCATED NO MORE THAN 20 FEET FROM THE NEXT PIPE. (SEE DETAILS BELOW FOR PIPE SIZE.)	LAY THE PERFORATED PIPE UNDER THE LENGTH OF THE BIORETENTION CELL, AND INSTALL NON-PERFORATED PIPE AS NEEDED TO CONNECT WITH THE STORM DRAIN SYSTEM OR TO DAYLIGHT IN A STABILIZED CONVEYANCE. INSTALL T'S AND Y'S AS NEEDED, DEPNDING ON THE UNDERDRAIN CONFIGURATION. EXTEND CLEANOUT PIPES TO THE SURFACE WITH VENTED CAPS AT THE T'S AND Y'S.

TABLE BR-4. MAXIMUM PONDING SURFACE AREA TO SOIL MEDIA SURFACE AREA RATIOS[1]

PER CHAPTER 4.2.3 OF THE WEST VIRGINIA STORMWATER MANAGEMENT & DESIGN GUIDANCE MANUAL

SURFACE PONDING VOLUME	SURFACE PONDING DEPTH (FT.)	MAXIMUM RATIO TO SURFACE AREAS
AT LEAST 50% OF DESIGN VOLUME	<1	1.5
AT LEAST 70% OF DESIGN VOLUME	≥1	1.25

[1] DEFINED AS THE RATIO OF THE PONDING SURFACE AREA MEASURED AT THE BOTTOM OF THE PONDING DEPTH TO THE SOIL MEDIA SURFACE AREA MEASURED AT THE TOP OF THE SOIL MEDIA.

FOR YOUR HEALTH & SAFETY

This is a man made stormwater management facility designed to treat stormwater and is not to be disturbed except for required maintenance. The facility may pond briefly after a storm. For your safety, please avoid the water.

BR-4.17. SIGNAGE

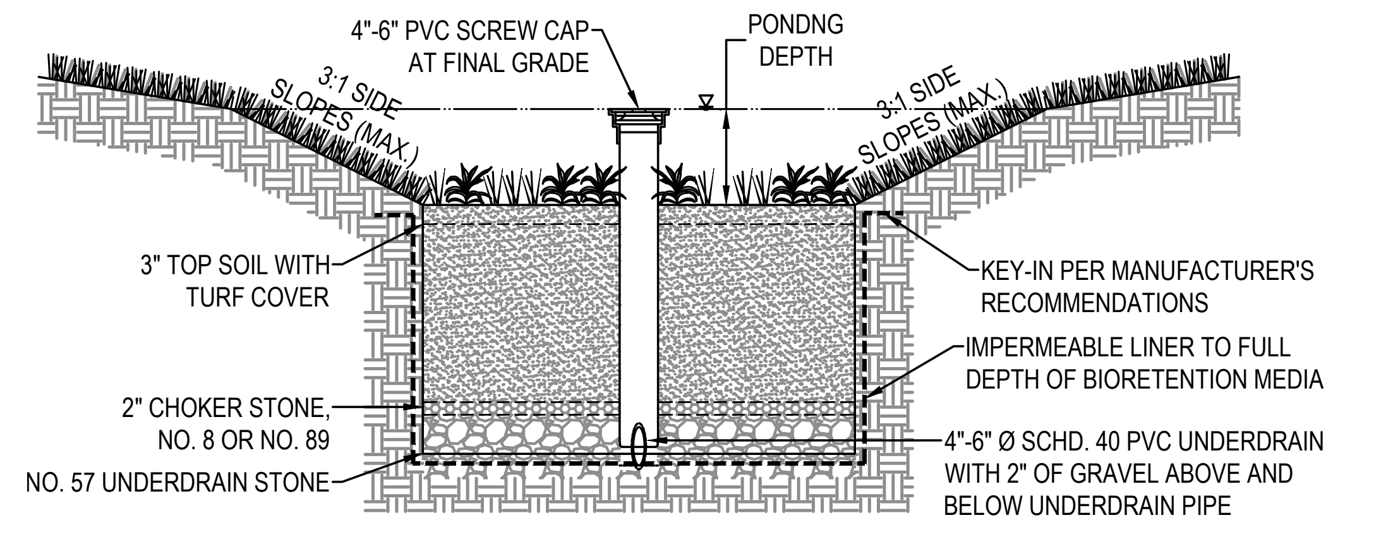
PER CHAPTER 4.2.3 OF THE WEST VIRGINIA STORMWATER MANAGEMENT & DESIGN GUIDANCE MANUAL

BIORETENTION UNITS IN HIGHLY VISIBLE AREAS (E.G., SCHOOLS, PARKS, URBAN SETTINGS, GOVERNMENT BUILDINGS) SHOULD BE STENCILED (1) OTHERWISE PERMANENTLY MARKED TO DESIGNATE IT AS A STORMWATER MANAGEMENT FACILITY. THE STENCIL OR PLAQUE SHOULD INDICATE (1) ITS WATER QUALITY PURPOSE, (2) THAT IT MAY POND BRIEFLY AFTER A STORM, AND (3) THAT IT IS NOT TO BE DISTURBED EXCEPT FOR REQUIRED MAINTENANCE.

NOTE: SEE SHEETS 26-30 FOR SIGNAGE PLACEMENT. SEE BELOW FOR ACCEPTABLE SIGNAGE DETAIL TO BE USE.

BIORETENTION BASIN:

NOT TO SCALE



NOTE: SEE BIORETENTION SIZING TABLE FOR PONDING, SOIL MEDIA & STONE DEPTHS; AND PONDING, SOIL MEDIA, CHOKER STONE, GRAVEL & UNDERDRAIN ELEVATIONS.

BIORETENTION SIZING TABLE

	BR-A	BR-B1	BR-B2	BR-C1	BR-C2	BR-C3
PONDING DEPTH (IN)	12	12	12	12	12	12
SOIL MEDIA DEPTH (IN)	24	24	24	24	24	24
MIN. UNDERDRAIN STONE DEPTH (IN)	12	12	12	12	12	12
TOP OF PONDING ELEVATION	510.00	516.00	514.00	515.00	515.00	515.00
BIORETENTION SURFACE ELEVATION	509.00	515.00	513.00	514.00	514.00	514.00
TOP OF SOIL MEDIA ELEVATION	508.75	514.75	512.75	513.75	513.75	513.75
BOTTOM OF SOIL MEDIA ELEVATION	506.75	512.75	510.75	511.75	511.75	511.75
BOTTOM OF CHOKER STONE ELEVATION	506.58	512.58	510.58	511.58	511.58	511.58
MINIMUM BOTTOM OF GRAVEL ELEVATION (EXTEND 2" BENEATH UNDERDRAIN)	505.58	511.58	509.58	510.58	510.58	510.58
DEPTH TO WATER TABLE (FT)	>6.5	>6.5	>6.5	>6.5	>6.5	3.5
SPILLWAY ELEVATION	509.50	516.50	515.00	516.00	516.00	516.00
SPILLWAY TYPE	RRAP	RRAP	RRAP	RRAP	RRAP	RRAP
SPILLWAY WIDTH (FT)	10	16	12	15	13	13

FOREBAY LINER DETAILS:

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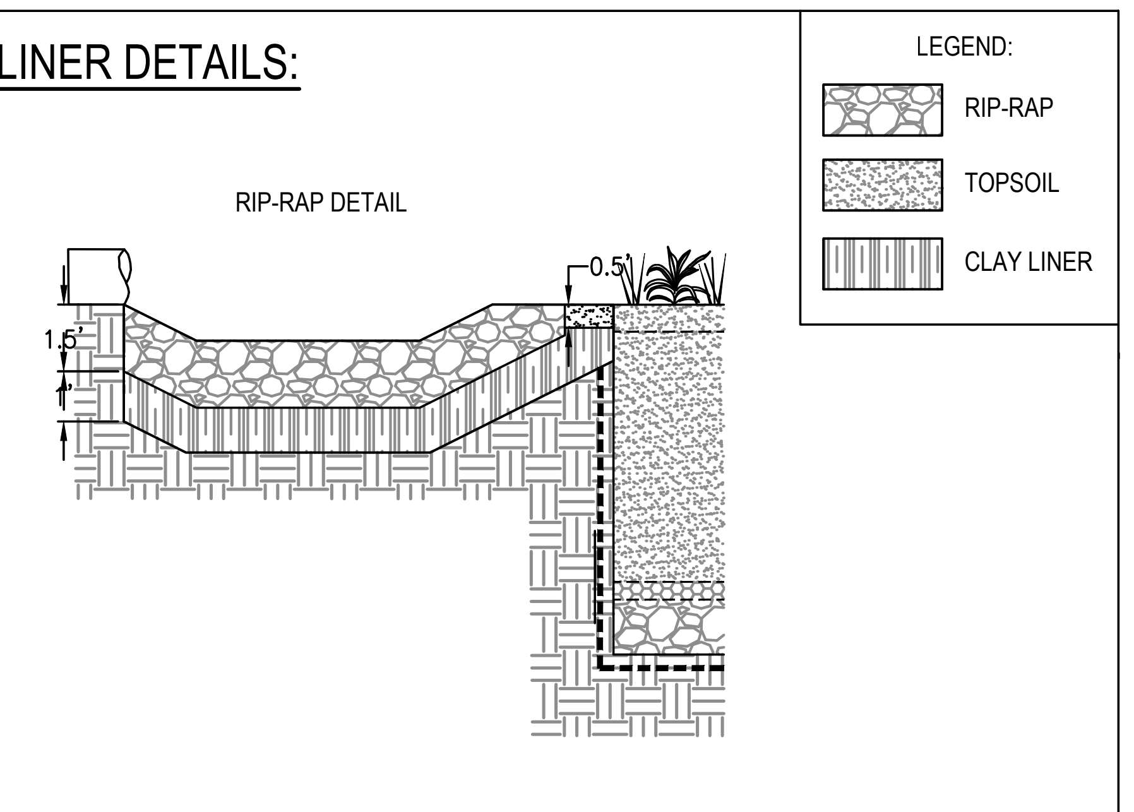

CLEANOUT DETAIL:

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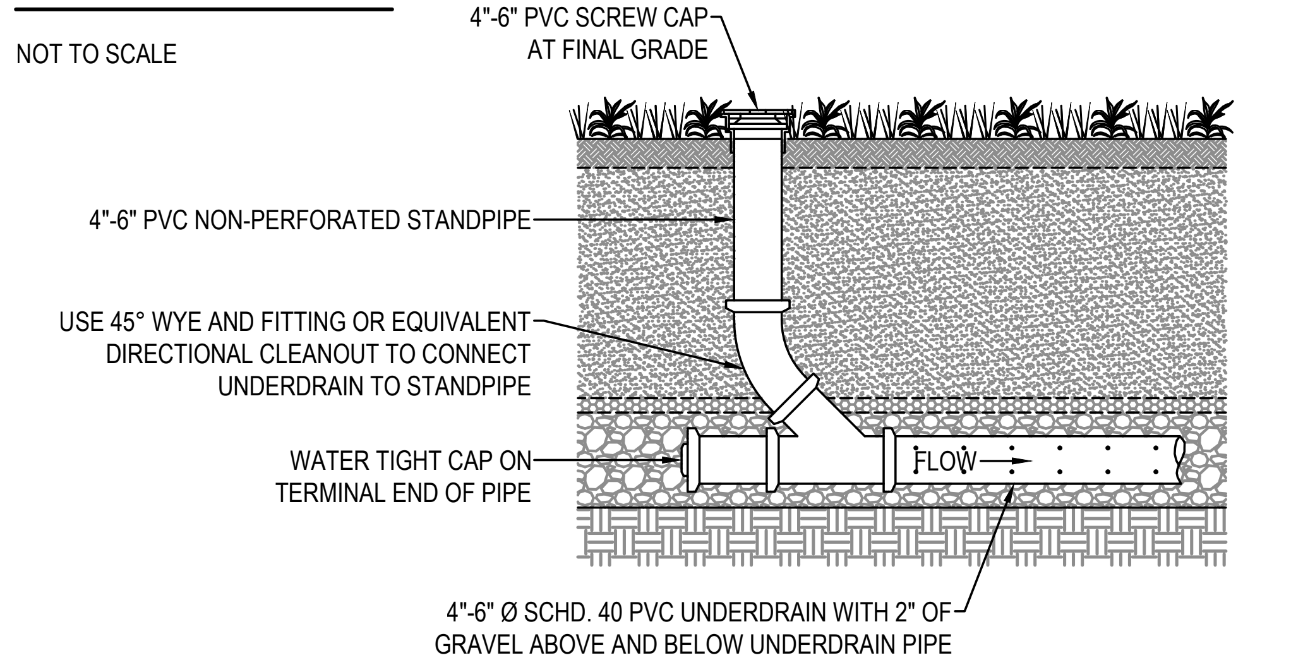

