CITY OF CHARLES TOWN
PLANNING COMMISSION
AGENDA • JANUARY 18, 2024

Special Meeting **CITY HALL** **7:00 PM**
101 E Washington Street, Charles Town, WV 25414 Special Meeting of the PC. Non-public hearing items only.

1. CALL TO ORDER

2. WORK SESSION - POSTPONED TO JAN 22 MEETING

: Text Amendment - Neighborhood Residential Use Changes
POSTPONED TO JAN 22 MEETING

: Text Amendment - Lighting Standards
POSTPONED TO JAN 22 MEETING

3. CALL TO ORDER

4. NEW BUSINESS

: *Commission Review*: SLD2023-02: Westover Dental - Preliminary Plan
(ITEM POSTPONED TO JAN 22 MEETING)

: *Commission Review*: SLD2023-06: Tiny Treasures Daycare - Preliminary Plan
1. Staff Report.pdf
2. Application.pdf
3. Revised Narrative.pdf
4. Preliminary Plan.pdf
5. CTUB.pdf
6. Stormwater Plan.pdf

: *Commission Review*: BR2023-08 : Tiny Treasures Daycare - Bond Establishment
1. Staff Report.pdf
2. Application.pdf
3. Estimate.PDF
4. KH Review.pdf

: *Commission Review*: BR2023-09: Joan and Joe's Coffee - Bond Establishment
1. Staff Report.pdf
2. Application.pdf
3. Estimate.pdf
4. KH Comments pt1.pdf
5._KH_Comments_pt_2.pdf

: *Commission Review:* BR2023-07: Norborne-Glebe Phases 9, 10A - Bond Reduction
1. Staff Report.pdf
2. Performance Bond Application.pdf
3. Performance Estimate.pdf
4. Land Disturbance Application.pdf

5. Land Disturbance Estimate.pdf
6. KH Review.pdf

5. ADJOURNMENT

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/18/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Text Amendment - Neighborhood Residential Use Changes
POSTPONED TO JAN 22 MEETING

ATTACHMENTS:

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/18/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Text Amendment - Lighting Standards
POSTPONED TO JAN 22 MEETING

ATTACHMENTS:

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/18/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Commission Review: SLD2023-02: Westover Dental - Preliminary Plan (ITEM POSTPONED TO JAN 22 MEETING)

ATTACHMENTS:

Planning Commission
101 East Washington Street
Charles Town, WV 25414

SCHEDULED

Meeting: 01/18/24
Department: Planning Commission
Category: Report
Initiator:

AGENDA ITEM (ID #)

Commission Review: SLD2023-06: Tiny Treasures Daycare - Preliminary Plan

ATTACHMENTS:

- 1. Staff Report.pdf
- 2. Application.pdf
- 3. Revised Narrative.pdf
- 4. Preliminary Plan.pdf
- 5. CTUB.pdf
- 6. Stormwater Plan.pdf

Preliminary Plan Staff Report
SLD2023-06

Date: For the January 18, 2024 Planning Commission Special Meeting.
Applicant: Christopher Hill
Property Owner: Tri-State Investment Properties LLC
Report by: James Newman, City Planner, Zoning/Subdivision Administrator.
Proposal: Expansion of an existing daycare center
Property Location: TD 02 / Map: 10 / Pcl: 9.002, located on Cherry Tree Drive
Current Zoning: Property lies on the County/City boundary. Portion in the City is zoned General Commercial.



PROJECT OVERVIEW

The property is 1.6 acres in size. The applicant has an existing day-care on site, and is seeking to expand the use.

HISTORY

On June 26, 2023, the Planning Commission voted to approve the sketch plan.

ZONING REVIEW

The portion of the site within the City is zoned General Commercial.

Setbacks

	Required	Proposed
Front	40 ft.	40 ft.
Sides	10 ft. /25 ft. if adjacent to residential zoning	106 ft.
Rear	30 ft.	82 ft.

Density

Not applicable.

Open Space

No requirement.

Parking

Required parking for a day-care center is .24 parking spaces per student. Total enrollment aim is for 105 children with 18 staff positions; currently has 46 children and nine staff.

Currently has 12 spaces, including one handicap space. Total enrollment of 105 children necessitates 25.2 spaces. Plans show 30 spaces, of which three are handicap spaces.

Traffic Impact

The application states that there will be a maximum of 23 employees and 105 staff at full occupancy.

Per the ITE 10th Edition, a Day Care Center (ITE Code 565) has the following trip generation:

- Weekday Traffic Volume – 21.38 VPD/Per Employee
- AM Peak Hour – 4.49 Vehicle/Employee
- PM Peak Hour – 4.36 Vehicle/Employee

The applicant has provided an narrative stating there will be a maximum of 18 employees and 105 students at full occupancy.

Per the ITE 10th Edition, a Day Care Center (ITE Code 565) has the following trip generation:

- Weekday Traffic Volume – 21.38 VPD/Per Employee
- AM Peak Hour – 4.49 Vehicle/Employee
- PM Peak Hour – 4.36 Vehicle/Employee

With the proposed number of 18 employees, the trips generated at peak hours are:

- Weekday Traffic Vehicles – 385 VPD
- AM Peak Hour – 81 Vehicles
- PM Peak Hour – 79 Vehicles

Street Connections

There is an existing entrance onto Cherry Tree St. No additional entrances/curb-cuts are proposed as part of this plan.

Landscaping

In parking lots with over 25 spaces, there must be one tree shade tree planted per every 10 parking spaces. Additionally, at least 5% of the parking to must be devoted to interior landscaping. For this site, 5% = 610 sq. ft. The applicant is providing 1,194 sq. ft. of interior landscaping.

Buffers

A 6ft. tall opaque buffer is required between residential and non-residential uses. The plans show a proposed 6 ft. tall wooden fence as the buffer, which meets Code requirements.

Stormwater

The City's Engineering firm, Kimley-Horn, had no comments at this stage about stormwater control facilities.

Utilities

Plans show water, gas, and sewer utility lines and locations/easements.

Dumpster

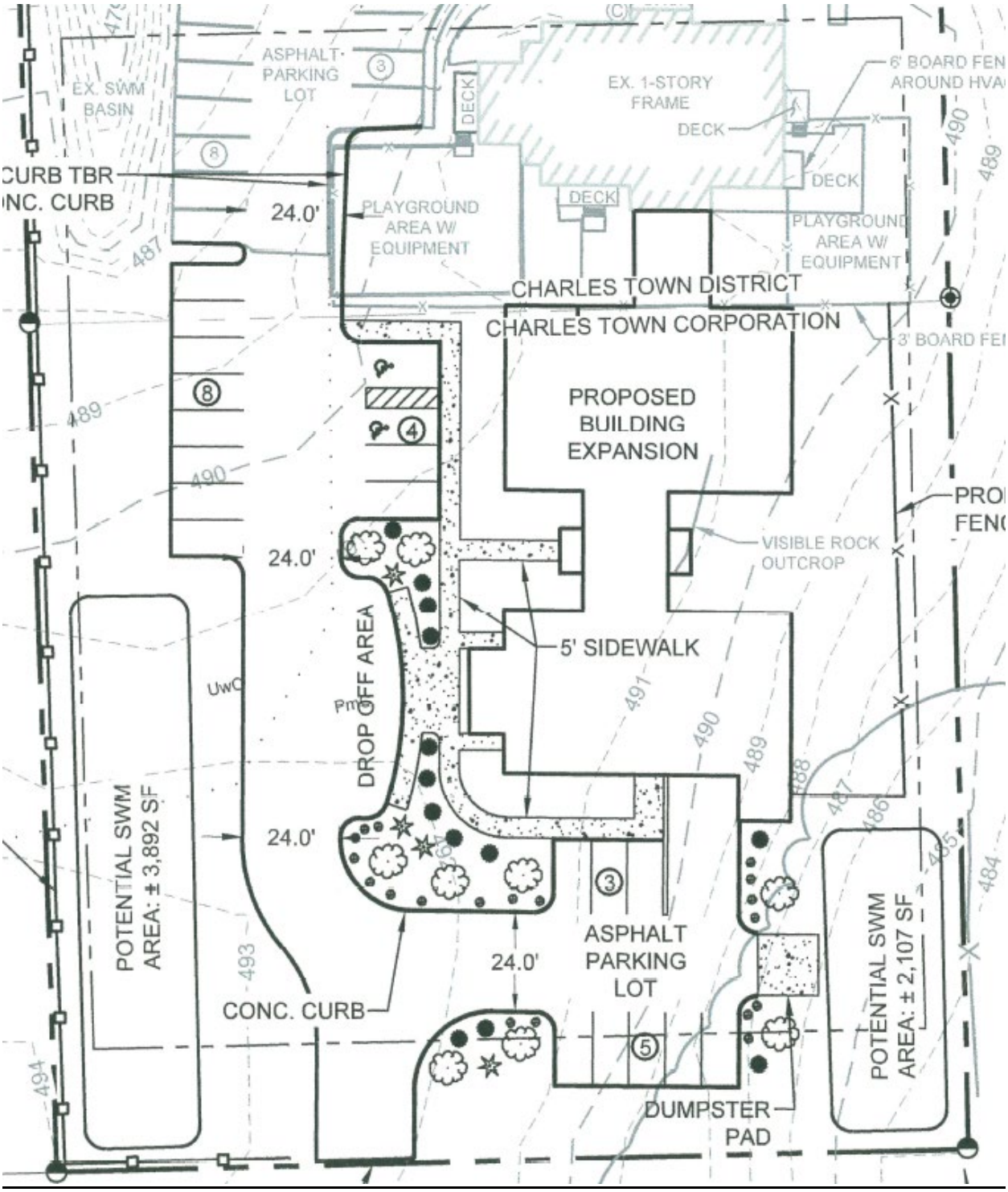
The dumpster will be fenced on 3 sides, and have landscaping around the exterior. This is in conformance with Code requirements.

Lighting

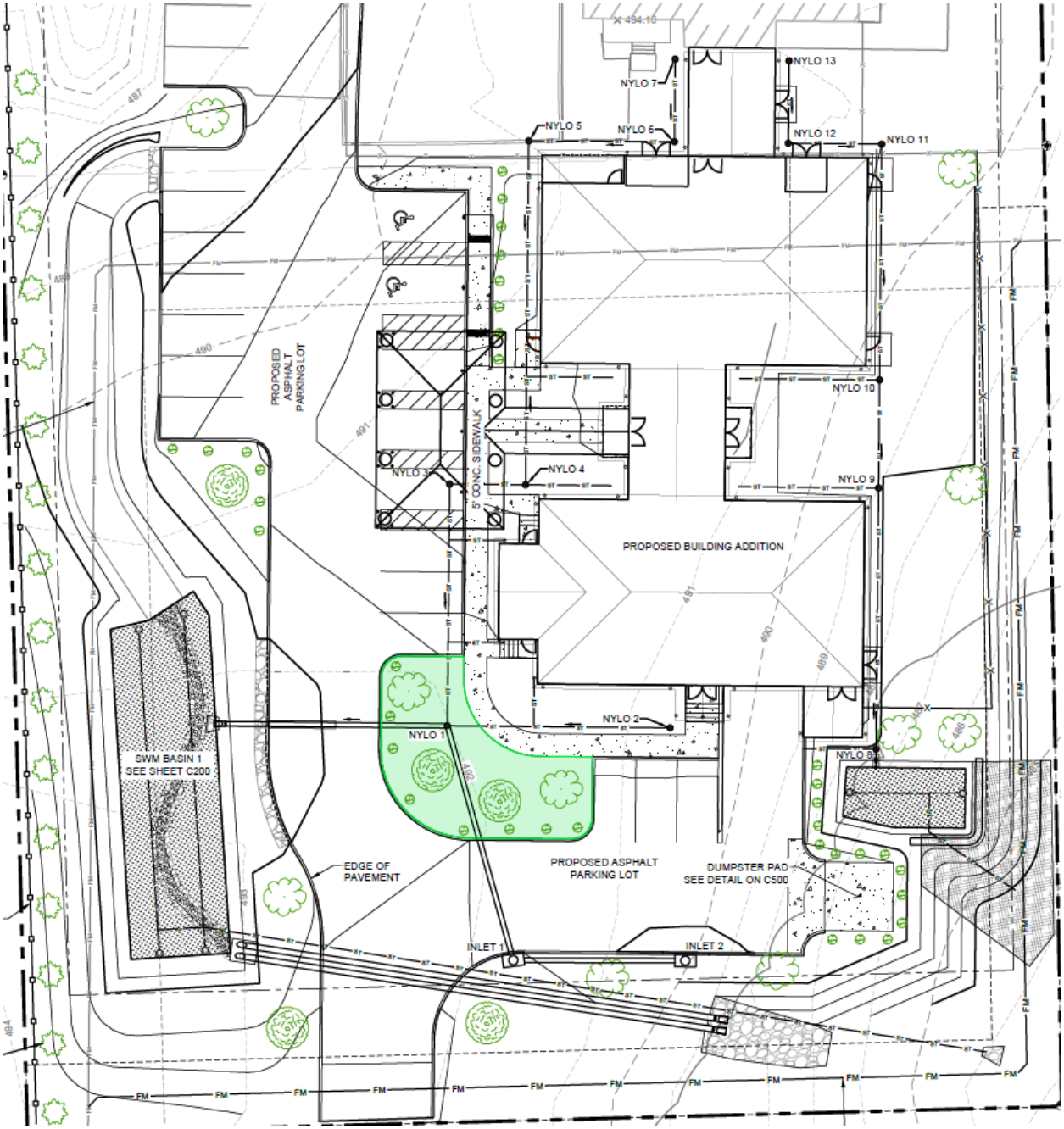
The application will not be providing any pole lighting in the parking lot. Wall-packs will be installed and photometric details provided on architectural drawings. Lighting must be shielded and downcast.

SKETCH PLAN

The preliminary plan is mostly in conformance with the sketch plan. The only major change was a drop-off area was shown on the sketch plan but removed from this plan. A canopy over part of the parking lot has taken its place. See the image on the following page:


EX. SWM BASIN
ASPHALT PARKING LOT
DECK
EX. 1-STORY FRAME
6' BOARD FEN AROUND HVA
DECK
DECK
DECK
CURB TBR
NC. CURB
24.0'
PLAYGROUND AREA W/ EQUIPMENT
PLAYGROUND AREA W/ EQUIPMENT
CHARLES TOWN DISTRICT
CHARLES TOWN CORPORATION
3' BOARD FE
PROPOSED BUILDING EXPANSION
PRO
FEN
VISIBLE ROCK OUTCROP
24.0'
DROP OFF AREA
5' SIDEWALK
24.0'
POTENTIAL SWM AREA: ± 3,892 SF
24.0'
ASPHALT PARKING LOT
CONC. CURB
POTENTIAL SWM AREA: ± 2,107 SF
DUMPSTER PAD

PRELIMINARY PLAN



COMPREHENSIVE PLAN

The 2040 Comprehensive Plan identifies this property as Mixed Use Commercial.

CONCLUSION

The applicant is seeking to build an addition to their structure and extend their parking lot. The application and design are in conformance with Code requirements.

RECOMMENDATION

Based on the provided information, conformance with Code requirements, and conformance with the sketch plan, the preliminary plan should be **approved**.

Sketch Plan Application No._____

SKETCH PLAN APPLICATION

SUBDIVISION AND LAND DEVELOPMENT ORDINANCE
ARTICLE 1332, SUBDIVISION AND LAND DEVELOPMENT APPLICATION & APPROVAL REQUIREMENTS

To assist the Subdivision Administrator in the review of a Sketch Plan Application, the Applicant must utilize this form to supply the City with the information prescribed under Section 1332.03 of the Charles Town S/LD Ordinance. The submission of this form, along with the prescribed information and required fees, shall serve as the Applicant's Sketch Plan Application as required by Ordinance Section 1332.03. Applicant is responsible to ensure the standards of Ordinance Section 1332.04, Sketch Plan Requirements, are met and provided herein is a checklist of the Sketch Plan requirements.

1. DATE April 21, 20 23

2. APPLICATION TYPE*

☒ Zoning Use Permit, Special Exception Use and Sketch Plan requirements found in the Supplemental Regulations of the Zoning Ordinance

- Submit Three (3) 11" x 17" copies of the Sketch Plan shall be submitted and in Adobe PDF format

☐ Major S/LD Development

- Submit Three (3) 18" x 24" copies of the Sketch Plan shall be submitted and in Adobe PDF format

*There are two types of Sketch Plan submissions:

1. For Zoning Use Permit, Special Exception Use and Sketch Plan requirements found in the Supplemental Regulations of the Zoning Ordinance. Submission standards are found in Section 1332.04(D).
2. For a Sketch Plan for a Major S/LD application, submission standards are found in Section 1332.04(E)

3. APPLICANT'S NAME* Christopher Hill

Address: 248 CHERRY TREE DRIVE CHARLES TOWN, WV 25414

Telephone Number (410)206-4791 Fax Number (___)

Email Address chris@tristatewv.com

4. PROPERTY OWNER'S NAME Tri-State Investment Properties, LLC.

Address: PO Box 1 Kearneysville, WV 25430

Telephone Number (410)206-4791 Fax Number (___)

Email Address chris@tristatewv.com

5. LEGAL DESCRIPTION OF THE SUBJECT PROPERTY (list all parcels that apply)

Property Address: 248 CHERRY TREE DRIVE CHARLES TOWN, WV 25414

Tax Map # and Parcel: Map 10 Parcel 9.20

Deed Book and Page #: 1228/138

Property Area in Square Feet or Acres: 1.6674 acres

6. DESCRIPTION OF PROJECT AND PROPOSED USE(S) OF THE PROPERTY:

Current property located in county is zoned as Residential Growth, and is operating as an approved daycare facility providing care for 46 children aged 6 weeks to 5 years old and employing 9 staff. Due to high demand and lack of childcare in the area, we propose to construct an addition to be licensed for an additional 59 children. The center will care for a total 105 children and propvide 23 staff positions.

7. DESCRIPTION OF THE EXISTING (OR FORMER) USE(S) OF THE PROPERTY AND CURRENT ZONING:

Currently the existing center is in county jurisdiction. The addition will span into the city jurisdiction that is zoned as general commercial.

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

8. ARE THERE ANY ANTICIPATED WAIVERS OR VARIANCES? IF YES, PROVIDE DETAILS.

No

9. HAS THE PROPERTY BEEN THE SUBJECT OF ANY COURT ACTION?

☐ Yes (Please specify nature of all proceedings and current status and attach any documents showing court decisions, etc.)

☒ No

10. PARCEL HISTORY (List all pending or previously approved applications on the subject parcels inventoried above, including previous site plan applications if this application is a site plan amendment)

Application No.	Project Name and Phase	Status	Approval Date

11. INTERESTED PARTY ADDRESSES, FOR PUBLIC NOTICE (including across street)
(Interested parties are defined as adjacent properties within 100 feet).

Owner	# and Street	City, State, Zip
First Charles Town Group	PO Box 183	Charles Town, WV 25414
Charles Town Limited Partnership	PO Box 547	Charles Town, WV 25414
Charles Town LTD III	PO Box 547	Charles Town, WV 25414

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Section 1332.02 of the Charles Town S/LD Ordinance and relevant provisions of the Charles Town City Code.

Signature of Applicant

_____ Date 04/20/2023

Signature of Property Owner (If different than Applicant)

_____ Date _____

Please submit an original completed Application and specified number of Site Plan copies to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

FOR CITY USE ONLY

Application Number:_____ Date Application Received:_____

Fee: $_____ Paid:$_____ Check No._____

Receipt No._____

Subdivision Administrator Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

Comments:_____

_____

_____

_____

_____

_____

CHARLES TOWN, WEST VIRGINIA
Department of Community Development
Division of Planning and Zoning
101 East Washington Street, P.O. Box 14
Charles Town, West Virginia 25414

Phone: (304) 725-2311

Fax (304) 725-1014

File Number: _____
Staff Initials: _____
Fees Paid: _____

https://goo.gl/KGzDMZ

Sketch Plan Review Checklist
Amended 2017 Subdivsion Ordinance

(please check one) _____**Major S/LD Application** or
_____**Zoning Use Permit, Special Exception Use, or Sketch Plan (requirements found in the Supplemental Regulations of the Zoning Ordinance)**

Project Name: Daycare Expansion

Property Owner Information					
Property Owner:					
Mailing Address:					
City:		State:		Zip Code:	
Phone Number:		Email:			
Signature:				Date:	

Applicant's Registered Engineer or Surveyor or Design Consultant					
Name:					
Mailing Address:					
City:		State:		Zip Code:	
Phone Number:		Email:			

Physical Property Details					
Physical Address:					
City:		State:		Zip Code:	
Tax District:		Map No:		Parcel No:	
Parcel Size:		Deed Book:		Page No:	

Zoning of Subject Property			**Is the Project to Be:**	**Is Property In:**
Urban Reserve (UR)	Residential Medium-High Density (R-15)	Neighborhood Commercial (NC)	Planned Unit Development (PUD)	Historic Overlay District (HOD)
General Commercial (GC)	Old Town Residential (OT-R)			Floodplain Overlay District (FOD)
Old Town Mixed Use Commercial (OT-MUC)	Neighborhood Residential (NR)			

City Use Only	1st Review	2nd Review	3rd Review	4th Review
Submittal Date				
Zoning Administrator				
City Planner				
GIS/Addressing				
Return Date				

Conditions of Approval (Attach Additional Comments As Needed)

Instructions

1. This checklist is provided as a quick reference guide only. The Consultant/Developer is responsible for reading the regulations and fully complying with all the requirements. All references to the Subdivision Ordinance and Zoning Ordinance are cited for informational purposes only.

2. The checklist shall be completed by the Engineer/Surveyor or Design Consultant and attached to the Sketch Plan review submission.

Requried Submittal Information

_____ 1 Check for Applciation Fees

_____ 1 Completed Application and Checklist (Signed by owner)

_____ 3 Sets of Sketch Plans and Adobe PDF Format

	Ordinance Requirements: *(See instructions on page 2)*	Engineer /Surveyor	1st Review	2nd Review	3rd Review	4th Review	Review Key	
							✓	Ok
							O	Incomplete
							N/A	Not Applicable
							X	Unacceptable
Sub-Section	**SUBDIVISION ORDINANCE** **Section 1332.04, Sketch Plan Requirements**							
A	**THERE ARE TWO TYPES OF SKETCH PLAN SUBMISSIONS:** **Sections in Red and Blue are depict the different types.**							
A1 and D	For: **• Zoning Use Permit** **• Special Exception Use** **• Sketch Plan requirements found in the Supplemental Regulations of the Zoning Ordinance** The following information shall be provided for Sketch Plan review:							
D1	Three (3) 11" x 17" copies of the Sketch Plan shall be submitted and in Adobe PDF format.							
D2	The Sketch Plan shall be drawn to a 1"=50' scale							
D2	The Sketch Plan must illustrate the following elements in such a way that the Subdivision Administrator or authorized designee can determine if the proposed Subdivision or Land Development meets the criteria of this Ordinance, **as applicable:**							
D2a	Existing conditions, including boundary lines of the property							
D2b	A land use plan, showing the location, arrangement and approximate boundaries of all proposed land uses							
D2c	Vicinity map, north arrow, scale (written and graphic) and date							
D2d	Name of proposed project or other identifying title and date plan was prepared. Name and address of the Engineer, Surveyor, Architect, Landscape Architect, Land Planner or Property Owner who prepared the plan							
D2e	Current zoning and total area of the property							
D2f	Maximum and proposed density							
D2g	Available utilities							
D2h	All existing sanitary sewer facilities and combined sewer facilities							
D2i	Depict location or statement of proposed water and sewer supply and other utility improvements							
D2j	Existing covenants							
D2k	General layout of any proposed number of Lots, average Lot sizes and any proposed commercial uses, including any associated parking. Include proposed height of structures							
D2l	Statement of total acreage of the tract being subdivided or developed							
D2m	Location of proposed Street layout, including connections to adjoining streets or vacant lots							
D2n	The location of sidewalks, trails and crosswalks							
D2o	Proposed open space and/or recreation areas, including notes on the plan describing the proposed use, activity area and/or improvement							
D2p	Any other information requested by the Subdivision Administrator in order for the Subdivision Administrator to make an accurate determination.							
A2 and E	For a **Major S/LD Application.** The following information shall be provided for Sketch Plan review:							
E1	Three (3) 18" x 24" copies of the Sketch Plan shall be submitted and in Adobe PDF format.							
E2	The Sketch Plan shall be drawn to a 1"=50' scale							
E2	The Sketch Plan must illustrate the following elements in such a way that the Subdivision Administrator or authorized designee can determine if the proposed Subdivision or Land Development meets the criteria of this Ordinance:							
E2a	Existing conditions, including boundary lines of the property							
E2b	A land use plan, showing the location, arrangement and approximate boundaries of all proposed land uses							

	Ordinance Requirements: *(See instructions on page 2)*	Engineer /Surveyor	1st Review	2nd Review	3rd Review	4th Review	Review Key	
							✓	Ok
							O	Incomplete
							N/A	Not Applicable
							X	Unacceptable
E2c	Vicinity Map, North arrow, scale (written and graphic) and date							
E2d	Names of the abutting owners, adjoining lot lines and structures on abutting lots within 100 feet of the property							
E2e	Title of the proposed project; the date, month and year the plan was prepared or revised; the name of the applicant(s), owner(s), and contract owner(s) and the name and address of the Engineer, Surveyor, Architect, Landscape Architect, or Land Planner who prepared the plan, including firm name							
E2f	Current zoning and total area of the property							
E2g	Maximum and proposed density based on the Net Buildable Land Area							
E2h	Available utilities							
E2i	All existing sanitary sewer facilities and combined sewer facilities							
E2j	Depict location or statement of proposed water and sewer supply and other utility improvements							
E2k	Existing covenants							
E2l	General layout of any proposed number of Lots, average Lot sizes and any proposed commercial uses, including any associated parking. Include proposed height of structures							
E2m	Statement of total acreage of the tract being subdivided or developed, including the Net Buildable Land Area							
E2n	The approximate acreage in common open space, in each use and housing type and in roads, streets or rights-of-way for the total development							
E2o	The proposed number of dwelling units of each type in each in the total development							
E2p	Location of proposed Street layout, including connections to adjoining streets or vacant lots							
E2q	The location of sidewalks, trails and crosswalks, as may be applicable							
E2r	Proposed open space and/or recreation areas, including notes on the plan describing the proposed use, activity area and/or improvement. The amount, approximate boundaries and location of common open space, with the percentage of the total acreage of the site to be placed in common open space							
E2s	The location of environmental sensitive land to be included in common open space							
E2t	Notes indicating any modifications, waivers, variances, special exceptions and/or conditional uses that are required							
E2u	The location and extent of proposed buffers							
E2v	The proposed location, arrangement, and right-of-way widths of roads and streets, including roads and streets providing access to adjoining parcels. The location and arrangement of street entrances, driveways and parking areas							
E2w	Calculations describing all proposed bonus factors with the location of and specifications for bonus improvements, when proposed							
E2x	Any other information requested by the Subdivision Administrator in order for the Subdivision Administrator to make an accurate determination							
Sub-Section	**SUBDIVISION ORDINANCE** **Section 1333.01, General Site Planning and Design Specifications**							
D1d	There is **no** requirement that a Sketch Plan or Preliminary Plat show phasing.							



248 Cherry Tree Drive • Charles Town, WV 25414 • 304-885-8518

June 21, 2023

TO: Whom it may concern

RE: Proposed Expansion of Daycare Center

MEMO: Tiny Treasures Daycare and Learning Center, at this time, proposes to expand onto their facility to better accommodate the community and address a growing waitlist of over 73 children waiting to receive childcare in the Charles Town and surrounding communities. We are currently at full capacity, licensed for 47 children. Our expansion is currently drawn and pending several reviews from agencies to add staff and children positions which will total 18 staff and 105 children after the addition. Our age groups vary from infancy (6 weeks) to school age.

Sincerely,

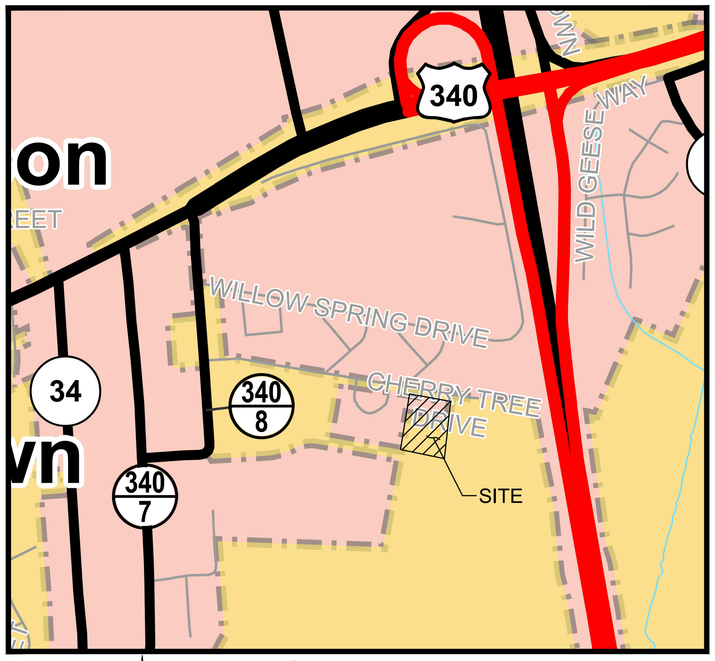
Amanda Hill

Owner

SITE PLAN

FOR

TINY TREASURES DAY CARE AND LEARNING CENTER BUILDING EXPANSION



VICINITY MAP
OF
CHARLES TOWN, WV
SCALE 1" = 400'

CHARLES TOWN - SITE WORK MILESTONE INSPECTIONS THE DEVELOPER SHALL REQUEST CITY ENGINEER INSPECTIONS MINIMUM OF 48 HOURS IN ADVANCE (CALL 304-728-3228). INSPECTIONS SHALL BE REQUESTED ACCORDING TO THE TABLE OF MILESTONES SHOWN BELOW:		INSPECTOR'S INITIALS & DATE
1.	INSTALLATION OF SEDIMENT & EROSION CONTROL DEVICES PRIOR TO BEGINNING SITE GRADING.	
2.	ROADWAY AND/OR PARKING LOT SUBGRADE PROOF ROLL PRIOR TO PLACING STONE BASE.	
3.	ROADWAY AND/OR PARKING LOT STONE BASE DEPTH CHECK PRIOR TO PLACING ASPHALT OR CONCRETE PAVEMENT.	
4.	WATER SYSTEM AND SANITARY SEWER SYSTEM INSPECTION AND APPROVAL BY THE CITY OF CHARLES TOWN PRIOR TO BACKFILLING OF TRENCHES.	
5.	FINAL INSPECTION INCLUDING BUT NOT LIMITED TO: SEEDING & MULCHING, ROADWAY & PARKING LOT PAVING, SIDEWALKS, STORM DRAINAGE AND STORMWATER MANAGEMENT SYSTEMS, TRAFFIC CONTROL SIGNS & PAVEMENT MARKINGS, LANDSCAPING, ETC.	
NOTE: THE CITY ENGINEER MAY ACCEPT "THIRD-PARTY" INSPECTION AND CERTIFICATION REPORTS IN PLACE OF INSPECTIONS PERFORMED BY THE CITY OF CHARLES TOWN ENGINEERING DEPARTMENT, UPON PRIOR APPROVAL. THIRD PARTY INSPECTION REPORTS SHALL BE SUBMITTED IN THE FORMAT SPECIFIED BY THE CITY ENGINEER.		

CONSTRUCTION NOTES

A. EROSION & SEDIMENT CONTROL MEASURES SHALL BE IN PLACE AND INSPECTED PRIOR TO PERFORMING ANY SIGNIFICANT EARTH DISTURBING ACTIVITIES AND SITE GRADING.

B. EARTH WORK SHALL BE COMPACTED TO THE PERCENTAGES OF MAXIMUM DRY DENSITY IN ACCORDANCE WITH AASHTO T99C, AS SHOWN BELOW:

A. ROADWAYS..... 98%
B. PARKING LOTS FOR HEAVY TRUCKS..... 98%
C. PARKING LOTS FOR PASSENGER VEHICLES..... 98%
D. UTILITY LINE TRENCHES..... 98%
E. BUILDING PADS..... 100%

THE ABOVE COMPACTION REQUIREMENTS SHALL BE CERTIFIED BY A PROFESSIONAL ENGINEER OR A SOILS TECHNICIAN UNDER THE DIRECTION OF A PROFESSIONAL ENGINEER, AND ACCEPTABLE TO THE COUNTY ENGINEER.

C. CHANGES AND REVISIONS TO THE CONSTRUCTION PLANS AND SPECIFICATIONS SHALL NOT BE MADE UNLESS FIRST SUBMITTED IN WRITING AND APPROVED BY THE COUNTY ENGINEER AND ANY OTHER AGENCIES, AS DEEMED APPROPRIATE.

D. WORK ZONE TEMPORARY TRAFFIC CONTROL ALONG A PUBLIC ROAD SHALL BE IN ACCORDANCE WITH WEST VIRGINIA DIVISION OF HIGHWAY REQUIREMENTS AND APPROVAL.

E. SEVENTY-TWO (72) HOURS PRIOR TO EXCAVATION IN PUBLIC RIGHT-OF-WAYS OR IN AREAS SERVED BY UNDERGROUND UTILITIES, CALL MISS UTILITY 1-800-245-4848.

CHARLES TOWMN - COMPLETE LIST OF WAIVERS/VARIANCES

ORDINANCE	SECTION OF ORDINANCE	DESCRIPTION OF WAIVER OR VARIANCE	DATE GRANTED
NONE GRANTED			

LIST OF PERMITS

- WVDEP NPDES PERMIT # - (PENDING)

ENGINEERS CERTIFICATE
THE ENGINEER, IN SIGNING THIS PLAT/PLAN ATTESTS TO THE BEST OF HIS OR HER KNOWLEDGE THAT THIS PLAN IS COMPLETE AND ACCURATE:

RICHARD W. KLEIN PE DATE:

SURVEYORS CERTIFICATE:
THIS PLAT/PLAN REPRESENTS A SURVEY MADE BY ME, RICHARD W. KLEIN; ALL MONUMENTS AND IMPROVEMENTS INDICATED THEREON ACTUALLY EXIST, AND THEIR LOCATION, SIZE AND MATERIAL ARE CORRECTLY SHOWN; I AM FAMILIAR WITH ALL OF THE REQUIREMENTS OF THIS ORDINANCE AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL REQUIREMENTS OF THIS ORDINANCE HAVE BEEN FULLY COMPLIED THEREWITH.

RICHARD W. KLEIN PS 1427 DATE:

OWNER'S ACCEPTANCE STATEMENT:
THE OWNER, IN SIGNING THIS PLAT, AGREES TO ABIDE BY ALL CONDITIONS, TERMS AND SPECIFICATIONS PROVIDED HERE ON; AND TO COMPLETE ALL OF THE IMPROVEMENTS REQUIRED BY THE PRELIMINARY PLAT OR SITE PLAN.

OWNER: DATE:

THIS PRELIMINARY PLAN AND PLAT WAS APPROVED BY THE CITY OF CHARLES TOWN ON THE _____DAY OF _____, 20_____, SUBJECT TO ANY CONDITIONS SPECIFIED HEREON.

ALL EXPENSES INCURRED WITH RESPECT TO IMPROVEMENTS FOR ALL UTILITY SERVICES, PAVING, GRADING, LANDSCAPING, CURBS, GUTTERS, SIDEWALKS, ROAD LIGHTING, ROAD SIGNS, FLOOD PROTECTION DEVICES, DRAINAGE STRUCTURES AND ALL OTHER IMPROVEMENTS THAT MAY BE REQUIRED SHALL BE THE RESPONSIBILITY OF THE SUBDIVIDER AND NOT THE CITY.

SECRETARY OF THE PLANNING COMMISSION: DATE:

Sheet List Table	
Sheet Number	Sheet Title
C000	COVER SHEET
C001	GENERAL NOTES
C100	EXISTING CONDITIONS
C101	SITE PLAN
C102	GRADING PLAN
C200	SWM PLAN AND DETAILS
C201	STORM DRAIN PROFILES AND SWM DETAILS
C300	E AND S CONTROL PLAN
C301	E AND S CONTROL DETAILS
C400	LANDSCAPE PLAN
C500	DETAILS

ALPHA ASSOCIATES, INC.
535 WEST KING STREET
MARTINSBURG, WV 25401
PHONE: 304-264-0051
FAX: 304-264-0707
www.thinkALPHAfirst.com

SITE PLAN
FOR
TINY TREASURES DAYCARE AND LEARNING
CENTER BUILDING EXPANSION

OWNER/DEVELOPER:
TRI-STATE INVESTMENT PROPERTIES, LLC

ADDRESS:
PO BOX 1,
KEARNEYSVILLE, WV 25430

PHONE:
410-206-4791

ATTN:
CHRISTOPHER HILL

REVISIONS

No.	ITEM	DATE

PROJ. NO.: 2304028.00
DATE: 11/9/2023
SHEET NO.:
C000

SLD2023-06

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SITE PLAN
FOR
TINY TREASURES DAYCARE AND
LEARNING CENTER BUILDING EXPANSION
CHARLES TOWN DISTRICT, T.M. 10 PAR. 9.20 D.B. 1228 Pg. 138 (PLAT REF: P.B. 26 PG. 518)
JEFFERSON COUNTY, WEST VIRGINIA

COVER SHEET

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11/9/2023

SYMBOLS, ABBREVIATIONS, AND LINETYPES

- EXISTING BUILDING OUTLINE
- EXISTING CONTOURS
- EXISTING INDEX CONTOURS (WITH ANNOTATION) (420)
- EXISTING SANITARY SEWER (SA)
- EXISTING ELECTRIC (E)
- EXISTING STORM (ST)
- EXISTING WATER (W)
- EXISTING PAVING
- EXISTING PROPERTY LINE
- EXISTING CONCRETE
- EXISTING FENCE (X)
- EXISTING OVERHEAD WIRES (OHW)
- EXISTING TREE LINE
- NEW CONTOURS
- NEW INDEX CONTOURS (WITH ANNOTATION) (420)
- NEW SANITARY SEWER (SA)
- NEW FORCE MAIN (FM)
- NEW STORM (ST)
- NEW WATER (W)
- NEW PAVING
- NEW CONCRETE
- NEW CENTERLINE
- NEW FENCE (X)
- SILT FENCE (SF)
- SUPER SILT FENCE (SSF)
- NEW BUILDING OUTLINE
- BUILDING RESTRICTION LINE (BRL)
- UTILITY POLE
- GUY POLE/WIRE
- BENCH MARK/SURVEY CONTROL
- WATER VALVE
- WATER METER
- SANITARY SEWER CLEANOUT
- EXISTING TREES
- WFP — WOODEN FENCE POST
- 5/8" IRON ROD W/ CAP FOUND
- 5/8" IRON ROD FOUND

CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
CRBR	CAPPED REBAR
DI	DROP INLET
ELEC	ELECTRICAL/ELECTRIC
EX	EXISTING
FF	FIRST FLOOR ELEVATION
FH	FIRE HYDRANT
FND	FOUND
GL	GROUND LIGHT
GM	GAS METER
GV	GATE VALVE
HC	HANDICAP
INV	INVERT
L.F.	LINEAR FEET
LP	LIGHT POLE
MH	MANHOLE
PP	POWER POLE
R/W	RIGHT OF WAY
SDMH	STORM DRAIN MANHOLE
SSMH	SANITARY SEWER MANHOLE
STM	STORM
TBR	TO BE REMOVED
TC	TOP OF CURB
TRAV	TRAVERSE
W/	WITH
WM	WATER METER
WV	WATER VALVE

ZONING ORDINANCE SUMMARY:

1. ZONING REQUIREMENTS
   - CURRENT ZONE: GENERAL COMMERCIAL
   - PROPOSED USE: DAY CARE CENTER
2. LANDSCAPING:
   - IT WILL BE THE RESPONSIBILITY OF THE DEVELOPER TO REPLACE ANY TREES THAT DIE. ALL BUFFER YARDS SHALL BE MAINTAINED BY THE PROPERTY OWNER.
3. SITE LIGHTING WILL BE PROVIDED ON ARCHITECTURAL DRAWINGS. THE CURRENT PLAN IS TO PROVIDE LIGHTS ON THE BUILDING TO LIGHT THE PARKING LOT SIMILAR TO THE EXISTING BUILDING.
4. USE REQUIREMENTS:

	REQUIRED	PROVIDED
MINIMUM LOT SIZE:	NO REQUIREMENT	± 1.6674 ACRES
MAXIMUM DENSITY	NO REQUIREMENT	N/A
MINIMUM LOT WIDTH:	NO REQUIREMENT	226.06'
MAXIMUM BUILDING HEIGHT:	55' (MAX)	18'
MAXIMUM LOT COVERAGE	90% (MAX)	45%
BUILDING SETBACKS		
FRONT:	40' (MIN)	40'
SIDE:	10' (MIN)	40'
SIDE WHEN ADJOINING RESIDENTIAL:	25' (MIN)	106'
REAR:	30' (MIN)	82'

5. PARKING TABULATIONS:
   REQUIRED: 0.24 SPACES PER STUDENT
   0.24 X 105 = 25.2 SPACES REQUIRED

   EXISTING: 12 SPACES (1 OF WHICH IS HANDICAP)
   PROPOSED: 18 SPACES (2 OF WHICH ARE HANDICAP, BOTH BEING VAN ACCESSIBLE)
   TOTAL POST CONSTRUCTION: 30 SPACES, 3 OF WHICH ARE HANDICAP

EXISTING UTILITIES:

THE LOCATION AND/OR ELEVATION OF ALL KNOWN UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON THE BEST AVAILABLE INFORMATION FROM EXISTING PLANS AND FROM FIELD INFORMATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN THE STATUS AND LOCATION OF EACH UTILITY PRIOR TO BEGINNING WORK AND TO TAKE THE NECESSARY PRECAUTIONS TO AVOID DAMAGE TO THESE UTILITIES. IN THE EVENT OF DAMAGE OR DISRUPTION OF THESE UTILITIES, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY AN OFFICIAL OF THE AFFECTED UTILITY AND LEND ALL POSSIBLE ASSISTANCE IN RESTORING SERVICE. THE CONTRACTOR SHALL ASSUME ALL COSTS ASSOCIATED WITH THE REPAIR AND INTERRUPTION OF SUCH SERVICES.

THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-245-4848 AT LEAST 72 HOURS BEFORE COMMENCING WORK ON THIS PROJECT.

SITE INFORMATION

1. THE PROPOSED USE OF THE SITE IS A DAY CARE CENTER. THIS PLAN PROPOSES AN ADDITION / EXPANSION OF THE DAY CARE CENTER. NO OPEN SPACE OR PUBLIC RECREATION AREAS ARE PROPOSED WITH THIS PROJECT.
2. SOURCE OF BOUNDARY INFORMATION: PLAT OF BOUNDARY LINE ADJUSTMENT DATED SEPT. 7, 2022 RECORDED IN THE OFFICE OF THE COUNTY CLERK OF JEFFERSON COUNTY IN P.B. 26 PG. 158.
3. PROPERTY ADDRESS: 248 CHERRY TREE DR, CHARLES TOWN, WV 25414
4. CONTOUR DATA AND BOUNDARY INFORMATION WERE GENERATED FROM A FIELD SURVEY BY ALPHA ASSOCIATES, INC. IN JANUARY 2023. CONTOUR INTERVAL = 1'.
5. THIS PROPERTY IS LOCATED ON FEMA MAP PANEL 54037C0137E, EFFECTIVE DATE 12/18/2009, AND IS DESIGNATED AS ZONE "X", AN AREA TO BE DETERMINED TO BE OUTSIDE THE 0.2% CHANCE FLOOD PLAIN.
6. THE SOILS ON THE SITE ARE AS FOLLOWS:
   PmC - POPLIMENTO SILT LOAM, 8 TO 15 PERCENT SLOPES.
   UwC - URBAN LAND-HAGERSTOWN COMPLEX, 0 TO 15 PERCENT SLOPES
7. THERE ARE NO WETLANDS ON THE SITE PER THE US FISH AND WILDLIFE SERVICE NATIONAL WETLANDS INVENTORY.
8. KNOWN EASEMENTS ARE SHOWN HEREON.
9. THE VARIOUS UTILITIES SERVING THE BUILDINGS WILL BE GRANTED EASEMENTS, AS NECESSARY IN THE LOCATION OF THE "AS-BUILT" UTILITIES, AFTER OR DURING THE CONSTRUCTION PHASE.
10. PROJECT LIMITS ARE NOT WITHIN 500' OF A STREAM.
11. NO RIGHT OF WAYS ARE PROPOSED WITH THIS PROJECT.
12. ALL PROPOSED UTILITY LINES SHALL BE UNDERGROUND.
13. CONTACT WVDOH A MINIMUM OF 24 HOURS PRIOR TO ANY WORK WITHIN THE WVDOH RIGHT OF WAY. (681)-320-2039
14. COORDINATE ALL UTILITY WORK WITHIN THE WVDOH RIGHT OF WAY WITH TOM CALDWELL. (681)-320-2040
15. THERE ARE NO FUTURE EASEMENTS OR RIGHTS OF WAYS TO CONNECT TO ADJOINING PROPERTIES.
16. WATER AND SEWER FOR THE BUILDING ADDITION WILL BE PROVIDED BY AN EXPANSION OF THE EXISTING BUILDING PLUMBING SYSTEM. NO NEW EXTERIOR WATER OR SEWER BUILDING CONNECTIONS WILL BE MADE.

SEQUENCE OF CONSTRUCTION - SITE WORK

(SITE CONTRACTOR SHALL COORDINATE SITE WORK WITH BUILDING CONTRACTOR)

1. CONTACT MISS UTILITY
2. INSTALL E & S CONTROLS
3. ROUGH GRADE SITE,
4. TEMPORARY SEED AS GRADING PROGRESSES
5. INSTALL SANITARY SEWER FORCEMAIN RELOCATION. WORK TO BE COORDINATED WITH CTUB.
6. INSTALL STORM WATER SYSTEM
7. INSTALL POWER & COMMUNICATION UTILITIES
8. CONSTRUCT BUILDING ADDITION
9. FINAL GRADE SITE
10. INSTALL CURBS
11. INSTALL BASE MATERIALS
12. PAVE PARKING LOT
13. PERMANENT SEED AND MULCH AREAS NOT TO BE PAVED OR LANDSCAPED
14. STRIPE PARKING LOT
15. LANDSCAPE AREAS.
16. REMOVE E & S CONTROLS WHEN ALL IS STABILIZED.

ALPHA ASSOCIATES, INC.
535 WEST KING STREET
MARTINSBURG, WV 25401
PHONE: 304-264-0051
FAX: 304-264-0707
www.thinkALPHAfirst.com

SITE PLAN FOR TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION

OWNER/DEVELOPER:
TRI-STATE INVESTMENT PROPERTIES, LLC

ADDRESS:
PO BOX 1,
KEARNEYSVILLE, WV 25430

PHONE:
410-206-4791

ATTN:
CHRISTOPHER HILL

REVISIONS

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CHARLES TOWN DISTRICT, T.M. 10 PAR. 9.20 D.B. 1228 Pg. 138 (PLAT REF: P.B. 26 PG. 518)
JEFFERSON COUNTY, WEST VIRGINIA

GENERAL NOTES

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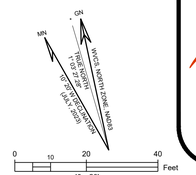
11/9/2023

N/F
FIRST CHARLES TOWN LTD II CHARLES TOWN DIST.
T.M. 10 PAR. 9.14
D.B. 582 PG. 689
USE: RESIDENTIAL
ZONE: RESIDENTIAL/ LIGHT INDUSTRIAL/ COMMERCIAL

N/F
FIRST CHARLES TOWN GROUP CHARLES TOWN CORP.
T.M. 15 PAR. 9.22
D.B. 1104 PG. 352
PLAT REF: P.B. 15 PG. 25
USE: VACANT
ZONE: GENERAL COMMERCIAL

STOP SIGN
NO PARK SIGN
STM INLET 24" DIA.
RIM = 480.95'
STORM INLET
RIM = 481.45'
INV. IN 12" CMP = 478.46'
INV. IN 15" CMP = 477.65'
INV. IN 18" CMP = 477.67'
INV. OUT 24" CMP = 477.38'
CURB INLET
RIM = 483.89'
STOP SIGN
SSMH
RIM = 484.27'
SSMH
RIM = 484.18'
EX. __" WATERLINE
FH
RIP RAP
CHERRY TREE LANE
50' EASEMENT
PLAT BOOK 15 PG. 25
BURIED CMP
BURIED CMP
INV. 15" CMP = 483.54'
ASPHALT ROAD
EX. WATER EASEMENT
S 79°27'58" E 228.55'
ROLLED APSHALT CURB
EDGE OF PAVEMENT
CONC. SIDEWALK
EX. SEWER EASEMENT
PROPANE TANK LID
HC SIGN
GRAVEL ROAD
SWM STRUCTURE
RIM = 482.18'
INV. OUT 15" 478.46'
INV. IN 3" PVC = 478.74'
SWM
CO
EX. SWM BASIN
EX. SEWER CLEAN-OUT
ROCK PLANTER
PORCH
ROCK PLANTER
CONC. APRON
N/F
CHARLES TOWN LIMITED PARTNERSHIP V
CHARLES TOWN DIST.
T.M. 10 PAR. 8.8
D.B. 763 PG. 700
USE: RESIDENTIAL APARTMENTS
ZONE: RESIDENTIAL GROWTH
N 10°38'54" E 110.31'
EXISTING 2-STORY BUILDING FF= 494.15
DECK
DECK
ROLLED APSHALT CURB
GATE
PLAYGROUND AREA W/ TIRE MULCH AND EQUIPMENT
BM: 417
N: 292334.75
E: 2437879.30
Z: 488.89
MAG NAIL
DECK
CONC. PAD
6' BOARD FENCE WITH HVAC UNITS
CONC. PAD
PLAYGROUND AREA W/ EQUIPMENT
EDGE OF PAVEMENT
3' BOARD FENCE
CHARLES TOWN DISTRICT
CHARLES TOWN CORP.
30' FORCE MAIN EASEMENT
D.B. 1178 PG. 552
N/F
FIRST CHARLES TOWN GROUP CHARLES TOWN CORP.
T.M. 15 PAR. 1.6
D.B. 1044 PG. 452
USE: VACANT
ZONE: GENERAL COMMERCIAL
STM GRATE
RIM = 489.10'
INV. IN 6" PVC = 487.66'
INV. OUT 12" CMP = 486.01'
N 10°26'00" E 209.10'
VISIBLE ROCK OUTCROP
EX. APARTMENT BUIDLING
LP
EX. CONC. SIDEWALK
UwC
PmC
TREELINE
S 10°56'09" W 319.24'
OLD WIRE FENCE
TREELINE
APPROX. LOCATION OF 6" PVC FORCE MAIN
N 79°30'39" W 226.16'
MULBERRY TREE STREET
50' EASEMENT
PLAT BOOK 15 PG. 25
N/F
SHENANDOAH RE, LLC
CHARLES TOWN DIST.
T.M. 10 PAR. 8.2
D.B. 1218 PG. 654
USE: COMMERCIAL
ZONE: RESIDENTIAL GROWTH
N/F
FIRST CHARLES TOWN GROUP CHARLES TOWN CORP.
T.M. 15 PAR. 1.6
D.B. 1044 PG. 452
USE: VACANT
ZONE: GENERAL COMMERCIAL



SOILS NOTE:
1. UWC--URBAN LAND-HAGERSTOWN COMPLEX, 0 TO 15 PERCENT SLOPES.
2. PMC--POPLIMENTO SILT LOAM, 8 TO 15 PERCENT SLOPES

LEGEND

T.M.	TAX MAP NUMBER
PAR.	PARCEL NUMBER
D.B.	DEED BOOK
PG.	PAGE NUMBER
N/F	NOW OR FORMERLY
	5/8" REBAR WITH CAP FOUND
	REBAR FOUND
	IRON PIPE FOUND
	METAL FENCE POST
	WOODEN FENCE POST
	UTILITY POLE
	GUY POLE/WIRE
	LIGHT POLE
	SANITARY MANHOLE
	STORM MANHOLE
	FIRE HYDRANT
	SANITARY CLEAN-OUT
	SIGN
	MAIL BOX
	PROPERTY LINE
	ADJOINER LINE
	BUILDING OUTLINE
	EDGE OF GRAVEL
X	WIRE FENCE
ST	SANITARY SEWER LINE
ST	STORM SEWER LINE
OHW	OVER HEAD WIRES

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JEFFERSON COUNTY, WEST VIRGINIA

EXISTING CONDITIONS

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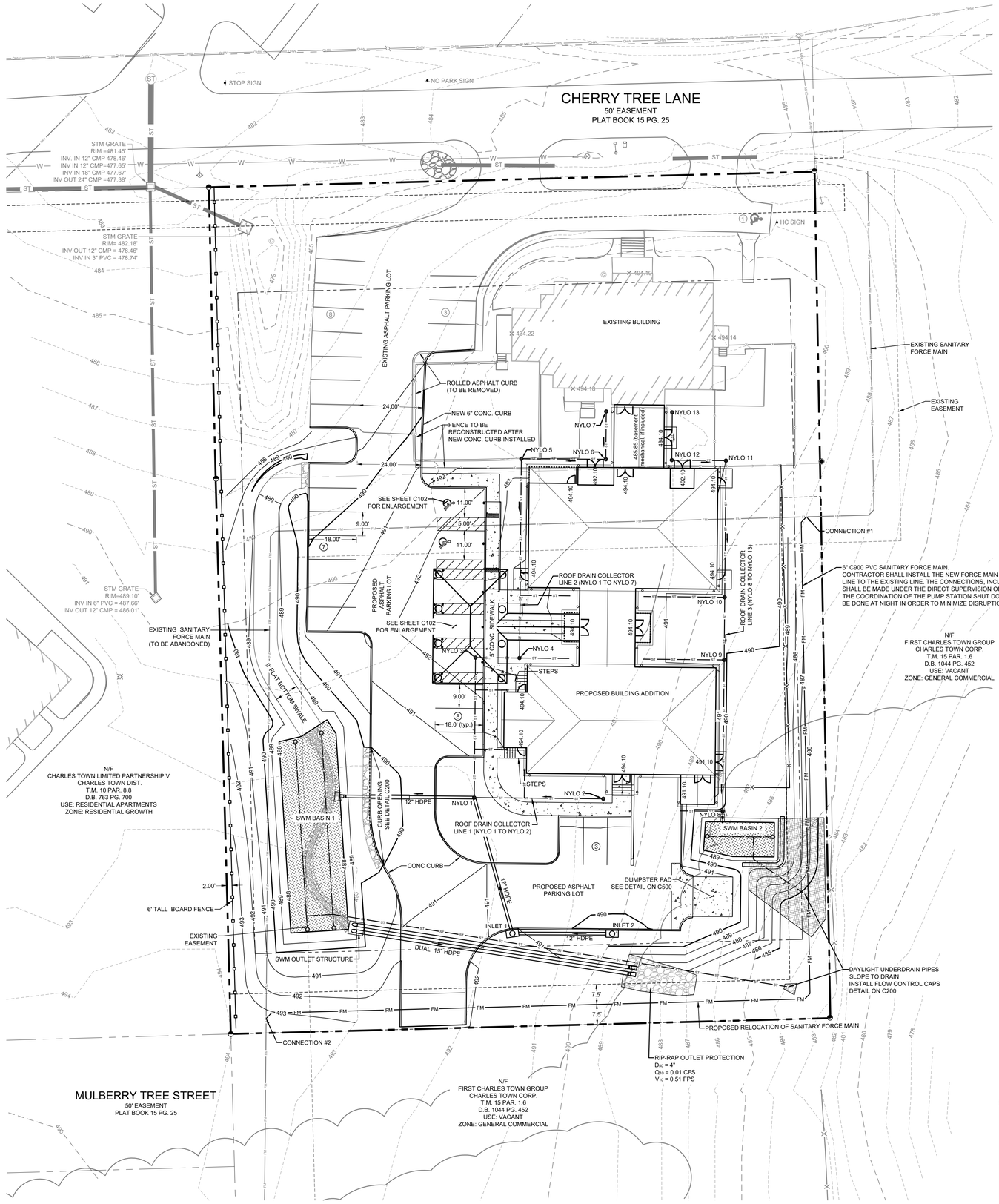