BIORETENTION FACILITY SPILLWAY:

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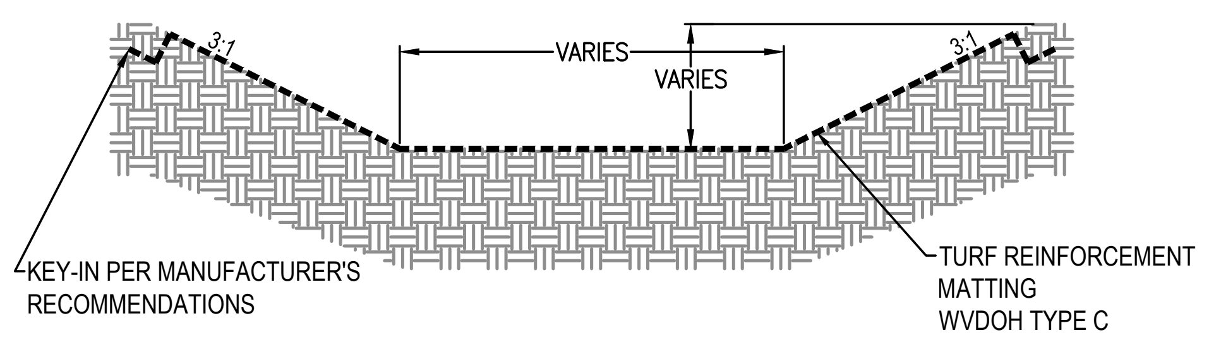

SPILLWAY FACILITY ID	WIDTH (FT)	HEIGHT (FT)
BR-A	12.0	0.5
BR-B1	20.0	1.0
BR-B2	12.0	0.5
BR-C1	15.0	0.5
BR-C2	13.0	0.5
BR-C3	13.0	0.5

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No. 19127
12-13-24

REVISIONS
1. 10/23/2024 - JEFFERSON COUNTY, WVDOH, CTUB, AND WVAW COMMENTS
2. 12/13/2024 - JEFFERSON COUNTY AND CTUB PUMP STATION COMMENTS

BIORETENTION NARRATIVE

BIRDHILL MEADOWS SUBDIVISION PHASE 1
TAX MAP 3, PARCEL 29; D.B. 1291, PG. 381
MIDDLEWAY TAX DISTRICT
JEFFERSON COUNTY, WEST VIRGINIA

J.C. FILE #24-12-SD

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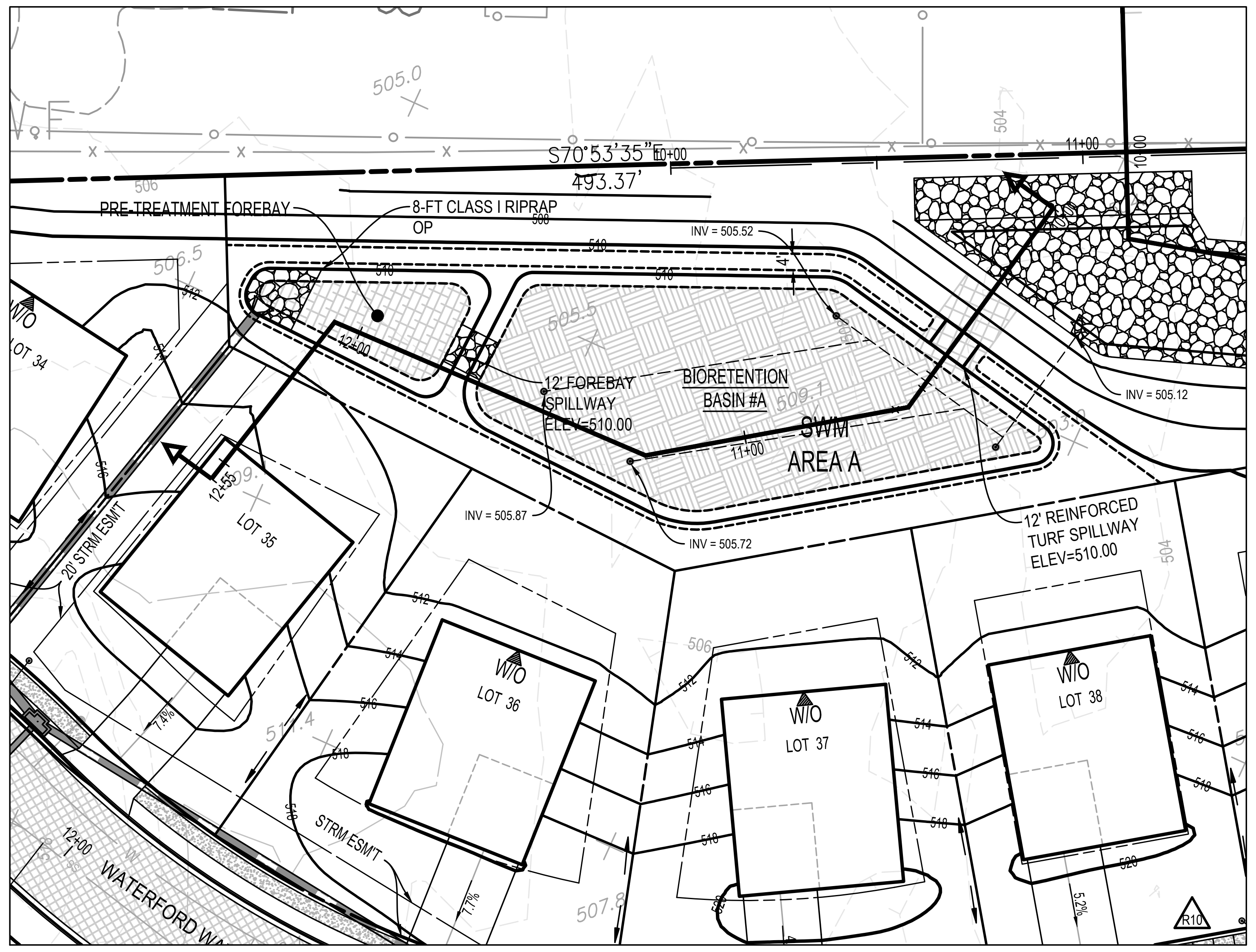
SHEET:	136 OF 147

ECT\GENERAL\3568-0301 MILLER PROPERTY PHASE 1\ENGIN\PLANS\C-CJ-501.DWG



BIORETENTION POND A - PLAN

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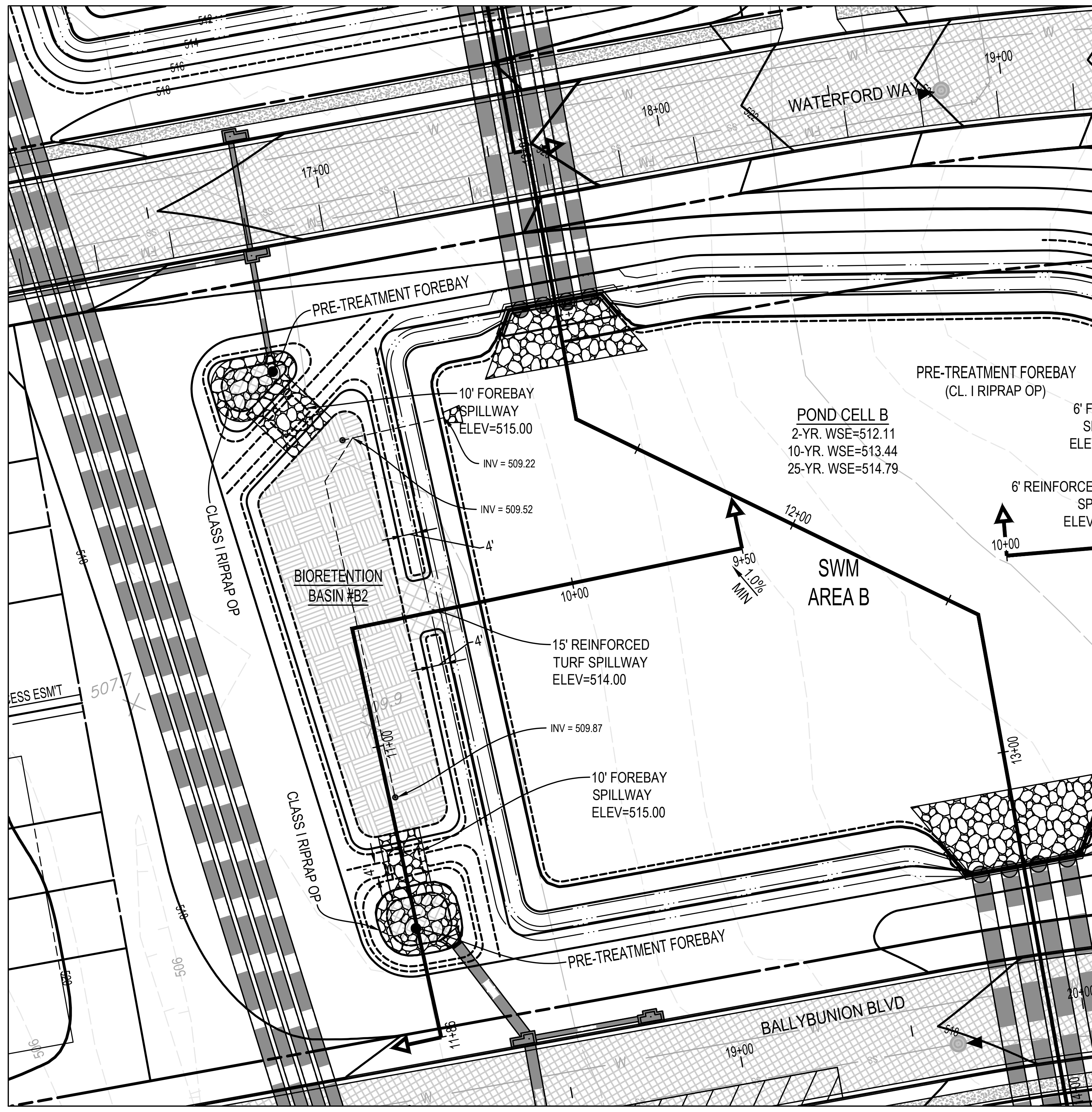

BIORETENTION PONDS B1 & B2 - PLAN

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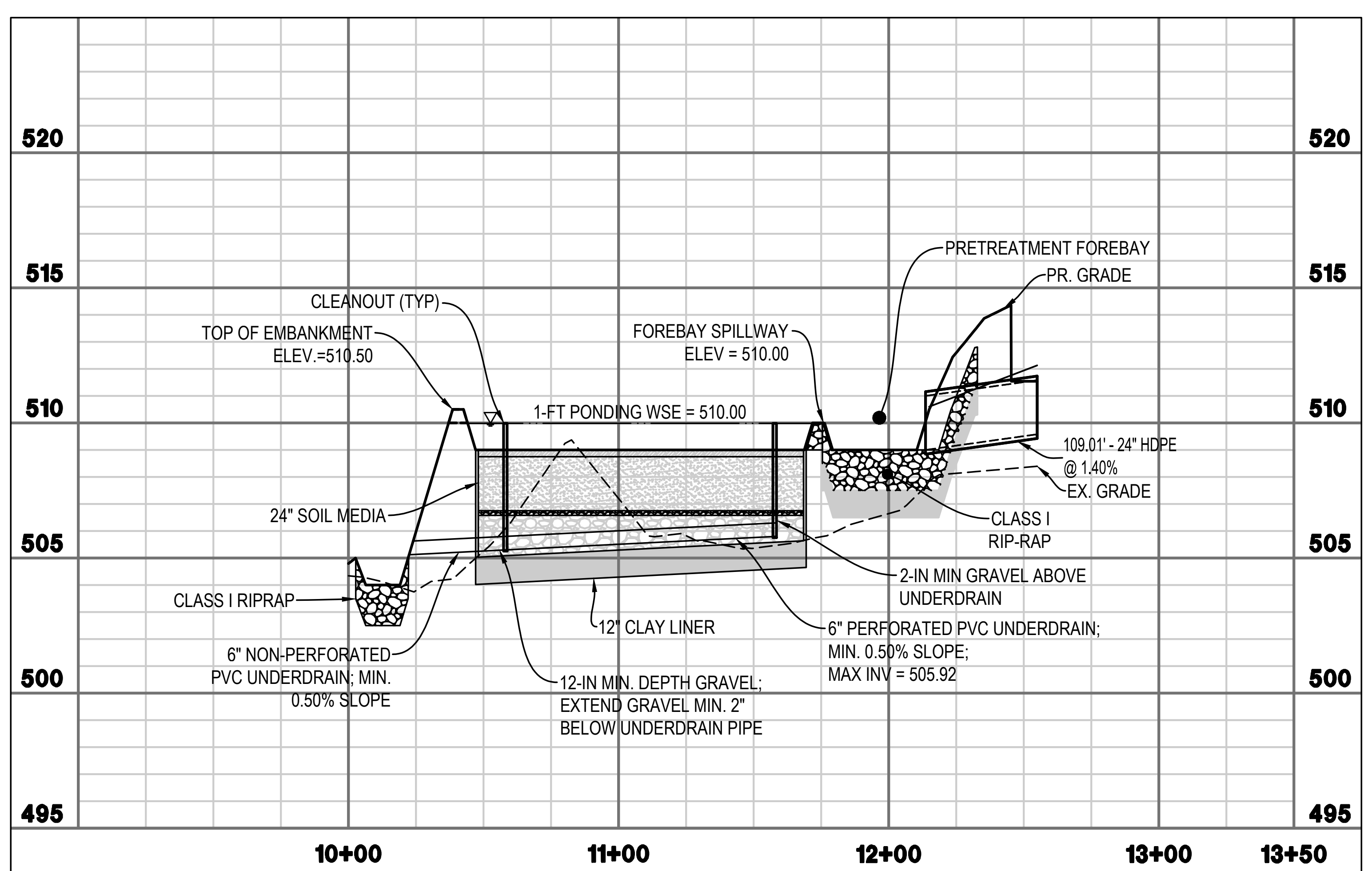

BIORETENTION A PROFILE

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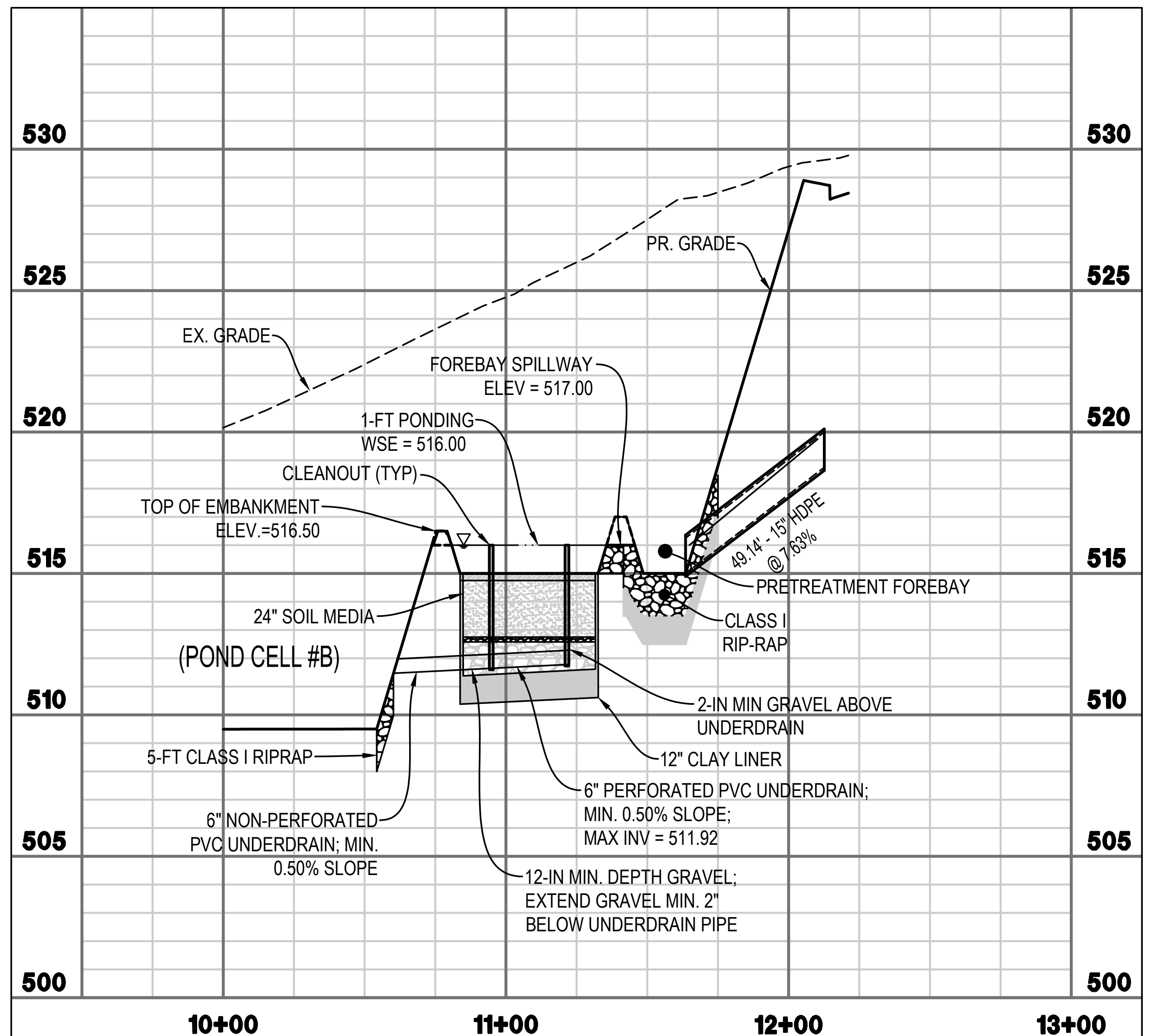

BIORETENTION B1 PROFILE

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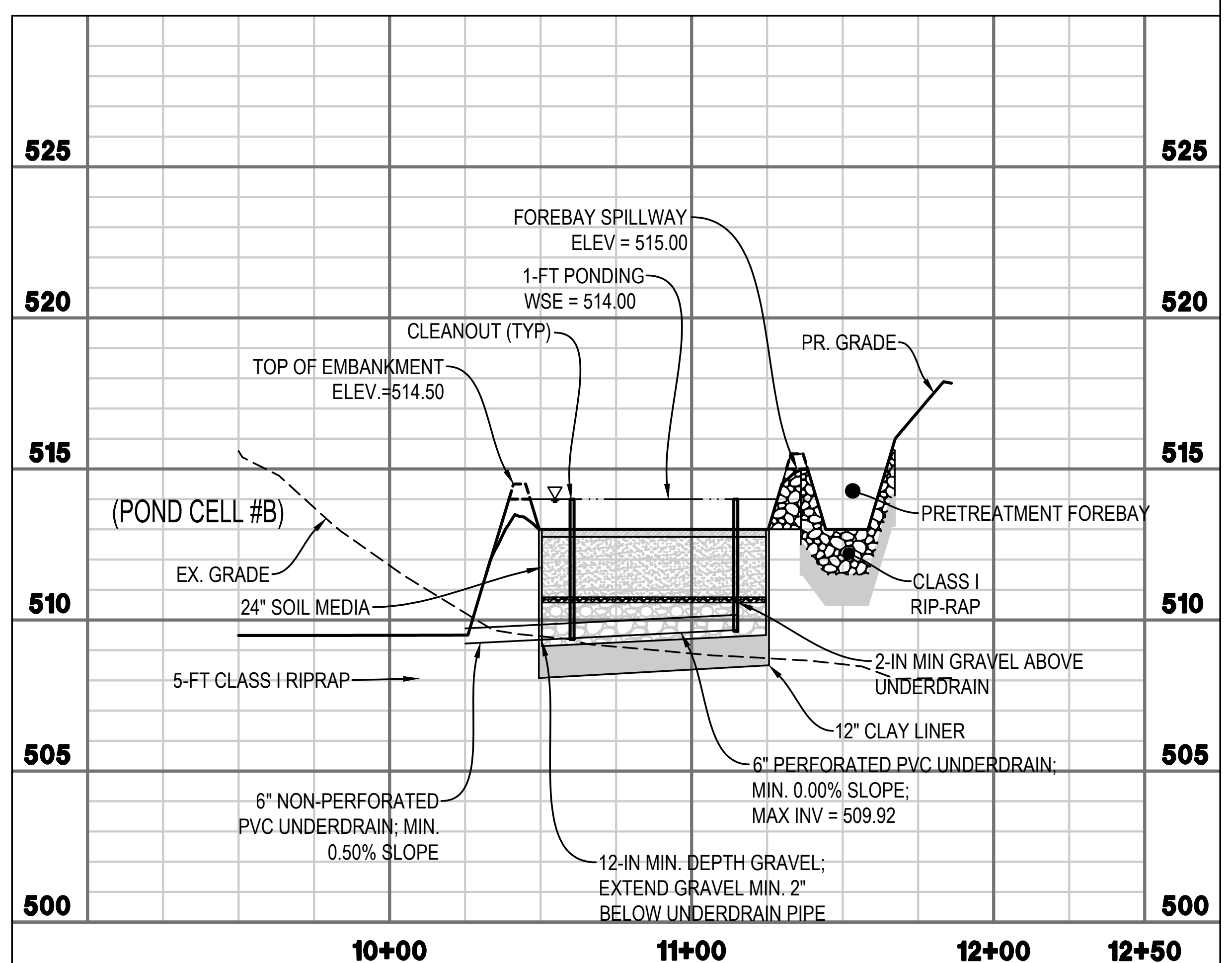

BIORETENTION B2 PROFILE

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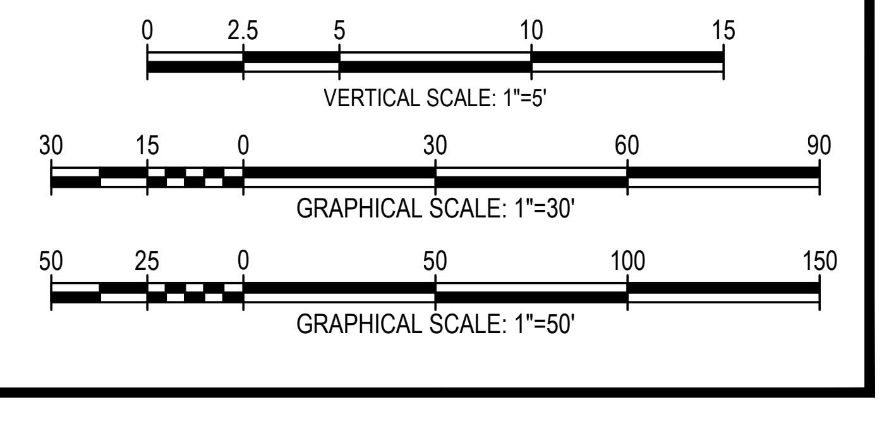

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BIORETENTION PLAN AND PROFILES

BIRDHILL MEADOWS SUBDIVISION PHASE 1

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MIDDLEWAY TAX DISTRICT
JEFFERSON COUNTY, WEST VIRGINIA

J.C. FILE #24-12-SD

SCALE: HORIZ.: AS NOTED
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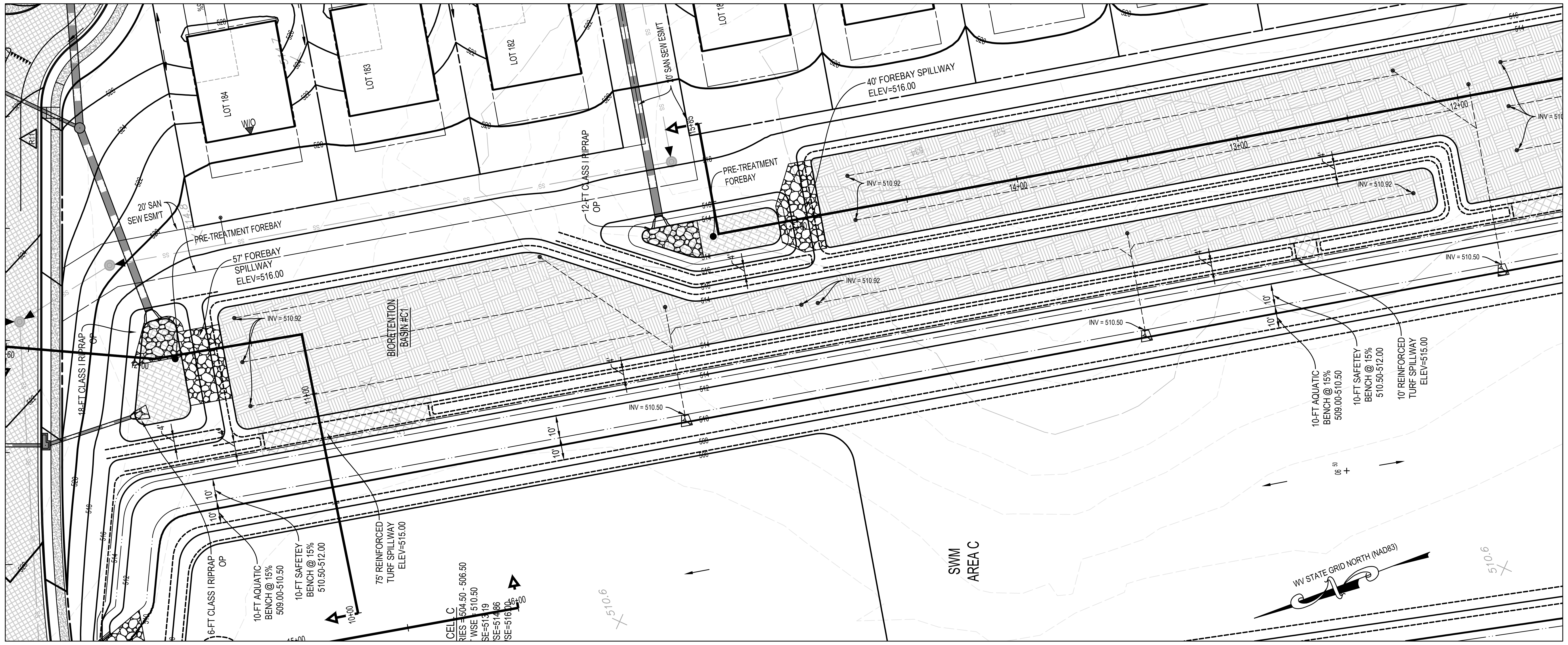
137 OF 147