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SITE PLAN

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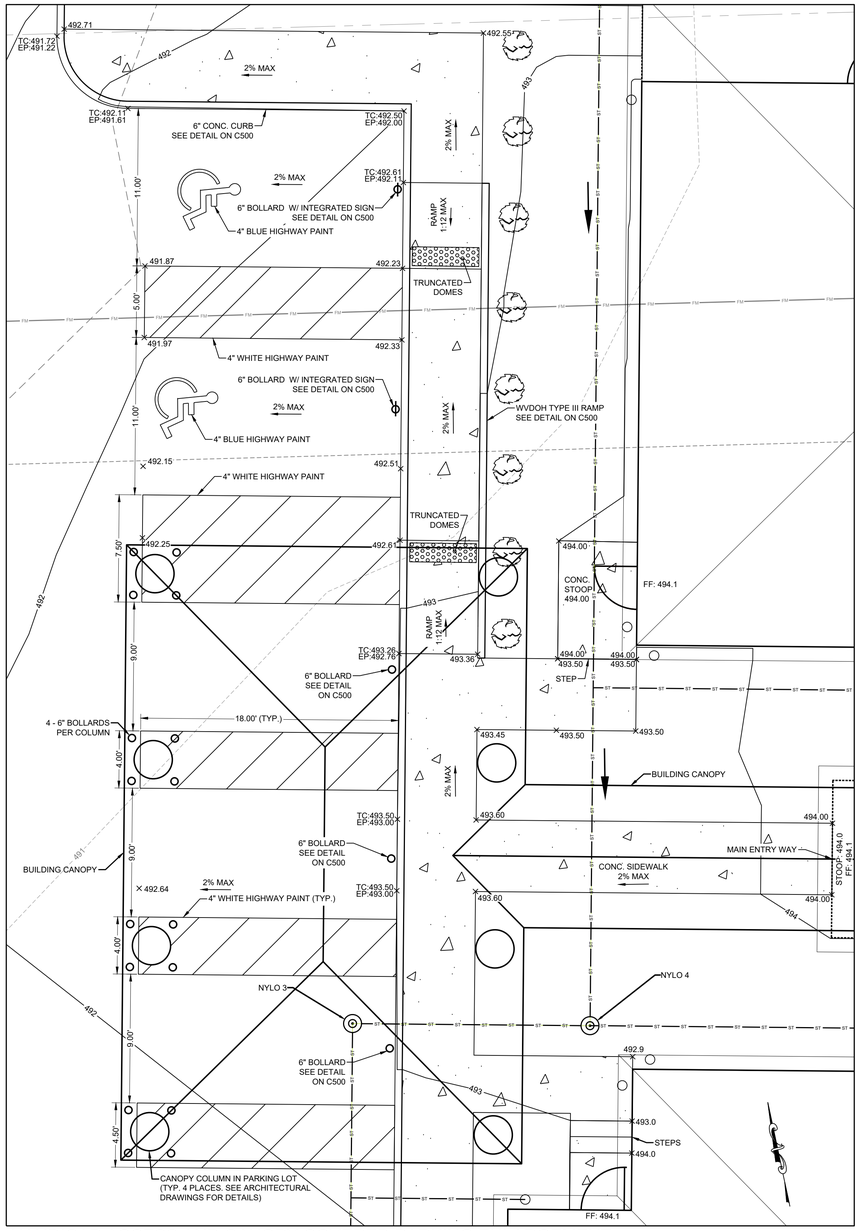


HANDICAP ACCESS AND CANOPY COVERED PARKING ENLARGEMENT

0 2.5 5 10 Feet
1" = 5'

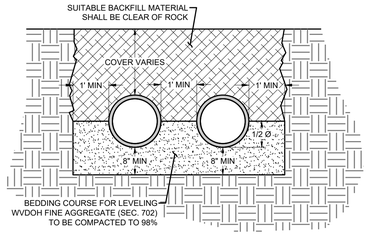
N/F
FIRST CHARLES TOWN LTD II CHARLES
TOWN DIST.
T.M. 10 PAR. 9.14
D.B. 582 PG. 689
USE: RESIDENTIAL
ZONE: RESIDENTIAL/
LIGHT INDUSTRIAL/ COMMERCIAL

STOP SIGN
NO PARK SIGN
STM INLET 24" DIA.
RIM = 480.95'

CHERRY TREE LANE
50' EASEMENT
PLAT BOOK 15 PG. 25
PLAT BOOK 15 PG. 25

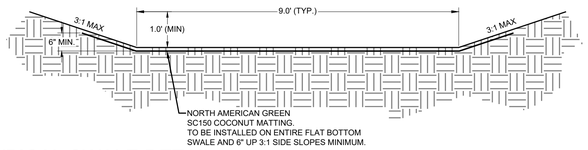
ASPHALT
ROAD
INV. 15" CMP = 483.54'
EX. WATER
EASEMENT
EX. SEWER EASEMENT

STM GRATE
RIM =481.45'
INV. IN 12" CMP 478.46'
INV IN 12" CMP=477.65'
INV IN 18" CMP 477.67'
INV OUT 24" CMP =477.38'
RIP RAP
BURIED CMP
ROLLED
APSHALT CURB
EDGE OF
PAVEMENT
CONC.
SIDEWALK
PROPANE
TANK LID
HC SIGN
STM GRATE
RIM= 482.18'
INV OUT 12" CMP = 478.46'
INV IN 3" PVC = 478.74'
SWM
CO.
EX. SEWER CLEAN-OUT
ROCK
PLANTER
PORCH
494.10
ROCK
PLANTER
CONC. APRON
EX. SWM BASIN
EXISTING ASPHALT PARKING LOT
N/F
CHARLES TOWN LIMITED
PARTNERSHIP V
CHARLES TOWN DIST.
T.M. 10 PAR. 8.8
D.B. 763 PG. 700
USE: RESIDENTIAL
APARTMENTS
ZONE: RESIDENTIAL GROWTH
EDGE OF
PAVEMENT
ROLLED
APSHALT CURB
GATE
PLAYGROUND
AREA W/ TIRE
MULCH AND
EQUIPMENT
DECK
494.22
EXISTING
2-STORY
BUILDING
FF= 494.15
DECK
494.14
TC:490.62
EP:490.12
TC:489.5
EP:489.0
487.84
488.2
489.4
6%
TC:490.97
EP:490.47
TC:489.5
EP:489.0
TC:489.8
EP:489.3
TC:489.9
EP:489.4
494.10
DECK
CONC. PAD
465.85 (basement
mechanical, if included)
494.10
6' BOARD FENCE
WITH HVAC UNITS
CONC.
PAD
PLAYGROUND
AREA W/
EQUIPMENT
3' BOARD
FENCE
EXISTING SANITARY
FORCE MAIN
EXISTING
EASEMENT
30' FORCE MAIN EASEMENT
SEE ENLARGEMENT
HEREON FOR
DETAILS
TC:491.22
EP:491.22
494.10
494.10
494.10



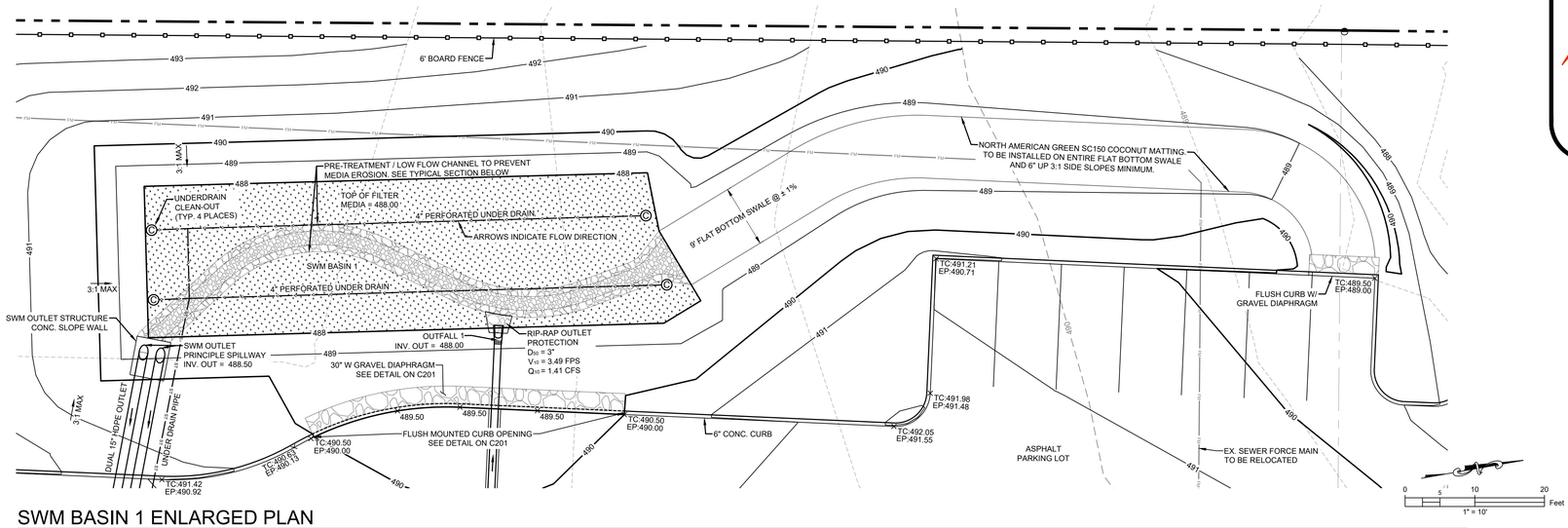
TYPICAL SECTION - DUAL 15" HDPE OUTLET

NOT TO SCALE



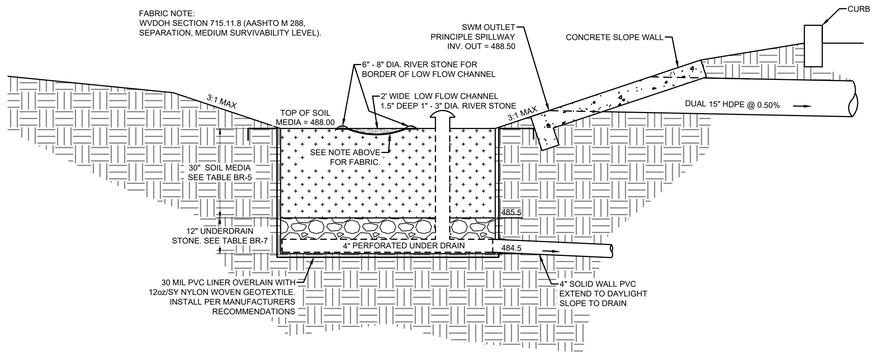
TYPICAL SWALE DETAIL

NOT TO SCALE



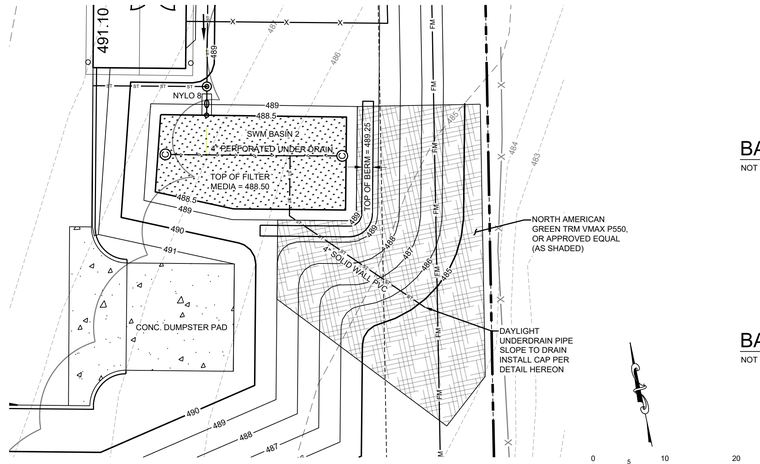
SWM BASIN 1 ENLARGED PLAN

SCALE: 1" = 10'



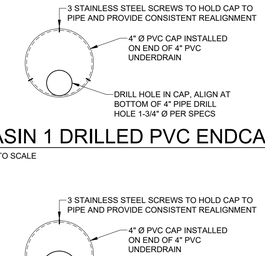
SWM BASIN 1 TYPICAL SECTION

NOT TO SCALE



SWM BASIN 2 ENLARGED PLAN

SCALE: 1" = 10'



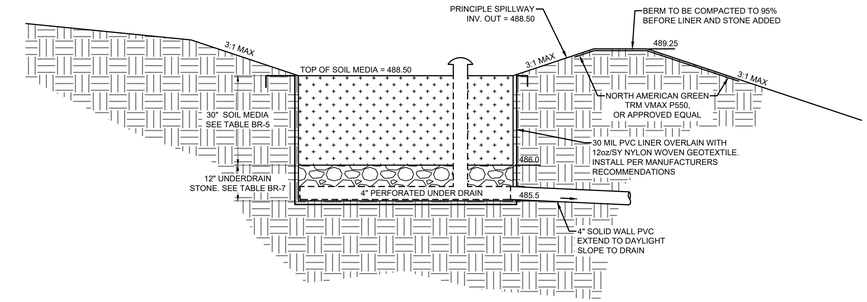
BASIN 1 DRILLED PVC ENDCAP DETAIL

NOT TO SCALE



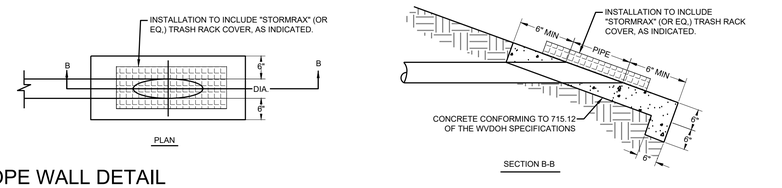
BASIN 2 DRILLED PVC ENDCAP DETAIL

NOT TO SCALE



SWM BASIN 2 TYPICAL SECTION

NOT TO SCALE



SLOPE WALL DETAIL

NOT TO SCALE

ALPHA ASSOCIATES, INC.
535 WEST KING STREET
MARTINSBURG, WV 25401
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ADDRESS:
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PHONE:
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ATTN:
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REVISIONS

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JEFFERSON COUNTY, WEST VIRGINIA

SWM PLAN AND DETAILS

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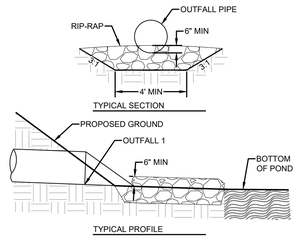
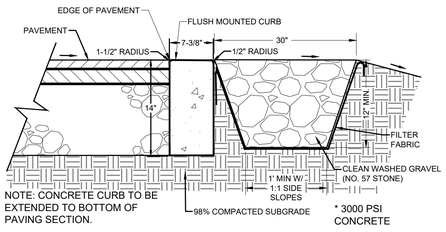
11/9/2023



OUTFALL DETAIL

NOT TO SCALE



FLUSH MOUNTED CURB GRAVEL DIAPHRAGM DETAIL

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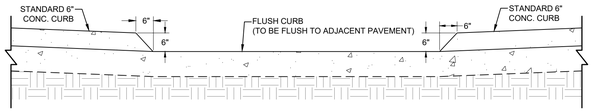

FLUSH MOUNTED CURB OPENING DETAIL

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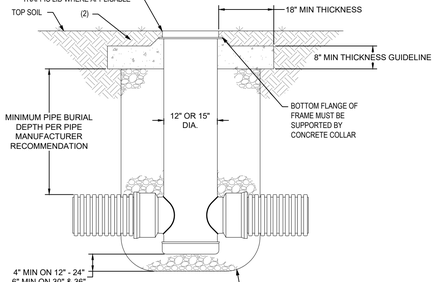
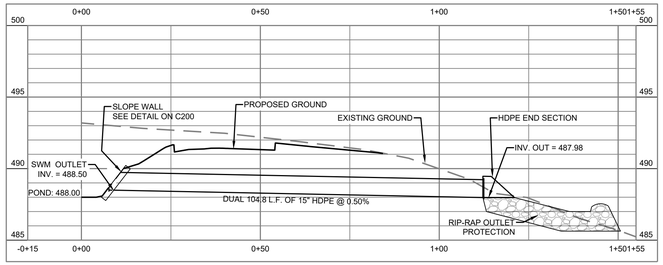


NOTES
1. GRATES/SOLID COVERS SHALL MEET H-20 LOAD RATING FOR 30" PEDESTRIAN & 12" - 30" STANDARD & SOLID
2. DESIGN SHOULD ACCOUNT FOR ROOT DEPTH TO ALLOW TURF TO GROW AND PREVENT EROSION AROUND GRATE SO THAT HAZARDS DO NOT FORM.

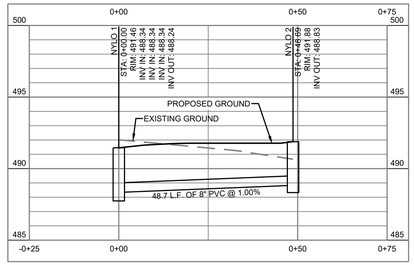
NYLOPLAST TURF TRAFFIC INSTALLATION

NOT TO SCALE



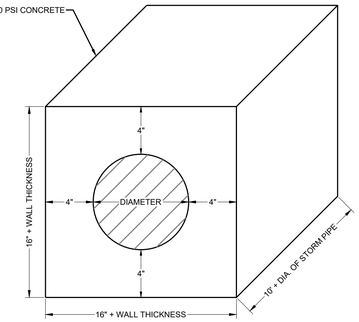
SWM OUTLET PRINCIPLE SPILLWAY

SCALE: 1"=20' HOR / 1"=5' VER



ROOF DRAIN COLLECTOR 1

SCALE: 1"=20' HOR / 1"=5' VER



CONCRETE ENCASEMENT DETAIL

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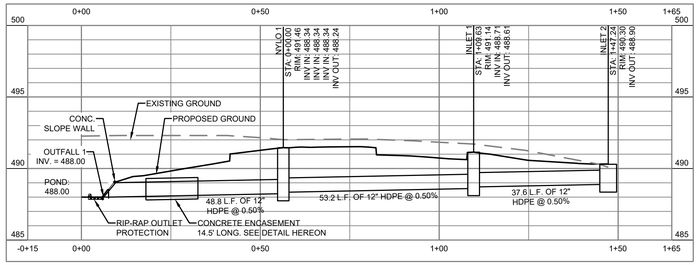
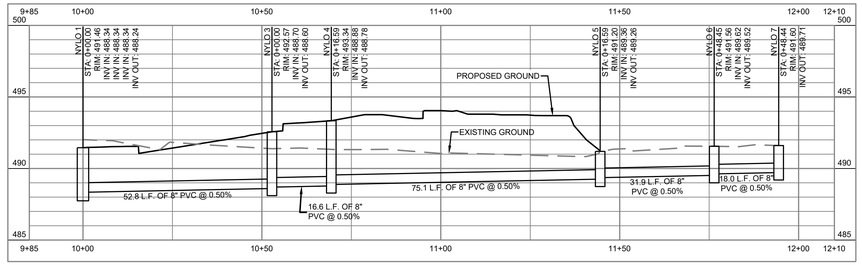


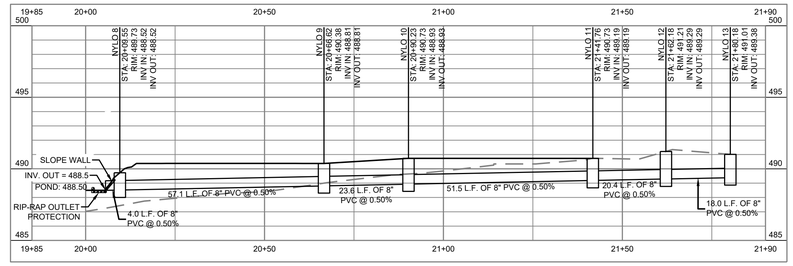
STORM LINE 1

SCALE: 1"=20' HOR / 1"=5' VER



ROOF DRAIN COLLECTOR 2

SCALE: 1"=20' HOR / 1"=5' VER



ROOF DRAIN COLLECTOR 3

SCALE: 1"=20' HOR / 1"=5' VER

STRUCTURE SCHEDULE

NAME	SIZE/TYPE/LID STYLE
INLET 1	WVDOH TYPE D CURB INLET
INLET 2	WVDOH TYPE D CURB INLET
NYLO 1	24" NYLOPLAST W/ GRATE
NYLO 2	12" NYLOPLAST W/ SOLID LID
NYLO 3	12" NYLOPLAST W/ TRAFFIC LID
NYLO 4	12" NYLOPLAST W/ GRATE
NYLO 5	12 NYLOPLAST W/ GRATE
NYLO 6	12" NYLOPLAST WITH SOLID LID
NYLO 7	12" NYLOPLAST W/ SOLID LID
NYLO 8	12" NYLOPLAST W/ GRATE
NYLO 9	15" NYLOPLAST W/ GRATE
NYLO 10	15" NYLOPLAST W/ GRATE
NYLO 11	12" NYLOPLAST W/ SOLID LID
NYLO 12	12" NYLOPLAST W/ SOLID LID
NYLO 13	12" NYLOPLAST W/ SOLID LID

BR-5 SOIL MEDIA CRITERIA AND TESTING FOR BIORETENTION

SOIL MEDIA CRITERION	DESCRIPTION	STANDARDS
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% - 80% SAND; 8% - 26% TOP SOIL; 3% - 5% ORGANIC MATTER (AGED COMPOST)
SAND	SILICA BASED COARSE AGGREGATE LOCALLY-APPROVED PULVERIZED GLASS MAY BE SUBSTITUTED IF THE LOCAL AUTHORITY UNDERTAKES TESTING TO VERIFY COMPLIANCE WITH THE SPECIFICATION AND ALSO LACK OF HEAVY MATERIALS	SIEVE / SIZE / % PASSING ⅜ IN 9.5MM 100 NO. 4 4.75MM 95-100 NO. 8 2.36MM 80-100 NO.16 1.18MM 45-85 NO. 30 0.6MM 15-60 NO. 50 0.3MM 3-15 NO. 100 0.15MM 0-4
TOP SOIL	LOAMY SAND OR SANDY LOAM	USDA TEXTURAL TRIANGLE
ORGANIC MATTER	WELL AGED, CLEAN COMPOST	APPENDIX D
P-INDEX OR PHOSPHORUS (P) CONTENT	SOIL MEDIA WITH HIGH P LEVELS WILL EXPORT P THROUGH THE MEDIA AND POTENTIALLY TO DOWNSTREAM CONVEYANCES 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	EFFECTIVE PARTICAL SIZE (D10 > 0.3MM UNIFORMITY COEFFICIENT (D60/D10) < 4.0 CEC > 10 MILLIEQUIVALENTS PER 100 GRAMS
INFILTRATION RATE	THIS REFERS TO THE INFILTRATION 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	SEE DETAILS FOR DEPTH

BR-9 MAINTENANCE TASKS FOR BIORETENTION PRACTICES

MAINTENANCE TASKS	
• FOR THE FIRST 6 MONTHS FOLLOWING CONSTRUCTION, THE PRACTICE AND DRAINAGE AREA SHOULD BE INSPECTED AT LEAST TWICE AFTER STORM EVENTS THAT EXCEED 0.25" OF RAINFALL. CONDUCT ANY NEEDED REPAIRS OR STABILIZATION. • INSPECTORS SHOULD LOOK FOR BARE OR ERODING AREAS IN THE DRAINAGE AREA OR AROUND THE BIORETENTION AREA, AND MAKE SURE THEY ARE IMMEDIATELY STABILIZED. • 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.	UPON ESTABLISHMENT
• 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 GROWNG SEASON
• ADD REINFORCEMENT PLANTING TO MAINTAIN THE DESIRED VEGETATION DENSITY. • REMOVE INVASIVE PLANTS USING RECOMMENDED CONTROL METHODS. • REMOVE ANY DEAD OR DISEASED PLANTS. • STABILIZE THE DRAINAGE AREA 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 AND REPLACE THE MULCH LAYER.	ONCE EVERY 2 TO 3 YEARS

BR-7 MATERIALS SPECIFICATIONS

MATERIAL	SPECIFICATION	NOTES
FILTER MEDIA	• 70%-88% SAND • 8%-26% TOP SOIL • 3%-5% ORGANIC MATTER IN THE COMPOST • SUPPLIED BY QUALIFIED VENDOR • REFER TO TABLE BR-5 FOR SPECIFIC MEDIA MATERIAL CONDITION	FORM OF LEAF SEE DETAILS FOR DEPTH. 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. CECs GREATER THAN 10	QUALIFIED VENDORS SHOULD TEST MEDIA IN BATCHES.
MULCH LAYER	USE AGED, SHREDDED HARDWOOD BARK MULCH.	LAY A 3 IN. LAYER ON THE SURFACE OF THE FILTER BED.
CHOKING LAYER	LAYER OF CHOKER STONE (TYPICALLY NO. 8 OR NO. 89 WASHED GRAVEL) WHICH IS LAID OVER THE |DENERDRAIN STONE AT A DEPTH OF 1 IN. OF CHOKER STONE FOR EVERY 1 FT. OF OVERLYING SOIL MEDIA. AN ALTERNATIVE IS NEEDLE-PUNCHED, NON-WOVEN GEOTEXTILE WITH THE FLOW RATE > 110 GAL./MIN./SQ.FT. (ONLY IF STONE CHOKING LAYER CANNOT FIT INTO THE PRACTICE)	
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	USE A THIRTY MIL (MINIMUM) PVC GEOMEMBRANE LINER COVERED BY 8 TO 12 OZ/SQ.YD. NON-WOVEN GEOTEXTILE.	
UNDERDRAINS, CLEANOUTS AND OBSERVATION WELLS	USE 4 IN. RIGID SCHEDULE 40 PVC PIPE, WITH ⅜ IN. PERFORATIONS AT 6 IN. ON CENTER; EACH UNDERDRAIN SHOULD BE LOCATED NO MORE THAN 20 FEET FROM THE NEXT PIPE.	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 TS AND Y'S AS NEEDED. DEPENDING ON THE UNDERDRAIN CONFIGURATION. EXTEND CLEANOUT PIPES TO THE SURFACE WITH VENTED CAPS AT THE T'S AND Y'S
PLANT MATERIALS	SEE SECTION BR-4.17	ESTABLISH PLANT MATERIALS AS SPECIFIED IN THE LANDSCAPING PLAN AND THE RECOMMENDED PLANT LIST.