BIORETENTION CELL C1 - PLAN

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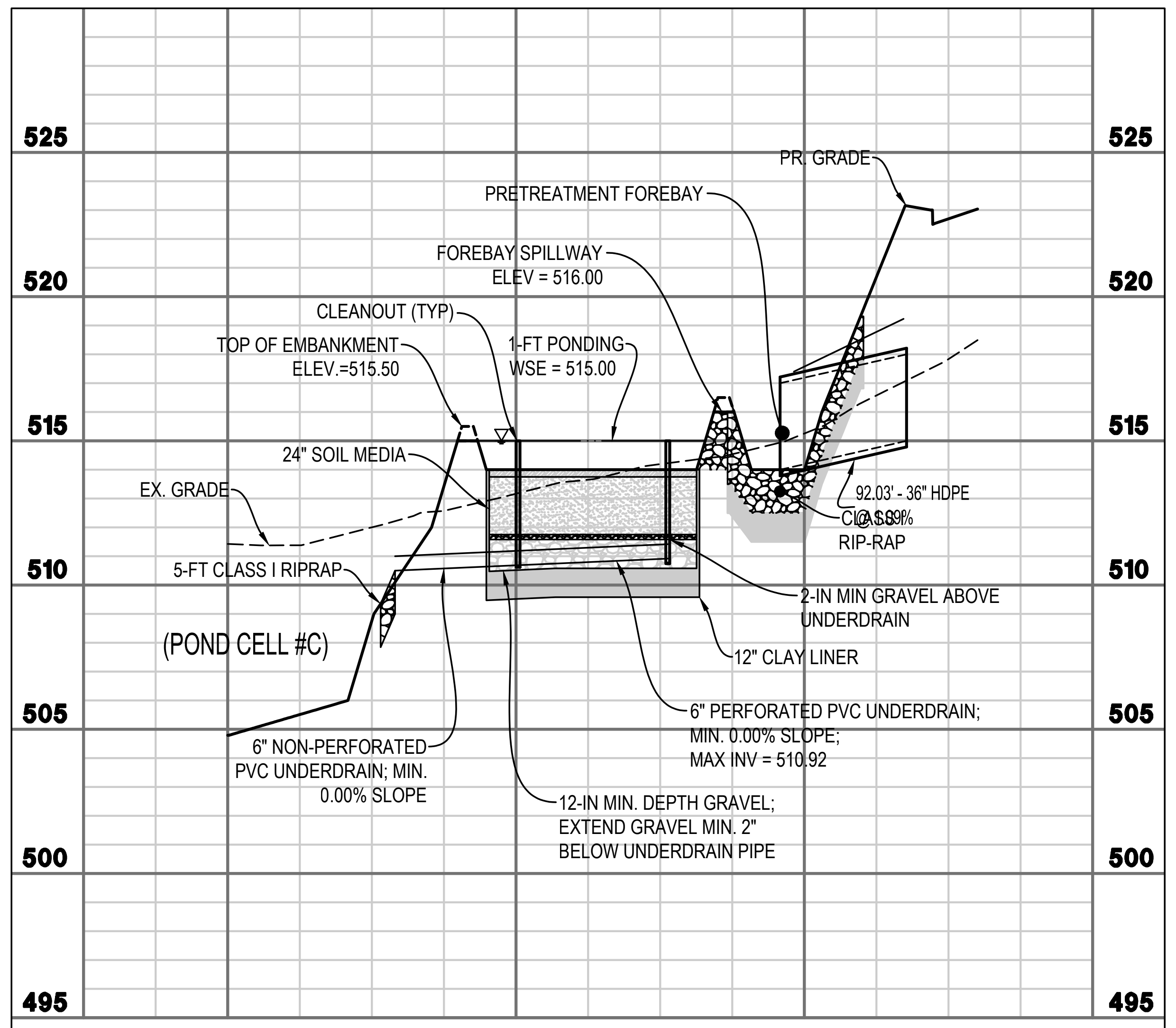

BIORETENTION C1 PROFILE

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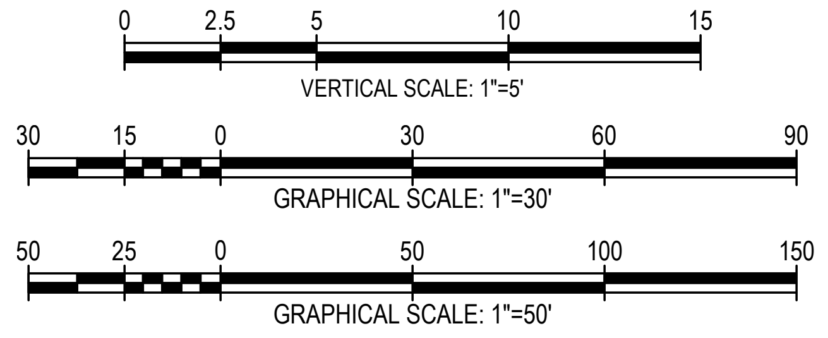

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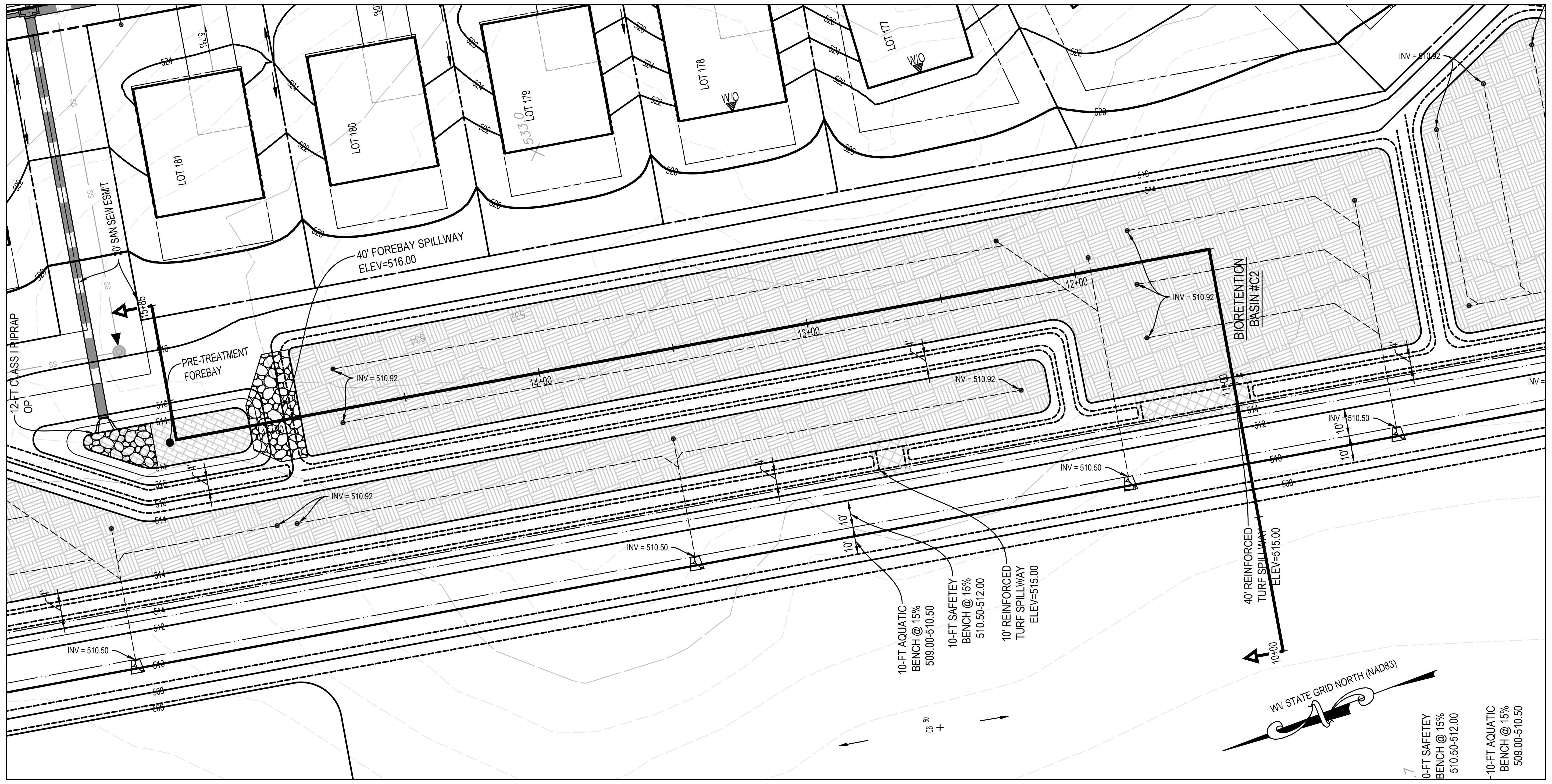
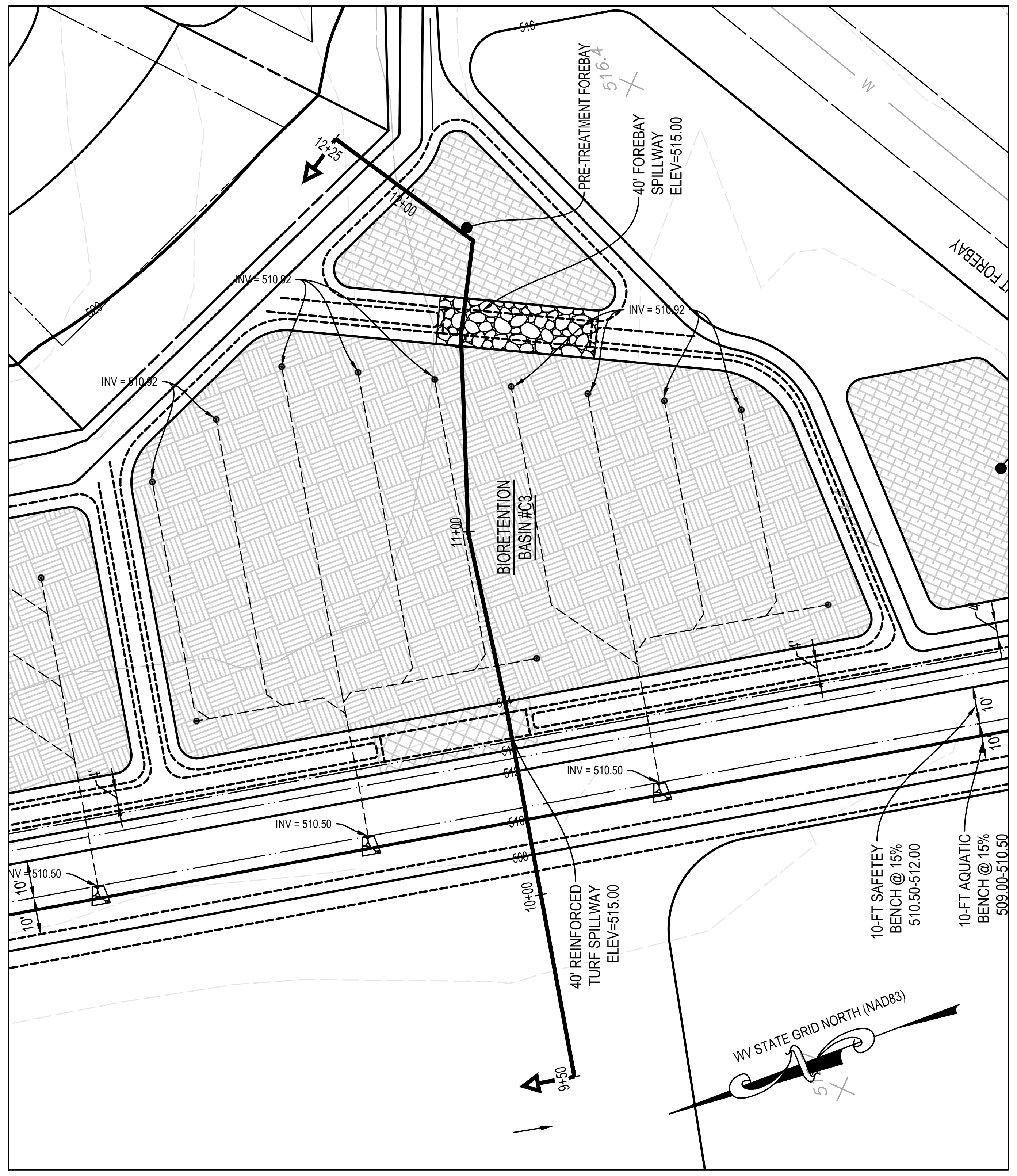
SCALE: HORIZ.: AS NOTED
VERT.: 1"=5'
DATE: JULY 2024
JOB: 3568-0301
DRAWN: JMM
CHECK: JPG
CADD: C-CJ-201.DWG
NCS:
SHEET:
138 OF 147



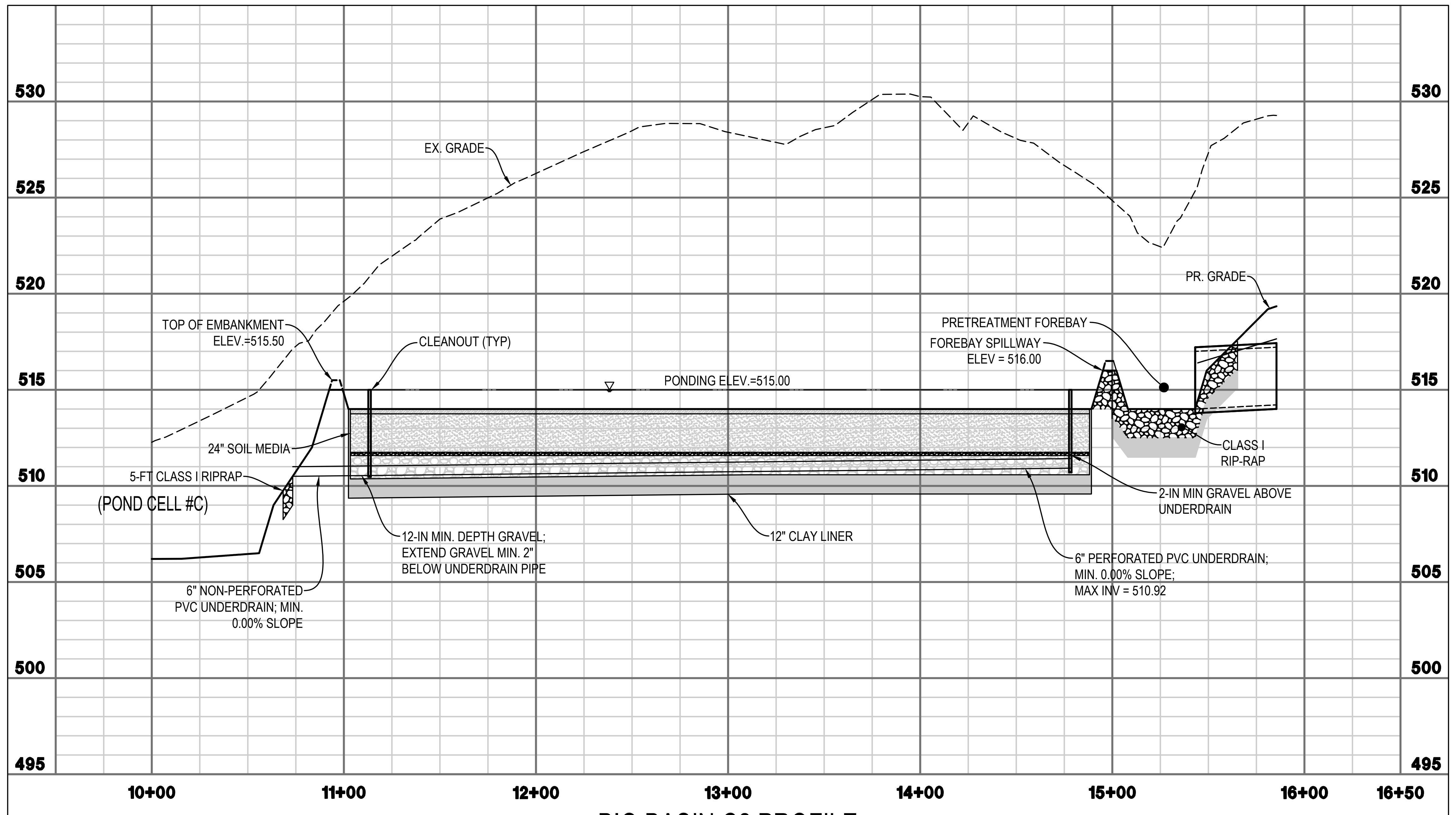
BIORETENTION CELL C2 - PLAN

SCALE: 1"=30'



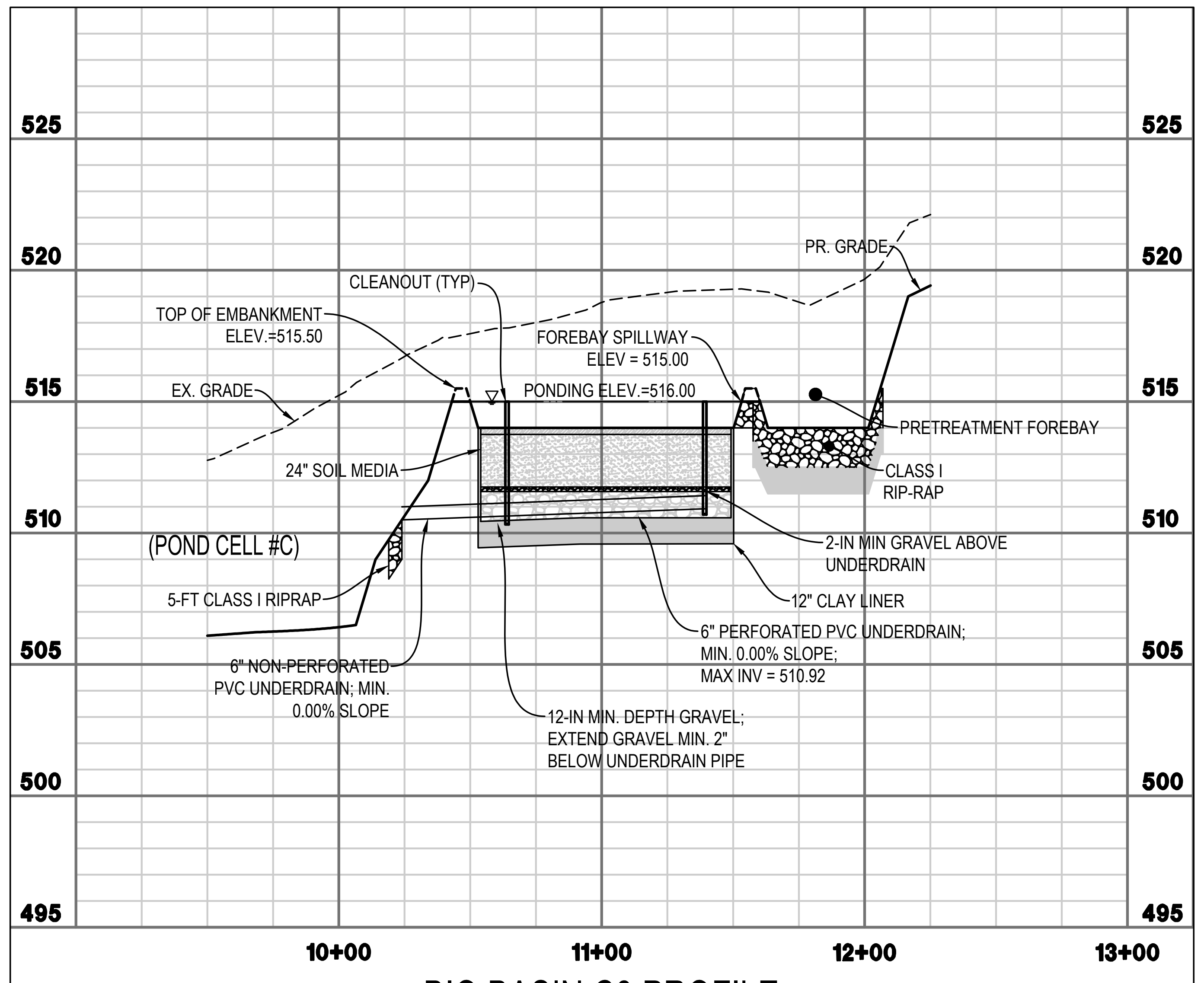
BIORETENTION CELL C3 - PLAN

SCALE: 1"=30'



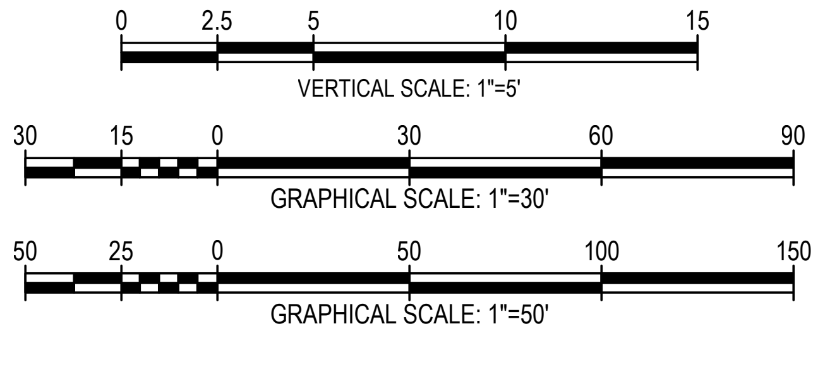
BIO BASIN C2 PROFILE

HORIZONTAL SCALE: 1"=50'; VERTICAL SCALE: 1"=5'



BIO BASIN C3 PROFILE

HORIZONTAL SCALE: 1"=50'; VERTICAL SCALE: 1"=5'



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JASON P. GERHART
No. 19127
12-13-24
SEAL:

REVISIONS
1. 10/23/2024 - JEFFERSON COUNTY, WVDOH, CTUB, AND WVAW COMMENTS
2. 12/13/2024 - JEFFERSON COUNTY AND CTUB PUMP STATION COMMENTS