BIORETENTION SPECIFICATIONS

1. MATERIAL SPECIFICATIONS
   A. SOIL MEDIA SHALL MEET THE REQUIREMENTS OF TABLE BR-5 FROM THE WV STORMWATER MANAGEMENT & DESIGN GUIDANCE MANUAL, PROVIDED HEREON FOR REFERENCE.
   B. UNDERDRAIN GRAVEL SHALL MEET THE REQUIREMENTS OF TABLE BR-7 FROM THE WV STORMWATER MANAGEMENT & DESIGN GUIDANCE MANUAL, PROVIDED HEREON FOR REFERENCE.
2. COMPACTION
   A. IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF THE BIORETENTION AREA AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF BIORETENTION AREAS ARE EXCAVATED USING A LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE. COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS A CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACTURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.
   B. PRIOR TO BACKFILLING, PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE. BACKFILL THE TOPSOIL TO FINAL GRADE. WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.
3. PLANT MATERIAL
   A. SURFACE OF BIORETENTION AREA SHALL BE PLANTED WITH WETLAND TYPE GRASSES SPACED 3' CENTER TO CENTER SUCH AS:
      FRINGED SEDGE, *'CAREX CRINITA'*
      SHALLOW SEDGE, *'CAREX LURIDA'*
      TUSSOCK SEDGE, *'CAREX STRICTA'*
      SOFT RUSH, *'JUNCUS EFFUSUS'*
   OR OTHER ACCEPTABLE GRASS PER THE WV SWM DESIGN GUIDANCE MANUAL.
4. PLANT INSTALLATION
   A. MULCH SHOULD BE PLACED TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.
   B. ROOT STOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8" OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION.
   C. TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.
   D. GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.
   E. THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.
5. MISCELLANEOUS
   A. THE BIORETENTION FACILITY MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.
6. INSPECTION
   A. THE CONTRACTOR SHALL EMPLOY A QUALIFIED INSPECTION PROFESSIONAL TO OBSERVE AND PROVIDE REPORTS ON THE FOLLOWING STAGES OF THE STORMWATER FACILITY CONSTRUCTION:
      1. DURING CONSTRUCTION OF THE FACILITY EMBANKMENT.
      2. DURING EXCAVATION TO SUBGRADE OF THE FILTRATION PRACTICE.
      3. DURING PLACEMENT AND BACKFILL OF UNDERDRAIN SYSTEMS (IF PRESENT).
      4. DURING PLACEMENT OF GEOTEXTILES AND ALL FILTER MEDIA.
      5. DURING CONSTRUCTION OF INLET AND OUTLET FACILITIES.
   6. UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.
   B. WRITTEN INSPECTION REPORTS SHALL INCLUDE (1) THE DATE & LOCATION OF INSPECTION, (2) WHETHER CONSTRUCTION WAS IN COMPLIANCE WITH THE APPROVED PLANS, (3) AND ANY VARIATIONS FROM THE APPOVED PLANS AND CONSTRUCTION SPECIFICATIONS.
7. MAINTENANCE
   A. SEE TABLE BR-9 ON THIS SHEET FOR BIORETENTION MAINTENANCE TASKS.

BR-7.2. BIORETENTION INSTALLATION GUIDELINES

THE FOLLOWING IS A TYPICAL CONSTRUCTION SEQUENCE TO PROPERLY INSTALL A BIORETENTION BASIN.

STEP 1. CONSTRUCTION OF THE BIORETENTION AREA MAY ONLY BEGIN AFTER THE ENTIRE DRAINAGE AREA 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 PRECONSTRUCTION MEETING, CHECKING THE BOUNDARIES OF THE DRAINAGE AREA AND THE 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

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 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 THE APPROPRIATE DEPTH OF NO.57 STONE ON THE BOTTOM, INSTALL THE PERFORATED UNDERDRAIN PIPE, PACK NO.57 STONE PER DETAILS ABOVE THE UNDERDRAIN PIPE, ON TOP OF THE NO.57 STONE, ADD REQUIRED LAYER OF CHOKER STONE (NO.8 OR NO.89 STONE) AS A FILTER BETWEEN THE UNDERDRAIN AND THE SOIL MEDIA LAYER.

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 OR INLETS 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 STORMS.

STEP 13. CONDUCT THE FINAL CONSTRUCTION INSPECTION, THEN LOG THE GPS COORDINATES FOR EACH BIORETENTION FACILITY AND SUBMIT THEM FOR ENTRY INTO THE LOCAL MAINTENANCE TRACKING DATABASE.

ALPHA ASSOCIATES, INC.
535 WEST KING STREET
MARTINSBURG, WV 25401
PHONE: 304-264-0051
FAX: 304-264-0707
www.thinkALPHAfirst.com

SITE PLAN
FOR
TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION

OWNER/DEVELOPER:
TRI-STATE INVESTMENT PROPERTIES, LLC

ADDRESS:
PO BOX 1,
KEARNEYSVILLE, WV 25430

PHONE:
410-206-4791

ATTN:
CHRISTOPHER HILL

REVISIONS

No.	ITEM	DATE

PROJ. NO.: 2304028.00
DATE: 11/9/2023
SHEET NO.:

C201

SLD2023-06

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SITE PLAN
FOR
TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION

CHARLES TOWN DISTRICT, T.M. 10 PAR. 9.20 D.B. 1228 Pg. 138 (PLAT REF: P.B. 26 PG. 518)
JEFFERSON COUNTY, WEST VIRGINIA

STORM DRAIN PROFILES AND SWM DETAILS

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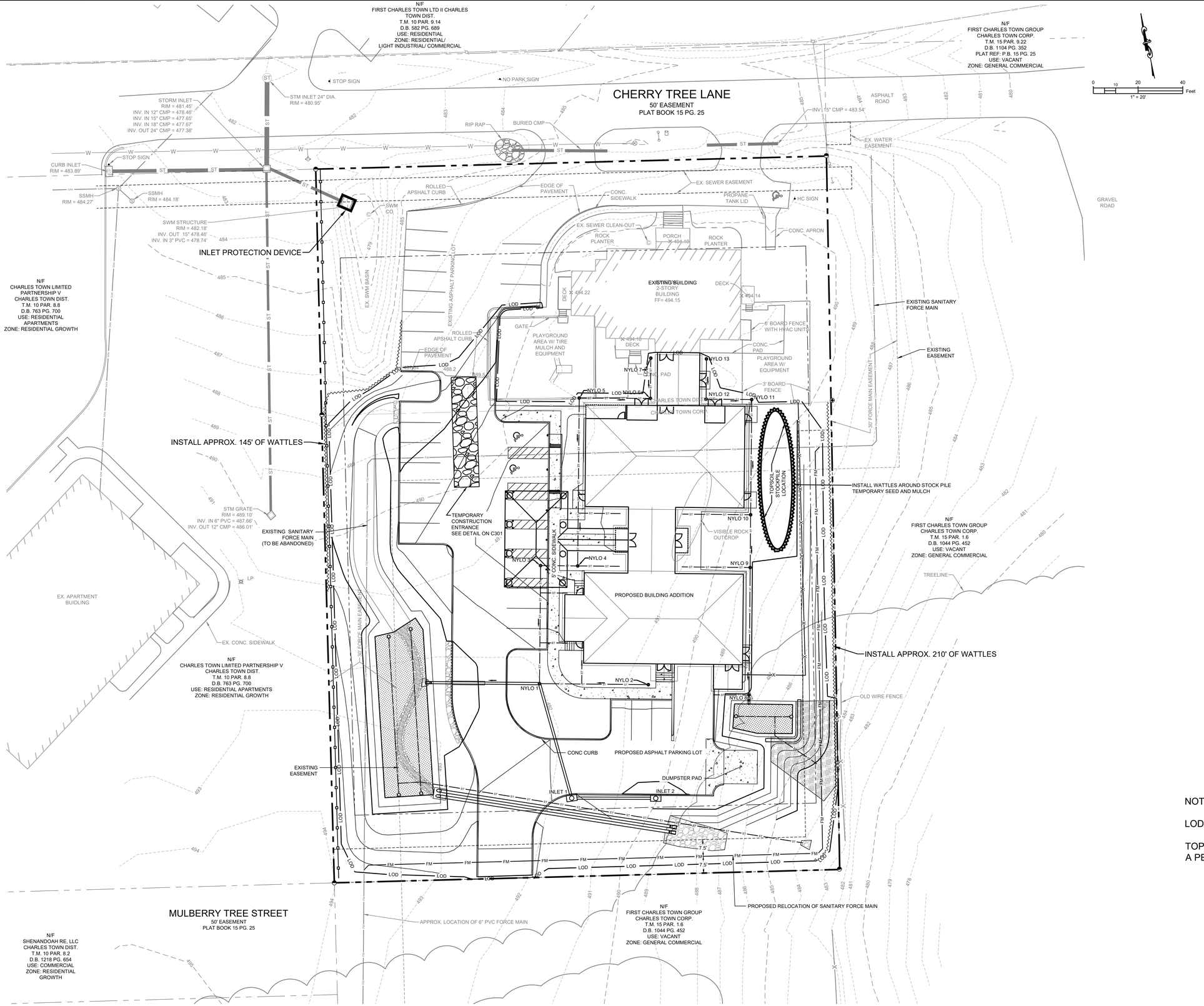
11/9/2023



ALPHA ASSOCIATES, INC.
535 WEST KING STREET
MARTINSBURG, WV 25401
PHONE: 304-264-0051
FAX: 304-264-0707
www.thinkALPHAfirst.com

SITE PLAN
FOR
TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION

OWNER/DEVELOPER:
TRI-STATE INVESTMENT PROPERTIES, LLC

ADDRESS:
PO BOX 1,
KEARNEYSVILLE, WV 25430

PHONE:
410-206-4791

ATTN:
CHRISTOPHER HILL

REVISIONS

No.	ITEM	DATE

NOTES:

LOD AREA = ± 1.10 ACRES

TOP SOIL STOCKPILE MUST HAVE A PERIMETER OF WATTLES

PROJ. NO.: 2304028.00
DATE: 11/9/2023
SHEET NO.:

C300

SLD2023-06

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SITE PLAN
FOR
TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION
CHARLES TOWN DISTRICT, T.M. 10 PAR. 9.20 D.B. 1228 Pg. 138 (PLAT REF: P.B. 26 PG. 518)
JEFFERSON COUNTY, WEST VIRGINIA

E AND S CONTROL PLAN

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11/9/2023

SITE GRADING NOTES

1. ALL FILLS SHALL BE PLACED IN APPROXIMATELY HORIZONTAL LAYERS, EACH LAYER HAVING A LOOSE THICKNESS OF NOT MORE THAN EIGHT (8) INCHES, FOR BUILDINGS AND TWELVE (12) INCHES FOR ROADWAYS AND PAVEMENT.
2. THE ENTIRE AREA INCLUDED WITHIN THE PROPOSED LIMITS OF CUT AND FILL SHALL BE STRIPPED OF ALL ROOT MAT, TRASH AND OTHER ORGANIC AND OTHERWISE OBJECTIONABLE, NON-COMPLYING AND UNSUITABLE SOILS AND MATERIALS. MATERIAL SHALL BE REMOVED FROM SITE AND DISPOSED OF PROPERLY.
3. NATURAL AND/OR EXISTING SLOPES STEEPER THAN 3:1 SHALL BE BENCHED OR CONTINUOUSLY STEPPED INTO COMPETENT MATERIALS PRIOR TO PLACING FILL.
4. NO FILL OR CUT SHALL BE MADE WHICH CREATES AN EXPOSED SURFACE STEEPER IN SLOPE THAN 2:1.
5. GRADING SHALL BE PERFORMED TO SECURE PROPER DRAINAGE AWAY FROM BUILDINGS AND TO PREVENT THE POOLING OR COLLECTION OF STORM WATER.
6. FILL SHALL BE COMPACTED TO PREVENT EROSION.
7. GRADING SHALL NOT BE DONE IN SUCH A WAY AS TO DIVERT WATER ONTO THE PROPERTY OF ANOTHER LANDOWNER.
8. SEDIMENT IN RUNOFF WATER SHALL BE TRAPPED USING SILT TRAPS, DITCH CHECKS OR OTHER ACCEPTABLE DEVICES UNTIL THE DISTURBED AREAS ARE STABILIZED.
9. EXCAVATION AND FILL SHALL NOT ENDANGER ADJOINING PROPERTY.
10. COVER OVER CULVERTS SHALL BE 1' MINIMUM.

SEDIMENT AND EROSION CONTROL NOTES

1. ALL SEDIMENT AND EROSION CONTROL MEASURES ARE TO BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE "WV EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL 2006" (HTTP://WWW.WVDEP.ORG/DWWM/STORMWATER/BMP/INDEX.HTML).
2. AREAS OF DEVELOPMENT SHALL BE PLANNED IN PHASES AND STAGES TO MINIMIZE EXPOSURE TO DISTURBED GROUND. GRADING SHALL BE COMPLETED AS SOON AS POSSIBLE AFTER IT HAS BEGUN.
3. INSPECTIONS ARE TO BE PERFORMED EVERY 4 DAYS AND WITHIN 24 HOURS OF RAIN EVENTS OF 0.25" OR GREATER. PERFORM MAINTENANCE OF ALL SEDIMENT CONTROL MEASURES TO INSURE EFFECTIVE SEDIMENT CONTROL.
4. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION IS ESTABLISHED.
5. ALL AREAS NOT COVERED BY PAVEMENT OR MULCH SHALL BE SEEDED USING PERMANENT SEED MIXTURE SHOWN ON THIS SHEET.
6. THE WVDEP AND CITY OF MARTINSBURG RESERVE THE RIGHT TO REQUIRE ADDITIONAL SEDIMENT AND EROSION CONTROL MEASURES DURING THE CONSTRUCTION OF THIS PROJECT.
7. EXCEPT AS NOTED BELOW, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOUR DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS PERMANENTLY CEASED.
   - WHERE THE INITIATION OF STABILIZATION MEASURES BY THE SEVENTH DAY AFTER CONSTRUCTION ACTIVITY TEMPORARILY OR PERMANENTLY CEASES IS PRECLUDED BY SNOW COVER, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS CONDITIONS ALLOW.
   - WHERE CONSTRUCTION ACTIVITY WILL RESUME ON A PORTION OF THE SITE WITHIN 14 DAYS FROM WHEN ACTIVITIES CEASED, (E.G., THE TOTAL TIME PERIOD THAT CONSTRUCTION ACTIVITY IS TEMPORARILY HALTED IS LESS THAT 21 DAYS) THEN STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE BY THE SEVENTH DAY AFTER CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED.
   - AREAS WHERE THE SEED HAS FAILED TO GERMINATE ADEQUATELY (UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70%) WITHIN 30 DAYS AFTER SEEDING AND MULCHING MUST BE RESEEDED IMMEDIATELY, OR AS SOON AS WEATHER CONDITIONS ALLOW.
8. THE DEVELOPER SHALL REQUEST THAT THE CITY OF MARTINSBURG PLANNING DEPARTMENT APPROVE THE WORK COMPLETED IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, THE GRADING PERMIT, AND THE STORMWATER MANAGEMENT ORDINANCE.

SEED BED PREPARATION

1. LIMIT PREPARATION TO AREAS WHICH WILL BE IMMEDIATELY SEEDED.
2. LOOSEN TOPSOIL OF LAWN AREAS TO MINIMUM DEPTH OF 4". REMOVE STONES OVER 1" IN ANY DIMENSION AND STICKS, ROOTS, RUBBISH, AND EXTRANEOUS MATTER.
3. GRADE LAWN AREAS TO A SMOOTH, FREE DRAINING EVEN SURFACE WITH A LOOSE, MODERATELY COARSE TEXTURE. ROLL AND RAKE, REMOVE RIDGES, AND FILL DEPRESSIONS AS REQUIRED TO DRAIN.
4. APPLY LIMESTONE, AT RATE SHOWN IN PERMANENT SEED MIXTURE. DISTRIBUTE EVENLY BY MACHINE AND INCORPORATE THOROUGHLY INTO TOPSOIL.
5. APPLY FERTILIZER AT RATE SHOWN IN PERMANENT SEED MIXTURE.
6. APPLY FERTILIZERS BY MECHANICAL ROTARY OR DROP TYPE DISTRIBUTOR, THOROUGHLY AND EVENLY INCORPORATED WITH SOIL TO A DEPTH OF 3" BY DISKING OR OTHER APPROVED METHOD. FERTILIZE AREAS INACCESSIBLE TO POWER EQUIPMENT WITH HAND TOOLS AND INCORPORATE INTO SOIL.
7. RESTORE PREPARED AREAS TO SPECIFIED CONDITION IF ERODED, SETTLED, OR OTHERWISE DISTURBED AFTER FINE GRADING AND PRIOR TO SEEDING.
8. SEED IMMEDIATELY AFTER PREPARATION OF BED.
9. PERFORM SEEDING OPERATIONS WHEN SOIL IS DRY AND WHEN WINDS DO NOT EXCEED 5 MILES PER HOUR VELOCITY.
10. APPLY SEED WITH A ROTARY OR DROP TYPE DISTRIBUTOR. INSTALL SEED EVENLY BY SOWING EQUAL QUANTITIES IN 2 DIRECTIONS, AT RIGHT ANGLES TO EACH OTHER.
11. SOW GRASS SEED AT RATE SHOWN IN PERMANENT SEED MIXTURE.
12. AFTER SEEDING, RAKE OR DRAG SURFACE OF SOIL LIGHTLY TO INCORPORATE SEED INTO TOP 1/8" OF SOIL. ROLL WITH LIGHT LAWN ROLLER.
13. PLACE STRAW MULCH ON SEEDED AREAS WITHIN 24 HOURS AFTER SEEDING.
14. PLACE STRAW MULCH UNIFORMLY IN A CONTINUOUS BLANKET AT THE RATE OF 1-1/2 TONS PER ACRES.
15. ANCHOR STRAW MULCH WITH ASPHALTIC EMULSION BINDER APPLIED UNIFORMLY AT A RATE OF NOT LESS THAN 200 GAL. PER ACRES.
16. PROTECT BUILDINGS, PAVING, PLANTINGS, AND ALL NONSEEDED AREAS FROM ASPHALTIC EMULSION OVER-SPRAY.
17. IF CONSTRUCTION IS COMPLETED BETWEEN OCT. AND MARCH 15, STABILIZE ALL DISTURBED AREAS WITH STRAW MULCH APPLIED AT 3 TON/AC. SEEDING TO TAKE PLACE IN THE SPRING USING THE PERMANENT SEEDING MIXTURE SHOWN HEREON.

SEEDING NOTES

1. PERMANENT SEEDING MIXTURE

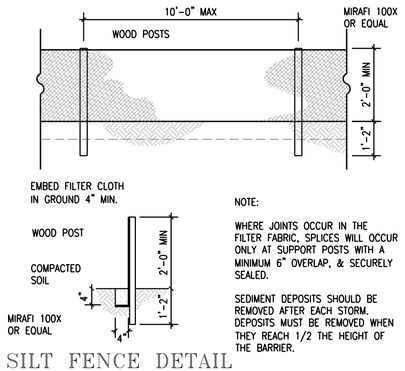
SEED:	KY 31 FESCUE	45 LB/AC
	RED FESCUE	20 LB/AC
	KY BLUEGRASS	25 LB/AC
	WHITE DUTCH CLOVER	5 LB/AC
FERTILIZER:	RATE DETERMINED BY SOIL TEST	
MULCH:	1.5 TONS STRAW PER ACRES	
ASPHALT:	SS-1 OR EQUIVALENT 150 GAL. PER ACRES (20 LBS./ACRES CROWN VETCH WILL BE ADDED TO ABOVE SEEDING MIXTURE TO STABILIZE CRITICAL AREAS)	
LIME:	RATE DETERMINED BY SOIL TEST	

2. TEMPORARY SEEDING MIXTURE

SEED:	ANNUAL RYEGRASS (LOLIUM MULTIFLORUM) 40 LB/AC OR (FEB 16 - MAY 15 & AUG 1 - NOV 1)
	OR - WINTER RYE (SECALE CEREALE) 170 LB/AC (AUG 15 - FEB 28)
	OR - WINTER WHEAT (TRITICUM AESTIVUM 180 LB/AC (AUG 15 - FEB 28)
	OR - JAPANESE MILLET (ECHINOCHLOA CRUSGALLI) 30 LB/AC (MAY 15 - AUG 15)
MULCH:	1.5 TONS STRAW PER ACRE
ASPHALT:	SS-1 OR EQUIVALENT 150 GAL. PER ACRE

3. SEED DATES
   MARCH 1ST - JUNE 15TH
   AUGUST 15TH - SEPTEMBER 15TH

ALL AREAS SHALL BE PERMANENTLY SEEDED AND MULCHED WITHIN FOUR (4) DAYS OF REACHING FINAL GRADE. IF IN SEEDING SEASON, OTHERWISE TEMPORARY SEEDING REQUIREMENTS SHALL BE MET. ALL AREAS SEEDED WITH A TEMPORARY MIXTURE WILL RECEIVE A PERMANENT SEED MIXTURE DURING THE FIRST GROWING SEASON FOLLOWING THE FINISHED GRADING. AREAS WITH PERMANENT SLOPES OF 2:1 OR GREATER SHALL BE STABILIZED USING CROWN VETCH, AS PER THE REQUIREMENTS OF STANDARD AND SPECIFICATIONS FOR CRITICAL AREAS STABILIZATION (WITH GROUND COVERS, VINES, SHRUBS, AND TREES).



SILT FENCE DETAIL
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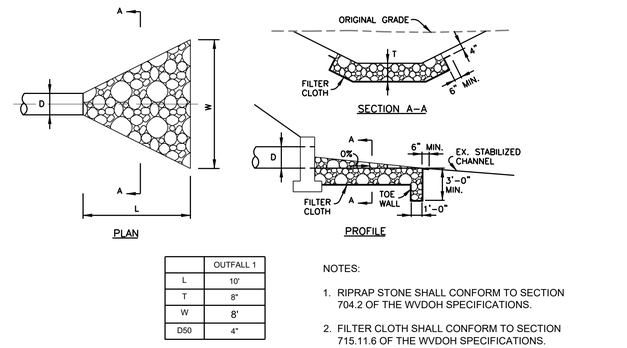
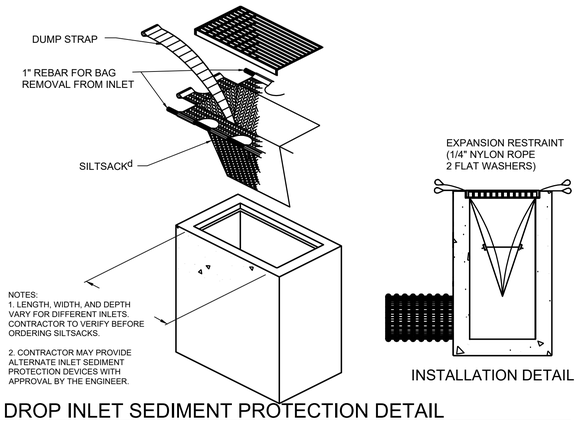


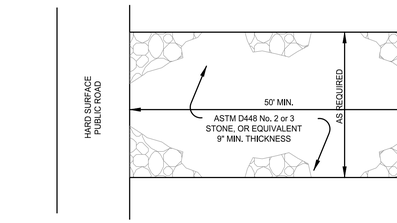
	OUTFALL 1
L	10'
T	8"
W	8'
D50	4"

NOTES:
1. RIPRAP STONE SHALL CONFORM TO SECTION 704.2 OF THE WVDOH SPECIFICATIONS.
2. FILTER CLOTH SHALL CONFORM TO SECTION 715.11.6 OF THE WVDOH SPECIFICATIONS.

RIPRAP OUTLET PROTECTION DETAIL
NOT TO SCALE

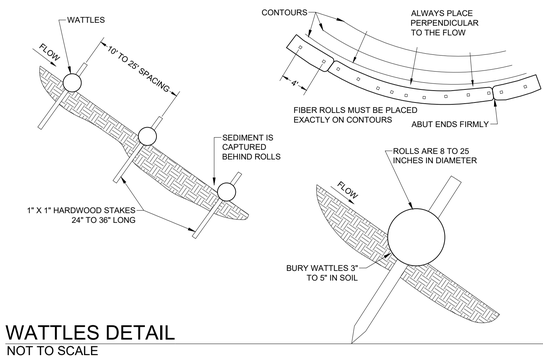


DROP INLET SEDIMENT PROTECTION DETAIL
NOT TO SCALE



1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - AS REQUIRED BUT NOT LESS THAN 100 FEET
3. THICKNESS - NOT LESS THAN (6) INCHES
4. WIDTH - TEN (10) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONES AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STABILIZED CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE



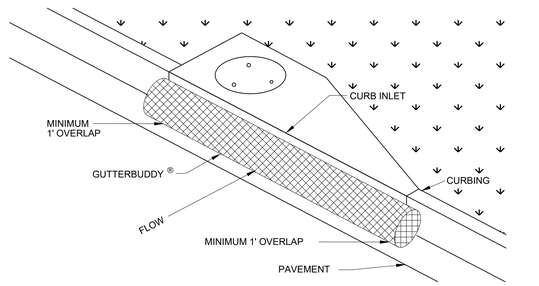
CONSTRUCTION SPECIFICATIONS

1. WATTLES SHALL BE INSTALLED PERPENDICULAR TO THE FLOW DIRECTION AND PARALLEL TO THE SLOPE CONTOUR.
2. NARROW TRENCHES SHOULD BE DUG ACROSS THE SLOPE, ON CONTOUR, TO A DEPTH OF 3 TO 5 INCHES ON CLAY SOILS AND SOILS WITH GRADUAL SLOPES. ON LOOSE SOILS, STEEP SLOPES, AND DURING HIGH RAINFALL EVENTS, THE TRENCHES SHOULD BE DUG TO A DEPTH OF 5 TO 7 INCHES, OR 1/2 TO 2/3 OF THE THICKNESS OF THE WATTLE.
3. START CONSTRUCTION OF TRENCHES AND INSTALLATION OF WATTLES FROM THE BASE OF THE SLOPE AND WORK UPHILL. EXCAVATED MATERIAL SHOULD BE SPREAD EVENLY ALONG THE UPHILL SLOPE AND COMPACTED USING HAND TAMPING OR OTHER METHOD. CONSTRUCT TRENCHES AT CONTOUR INTERVALS OF 3 TO 30 FEET APART DEPENDING ON THE STEEPNESS OF THE SLOPE, SOIL TYPE, AND RAINFALL. THE STEEPER THE SLOPE THE CLOSER TOGETHER THE TRENCHES SHOULD BE CONSTRUCTED.
4. INSTALL THE WATTLES SNUGLY INTO THE TRENCHES AND ABUT TIGHTLY END TO END. DO NOT OVERLAP THE ENDS.
5. INSTALL STAKES AT EACH END OF THE WATTLE, AND AT 4-FOOT CENTERS ALONG THE ENTIRE LENGTH OF THE WATTLE.
6. IF REQUIRED, INSTALL PILOT HOLES FOR THE STAKES USING A STRAIGHT BAR TO DRIVE HOLES THROUGH THE WATTLE AND INTO THE SOIL.
7. AT A MINIMUM, WOODEN STAKES SHOULD BE APPROXIMATELY 3/4 X 3/4 X 24 INCHES. WILLOW CUTTINGS OR 3/8-INCH REBAR CAN ALSO BE USED FOR STAKES. STAKES SHOULD BE DRIVEN THROUGH THE MIDDLE OF THE WATTLE, LEAVING 2 TO 3 INCHES OF THE STAKE PROTRUDING ABOVE THE WATTLE.

MAINTENANCE

1. INSPECT WATTLES AT A MINIMUM ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES OF RAIN PER 24 HOUR PERIOD.
2. REPAIR OR REPLACE SPLIT, TORN, RAVELING, OR SLUMPING WATTLES.
3. REMOVE SEDIMENT ACCUMULATIONS WHEN EXCEEDING 1/2 THE HEIGHT BETWEEN THE TOP OF THE WATTLE AND THE GROUND SURFACE.
4. REPAIR ANY RILLS OR GULLIES PROMPTLY.
4. RESEED OR REPLANT VEGETATION AS NECESSARY UNTIL THE SLOPE IS STABILIZED.

WATTLES DETAIL
NOT TO SCALE



NOTES:
1. CONTRACTOR MAY PROVIDE ALTERNATE INLET SEDIMENT PROTECTION DEVICES WITH APPROVAL BY THE ENGINEER.