BIORETENTION PLAN AND PROFILES

BIRDHILL MEADOWS SUBDIVISION PHASE 1

TAX MAP 3, PARCEL 29; D.B. 1291, PG. 381
MIDDLEWAY TAX DISTRICT
JEFFERSON COUNTY, WEST VIRGINIA

J.C. FILE #24-12-SD

SCALE:	HORIZ.: AS NOTED VERT.: 1"=5'
DATE: JULY 2024	
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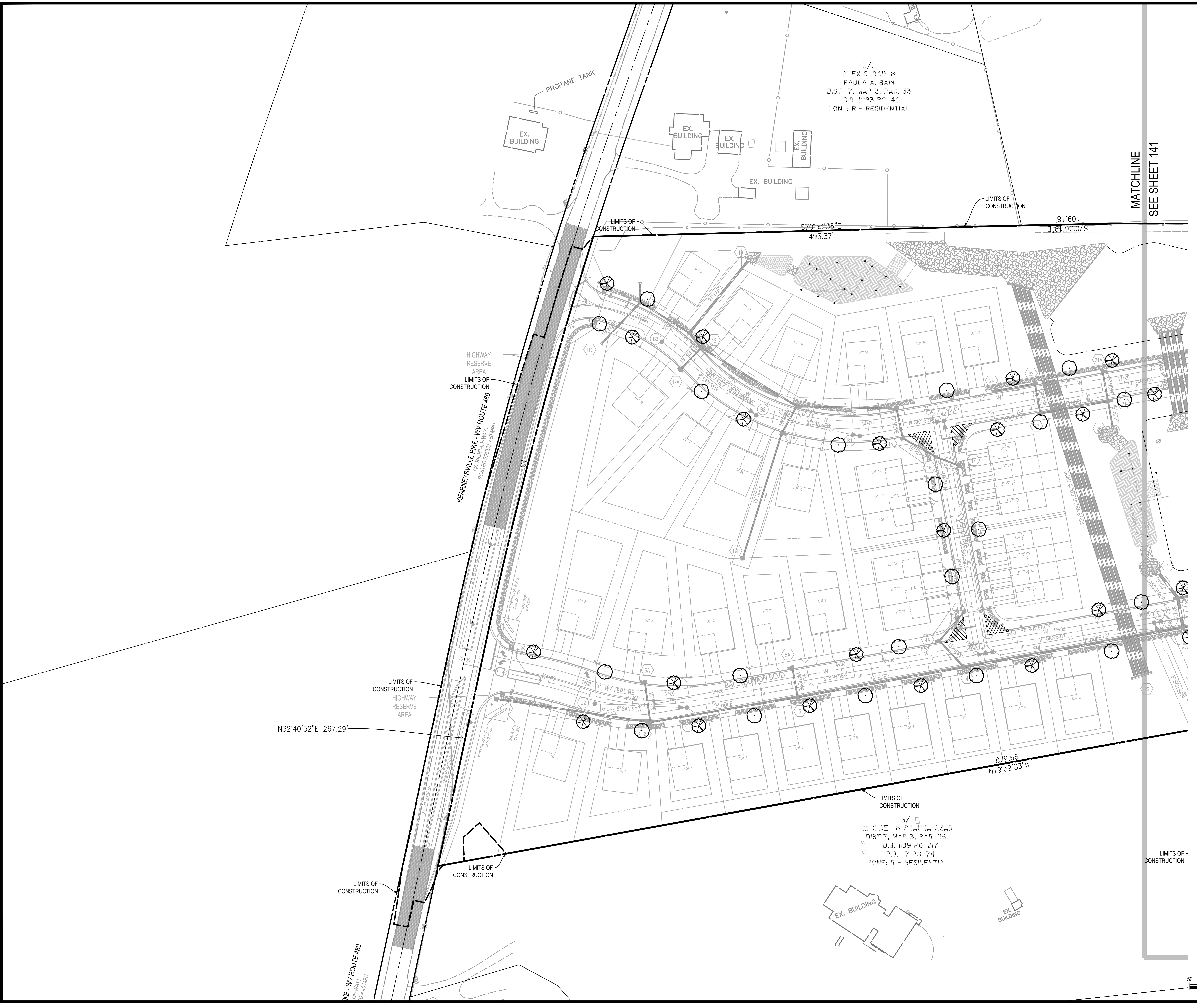
SHEET: 139 OF 147	



LEGEND:

✱	ACER RUBRUM 'RED SUNSET'
○	QUERCUS ALBA

NOTES:

1. ALL BUFFER SIZES AS REQUIRED PURSUANT TO THE JEFFERSON COUNTY ZONING & LAND DEVELOPMENT ORDINANCE.
2. SPECIES LISTED ARE PRELIMINARY AND MAY CHANGE WITH AVAILABILITY UPON APPROVAL BY THE OWNER OR OWNERS REPRESENTATIVE.
3. LANDSCAPING PROVIDED PURSUANT TO SECTION 4.11.E & SECTION 4.11.I. OF THE JEFFERSON COUNTY ZONING & LAND DEVELOPMENT ORDINANCE AND APPENDIX B, SECTION 5.3G OF THE SUBDIVISION & LAND DEVELOPMENT REGULATIONS.
4. ALL PERVIOUS AREAS WITHIN THE LIMITS OF CONSTRUCTION THAT ARE NOT SHOWN AS PLANTING BEDS SHALL BE TURF.
5. ALL LANDSCAPE MATERIALS SHALL CONFORM TO THE LATEST VERSION OF THE AMERICAN STANDARD OF NURSERY STOCK (ANSI Z60.1). PLANT MATERIALS SHALL BE OF STANDARD QUALITY OR BETTER, TRUE TO NAME AND TYPE OF THEIR SPECIES OR VARIANT.
6. ALL WORKMANSHIP AND MATERIALS (INCLUDING PLANTS) TO BE GUARANTEED FOR ONE FULL YEAR FOLLOWING INITIAL ACCEPTANCE OF INSTALLATION BY OWNER
7. THE CONTRACTOR SHALL COMPLY WITH THE LATEST EDITION OF THE LANDSCAPE SPECIFICATION GUIDELINES ADOPTED BY THE LANDSCAPE CONTRACTORS ASSOCIATION FOR PLANTING BED PREPARATION AND SOIL MIX GUIDELINES AND PROCEDURES.
8. THE EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CALLING MISS UTILITY TO DETERMINE THE EXACT LOCATION OF ALL UTILITIES BEFORE COMMENCING WORK AND IS RESPONSIBLE FOR ANY DAMAGES WHICH OCCUR BY THEIR FAILURE TO LOCATE OR PRESERVE THESE UNDERGROUND UTILITIES.
9. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION AND TO NOTIFY GORDON IF THE FIELD CONDITIONS ARE NOT IN CONFORMANCE WITH THE APPROVED PLANS.
10. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL TREES ARE NOT PLANTED WITHIN 5' OF ANY UNDERGROUND UTILITY.
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14. EXISTING TREES TO BE SAVED WHEREVER PRACTICAL.

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LANDSCAPE PLAN

BIRDHILL MEADOWS SUBDIVISION PHASE 1

TAX MAP 3, PARCEL 29; D.B. 1291, PG. 381
MIDDLEWAY TAX DISTRICT
JEFFERSON COUNTY, WEST VIRGINIA

J.C. FILE #24-12-SD

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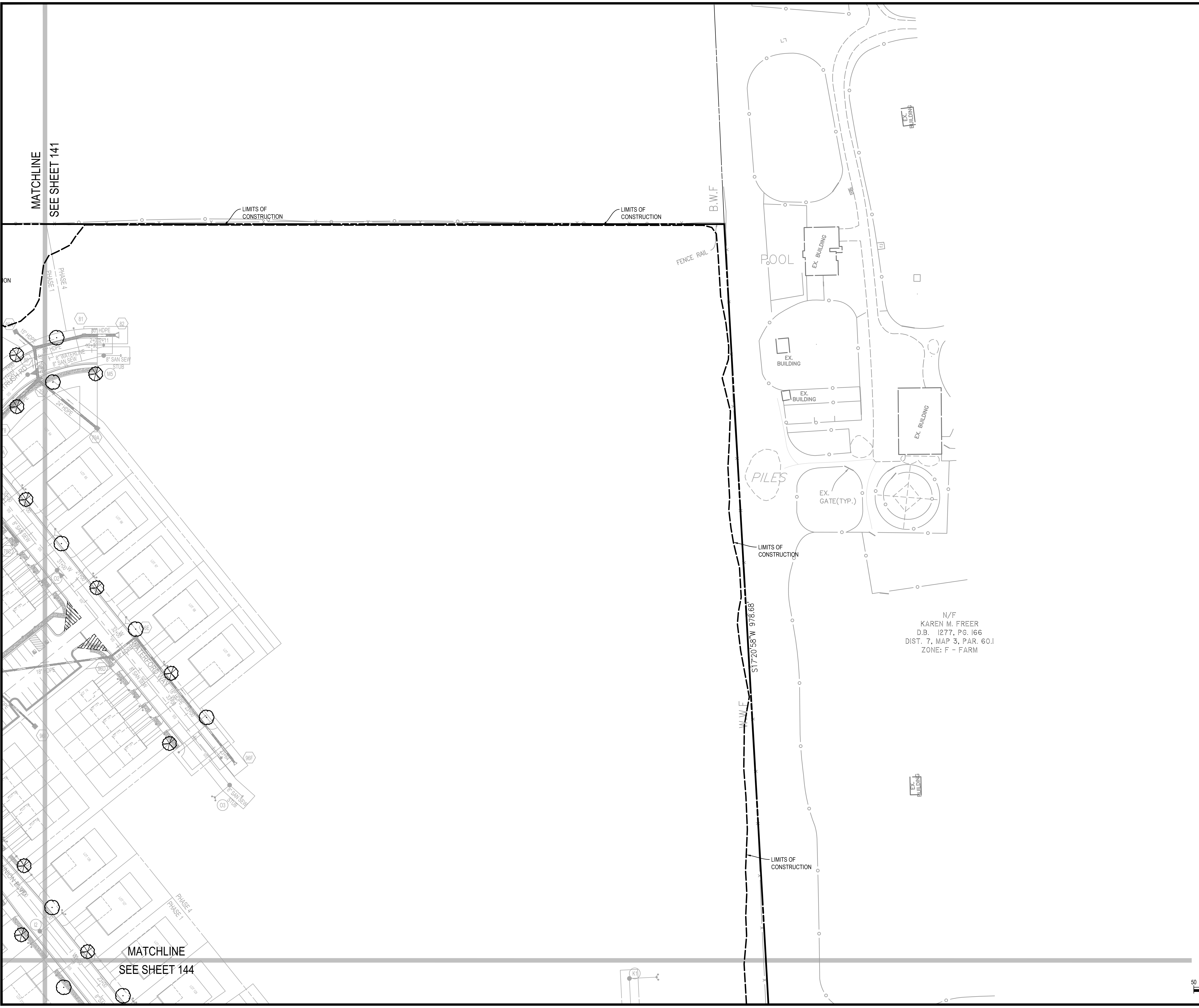

LEGEND:

✻	ACER RUBRUM 'RED SUNSET'
○	QUERCUS ALBA

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50 25 0 50 100 150
GRAPHICAL SCALE: 1"=50'

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LANDSCAPE PLAN

BIRDHILL MEADOWS SUBDIVISION PHASE 1

TAX MAP 3, PARCEL 29; D.B. 1291, PG. 381
MIDDLEWAY TAX DISTRICT
JEFFERSON COUNTY, WEST VIRGINIA

J.C. FILE #24-12-SD

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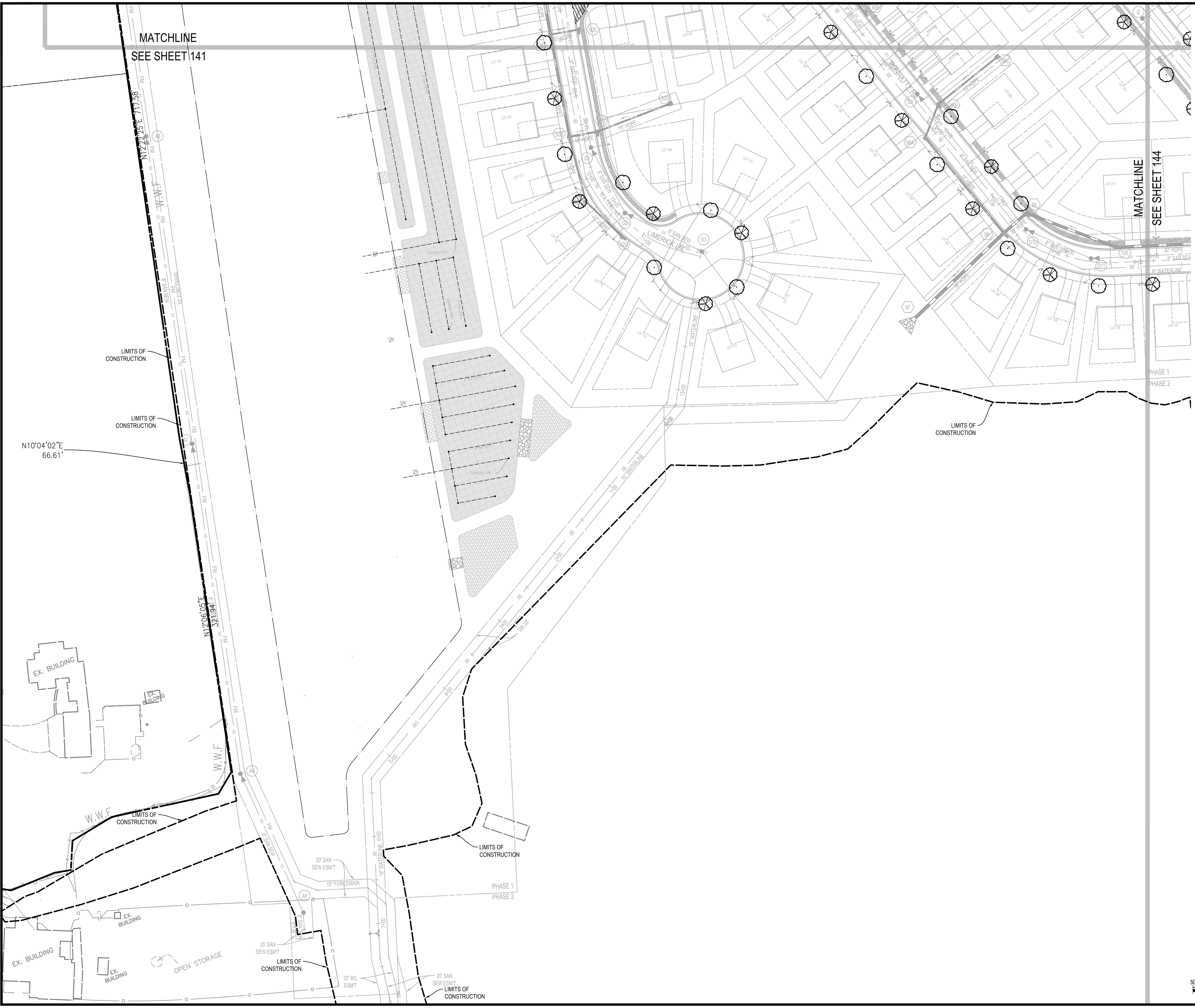