CURB INLET SEDIMENT PROTECTION DETAIL
NOT TO SCALE

ALPHA ASSOCIATES, INC.
535 WEST KING STREET
MARTINSBURG, WV 25401
PHONE: 304-264-0051
FAX: 304-264-0707
www.thinkALPHAfirst.com

SITE PLAN
FOR
TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION

OWNER/DEVELOPER:
TRI-STATE INVESTMENT PROPERTIES, LLC

ADDRESS:
PO BOX 1,
KEARNEYSVILLE, WV 25430

PHONE:
410-206-4791

ATTN:
CHRISTOPHER HILL

REVISIONS

No.	ITEM	DATE

PROJ. NO.: 2304028.00
DATE: 11/9/2023
SHEET NO.:
C301

SLD2023-06

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SITE PLAN
FOR
TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION
CHARLES TOWN DISTRICT, T.M. 10 PAR. 9.20 D.B. 1228 Pg. 138 (PLAT REF: P.B. 26 PG. 518)
JEFFERSON COUNTY, WEST VIRGINIA

E AND S CONTROL DETAILS

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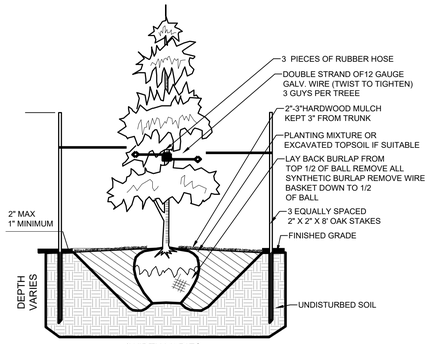
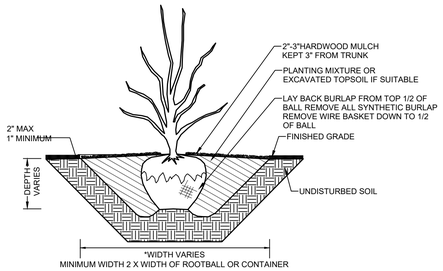
11/8/2023



EVERGREEN TREE PLANTING DETAIL WITH STAKES

NO SCALE



SHRUB PLANTING DETAIL

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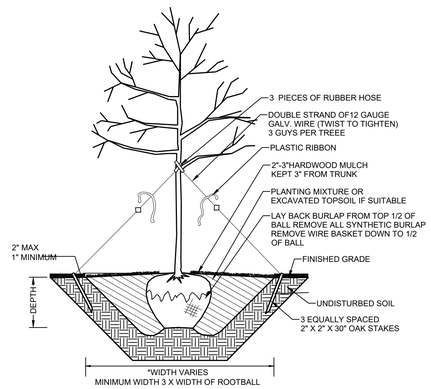


HARDWOOD TREE PLANTING DETAIL WITH STAKES

NO SCALE

HATCH LEGEND

LANDSCAPING REQUIREMENTS

- 5% OF PARKING LOT IMPERVIOUS AREA SHALL BE PROVIDED IN LANDSCAPING
  PARKING LOT AREA = 12,198 SF X 0.05 = 610 SF REQUIRED LANDSCAPING
  PROVIDED: AREA AS SHADED IN PLAN VIEW = 1,194 SF
- 1 SHADE TREE & 2 SHRUBS FOR EVERY 10 SPACES, MIN.
  NUMBER OF SPACES: 30 = 30 SHADE TREES AND 6 SHRUBS REQUIRED
  PROVIDED:15 SHADE TREES AND 52 SHRUBS

LANDSCAPING NOTES:

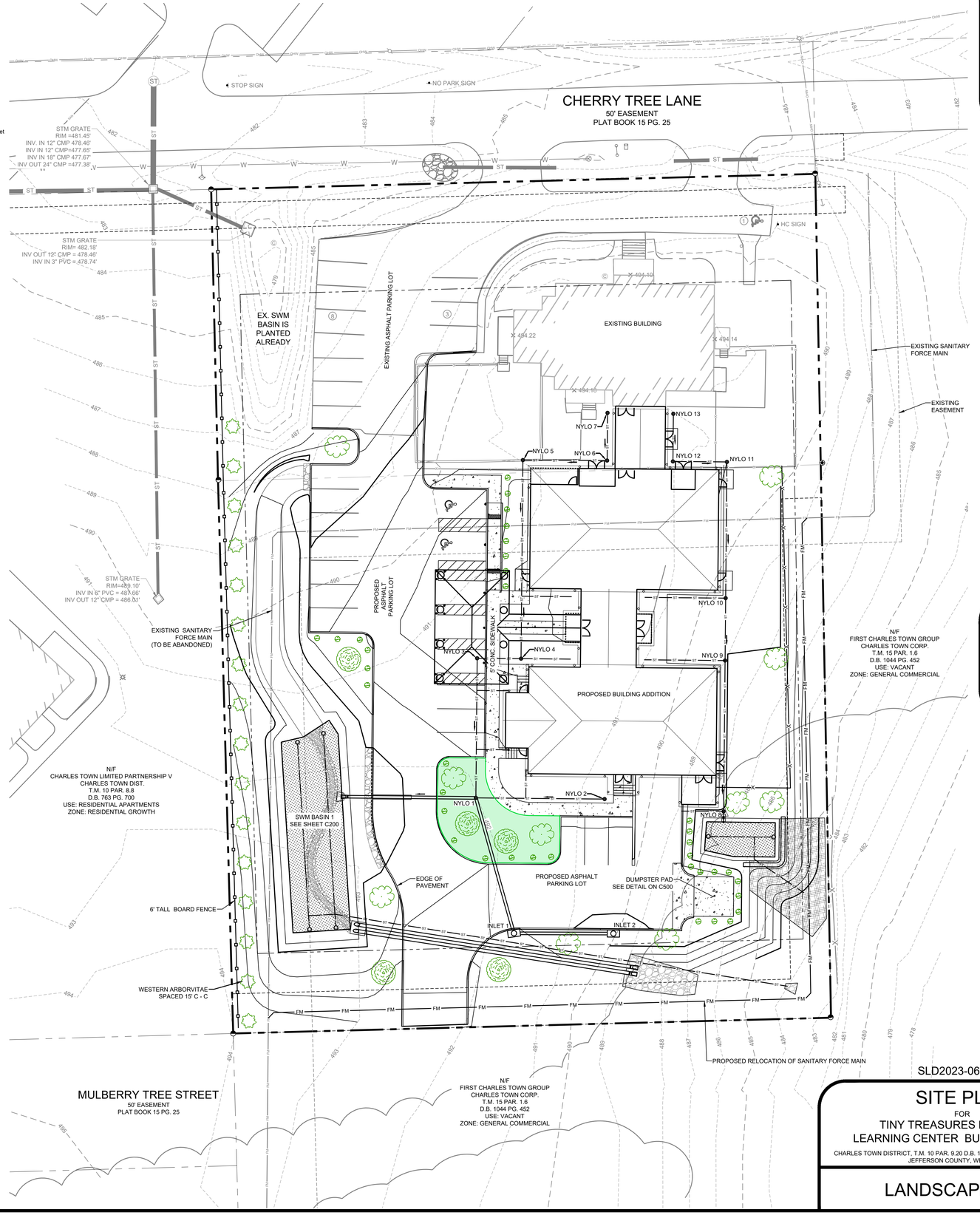
- IT WILL BE THE RESPONSIBILITY OF THE LANDOWNER TO REPLACE ANY TREES THAT DIE.
- SCREEN PLANTING SPACING ALONG NORTH AND EAST PROPERTY LINES SHALL BE IN ACCORDANCE WITH JCPC STANDARD DETAIL M-54, OPTION F

TREE LEGEND

- EASTERN REDBUD *"CERCIS CANADENSIS"*
- WESTERN ARBORVITAE *"THUJA PLICATA"*
- INKBERRY HOLLY *"ILEX GLABRA"*
- SUNSET MAPLE *"ACER RUBRUM"*

NUMBER OF TREES NEEDED	
EASTERN REDBUD	5
WESTERN ARBORVITAE	16
INKBERRY HOLLY	36
SUNSET MAPLE	10

0 10 20 40 Feet
1" = 20'
NAD83 WVSP NORTH ZONE



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REVISIONS

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PROJ. NO.: 2304028.00
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C400

SLD2023-06

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SITE PLAN
FOR
TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION

CHARLES TOWN DISTRICT, T.M. 10 PAR. 9.20 D.B. 1228 Pg. 138 (PLAT REF: P.B. 26 PG. 518)
JEFFERSON COUNTY, WEST VIRGINIA

LANDSCAPE PLAN

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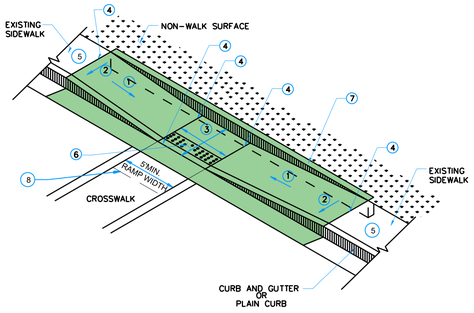
11/9/2023

LEGEND

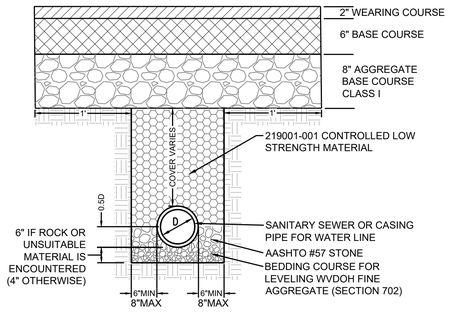
1. 8.33% (12:1) MAXIMUM RAMP SLOPE INCLUDING CONSTRUCTION TOLERANCE
2. CROSS SLOPE: 2.00% MAXIMUM INCLUDING CONSTRUCTION TOLERANCE
3. CURB RAMPS REQUIRE A (5'-0") MINIMUM TURNING SPACE WHERE PEDESTRIANS PERFORM TURNING MANEUVERS WITH A MAXIMUM CROSS SLOPE OF 2% AND LONGITUDINAL SLOPE MATCHING ROADWAY
4. GRADE BREAK REQUIRED TO BE FLUSH (0") AND PERPENDICULAR TO PEDESTRIAN PATH OF TRAVEL
5. IF SIDEWALK IS EXISTING AND NON-COMPLIANT SEE "TRANSITION TO EXISTING NON-COMPLIANT SIDEWALK" DETAIL SHEET 12
6. DETECTABLE WARNING SURFACE SEE "DETECTABLE WARNING SURFACE (DWS)" DETAIL SHEET 11
7. CURB WALL OR CHEEK WALL AS DICTATED BY FIELD CONDITIONS. SEE "EXISTING ADJACENT SURFACE TRANSITION" DETAIL SHEET 13
8. CLEAR SPACE - WIDTH OF CURB RAMP AND EXTENDING 4' MINIMUM
9. 3/4" CHAMFER EDGE

PAY LIMITS FOR CURB RAMPS (EXCLUDING DWS)



TYPE III RAMP

NOT TO SCALE



ASPHALT REPAIR AND TRENCH DETAIL

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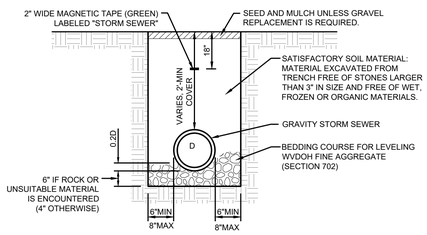

STORM SEWER TRENCH DETAIL

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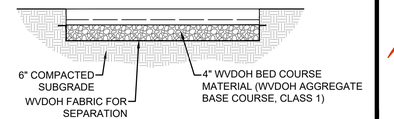

CONCRETE SIDEWALK DETAIL

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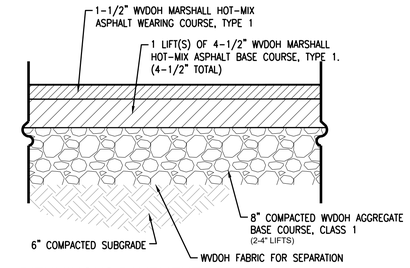

BITUMINOUS PAVEMENT DETAIL

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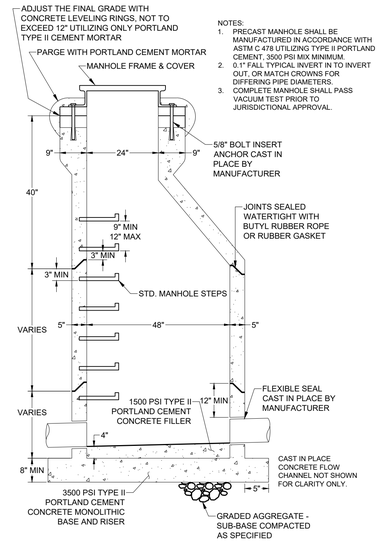
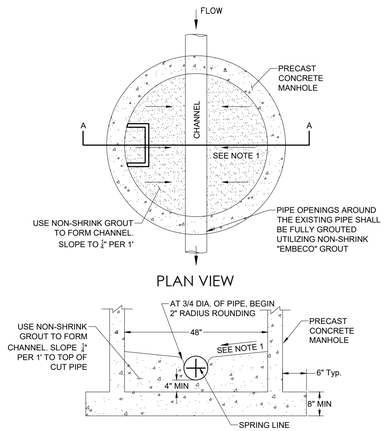


NOTES:
1. PRECAST MANHOLE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C 478 UTILIZING TYPE II PORTLAND CEMENT, 3500 PSI MIX MINIMUM.
2. 0.1" FALL TYPICAL INVERT IN TO INVERT OUT, OR MATCH CROWNS FOR DIFFERING PIPE DIAMETERS.
3. COMPLETE MANHOLE SHALL PASS VACUUM TEST PRIOR TO JURISDICTIONAL APPROVAL.

STANDARD THROUGH MANHOLE DETAIL

NOT TO SCALE



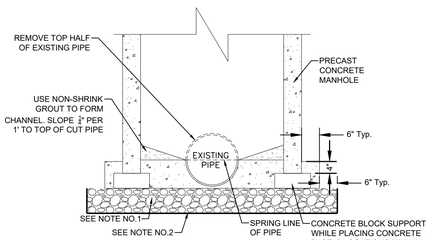
PLAN VIEW

SECTION A - A

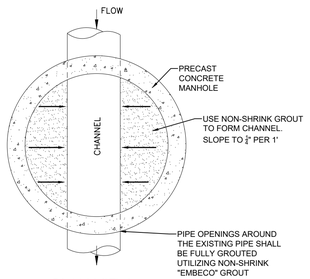
NOTES:
1. ALL BENCHES SHALL SLOPE AT 1/4" / FT. TOWARD FLOW CHANNEL.
2. FLOW CHANNELS SHALL SLOPE 0.1 FT. FROM INVERT TO INVERT OUT OR PIPE CROWNS SHALL MATCH GRADE FOR DIFFERING DIAMETERS.
3. CHANNEL SHALL CONFORM TO PIPE ROUNDNESS & DIAMETER.
4. SEE DETAIL S-27 FOR TYPICAL CONFIGURATION.

TYPICAL BENCH AND FLOW CHANNEL DETAIL

NOT TO SCALE



TYPICAL SECTION

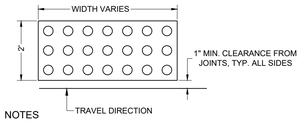


PLAN VIEW

NOTES:
1. STONE BEDDING SHALL CONFORM TO DOH CLASS 1 AGGREGATE
2. IF MANHOLE EXCAVATION BOTTOM IS UNSUITABLE MATERIAL, SUITABLE FILL MATERIAL AND MIRAFI 140N OR APPROVED EQUAL FILTER FABRIC WILL BE REQUIRED PRIOR TO PLACEMENT OF BEDDING.

DOGHOUSE MANHOLE DETAIL

NOT TO SCALE



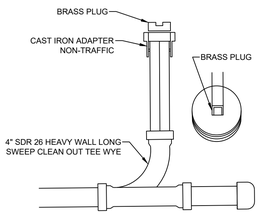
NOTES

DETECTABLE WARNING SURFACES SHALL EXTEND ACROSS THE FULL WIDTH OF THE CURB RAMP, LANDING OR TRANSITION.

DOMES SHALL BE ALIGNED IN THE PREDOMINANT DIRECTION OF THE CURB RAMP

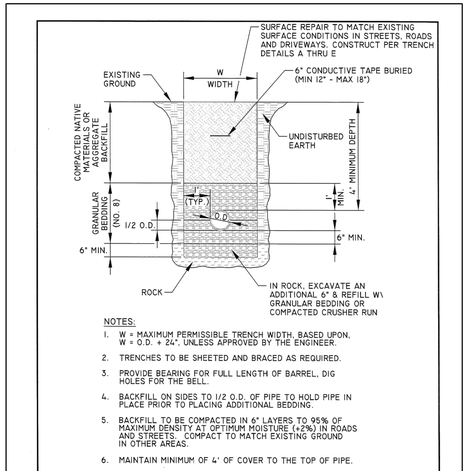
DETECTABLE WARNING SURFACE DETAIL

NOT TO SCALE



TYPICAL CLEAN-OUT DETAIL

NOT TO SCALE



NOTES:
1. W = MAXIMUM PERMISSIBLE TRENCH WIDTH, BASED UPON, W = O.D. + 24", UNLESS APPROVED BY THE ENGINEER.
2. TRENCHES TO BE SHEETED AND BRACED AS REQUIRED.
3. PROVIDE BEARING FOR FULL LENGTH OF BARREL, DIG HOLES FOR THE BELL.
4. BACKFILL ON SIDES TO I/2 O.D. OF PIPE TO HOLD PIPE IN PLACE PRIOR TO PLACING ADDITIONAL BEDDING.
5. BACKFILL TO BE COMPACTED IN 6" LAYERS TO 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE (+2%) IN ROADS AND STREETS. COMPACT TO MATCH EXISTING GROUND IN OTHER AREAS.
6. MAINTAIN MINIMUM OF 4' OF COVER TO THE TOP OF PIPE.
7. A CASING PIPE SHALL BE REQUIRED IN ROAD CROSSINGS WHERE SHOWN ON PLANS
8. ALL WATER LINES REQUIRE PERMIT FROM APPLICABLE REGULATORY ENTITIES. PERMIT REQUIREMENTS SUPERCEDE WHAT IS SHOWN ON THIS DETAIL.

Charles Town Utility Board 632 S. George Street, P.O. Box 359, Charles Town, WV 25414 Phone: (304) 725-2516 •Fax: (304) 725-4303	SEWER LINE TRENCH DETAIL	Standard Detail No. S-1 NOT TO SCALE SEPTEMBER 2015

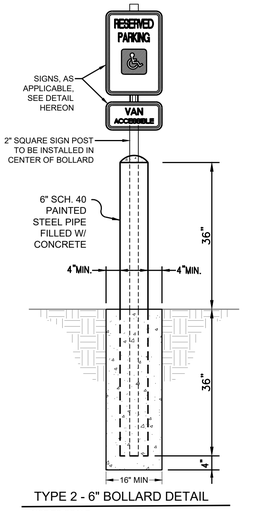


NOTE: CONCRETE CURB TO BE EXTENDED TO BOTTOM OF PAVING SECTION.

* 3000 PSI CONCRETE

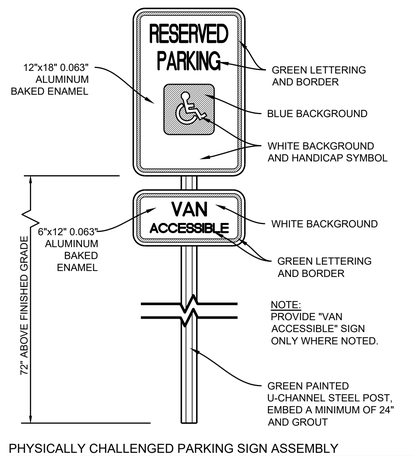
CURB AND SIDEWALK DETAIL

NO SCALE



TYPE 2 - 6" BOLLARD DETAIL

NOT TO SCALE

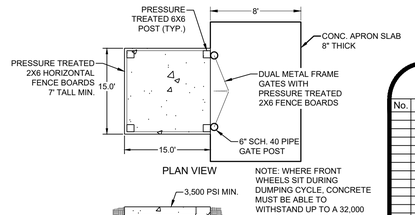


PHYSICALLY CHALLENGED PARKING SIGN ASSEMBLY

NOT TO SCALE

TYPE 1 - 6" BOLLARD DETAIL

NOT TO SCALE



NOTE: WHERE FRONT WHEELS SIT DURING DUMPING CYCLE, CONCRETE MUST BE ABLE TO WITHSTAND UP TO A 32,000 LB LOAD THAT BOUNCES.

DUMPSTER ENCLOSURE DETAIL

NOT TO SCALE

ALPHA ASSOCIATES, INC.
535 WEST KING STREET
MARTINSBURG, WV 25401
PHONE: 304-264-0051
FAX: 304-264-0707
www.thinkALPHAfirst.com

SITE PLAN
FOR
TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION

OWNER/DEVELOPER:
TRI-STATE INVESTMENT PROPERTIES, LLC

ADDRESS:
PO BOX 1,
KEARNEYSVILLE, WV 25430

PHONE:
410-206-4791

ATTN:
CHRISTOPHER HILL

REVISIONS

No.	ITEM	DATE

PROJ. NO.: 2304028.00
DATE: 11/9/2023
SHEET NO.:
C500

SLD2023-06

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SITE PLAN
FOR
TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION
CHARLES TOWN DISTRICT, T.M. 10 PAR. 9.20 D.B. 1228 Pg. 138 (PLAT REF: P.B. 26 PG. 518)
JEFFERSON COUNTY, WEST VIRGINIA

DETAILS

z:\projects\2023_jobs\2304028\00\drawings\civil\current\constructionc500.dwg - docsello
11/9/2023

Charles Town
Utility Board

661 S. George Street, Suite 101 Charles Town, WV 25414
Phone: (304) 725-2316 ♦ Fax: (304) 725-7150 ♦ Web: www.ctubwv.com

UTILITY BOARD

CHAIRMAN
City of Charles Town City Manager John Nissel

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Board Member Jefferson Whitten

Board Member Heidi Parker

UTILITY MANAGER
Kristen Stolipher

December 5, 2023

Richard Klein
Alpha Associates Inc.
535 W. King Street
Martinsburg, WV 25401

Re: Tiny Treasures Daycare and Learning Center - Site Plan Approval

Dear Mr. Klein:

We have reviewed the revised plans and find the plan acceptable for approval.

Please notify us of any changes to these plans and provide as-built drawings upon completion in electronic format in accordance with the CTUB Sanitary Sewer Specifications.

If you have any questions, please contact me at 304-725-2316.

Sincerely,



Travis Markley
Engineering Technician

CITY OF CHARLES TOWN

JEFFERSON COUNTY, WEST VIRGINIA

STORMWATER MANAGEMENT PLAN

FOR

TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION

November, 2023

PREPARED FOR:

TRI-STATE INVESTMENT PROPERTIES, LLC
PO Box 1
Kearneysville, WV 25430

Alpha ARCHITECTS ENGINEERS
535 West King Street
Martinsburg, WV 25401
Phone 304-264-0051 Fax 304-264-0707
Toll Free 877-264-0051
www.thinkALPHAfirst.com

AAI PROJECT NO. 2304028.00

RICHARD W. KLEIN, PE NO. 7624

PREPARED BY: BRADLEY H. CASDORPH, PE NO. 16618



TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION

TABLE OF CONTENTS

1.0 Introduction
- 1.1 Project Purpose / Compliance Objectives
- 1.2 Project Location
- 1.3 Existing Conditions
- 1.4 Proposed Conditions

2.0 Available Site Data
- 2.1 Site Reconnaissance / Topographical Survey
- 2.2 USDA Web Soil Survey
- 2.3 Karst Terrain Study

3.0 Computational Tools
- 3.1 Computer Software

4.0 Evaluation Methodology
- 4.1 Erosion & Sedimentation Evaluation
  - 4.1.1 SWM Basin Sizing, Drawdown
- 4.2 Onsite Hydrology and Hydraulic Evaluation
  - 4.2.1 Stormwater Conveyance (Buried Pipe Network)
  - 4.2.2 Stormwater Quality (Bioretention)
  - 4.2.3 Stormwater Quantity (Detention)
  - 4.2.4 Stormwater Pipe Conveyance Network
- 4.3 Offsite Hydrology and Hydraulic Evaluation
  - 4.3.1 Eccentric H&H Study

APPENDICES

Appendix A - Quadrangle Location Map, Aerial Overview Map, Aerial Site Specific Map

Appendix B - USDA Web Soil Survey, WV Flood Tool

Appendix C - Existing Site Plan, Proposed Site Plan

Appendix D - MS4 Spreadsheet

Appendix E - Stormwater Quantity Study, Pre- Construction Evaluation, Post-Construction Evaluation

Appendix F - Pipe Conveyance Network

Appendix G - Reference Data

1.0 INTRODUCTION

1.1 Project Purpose / Compliance Objectives

This report has been prepared to document the long term stormwater management study conducted for the proposed “Tiny Treasures Daycare And Learning Center Building Expansion” project being developed by Tri-State Investment Properties, LLC, of Kearneysville, WV. In compliance with the City of Charles Town current Subdivision and Land Development Ordinance for Stormwater Management, the 10-, and 100-year precipitation events must be evaluated for quantity discharge. Additionally, the facility must provide quality control measures which include capture of the volume of the first one inch of water at the site.

1.2 Project Location

The project is situated within the city limits of Charles Town, West Virginia. The project can further be described as being situated along the southern boundary of Cherry Tree Drive approximately 0.24 miles east of the intersection of Cherry Tree Drive and Prospect Avenue (Route 340/8). Geographically, the project is situated at Latitude 39°17'26"N and Longitude 77°50'29"W with site ingress and egress routing through Cherry Tree Dr.

1.3 Existing Conditions

The surrounding community is described as a typical city-based, multi-use small lot residential/commercial mix. The southern and eastern boundaries of the subject property adjoin cleared but undeveloped meadow and scattered scrub brush. The immediate northern boundary is a daycare center which is owned and operated by the subject developer. The actual north boundary includes a two-lane paved roadway identified as Cherry Tree Drive. A multi-unit housing development adjoins Cherry Tree Drive further to the north. The western adjoiner includes a multi-unit residential housing facility identified as Willow Spring Farms Apartments. US Route 340 is located approximately 700 feet to the east of the subject property.

The subject lot is currently maintained as meadow with sparse scrub brush. The lot is further described as a 209’ x 226’ rectangular area (+-1.1 acres) that generally slopes from west to east. The site does not reside within a 100-, or 500-yr flood zone (see West Virginia Flood Tool website and FEMA Flood Map 54037C0137E, effective date December 18, 2009).

Site runoff is projected to discharge through a proposed level lip spreader device located near the south east corner of the site. While no accommodations currently exist to allow for a local stormwater network connection, this outfall could be altered in the future to connect into Mulberry Tree Street Extended. Drainage from the site is situated within the headwaters of Cattail Run Tributary of the Shenandoah River Basin.

1.4 Proposed Conditions

The developer intends to expand the existing daycare structure in a southerly direction by adding two 70' x 45' wood frame structures. The structures are interconnected by fully enclosed walkways and primary access door entries. The existing daycare facility includes a paved parking lot along the western boundary which will be extended to the south and wrap along the proposed southern border. Accommodations for a loading dock and trash pickup are also provided along the proposed southern boundary.

As mentioned within the existing conditions section of this report, the general terrain found across the proposed site dips from west to east. Because the existing daycare center is situated near the north eastern corner of the site, the proposed extension was sited to generally follow the eastern boundary. Planimetrically, this provided for stormwater management to be located near the south western corner of the site. This area is, for the most part, higher than other portions of the site which require management. As a result, the most effective means of controlling stormwater discharge included separating the eastern roof drains into a smaller secondary structure while providing the bulk of the protection within a larger southwest structure.

The stormwater management area overview is anticipated to provide containment of the first 1" capture and control of the 10yr, and 100yr-24hr storm events associated with the proposed land modifications. A limited turf area, designated as 'playground' located along the eastern property boundary is defined within the proposed scenario as having uncontrolled discharge. This determination was based on the fact that existing and proposed conditions for this exact land use area are unchanged.

2.0 AVAILABLE SITE DATA

2.1 Site Reconnaissance / Topographical Survey

Due to the lack of accurate available topography in the vicinity of the project, a survey crew was dispatched to collect elevation data suitable for site design. The survey data was later utilized to develop proposed condition topography 'contours'.

Pre-condition and catchment terrain was compiled from an on-the-ground field survey under canopy. The field data was transposed and reduced to the SPC NAD83 WV North zone and NAVD88 vertical datums. Once transposed, the data was inserted into AutoCAD Civil3d. From there, catchments, flow paths and scalable X, Y, and Z geometry was applied.

2.2 USDA Web Soil Survey

In order to gain a further understanding of the site's hydrologic properties, including the potential for exfiltration, the Jefferson County Soil Survey (USDA Web Soil Survey) was consulted to determine the soil classification and hydrologic soil group properties.

The primary soils group noted Web Soil Survey is the Poplimento silt loam (PmB), 8 to 15 percent slopes, on the Jefferson County Soils Map. A copy of the soils map and description of the soils have been included in **Appendix B** of this report. These soils are identified as residing with the B-rating hydrologic group.

At the time of this hydrologic and hydrographic study, there were no geotechnical studies available for review. Additionally, no incidental soil borings or percolation field studies had been conducted. Based on information obtained from the USDA Web Soil Survey, the estimated depth to the water table is > 200cm (+-6.5').

During the site survey, the project area was reviewed for the presence of Karst topography and water transmission capacity. The presence of Karst topography to exist across this site in whole or part was determined to be minimal. For design purposes herein, an exfiltration value was not considered because of the potential presence of karst. A basin liner was incorporated into the basin component list.

2.3 Karst Terrain Study

Due to the prevalence of Karst Terrain in Jefferson County, and in compliance with the Charles Town Stormwater Ordinance, H&H computations performed herein were based on 100% Karst Terrain adjustment factors.

3.0 COMPUTATIONAL TOOLS

3.1 Computer Software

All hydrologic and hydraulic computations performed under the QUANTITY scope of work were performed utilizing HydroCAD v10.00-26 as developed by HydroCAD Software Solutions, LLC. Output tables and textural graphics generated from the study were saved as *.pdf files and later printed and subsequently incorporated into **Appendix E** of this report. Computational methods were based on SCS TR-20 and TR-55.

All QUALITY computations were performed utilizing the standardized West Virginia MS4 Stormwater Compliance Spreadsheet, version v2.0, as dated April 2013.

4.0 EVALUATION METHODOLOGY

4.1 Erosion & Sedimentation Evaluation

4.1.1 SWM Basin Sizing, Drawdown

Site development will require land disturbance. Therefore, sedimentation and erosion control devices are required to be installed. It is suggested that wattles, or other similar controlling devices, be installed along the downstream perimeter prior to commencing sedimentation producing earthwork operations.

Topsoil stockpiles shall be protected from improper sediment lain discharge by providing a perimeter silt fence and a hard cover (as necessary, to the extent necessary).

4.2 Onsite Hydrology and Hydraulic Evaluation

4.2.1 Stormwater Conveyance

It is anticipated that all proposed roof lines will include gutters, downspouts, and direct connect leaders to carry discharge to the proposed stormwater management pipe network system.

A minimum Tc was established as 5 min for all network entries (if any).

4.2.2 Stormwater Quality (Bioretention)

The SUBJECT AREA total watershed associated with this project is 1.11 acres. Utilizing the WVDEP MS4 Stormwater Compliance Spreadsheet to determine the minimum required target runoff reduction volume provided an RRv value of approximately 2,212 cubic feet. Since the site includes 0.23 acres of proposed turf in the form of playground and perimeter grade recovery, an equal amount of reduction was applied to the computations which resulted in a revised RRV of 2,047cubic feet.

Due to the potential occurrence of Karst across the site, all bio-retention cells were designed and intended to be constructed as Level 1 construction.

The bioretention cells are formed in a somewhat rectangular shape. Each cell is intended to include 12-inches of base aggregate, 30-inches of soil matrix media, and allow for approximately 6-inches of water ponding. Each cell is wrapped with a geosynthetic liner and includes a capped underdrain pipe system designed to drain into the surrounding site over an extended time period.

STORMWATER QUALITY COMPLIANCE:

1" Capture Volume / Max Elev = (1,733/0.6=2,888cf) @ 488.62' **Basin-1**

1" Capture Volume / Max Elev = (314/0.6=523cf) @ 488.80' **Basin-2**

Each bioretention basin requires a contact drawdown time ranging between 48 and 72 hours. This is accomplished by installing and securing a pipe cap at the discharge point which has an eccentricly located orifice reducer. Basin-1 requires a 1.75" orifice (70hr drawdown) and Basin-2 requires a 0.75" orifice (58hr drawdown).

4.2.3 Stormwater Quantity (Detention)

The Charles Town Stormwater Ordinance states that *"All Stormwater Management Facilities shall be designed so that the specific storm frequency storage volumes (e.g., water quality, channel protection, 10-year, 100-year) as identified in the current Virginia Stormwater Management Handbook are met, unless the Planning Commission grants the applicant a waiver or the applicant is exempt from such requirements." Find below a tabulation of the pre- vs post- comparison results as generated for a common downstream discharge location.*

STORMWATER QUANTITY COMPLIANCE:

STORMWATER QUANTITY				
Event (yr)	**Q – Existing (cfs)**	**Q – Proposed (cfs)**	**Peak Elev (ft) B1 / B2**	**Storage (cf) B1 / B2 / Total**
10	1.15	0.24	488.64 / 488.18	2940 / 364 / 3304
100	3.45	3.20	489.20 / 489.39	4752 / 802 / 5554

With regards to general criteria for Stormwater Management Plans, the city ordinance states that "*Outflows from a Stormwater Management Facility shall be discharged to an adequate channel, and velocity dissipaters shall be placed at the outfall of all Stormwater Management Facilities and along the length of any outfall channel as necessary to provide a non-erosive velocity of flow from the basin to a channel*." Based on visual observations made at the site, and topography data collected during the site survey, there are no existing channels located along the eastern property boundary. Therefore, stormwater discharge exiting Basin-1 is planned to flow easterly into a proposed coarse rock channel. The channel is intended to provide interference at the discharge point and dissipate, as well as spread, the outflow. Stormwater discharge exiting Basin-2 is also planned to flow easterly, but will be directed over a 3' wide x 30' long level turf berm.

Find computations which derive outlet pipe armor size within the SWM Quantity section of the Appendix.

4.2.4 Stormwater Pipe Conveyance Network

Refer to Appendix Section F for details concerning the pipe conveyance network.

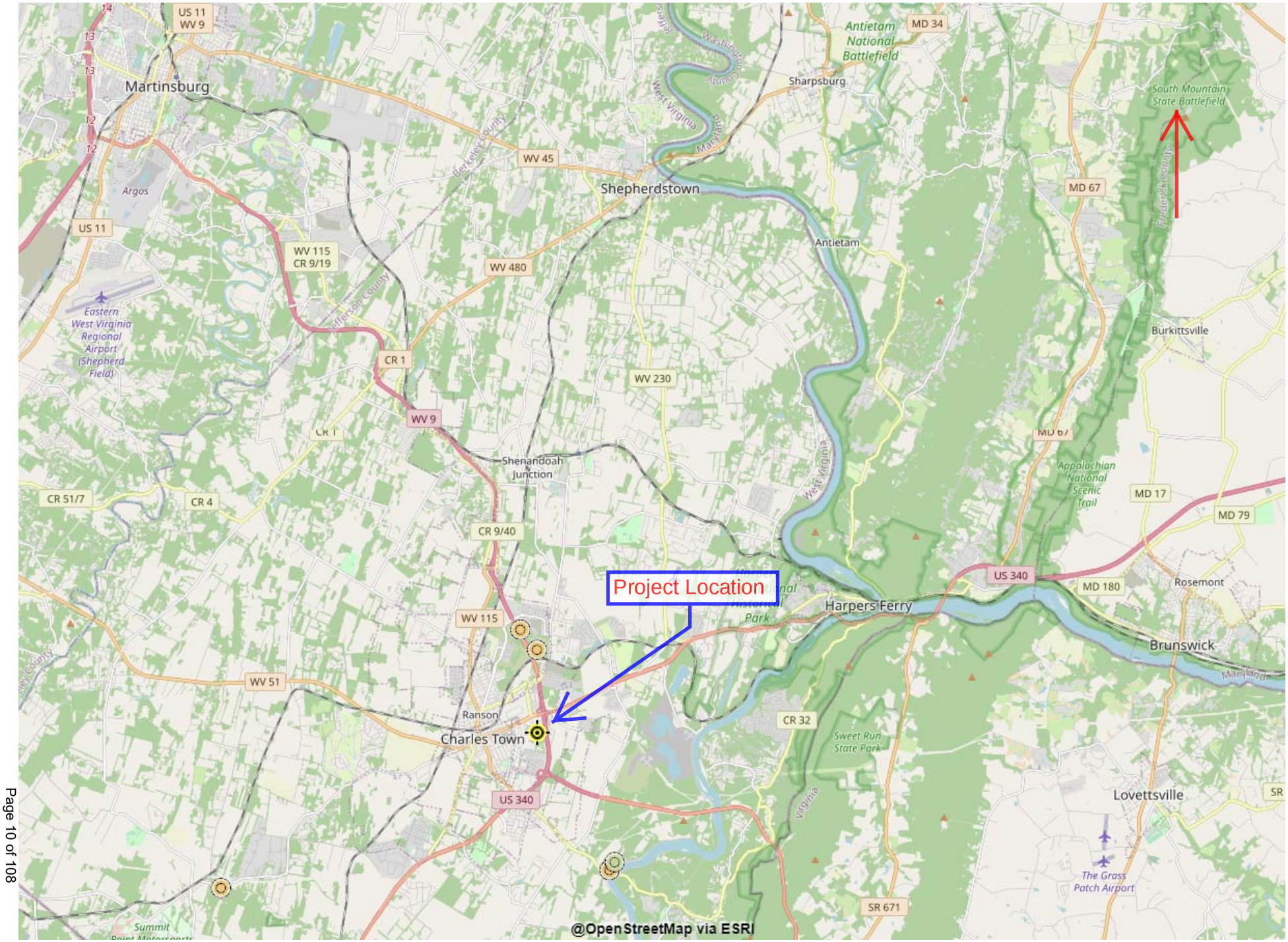
4.3 Offsite Hydrology & Hydraulic Evaluation

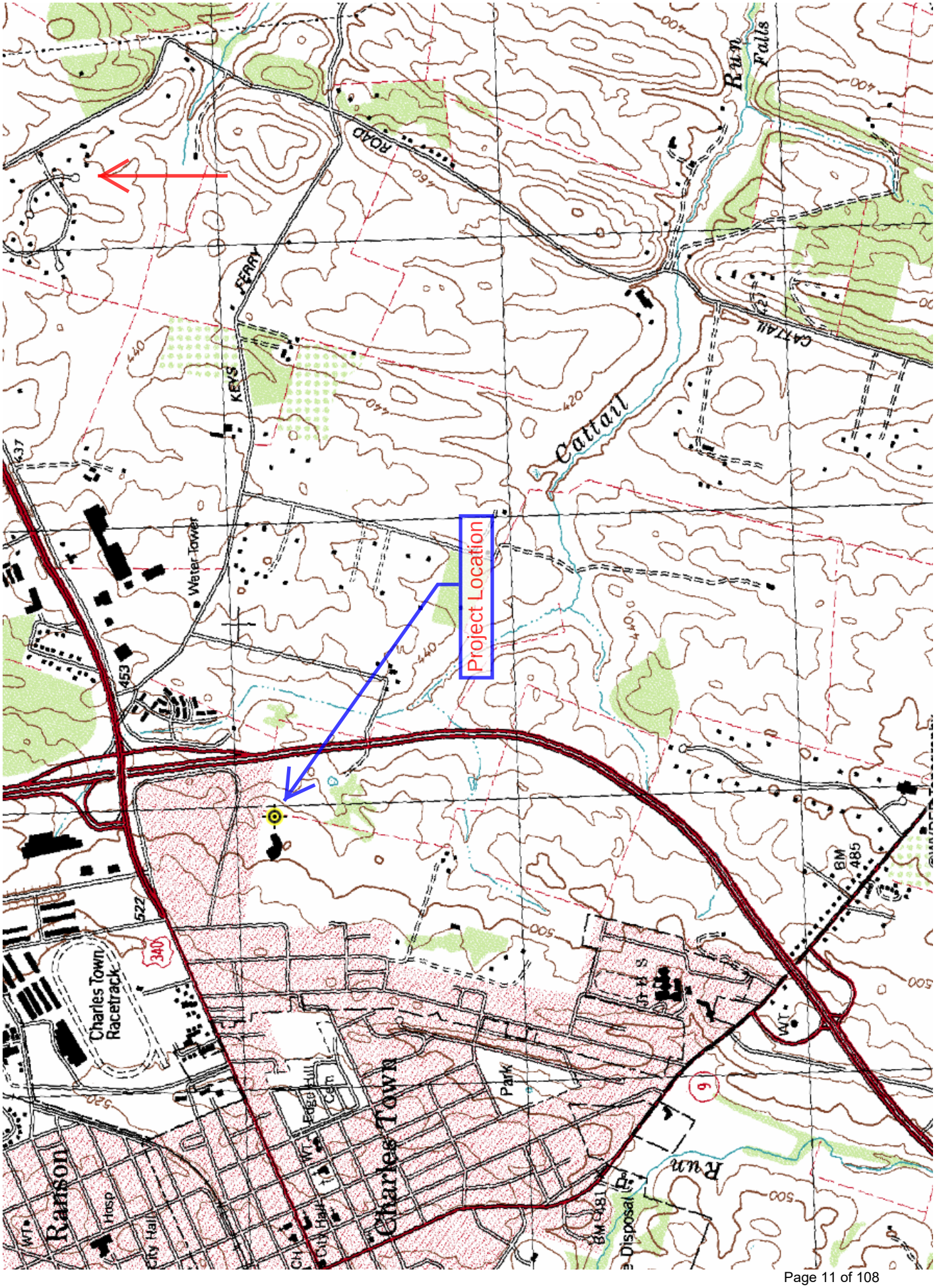
4.3.1 Eccentric H&H Study

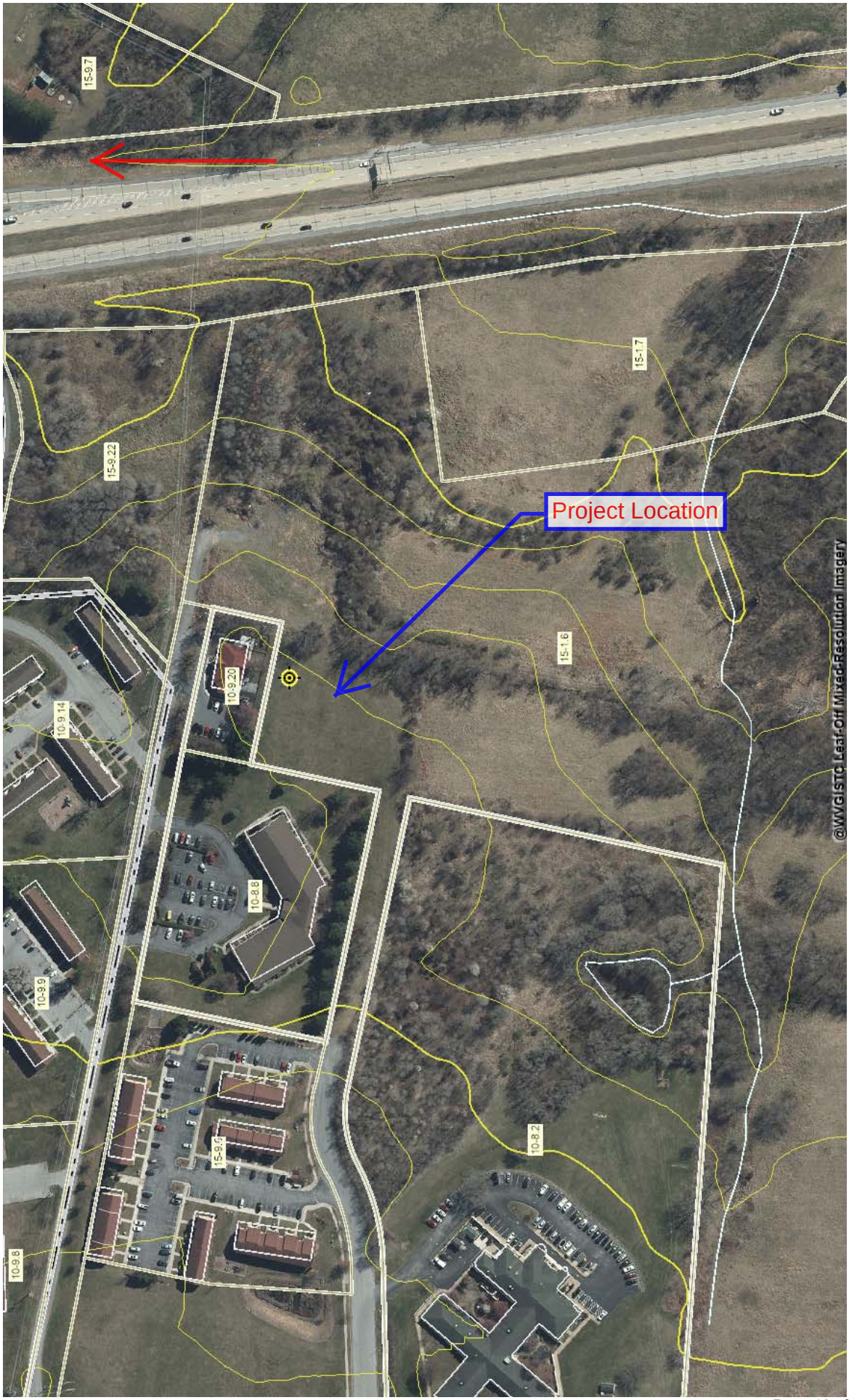
As part of the site H&H study, it was determined that no eccentric flows influence the hydrology or hydrologic balance within the subject area. Therefore, no eccentric studies were performed.

APPENDIX A

QUADRANGLE LOCATION MAP, AERIAL OVERVIEW MAP, AERIAL SITE SPECIFIC MAP


Project Location
Martinsburg
Shepherdstown
Sharpsburg
Antietam
Antietam National Battlefield
South Mountain State Battlefield
Burkittsville
Harpers Ferry
Brunswick
Rosemont
Shenandoah Junction
Ranson
Charles Town
Lovettsville
Argos
Eastern West Virginia Regional Airport (Shepherd Field)
Appalachian National Scenic Trail
Sweet Run State Park
The Grass Patch Airport
US 11
WV 9
WV 45
WV 115
CR 9/19
WV 480
CR 1
WV 230
CR 51/7
CR 4
CR 9/40
WV 115
WV 51
US 340
CR 32
SR 671
MD 34
MD 67
MD 17
MD 79
MD 180
@OpenStreetMap via ESRI


Project Location
Ranson
Charles Town
Charles Town Racetrack
Water Tower
Cattail Run
Cattail Run Falls
KEYS FERRY ROAD
City Hall
Hosp
Park
Cem
Disposal
WT
BM 485
BM 481
340
522
453
437
440
420
460
500
520


Project Location
15-9.7
15-17
15-9.22
15-16
10-9.20
10-9.14
10-8.8
10-9.9
10-8.2
10-9.8
@WVGIST© Leaf-Off Mixed-Resolution Imagery

APPENDIX B

USDA WEB SOIL SURVEY, WV FLOOD TOOL


Plum Tree Ct
UwC
New Sycamore Cir
Project Location
PmC

Tables — Hydrologic Soil Group — Summary By Map Unit

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
PmC	Poplimento silt loam, 8 to 15 percent slopes	B	9.6	65.3%
UwC	Urban land-Hagerstown complex, 0 to 15 percent slopes		5.1	34.7%
Totals for Area of Interest			**14.7**	**100.0%**

Description — Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options — Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Tables — Retention Systems, Unlined — Summary By Map Unit

Pix4Dcloud
https://cloud.pix4d.com/drive

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
PmC	Poplimento silt loam, 8 to 15 percent slopes	Severely limited	Poplimento, silt loam (65%)	Insufficient groundwater (1.00)	9.6	65.3%
				Slope (1.00)		
				Collapse risk, onsite investigation needed (0.80)		
				Groundwater contamination (0.50)		
				Vegetation establishment (0.14)		
UwC	Urban land-Hagerstown complex, 0 to 15 percent slopes	Not rated	Urban land (40%)		5.1	34.7%
Totals for Area of Interest					**14.7**	**100.0%**

Table — Retention Systems, Unlined — Summary by Rating Value

Summary by Rating Value

Summary by Rating Value

Rating	Acres in AOI	Percent of AOI
Severely limited	9.6	65.3%
Null or Not Rated	5.1	34.7%
Totals for Area of Interest	**14.7**	**100.0%**

Description — Retention Systems, Unlined

Unlined retention systems are stormwater management practices that are placed 3 to 5 feet in the ground, depending on the application. These systems include retention basins and intermittent wetlands. They slow the movement of stormwater to surface waters and also filter a significant portion of pollutants from the stormwater. The fundamental function of these systems is to hold the runoff generated by an area, such as a parking lot, from the first 1 inch of rainfall during a 24-hour storm preceded by 48 hours of no measurable precipitation. Water should not be at the surface continuously, but a water table within the depth of the system is needed to allow the growth of hydrophytic vegetation. . Only that part of the soil between depths of 24 and 80 inches is evaluated.

The ratings are based on the soil properties that affect infiltration of the stormwater, construction and maintenance of the system, and public safety and health. Saturated hydraulic conductivity (Ksat), depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect the transmission of rainwater. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the water in downslope areas. Some slopes may become unstable and move upon addition of water.

Soils underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the bottom of the system may adversely affect water quality and public health. In these soils the unlined retention system may not adequately filter the stormwater, particularly if the adsorptive capacity of the soil below the system is low. As a result, the ground water may become contaminated. In areas underlain by limestone, solution channels and subsequent subsidence may damage adjacent infrastructure. . Also, areas underlain by limestone may be subject to ground-water contamination.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified system. "Not limited" indicates that the soil has features that are very favorable for the specified system. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified system. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified system. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified system (1.00) and the point at which the soil feature is not a limitation (0.00).

The accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer lists the map unit components. These components are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as the one listed for the map unit. The percent composition of each component in a particular map unit is shown to help the user better understand the percentage of each map unit that has the rating indicated. Other components with different ratings may occur in each map unit.

Tables — Depth to Bedrock — Summary By Map Unit

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
PmC	Poplimento silt loam, 8 to 15 percent slopes	>200	9.6	65.3%
UwC	Urban land-Hagerstown complex, 0 to 15 percent slopes	>200	5.1	34.7%
Totals for Area of Interest			**14.7**	**100.0%**

Description — Depth to Bedrock

The term bedrock in soil survey refers to a continuous root and water restrictive layer of rock that occurs within the soil profile.

There are many types of restrictions that can occur within the soil profile but this theme only includes the three restrictions that use the term bedrock. These are:

1) Lithic Bedrock
2) Paralithic Bedrock
3) Densic Bedrock

Lithic bedrock and paralithic bedrock are comprised of igneous, metamorphic, and sedimentary rocks, which are coherent and consolidated into rock through pressure, heat, cementation, or fusion. Lithic bedrock represents the hardest type of bedrock, with a hardness of strongly coherent to indurated. Paralithic bedrock has a hardness of extremely weakly coherent to moderately coherent. It can occur as a thin layer of weathered bedrock above harder lithic bedrock. Paralithic bedrock can also be much thicker, extending well below the soil profile.

Densic bedrock represents a unique kind of bedrock recognized within the soil survey. It is non-coherent and consolidated, dense root restrictive material, formed by pressure, heat, and dewatering of earth materials or sediments. Densic bedrock differs from densic materials, which formed under the compaction of glaciers, mudflows, and or human-caused compaction.

If more than one type of bedrock is described for an individual soil type, the depth to the shallowest one is given. If no bedrock is described in a map unit, it is represented by the "greater than 200" depth class.

Depth to bedrock is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Tables — Unified Soil Classification (Surface) — Summary By Map Unit

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
PmC	Poplimento silt loam, 8 to 15 percent slopes	CL	9.6	65.3%
UwC	Urban land-Hagerstown complex, 0 to 15 percent slopes		5.1	34.7%
Totals for Area of Interest			**14.7**	**100.0%**

Description — Unified Soil Classification (Surface)

The Unified soil classification system classifies mineral and organic mineral soils for engineering purposes on the basis of particle-size characteristics, liquid limit, and plasticity index. It identifies three major soil divisions: (i) coarse-grained soils having less than 50 percent, by weight, particles smaller than 0.074 mm in diameter; (ii) fine-grained soils having 50 percent or more, by weight, particles smaller than 0.074 mm in diameter; and (iii) highly organic soils that demonstrate certain organic characteristics. These divisions are further subdivided into a total of 15 basic soil groups. The major soil divisions and basic soil groups are determined on the basis of estimated or measured values for grain-size distribution and Atterberg limits. ASTM D 2487 shows the criteria chart used for classifying soil in the Unified system and the 15 basic soil groups of the system and the plasticity chart for the Unified system.

The various groupings of this classification correlate in a general way with the engineering behavior of soils. This correlation provides a useful first step in any field or laboratory investigation for engineering purposes. It can serve to make some general interpretations relating to probable performance of the soil for engineering uses.

For each soil horizon in the database one or more Unified soil classifications may be listed. One is marked as the representative or most commonly occurring. The representative classification is shown here for the surface layer of the soil.