WV STATE GRID NORTH (NAD83)

LEGEND:

- ACER RUBRUM 'RED SUNSET'
- QUERCUS ALBA

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50 25 0 50 100 150

GRAPHICAL SCALE: 1"=50'

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LANDSCAPE PLAN

BIRDHILL MEADOWS SUBDIVISION PHASE 1

TAX MAP 3, PARCEL 29; D.B. 1291, PG. 381
MIDDLEWAY TAX DISTRICT
JEFFERSON COUNTY, WEST VIRGINIA

J.C. FILE #24-12-SD

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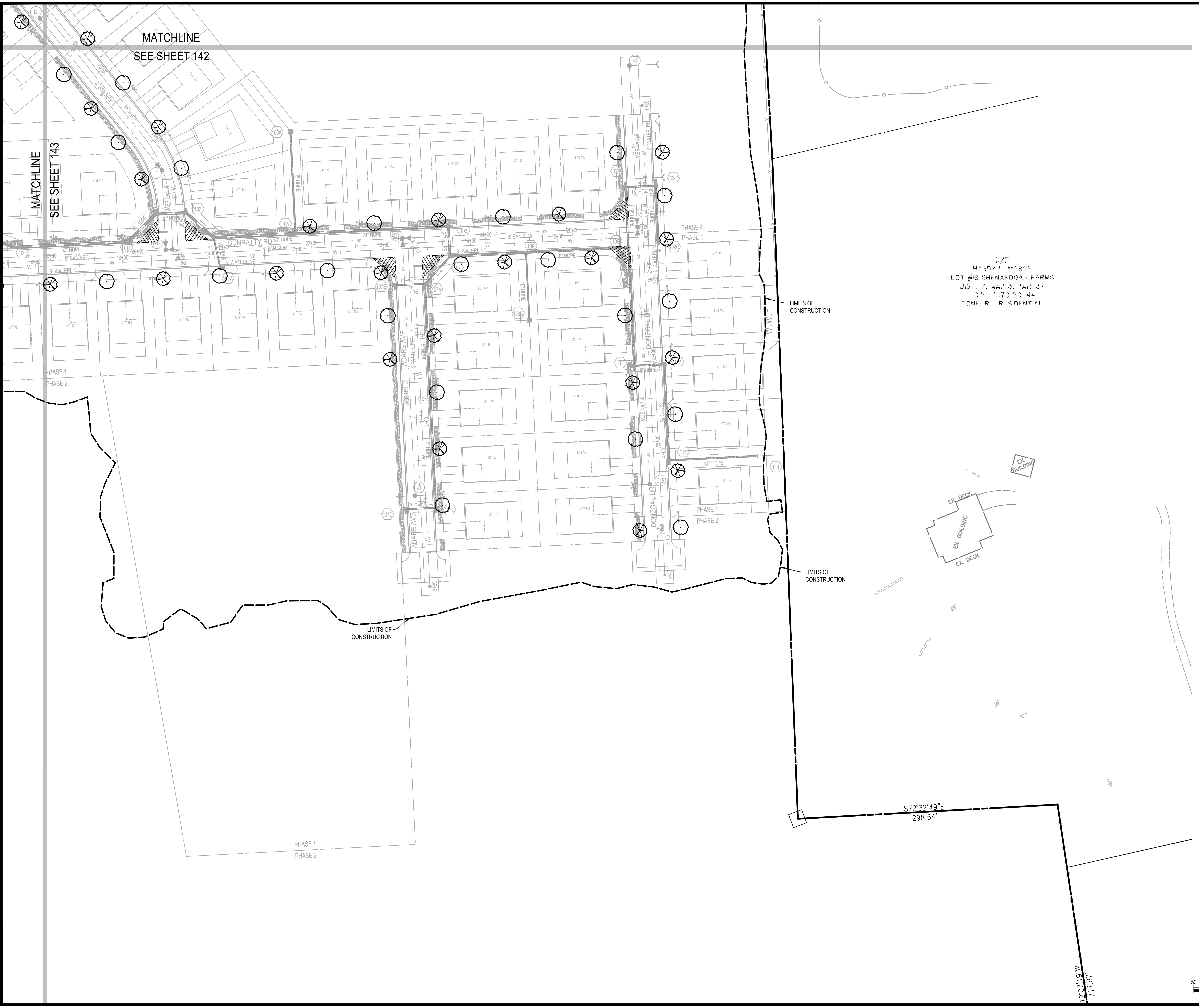

LEGEND:

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LANDSCAPE PLAN

BIRDHILL MEADOWS SUBDIVISION PHASE 1

TAX MAP 3, PARCEL 29; D.B. 1291, PG. 381
MIDDLEWAY TAX DISTRICT
JEFFERSON COUNTY, WEST VIRGINIA

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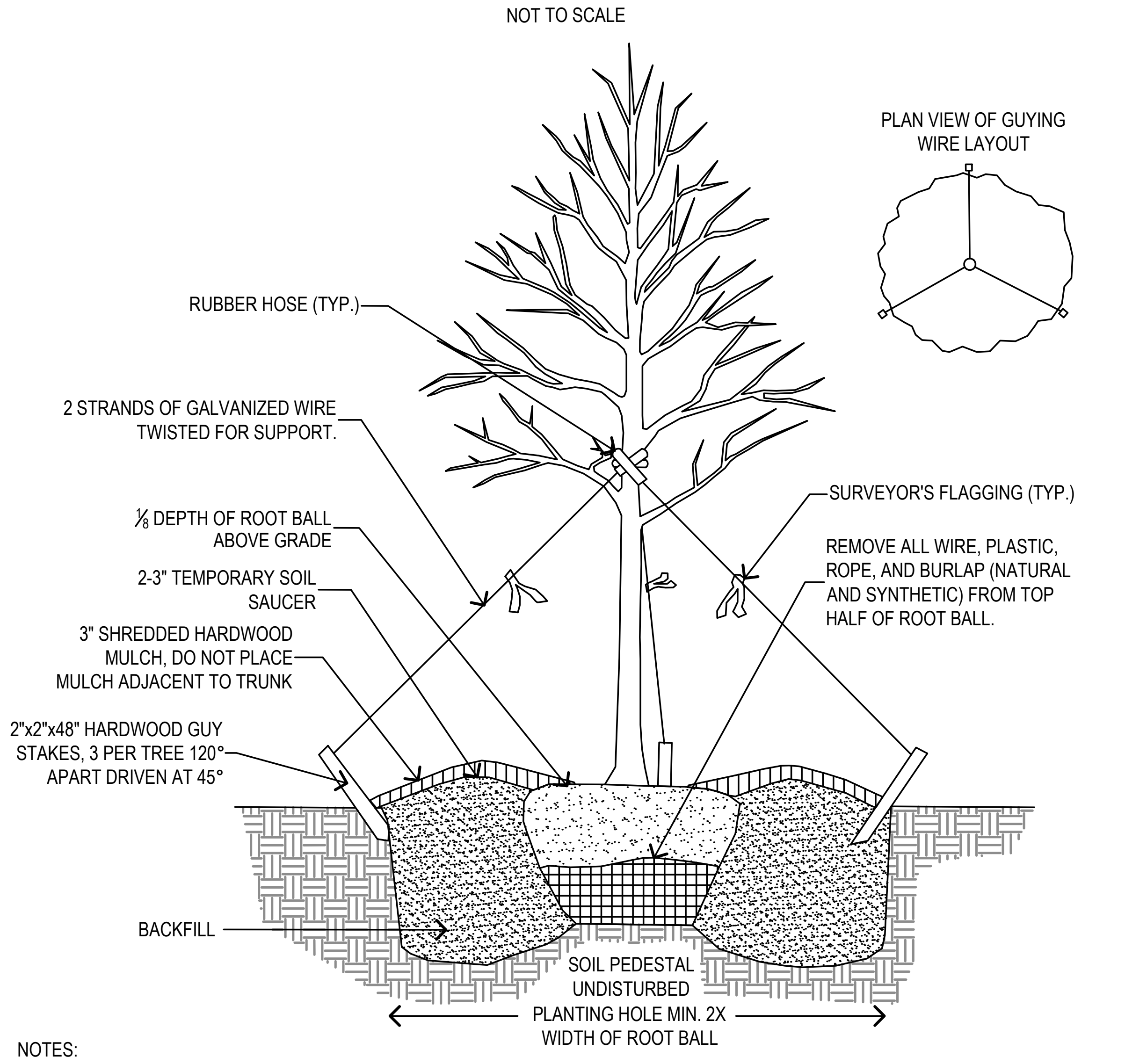
144 OF 147

DECIDUOUS TREE PLANTING DETAIL

NOT TO SCALE



NOTES:

1. STAKING AND GUYING MAY BE REQUIRED TO COUNTER HIGH WINDS, SOIL SETTLEMENT, STEEP SLOPES, VANDALISM, OR OTHER CONDITIONS THREATENING TREE HEALTH OR SUITABLE GROWTH PATTERNS. STAKES TO BE DRIVEN INTO UNDISTURBED SOIL FOR STABILITY.

Section 4.11.I.1.b. of the Zoning and Land Development Ordinance*

REGULATION	REQUIRED	PROVIDED
The Greater of 4 Trees or 1 Tree per 100' of Street Frontage (Frontage > 200')	**182**	**182**
Street Frontage = 18,200'		
18,200' / 100' = 182 Trees		

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LANDSCAPE DETAILS

BIRDHILL MEADOWS
SUBDIVISION PHASE 1
TAX MAP 3, PARCEL 29, D.B. 1291, PG. 381
MIDDLEWAY TAX DISTRICT
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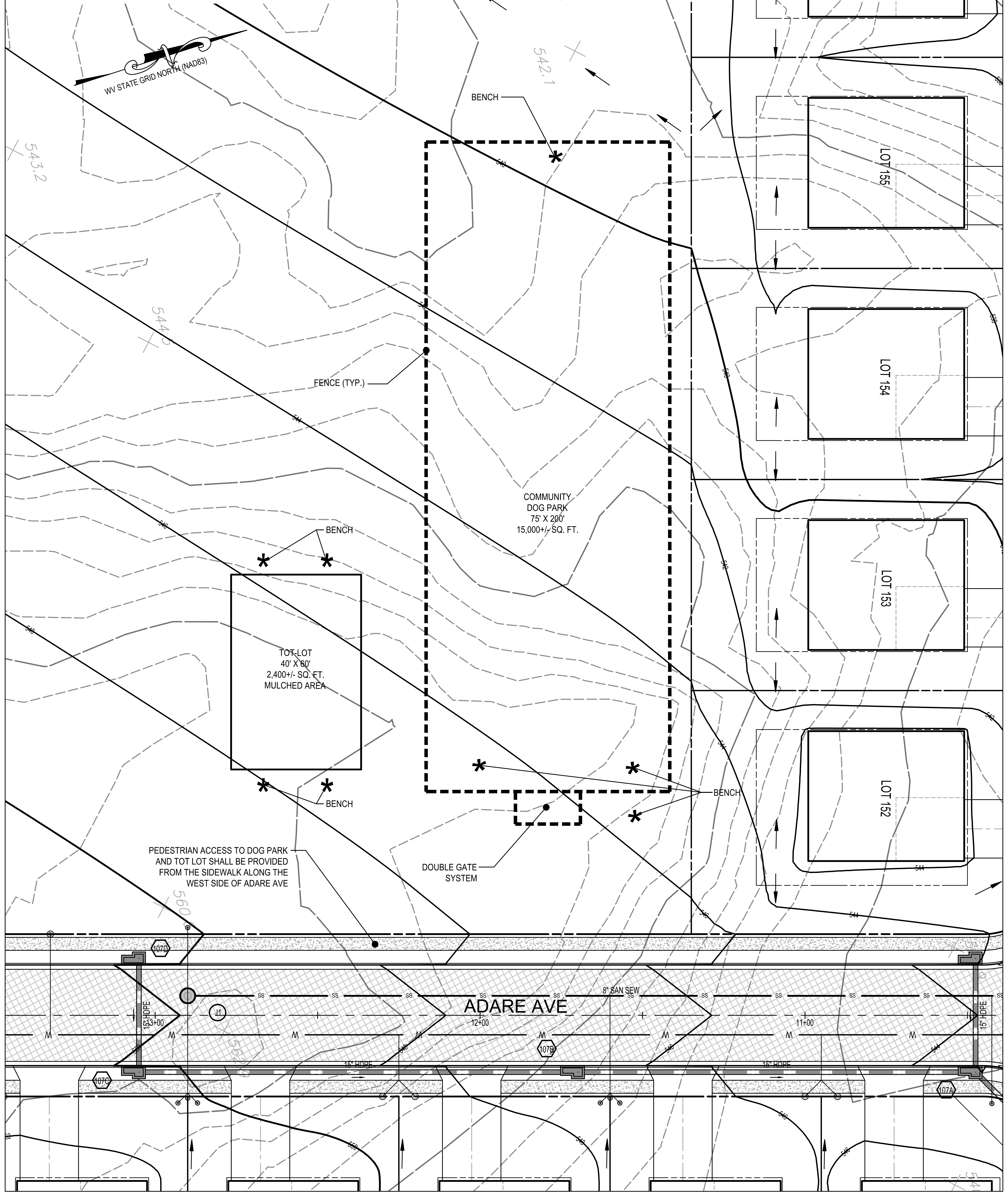
SHEET:	145 OF 147