Tables — Depth to Water Table — Summary By Map Unit

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
PmC	Poplimento silt loam, 8 to 15 percent slopes	>200	9.6	65.3%
UwC	Urban land-Hagerstown complex, 0 to 15 percent slopes	>200	5.1	34.7%
Totals for Area of Interest			**14.7**	**100.0%**

Description — Depth to Water Table

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options — Depth to Water Table

Units of Measure: centimeters

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

Tables — Drainage Class — Summary By Map Unit

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
PmC	Poplimento silt loam, 8 to 15 percent slopes	Well drained	9.6	65.3%
UwC	Urban land-Hagerstown complex, 0 to 15 percent slopes		5.1	34.7%
Totals for Area of Interest			**14.7**	**100.0%**

Description — Drainage Class

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Rating Options — Drainage Class

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

Tables — Infiltration Systems, Deep — Summary By Map Unit

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Summary by Map Unit — Jefferson County, West Virginia (WV037)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
PmC	Poplimento silt loam, 8 to 15 percent slopes	Severely limited	Poplimento, silt loam (65%)	Slope (1.00)	5.4	99.9%
				Water movement (1.00)		
				Collapse risk, onsite investigation needed (0.80)		
				Groundwater contamination (0.50)		
				Adsorptive capacity (0.20)		
UwC	Urban land-Hagerstown complex, 0 to 15 percent slopes	Not rated	Urban land (40%)		0.0	0.1%
Totals for Area of Interest					**5.4**	**100.0%**

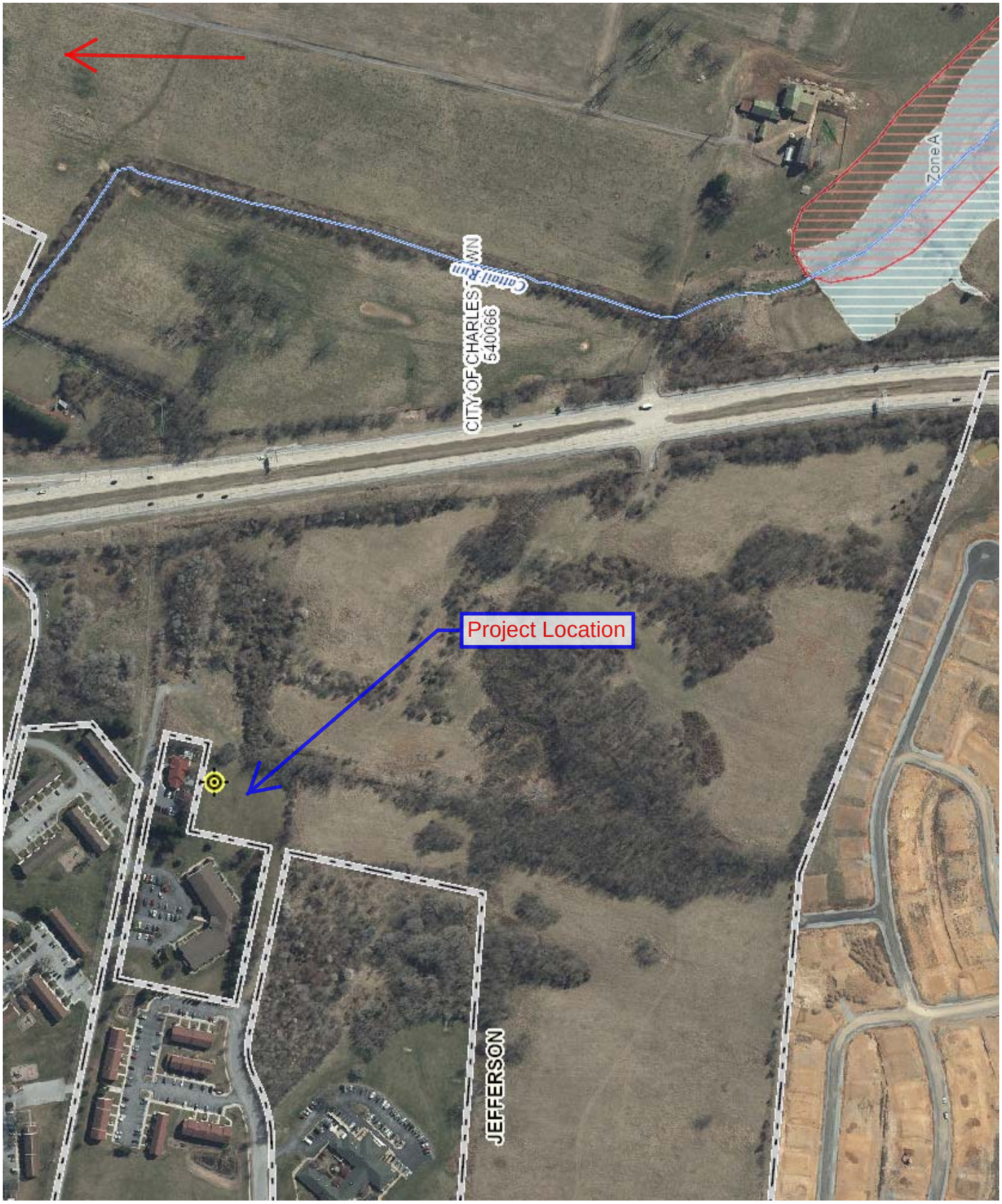
Table — Infiltration Systems, Deep — Summary by Rating Value

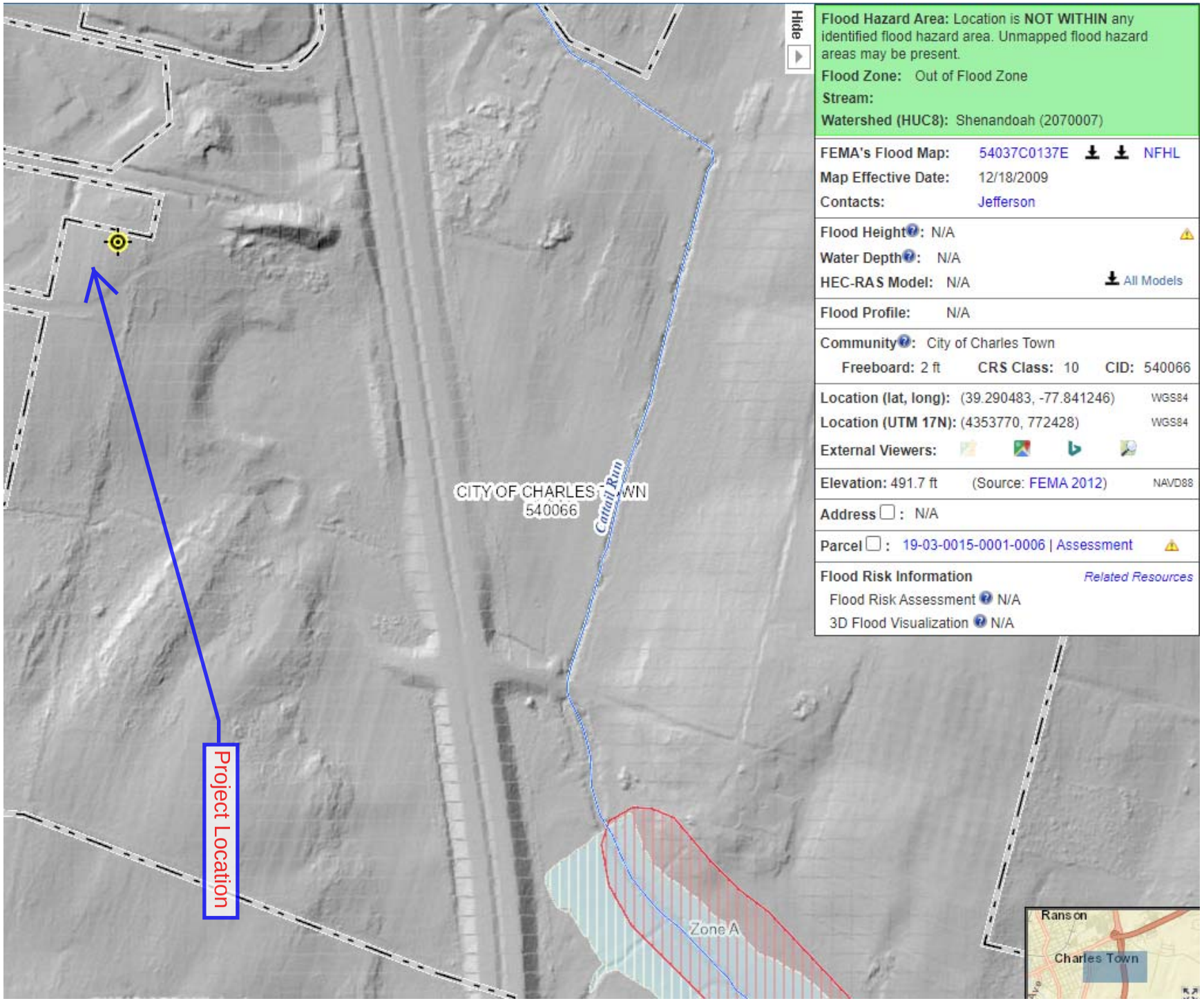
Summary by Rating Value

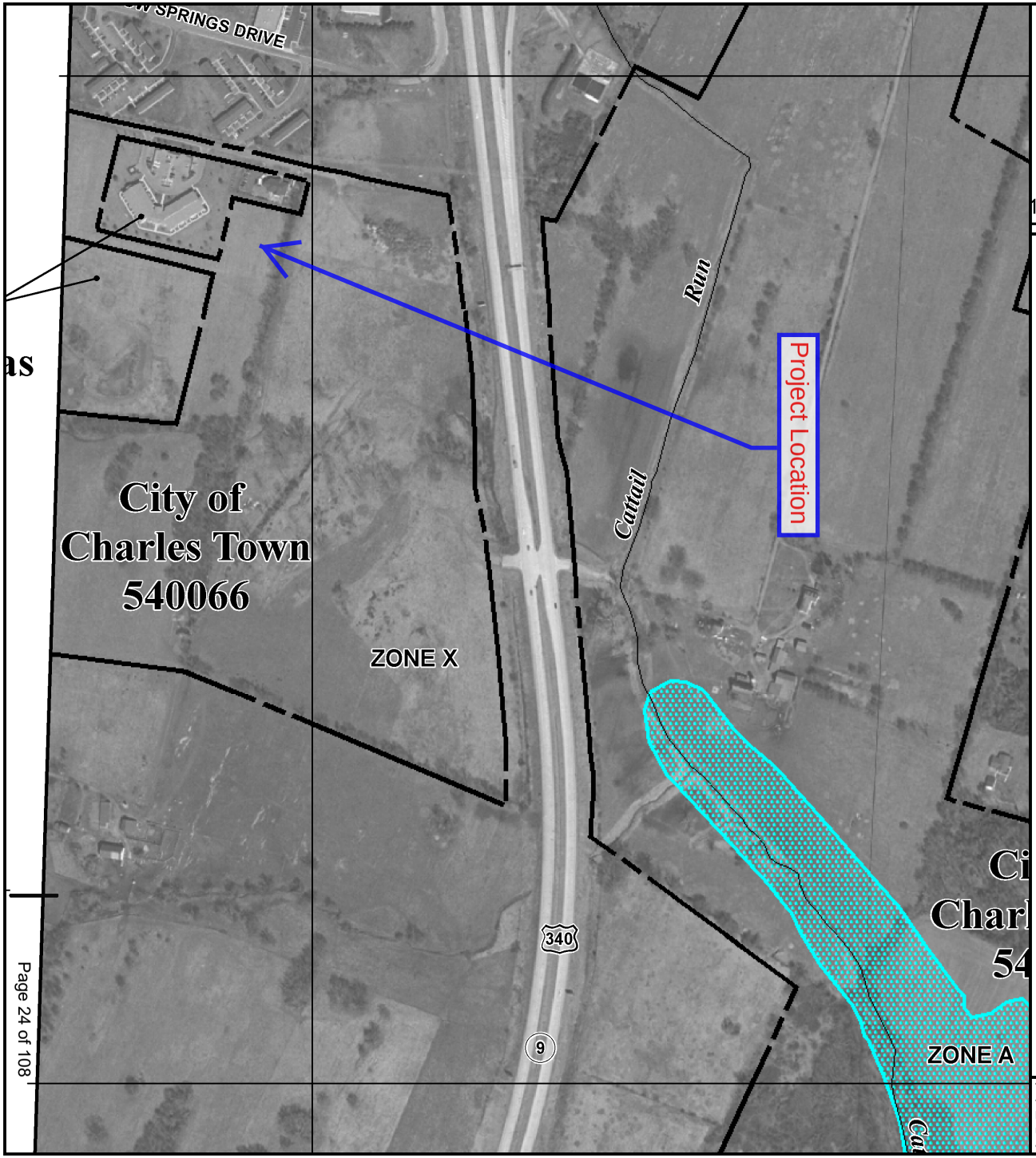
Summary by Rating Value

Rating	Acres in AOI	Percent of AOI
Severely limited	5.4	99.9%
Null or Not Rated	0.0	0.1%
Totals for Area of Interest	**5.4**	**100.0%**

Description — Infiltration Systems, Deep


Zone A
CITY OF CHARLESTOWN
540066
Project Location
JEFFERSON


Hide
Flood Hazard Area: Location is NOT WITHIN any identified flood hazard area. Unmapped flood hazard areas may be present.
Flood Zone: Out of Flood Zone
Stream:
Watershed (HUC8): Shenandoah (2070007)
FEMA's Flood Map: 54037C0137E NFHL
Map Effective Date: 12/18/2009
Contacts: Jefferson
Flood Height: N/A
Water Depth: N/A
HEC-RAS Model: N/A All Models
Flood Profile: N/A
Community: City of Charles Town
Freeboard: 2 ft CRS Class: 10 CID: 540066
Location (lat, long): (39.290483, -77.841246) WGS84
Location (UTM 17N): (4353770, 772428) WGS84
External Viewers:
Elevation: 491.7 ft (Source: FEMA 2012) NAVD88
Address : N/A
Parcel : 19-03-0015-0001-0006 | Assessment
Flood Risk Information Related Resources
Flood Risk Assessment N/A
3D Flood Visualization N/A
CITY OF CHARLES TOWN
540066
Cattail Run
Project Location
Zone A
Ranson
Charles Town



MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 M

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0137E

FIRM

FLOOD INSURANCE RATE MAP

JEFFERSON COUNTY, WEST VIRGINIA AND INCORPORATED AREAS

PANEL 137 OF 245

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CHARLES TOWN, CITY OF	540066	0137	E
JEFFERSON COUNTY	540065	0137	E
RANSON, CITY OF	540068	0137	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
54037C0137E

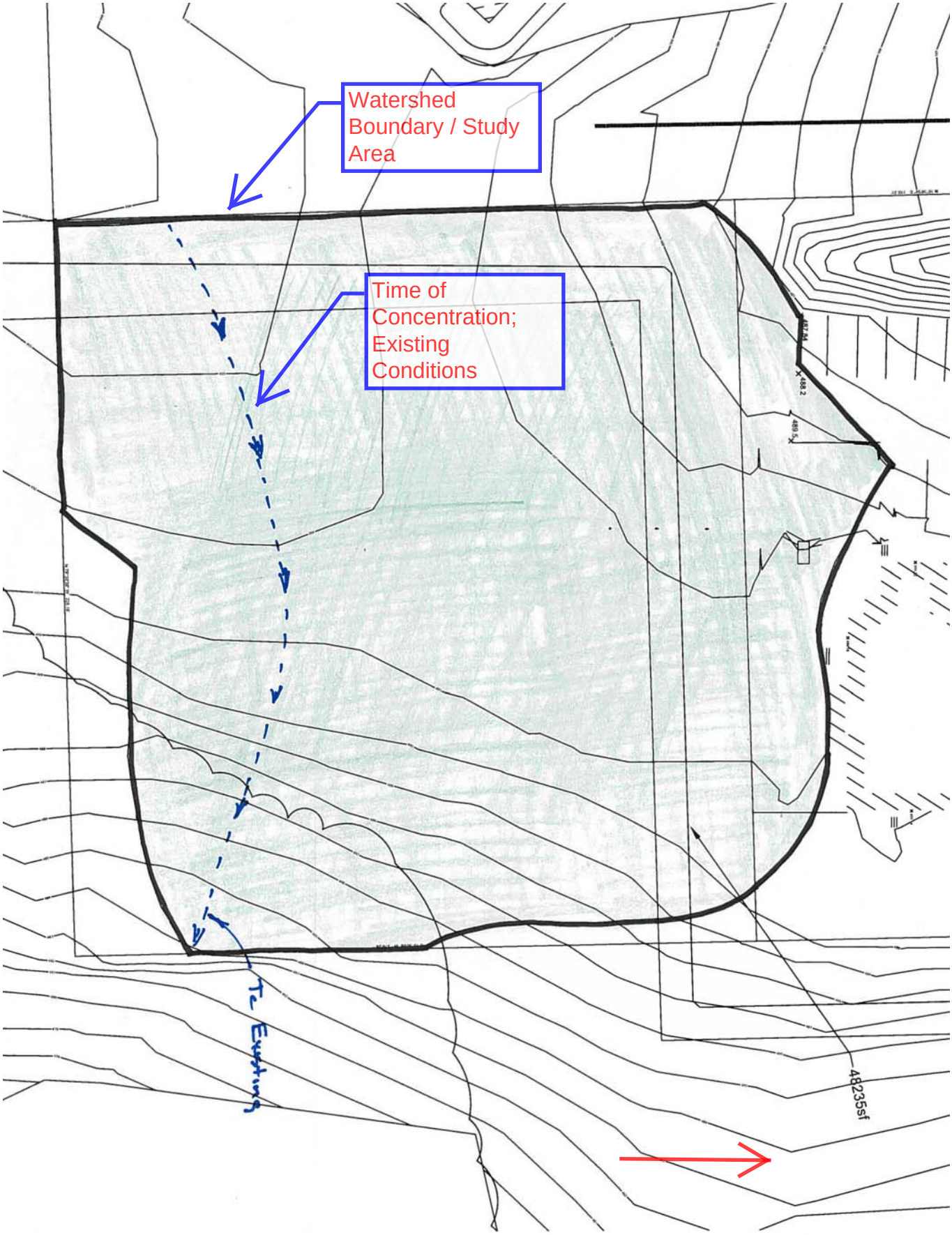
EFFECTIVE DATE
DECEMBER 18, 2009

Federal Emergency Management Agency

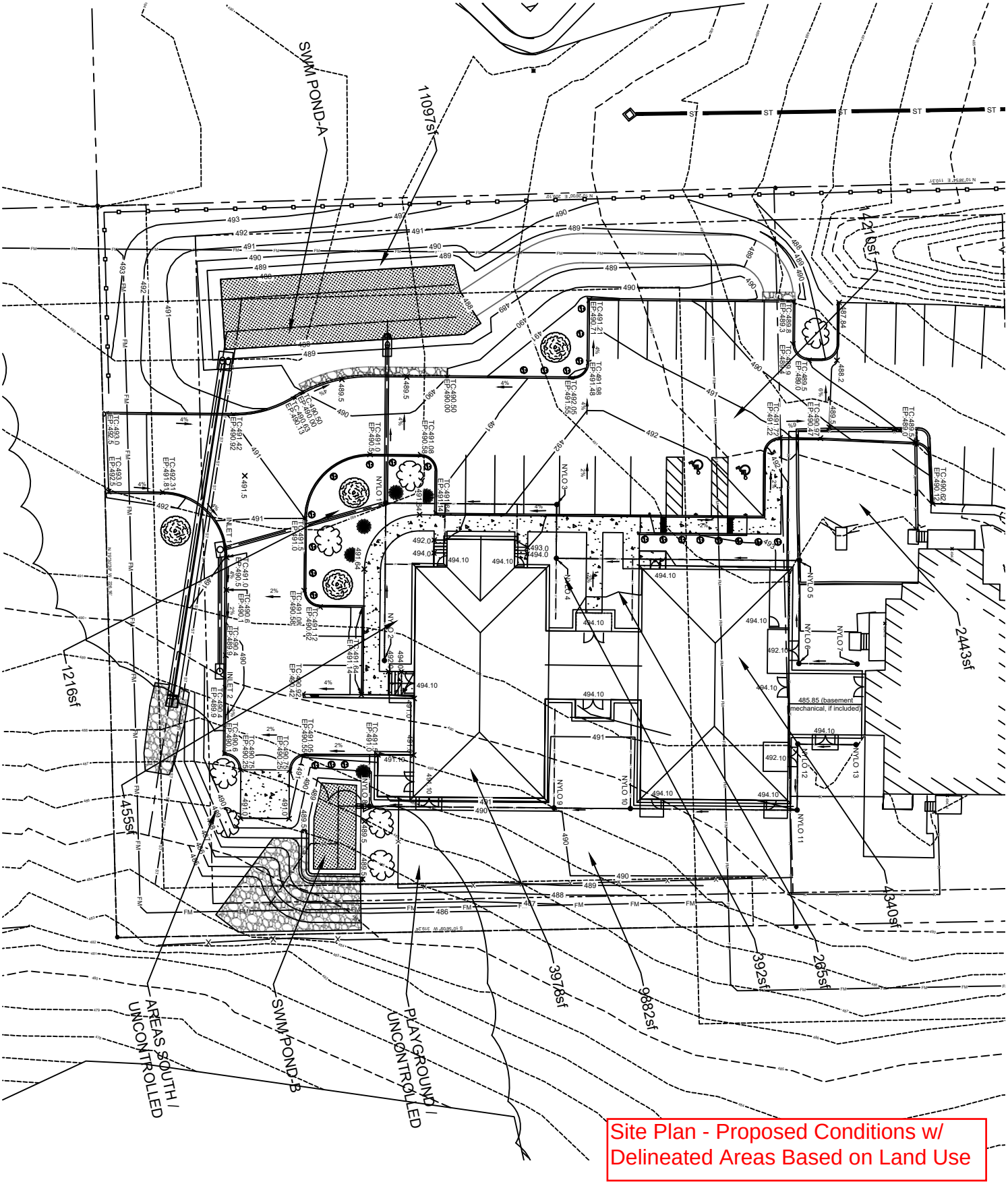
This is an official FIRMette showing a portion of the above-referenced flood map created from the MSC FIRMette Web tool. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For additional information about how to make sure the map is current, please see the Flood Hazard Mapping Updates Overview Fact Sheet available on the FEMA Flood Map Service Center home page at https://msc.fema.gov.

APPENDIX C

EXISTING SITE PLAN, PROPOSED SITE PLAN

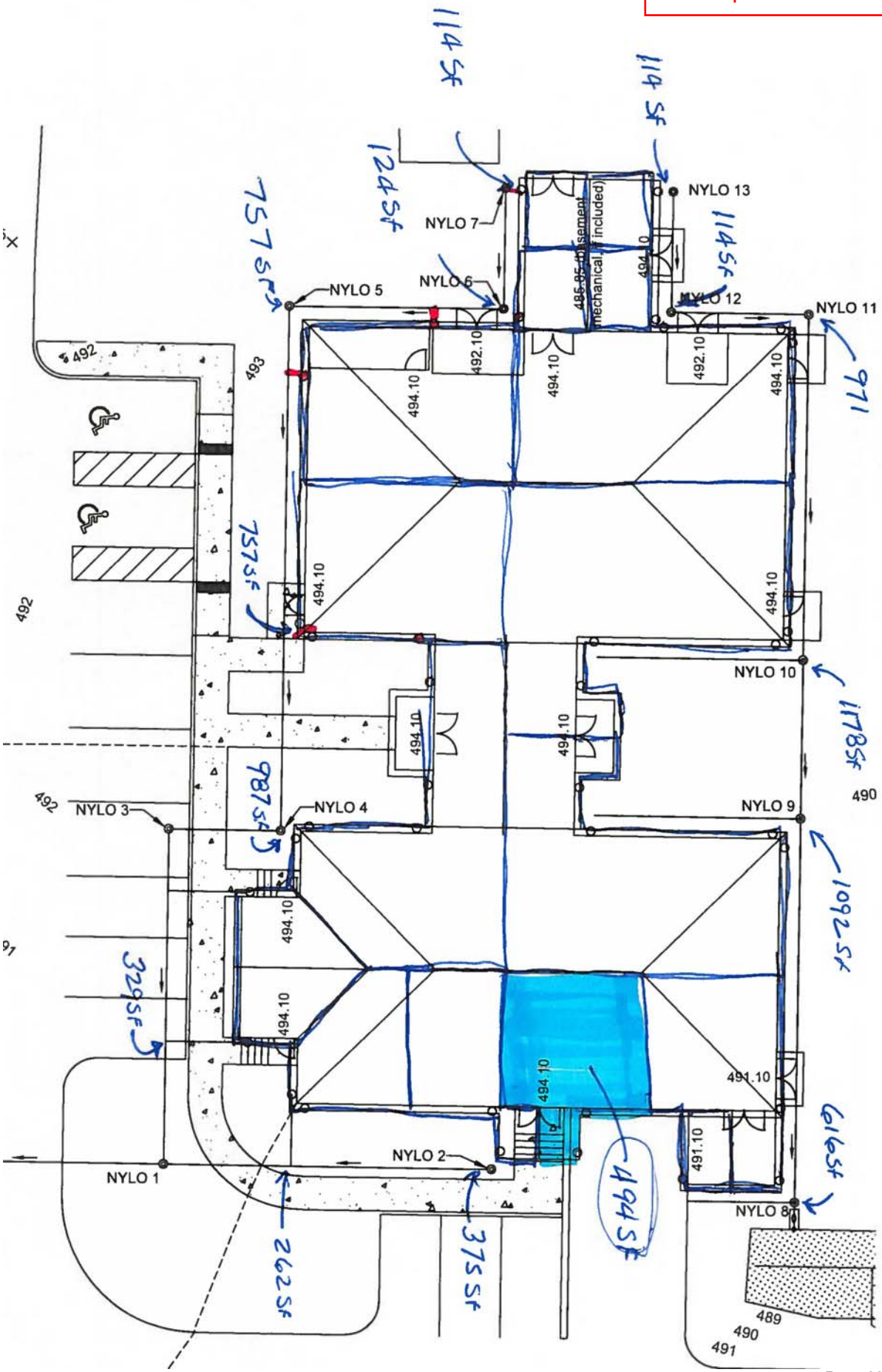


Site Plan - Existing Conditions



Site Plan - Proposed Conditions w/ Delineated Areas Based on Land Use

Roof Top Catchment Areas



APPENDIX D

MS4 SPREADSHEET

West Virginia MS4 Stormwater Compliance Spreadsheet v2.0; April 2013

data input cells

calculation cells

constant values

Site Data

Site Name: CT Daycare-1

Site Information

Post-Development Land Cover

Drainage Area A

Land Cover Type	HSG A Soils	HSG B Soils	HSG C Soils	HSG D Soils	Totals
Forest/Preserved Open Space (acres)	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres)	0.00	0.36	0.00	0.00	0.36
Impervious Cover (acres)	0.00	0.43	0.00	0.00	0.43
				Total	0.79

Drainage Area B

Land Cover Type	HSG A Soils	HSG B Soils	HSG C Soils	HSG D Soils	Totals
Forest/Preserved Open Space (acres)	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres)	0.00	0.00	0.00	0.00	0.00
Impervious Cover (acres)	0.00	0.09	0.00	0.00	0.09
				Total	0.09

Drainage Area C

Land Cover Type	HSG A Soils	HSG B Soils	HSG C Soils	HSG D Soils	Totals
Forest/Preserved Open Space (acres)	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres)	0.00	0.00	0.00	0.00	0.00
Impervious Cover (acres)	0.00	0.00	0.00	0.00	0.00
				Total	0.00

Drainage Area D

Land Cover Type	HSG A Soils	HSG B Soils	HSG C Soils	HSG D Soils	Totals
Forest/Preserved Open Space (acres)	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres)	0.00	0.00	0.00	0.00	0.00
Impervious Cover (acres)	0.00	0.00	0.00	0.00	0.00
				Total	0.00

Drainage Area E

Land Cover Type	HSG A Soils	HSG B Soils	HSG C Soils	HSG D Soils	Totals
Forest/Preserved Open Space (acres)	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres)	0.00	0.00	0.00	0.00	0.00
Impervious Cover (acres)	0.00	0.00	0.00	0.00	0.00
				Total	0.00

Total Site Area

Land Cover Type	HSG A Soils	HSG B Soils	HSG C Soils	HSG D Soils	Totals
Forest/Preserved Open Space (acres)	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres)	0.00	0.36	0.00	0.00	0.36
Impervious Cover (acres)	0.00	0.52	0.00	0.00	0.52
Total:	0.00	0.88	0.00	0.00	0.88

Rv Coefficients

Land Cover Type	HSG A Soils	HSG B Soils	HSG C Soils	HSG D Soils
Forest/Preserved Open Space	0.00	0.00	0.00	0.00
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

Land Cover Summary

Forest/Preserved Open Space (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf (acres)	0.36
Weighted Rv(turf)	0.20
% Managed Turf	41%
Impervious Cover (acres)	0.52
Rv(impervious)	0.95
% Impervious	59%
Site Area (acres)	0.88
Site Rv	**0.64**

Development Credits (Select all that apply)

Is the proposed development:	
a) Redevelopment?	No
b) Brownfield redevelopment?	No
c) High density (>7 units per acre)?	No
d) Vertical Density, (Floor to Area Ratio (FAR) of 2 or >18 units per acre)?	No
e) Mixed use or Transit Oriented Development (within 1/2 mile of transit)?	No
Total Credits (inches)	**0**

Runoff Reduction Rainfall Event (inches)	1.00
Target Runoff Reduction Volume, RRv (acre-feet)	0.05
Target Runoff Reduction Volume, RRv (cubic feet)	2,047

West Virginia MS4 Stormwater Compliance Spreadsheet v2.0; April 2013

Drainage Area A

Drainage Area A Post-Development Land Cover (acres)

Land Cover Type	HSG A soils	HSG B Soils	HSG C Soils	HSG D Soils	Totals
Forest/Preserved Open Space	0.00	0.00	0.00	0.00	0.00
Managed Turf	0.00	0.36	0.00	0.00	0.36
Impervious Cover	0.00	0.43	0.00	0.00	0.43
				Total	0.79
Rv(drainage area)	0.60				
Rv(turf)	0.20				
Rv(impervious)	0.95				

RRv Achieved for Drainage Area A (cubic feet): 1733
RRv Balance for Drainage Area A (cubic feet): 0
RRv Balance for Total Site (cubic feet): 0