FILE PATH: G:\PROJECT\GENERAL\3568-0301 MILLER PROPERTY PHASE 1\ENGIN\PLANS\L-LP-501.DWG

PLAN NOTES:

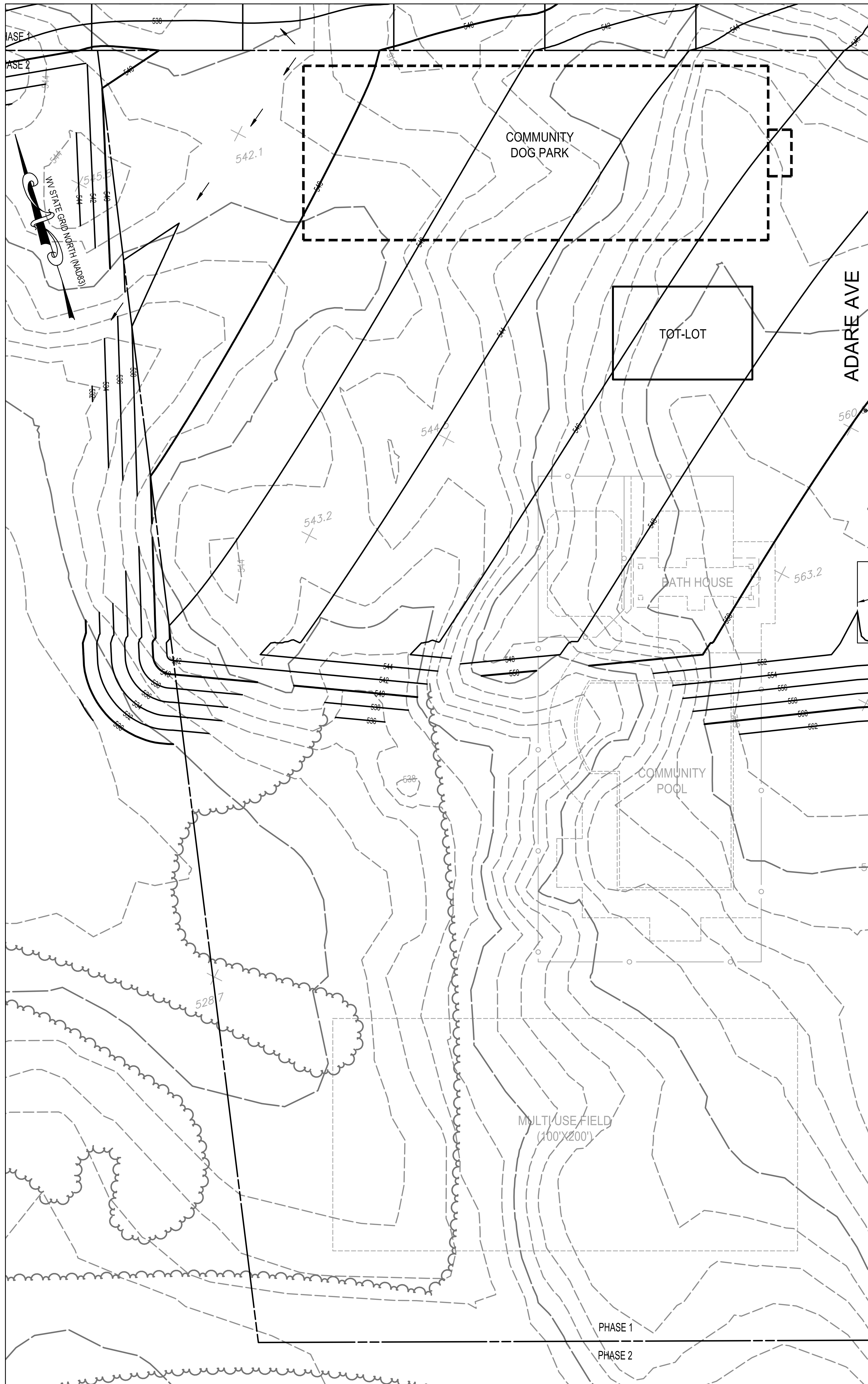
1. THIS PLAN IS FOR CONCEPTUAL PURPOSES ONLY.
2. SEE SHEET 147 FOR EXAMPLES AND QUANTITIES OF PROPOSED SITE AMENITIES.
3. THE EXISTING AND/OR PROPOSED UNDERGROUND UTILITIES SHOWN HEREON ARE BASED UPON AVAILABLE INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CALLING MISS UTILITY TO DETERMINE THE EXACT LOCATION OF ALL UTILITIES BEFORE COMMENCING WORK AND IS RESPONSIBLE FOR ANY DAMAGES WHICH OCCUR BY THEIR FAILURE TO LOCATE OR PRESERVE THESE UNDERGROUND UTILITIES.
4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION AND TO NOTIFY THE OWNER/DEVELOPER IF THE FIELD CONDITIONS ARE NOT IN CONFORMANCE WITH THIS PLAN.
5. BID SHALL BE BASED ON ACTUAL SITE CONDITIONS. NO EXTRA PAYMENT SHALL BE MADE FOR WORK ARISING FROM SITE CONDITIONS DIFFERING FROM THOSE INDICATED ON DRAWINGS.
6. CONTRACTOR TO PROVIDE ALL REQUIRED TOPSOIL (AS REQUIRED). CONTRACTOR TO SUPPLY FROM OFFSITE SOURCES IF ONSITE STOCKPILES ARE INSUFFICIENT.



PHASE 1 RECREATIONAL AREA PLAN

20 10 0 20 40 60

GRAPHICAL SCALE: 1" = 20'



CONCEPT NOTES:

1. THIS PLAN IS FOR CONCEPTUAL PURPOSES ONLY.
2. COMMUNITY DOG PARK AND LOT–LOT SHALL BE CONSTRUCTED WITH PHASE 1 PRELIMINARY PLAT.
3. POOL AREA AND MULTI USE FIELD SHALL BE CONSTRUCTED WITH PHASE 2 PRELIMINARY PLAT.

OVERALL RECREATIONAL AREA CONCEPT

30 15 0 30 60 90

GRAPHICAL SCALE: 1" = 30'

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NCS: NA	
SHEET: 146 OF 147	

BENCHES:

1. A TOTAL OF EIGHT (8) BENCHES SHALL BE PROVIDED AT LOCATIONS IDENTIFIED ON THE CONCEPTUAL PLAN.
2. BENCH TO BE LATITUDE 6' FLAT BENCH BY ANOVA OR EQUIVALENT. PRODUCT DATA FOR ALTERNATES TO BE PROVIDED BY CONTRACTOR TO OWNER/DEVELOPER WITH BID DOCUMENTS.
3. CONCRETE PADS TO BE PROVIDED FOR EACH BENCH. INSTALLATION AND SURFACE MOUNT TO BE COMPLETED PURSUANT TO MANUFACTURERS SPECIFICATIONS.
4. SHOP DRAWINGS TO BE PROVIDED BY CONTRACTOR TO OWNER/DEVELOPER FOR APPROVAL PRIOR TO INSTALLATION.

COMMUNITY DOG PARK:

1. DOG PARK SHALL BE SEEDED AND STABILIZED WITH TURF UPON COMPLETION.
2. ENTIRE DOG PARK TO BE ENCLOSED BY WITH A 5 FOOT TALL GREEN VINYL COATED (#9 GAUGE) CHAIN LINK FENCE PROVIDED BY LONG FENCE OR EQUIVALENT. ALTERNATIVE MANUFACTURERS PERMITTED UPON APPROVAL OF OWNER/DEVELOPER. FENCE TO BE INSTALLED PURSUANT TO MANUFACTURERS SPECIFICATIONS.
3. FENCE TO BE INSTALLED SO NO GAPS OR OTHER VOIDS OCCUR WHICH DOGS MAY BYPASS FENCE ENCLOSURE.
4. TWO GATE ENTRANCE/EXIT SYSTEM SHALL BE INCLUDED WITH THE PERIMETER ENCLOSURE (SEE ADJACENT IMAGE)
5. SIGN TO BE INSTALLED IDENTIFYING PARK RULES. SIGN TO BE SIMILAR TO THE ADJACENT EXAMPLE.
6. DOG PARK TO CONTAIN A MINIMUM OF 2 WASTE DISPOSAL STATIONS. STATIONS TO BE MODEL #BARK-490 PROVIDE BY BARKPARK.
7. PRODUCT DATA FOR ALL EQUIPMENT TO BE PROVIDED BY CONTRACTOR TO OWNER/DEVELOPER WITH BID DOCUMENTS.
8. SHOP DRAWINGS TO BE PROVIDED BY CONTRACTOR TO OWNER/DEVELOPER FOR APPROVAL PRIOR TO INSTALLATION.

DOG PARK RULES

1. No dogs without people. No people without dogs.
2. Watch your dogs at all times. Discourage barking and digging. If your dog digs a hole, fill it in.
3. No spike, prong or pinch collars. However your dog must wear a collar or harness in the run at all times.
4. Clean up after your dog.
5. No aggressive dogs. Do not let your dog poster or mount other dogs. Watch for signs of aggression.
6. No dogs in heat. Closely monitor un-neutered males.
7. If your dog gets in a fight, exchange contact information and leave the dog run. You are responsible for any injury caused by your dog.
8. Dogs must be licensed and immunized.
9. Bring children at your own risk. Children under ten must be accompanied by an adult.
10. No glass containers. Use caution and judgement when bringing food into the run.

SIGNAGE

WASTE DISPOSAL STATION

TWO GATE ENTRANCE / EXIT SYSTEM

TOT-LOT:

1. ALL TOT-LOT AMENITIES TO BE PROVIDED BY LANDSCAPE STRUTURES. ALTERNATIVE MANUFACTURERS PERMITTED UPON APPROVAL OF OWNER/DEVELOPER.
2. TOT-LOT SURFACE TO BE ENGINEERED WOOD FIBER INSTALLED TO MANUFACTURERS DEPTHS AND SPECIFICATIONS.
3. WOOD FIBER TO BE CONTAINED WITH GAMETIME PLAYCURBS OR EQUIVALENT.
4. FINAL ORIENTATION OF TOT-LOT EQUIPMENT TO BE BASED ON RECOMENDATIONS FROM MANUFACTURER.
5. SHOP DRAWINGS TO BE PROVIDED BY CONTRACTOR TO OWNER/DEVELOPER FOR APPROVAL PRIOR TO INSTALLATION.

INTEGRITY
FEDERAL SERVICES
CIVIL ENGINEERING • LANDSCAPE ARCHITECTURE • PLANNING
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SEAL:
JASON P. GERHART
No. 19127
12-13-24

REVISIONS
1. 10/23/2024 - JEFFERSON COUNTY, WVDOH, CTUB, AND WVAW COMMENTS
2. 12/13/2024 - JEFFERSON COUNTY AND CTUB PUMP STATION COMMENTS

RECREATIONAL AREA DETAILS

BIRDHILL MEADOWS
SUBDIVISION PHASE 1
TAX MAP 3, PARCEL 29; D.B. 1291, PG. 381
MIDDLEWAY TAX DISTRICT
JEFFERSON COUNTY, WEST VIRGINIA

J.C. FILE #24-12-SD

SCALE: HORIZ.: N/A
VERT.: N/A
DATE: JULY 2024
JOB: 3568-0301
DRAWN: JMM
CHECK: JPG
CADD: L-LP-510.DWG
NCS:
SHEET:
147 OF 147

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