Apply Runoff Reduction Practices

Runoff Reduction Practice	Impervious Cover in Contributing Drainage Area (acres)	Managed Turf in Contributing Drainage Area (acres)	Volume Received by Practice (cubic feet)	Description of Credit	% Credit	Volume Received from Upstream Practices (cubic feet)	Total Volume Received by Practice (cubic feet)	Disconnection Area of Practice (square feet)	Storage Volume Provided by Practice (cubic feet)	Runoff Reduction (cubic feet)	Remaining Volume (cubic feet)	Downstream Practice
1. Vegetated Roof (4.2.9)												
Vegetated Roof		N/A	0	Reduce volume conveyed through green roof by 100%.	100%	N/A	0	N/A		0	0	
2. Impervious Surface Disconnection/Rooftop Practices												
Simple Disconnection to A/B Soils or Soil-Amended Filter Path in C/D Soils (4.2.2, Appendix D)		N/A	0	Reduce volume conveyed to conservation area by 4 cu. ft per each 100 sq. ft. of pervious receiving area.	N/A	0	0		N/A	0	0	
Simple Disconnection to C/D Soils (4.2.2)		N/A	0	Reduce volume conveyed to conservation area by 2 cu. ft per each 100 sq. ft. of pervious receiving area.	N/A	0	0		N/A	0	0	
To Residential Rain Garden (4.2.3.C)		N/A	0	60% volume reduction for the Design Volume of the practice	60%	0	0	N/A		0	0	
To Rainwater Harvesting (4.2.8)		N/A	0	Subtract a variable % of the provided Design Volume based on annual beneficial use (see Cistern Design Spreadsheet).		0	0	N/A		0	0	
3. Permeable Pavement (4.2.4)												
Permeable Pavement, Level 1		N/A	0	Subtract 45% of the provided storage volume	45%	N/A	0	N/A		0	0	
Permeable Pavement, Level 2 (infiltration)		N/A	0	Subtract 100% of the provided storage volume	100%	N/A	0	N/A		0	0	
Permeable Pavement, Level 2 (infiltration & underdrain)		N/A	0	Subtract 100% of the provided storage volume of sump and 45% of the provided storage volume in reservoir layer.		N/A	0	N/A		0	0	
4. Grass Swale (4.2.5)												
Grass Swale A/B Soils			0	Reduce volume conveyed through grass swale by 0.2 inches.	0.2	0	0	N/A	N/A	0	0	
Grass Swale C/D Soils			0	Reduce volume conveyed through grass swale by 0.1 inches.	0.1	0	0	N/A	N/A	0	0	
Grass Swale in C/D Soil with Soil Amendments			0	Reduce volume conveyed through grass swale by 0.2 inches.	0.2	0	0	N/A	N/A	0	0	
5. Water Quality Swale (4.2.3.A)												
Water Quality Swale, Level 1			0	Subtract 55% of the provided storage volume.	55%	0	0	N/A		0	0	
Water Quality Swale, Level 2			0	Subtract 100% of the provided storage volume.	100%	0	0	N/A		0	0	
6. Bioretention (4.2.3)												
Bioretention, Level 1 or Urban Bioretention (4.2.3.B)	0.43	0.36	1733	Subtract 60% of the provided storage volume.	60%	0	1733	N/A	2900	1733	0	
Bioretention, Level 2			0	Subtract 100% of the provided storage volume.	100%	0	0	N/A		0	0	
7. Infiltration (4.2.6) or Regenerative Stormwater Conveyance (4.2.7)												
Infiltration			0	Subtract 100% of the provided storage volume.	100%	0	0	N/A		0	0	
8. Filtration Practice (4.2.10) or Stormwater Wetland (4.2.11)*												
*Filtration Practice/Stormwater Wetland do NOT receive runoff reduction values, but do have associated pollutant removal values			0	0% runoff reduction	0%	0	0	N/A	0	0	0	
9. Sheetflow to Filter/Conservation Area (4.2.1												
Sheetflow to Conservation Area with A/B Soils			0	Reduce volume conveyed to conservation area by 9 cu. ft per each 100 sq. ft. of conservation area.	N/A	0	0		N/A	0	0	
Sheetflow to Conservation Area with C/D Soils			0	Reduce volume conveyed to conservation area by 4 cu. ft per each 100 sq. ft. of conservation area.	N/A	0	0		N/A	0	0	
Sheetflow to Vegetated Filter Strip in A/B Soils or Compost Amended C/D Soils			0	Reduce volume conveyed to conservation area by 6 cu. ft per each 100 sq. ft. of filter strip.	N/A	0	0		N/A	0	0	
Sheet flow to Vegetated Filter Strip in C/D Soils			0	Reduce volume conveyed to conservation area by 3 cu. ft per each 100 sq. ft. of filter strip.	N/A	0	0		N/A	0	0	
Totals	**0.43**	**0.36**										

Runoff Reduction Volume Achieved for Drainage Area A: 1733 — See Runoff Reduction Summary Tab for Detailed Results

Runoff Reduction Volume Balance for Total Site: 0

West Virginia MS4 Stormwater Compliance Spreadsheet v2.0; April 2013

Drainage Area B

Drainage Area B Post-Development Land Cover (acres)

Land Cover Type	HSG A soils	HSG B Soils	HSG C Soils	HSG D Soils	Totals
Forest/Preserved Open Space	0.00	0.00	0.00	0.00	0.00
Managed Turf	0.00	0.00	0.00	0.00	0.00
Impervious Cover	0.00	0.09	0.00	0.00	0.09
				Total	0.09

Rv(drainage area)	0.95
Rv(turf)	0.00
Rv(impervious)	0.95

RRv Achieved for Drainage Area B (cubic feet)	314
RRv Balance for Drainage Area B (cubic feet)	0
RRv Balance for Total Site (cubic feet)	0

Apply Runoff Reduction Practices

Runoff Reduction Practice	Impervious Cover in Contributing Drainage Area (acres)	Managed Turf in Contributing Drainage Area (acres)	Volume Received by Practice (cubic feet)	Description of Credit	% Credit	Volume Received from Upstream Practices (cubic feet)	Total Volume Received by Practice (cubic feet)	Disconnection Area of Practice (square feet)	Storage Volume Provided by Practice (cubic feet)	Runoff Reduction (cubic feet)	Remaining Volume (cubic feet)	Downstream Practice		
1. Vegetated Roof (4.2.9)														
Vegetated Roof		N/A	0	Reduce volume conveyed through green roof by 100%.	100%	N/A	0	N/A		0	0			
2. Impervious Surface Disconnection/Rooftop Practices														
Simple Disconnection to A/B Soils or Soil-Amended Filter Path in C/D Soils (4.2.2, Appendix D)		N/A	0	Reduce volume conveyed to conservation area by 4 cu. ft per each 100 sq. ft. of pervious receiving area.	N/A	0	0		N/A	0	0			
Simple Disconnection to C/D Soils (4.2.2)		N/A	0	Reduce volume conveyed to conservation area by 2 cu. ft per each 100 sq. ft. of pervious receiving area.	N/A	0	0		N/A	0	0			
To Residential Rain Garden (4.2.3.C)		N/A	0	60% volume reduction for the Design Volume of the practice	60%	0	0	N/A		0	0			
To Rainwater Harvesting (4.2.8)		N/A	0	Subtract a variable % of the provided Design Volume based on annual beneficial use (see Cistern Design Spreadsheet).		0	0	N/A		0	0			
3. Permeable Pavement (4.2.4)													Storage Volume Provided by Sump Below Underdrain (cubic feet)	Storage Volume Provided by Reservoir Layer Above Underdrain (cubic feet)
Permeable Pavement, Level 1		N/A	0	Subtract 45% of the provided storage volume	45%	N/A	0	N/A		0	0			
Permeable Pavement, Level 2 (infiltration)		N/A	0	Subtract 100% of the provided storage volume	100%	N/A	0	N/A		0	0			
Permeable Pavement, Level 2 (infiltration & underdrain)		N/A	0	Subtract 100% of the provided storage volume of sump and 45% of the provided storage volume in reservoir layer.		N/A	0	N/A		0	0			
4. Grass Swale (4.2.5)													Water volume associated with contributing area (cubic feet)	
Grass Swale A/B Soils			0	Reduce volume conveyed through grass swale by 0.2 inches.	0.2	0	0	N/A	N/A	0	0		0	
Grass Swale C/D Soils			0	Reduce volume conveyed through grass swale by 0.1 inches.	0.1	0	0	N/A	N/A	0	0		0	
Grass Swale in C/D Soil with Soil Amendments			0	Reduce volume conveyed through grass swale by 0.2 inches.	0.2	0	0	N/A	N/A	0	0		0	
5. Water Quality Swale (4.2.3.A)														
Water Quality Swale, Level 1			0	Subtract 55% of the provided storage volume.	55%	0	0	N/A		0	0			
Water Quality Swale, Level 2			0	Subtract 100% of the provided storage volume.	100%	0	0	N/A		0	0			
6. Bioretention (4.2.3)														
Bioretention, Level 1 or Urban Bioretention (4.2.3.B)	0.09	0.00	314	Subtract 60% of the provided storage volume.	60%	0	314	N/A	540	314	0			
Bioretention, Level 2			0	Subtract 100% of the provided storage volume.	100%	0	0	N/A		0	0			
7. Infiltration (4.2.6) or Regenerative Stormwater Conveyance (4.2.7)														
Infiltration			0	Subtract 100% of the provided storage volume.	100%	0	0	N/A		0	0			
8. Filtration Practice (4.2.10) or Stormwater Wetland (4.2.11)*														
*Filtration Practice/Stormwater Wetland do NOT receive runoff reduction values, but do have associated pollutant removal values			0	0% runoff reduction	0%	0	0	N/A	0	0	0			
9. Sheetflow to Filter/Conservation Area (4.2.1														
Sheetflow to Conservation Area with A/B Soils			0	Reduce volume conveyed to conservation area by 9 cu. ft per each 100 sq. ft. of conservation area.	N/A	0	0		N/A	0	0			
Sheetflow to Conservation Area with C/D Soils			0	Reduce volume conveyed to conservation area by 4 cu. ft per each 100 sq. ft. of conservation area.	N/A	0	0		N/A	0	0			
Sheetflow to Vegetated Filter Strip in A/B Soils or Compost Amended C/D Soils			0	Reduce volume conveyed to conservation area by 6 cu. ft per each 100 sq. ft. of filter strip.	N/A	0	0		N/A	0	0			
Sheet flow to Vegetated Filter Strip in C/D Soils			0	Reduce volume conveyed to conservation area by 3 cu. ft per each 100 sq. ft. of filter strip.	N/A	0	0		N/A	0	0			
Totals	**0.09**	**0.00**												

Runoff Reduction Volume Achieved for Drainage Area A: **314**

Runoff Reduction Volume Balance for Total Site **0**

See Runoff Reduction Summary Tab for Detailed Results

West Virginia MS4 Stormwater Compliance Spreadsheet v2.0; April 2013		
Stormwater Runoff Reduction Summary		
Target Runoff Reduction Volume, RRv (cubic feet)	2,047	
Runoff Reduction Achieved (cubic feet)	2,047	
Runoff Reduction Volume Remaining (cubic feet)	0	
1.5:1 Mitigation Runoff Volume (cubic feet)	0	
2:1 Mitigation Runoff Volume (cubic feet)	0	
Total Mitigation Runoff Volume Required (cubic feet)	0	

WV MS4 Stormwater Compliance Spreadsheet v2.0; April 2013		1-year storm	2-year storm	10-year storm		
Target Rainfall Event (in)		2.70	2.87	4.17		
Drainage Area A						
Drainage Area (acres)	0.79					
Storage Volume Provided By Runoff Reduction Practices (cf)	2,900					
Drainage Area B						
Drainage Area (acres)	0.09					
Storage Volume Provided By Runoff Reduction Practices (cf)	540					
Drainage Area C						
Drainage Area (acres)	0.00					
Storage Volume Provided By Runoff Reduction Practices (cf)	0					
Drainage Area D						
Drainage Area (acres)	0.00					
Storage Volume Provided By Runoff Reduction Practices (cf)	0					
Drainage Area E						
Drainage Area (acres)	0.00					
Storage Volume Provided By Runoff Reduction Practices (cf)	0					

Based on the use of Runoff Reduction practices in the various drainage areas, the spreadsheet calculates an adjusted $RV_{Developed}$ and adjusted Curve Number.

Drainage Area A		A soils	B Soils	C Soils	D Soils	
Forest/Preserved Open Space	Area (acres)	0.0	0.0	0.0	0.0	
	CN	30	55	70	77	
Managed Turf	Area (acres)	0.0	0.4	0.0	0.0	
	CN	39	61	74	80	
Impervious Cover	Area (acres)	0.0	0.4	0.0	0.0	
	CN	98	98	98	98	
					Weighted CN	**S**
					81	2.35
		1-year storm	**2-year storm**	**10-year storm**		
$RV_{Developed}$ (in) with no Runoff Reduction		1.08	1.21	2.26		
$RV_{Developed}$ (in) with Runoff Reduction		0.07	0.20	1.25		
Adjusted CN for D.A. A		**52**	**57**	**67**		

Drainage Area B		A soils	B Soils	C Soils	D Soils	
Forest/Preserved Open Space	Area (acres)	0.0	0.0	0.0	0.0	
	CN	30	55	70	77	
Managed Turf	Area (acres)	0.0	0.0	0.0	0.0	
	CN	39	61	74	80	
Impervious Cover	Area (acres)	0.0	0.1	0.0	0.0	
	CN	98	98	98	98	
					Weighted CN	**S**
					98	0.20
		0	**0**	**0**		
$RV_{Developed}$ (in) with no Runoff Reduction		2.47	2.64	3.93		
$RV_{Developed}$ (in) with Runoff Reduction		0.83	1.00	2.30		
Adjusted CN for D.A. B		**76**	**77**	**81**		

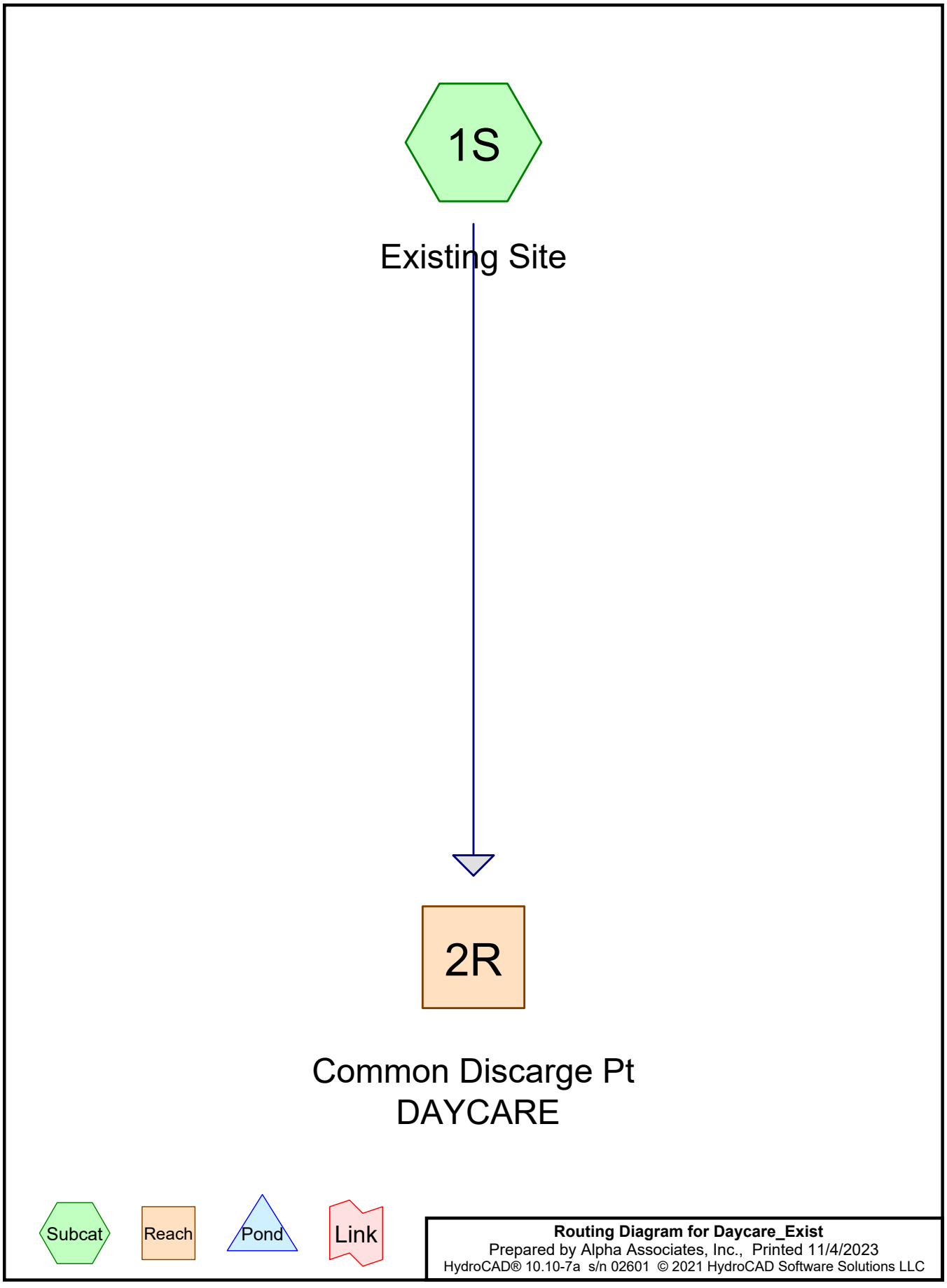
Drainage Area C		A soils	B Soils	C Soils	D Soils	
Forest/Preserved Open Space	Area (acres)	0.0	0.0	0.0	0.0	
	CN	30	55	70	77	
Managed Turf	Area (acres)	0.0	0.0	0.0	0.0	
	CN	39	61	74	80	
Impervious Cover	Area (acres)	0.0	0.0	0.0	0.0	
	CN	98	98	98	98	
					Weighted CN	**S**
					0	1000.00
		0	**0.426**	**0**		
$RV_{Developed}$ (in) with no Runoff Reduction		0.00	0.00	0.00		
$RV_{Developed}$ (in) with Runoff Reduction		0.00	0.00	0.00		
Adjusted CN for D.A. C		**0**	**0**	**0**		

Drainage Area D		A soils	B Soils	C Soils	D Soils	
Forest/Preserved Open Space	Area (acres)	0.0	0.0	0.0	0.0	
	CN	30	55	70	77	
Managed Turf	Area (acres)	0.0	0.0	0.0	0.0	
	CN	39	61	74	80	
Impervious Cover	Area (acres)	0.0	0.0	0.0	0.0	
	CN	98	98	98	98	
					Weighted CN	**S**
					0	1000.00
		0	**0.091**	**0**		
$RV_{Developed}$ (in) with no Runoff Reduction		0.00	0.00	0.00		
$RV_{Developed}$ (in) with Runoff Reduction		0.00	0.00	0.00		
Adjusted CN for D.A. D		**0**	**0**	**0**		

Drainage Area E		A soils	B Soils	C Soils	D Soils	
Forest/Preserved Open Space	Area (acres)	0.0	0.0	0.0	0.0	
	CN	30	55	70	77	
Managed Turf	Area (acres)	0.0	0.0	0.0	0.0	
	CN	39	61	74	80	
Impervious Cover	Area (acres)	0.0	0.0	0.0	0.0	
	CN	98	98	98	98	
					Weighted CN	**S**
					0	1000.00
		0	**0**	**0**		
$RV_{Developed}$ (in) with no Runoff Reduction		0.00	0.00	0.00		
$RV_{Developed}$ (in) with Runoff Reduction		0.00	0.00	0.00		
Adjusted CN for D.A. E		**0**	**0**	**0**		

APPENDIX E

STORMWATER QUANTITY STUDY, PRE- CONSTRUCTION EVALUATION, POST- CONSTRUCTION EVALUATION


1S
Existing Site
2R
Common Discarge Pt
DAYCARE
Subcat
Reach
Pond
Link
Routing Diagram for Daycare_Exist
Prepared by Alpha Associates, Inc., Printed 11/4/2023
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.107	61	Pasture/grassland/range, Good, HSG B (1S)
1.107	**61**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.107	HSG B	1S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.107		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	1.107	0.000	0.000	0.000	1.107	Pasture/grassland/range, Good	1S
0.000	**1.107**	**0.000**	**0.000**	**0.000**	**1.107**	**TOTAL AREA**	

Summary for Subcatchment 1S: Existing Site

Runoff = 1.15 cfs @ 12.18 hrs, Volume= 0.083 af, Depth= 0.90"
Routed to Reach 2R : Common Discarge Pt DAYCARE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-96.00 hrs, dt= 0.01 hrs
NOAA 24-hr B 10-Year Rainfall=4.17"

Area (sf)	CN	Description
48,235	61	Pasture/grassland/range, Good, HSG B
48,235		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	85	0.0220	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.87"
0.6	125	0.0560	3.55		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.3	210	Total			

Summary for Reach 2R: Common Discarge Pt DAYCARE

Inflow Area = 1.107 ac, 0.00% Impervious, Inflow Depth = 0.90" for 10-Year event
Inflow = 1.15 cfs @ 12.18 hrs, Volume= 0.083 af
Outflow = 1.15 cfs @ 12.18 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-96.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 1S: Existing Site

Runoff = 3.45 cfs @ 12.17 hrs, Volume= 0.223 af, Depth= 2.42"
Routed to Reach 2R : Common Discarge Pt DAYCARE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-96.00 hrs, dt= 0.01 hrs
NOAA 24-hr B 100-Year Rainfall=6.60"

Area (sf)	CN	Description
48,235	61	Pasture/grassland/range, Good, HSG B
48,235		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	85	0.0220	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.87"
0.6	125	0.0560	3.55		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
9.3	210	Total			

Summary for Reach 2R: Common Discarge Pt DAYCARE

Inflow Area = 1.107 ac, 0.00% Impervious, Inflow Depth = 2.42" for 100-Year event
Inflow = 3.45 cfs @ 12.17 hrs, Volume= 0.223 af
Outflow = 3.45 cfs @ 12.17 hrs, Volume= 0.223 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-96.00 hrs, dt= 0.01 hrs

Events for Subcatchment 1S: Existing Site

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
10-Year	4.17	1.15	0.083	0.90
100-Year	**6.60**	**3.45**	**0.223**	**2.42**

Events for Reach 2R: Common Discarge Pt DAYCARE

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
10-Year	1.15	1.15	**0.00**	**0**
100-Year	**3.45**	**3.45**	0.00	0

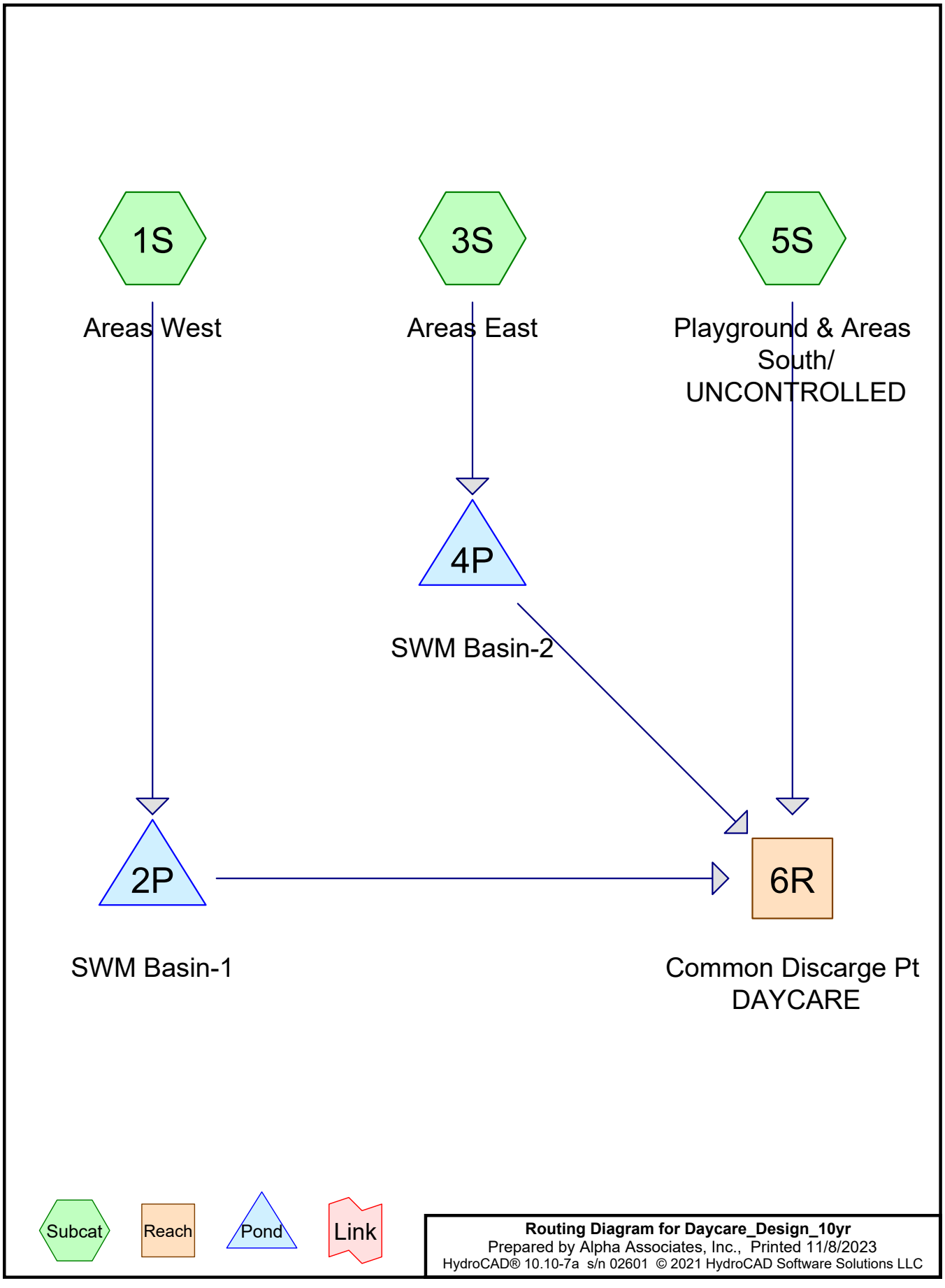
TABLE OF CONTENTS

Project Reports
1 Routing Diagram
2 Area Listing (all nodes)
3 Soil Listing (all nodes)
4 Ground Covers (all nodes)

10-Year Event
5 Subcat 1S: Existing Site
6 Reach 2R: Common Discarge Pt DAYCARE

100-Year Event
7 Subcat 1S: Existing Site
8 Reach 2R: Common Discarge Pt DAYCARE

Multi-Event Tables
9 Subcat 1S: Existing Site
10 Reach 2R: Common Discarge Pt DAYCARE



Routing Diagram for Daycare_Design_10yr
Prepared by Alpha Associates, Inc., Printed 11/8/2023
HydroCAD® 10.10-7a s/n 02601 © 2021 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.227	61	>75% Grass cover, Good, HSG B (5S)
0.790	67	CN Modified per MS4 (10yr) (1S)
0.091	81	CN Modified per MS4 (10yr) (3S)
1.108	**67**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.227	HSG B	5S
0.000	HSG C	
0.000	HSG D	
0.881	Other	1S, 3S
1.108		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.227	0.000	0.000	0.000	0.227	>75% Grass cover, Good	5S
0.000	0.000	0.000	0.000	0.881	0.881	CN Modified per MS4 (10yr)	1S, 3S
0.000	**0.227**	**0.000**	**0.000**	**0.881**	**1.108**	**TOTAL AREA**	

Summary for Subcatchment 1S: Areas West

Runoff = 1.11 cfs @ 12.21 hrs, Volume= 0.082 af, Depth= 1.25"
Routed to Pond 2P : SWM Basin-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=4.17"

	Area (sf)	CN	Description
*	34,418	67	CN Modified per MS4 (10yr)
	34,418		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0220	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.87"
1.8	112	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
11.8	212	Total			

Summary for Subcatchment 3S: Areas East

Runoff = 0.34 cfs @ 12.05 hrs, Volume= 0.017 af, Depth= 2.27"
Routed to Pond 4P : SWM Basin-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=4.17"

	Area (sf)	CN	Description
*	3,978	81	CN Modified per MS4 (10yr)
	3,978		100.00% Pervious Area

Summary for Subcatchment 5S: Playground & Areas South/ UNCONTROLLED

Runoff = 0.21 cfs @ 12.22 hrs, Volume= 0.017 af, Depth= 0.90"
Routed to Reach 6R : Common Discarge Pt DAYCARE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 10-Year Rainfall=4.17"

Area (sf)	CN	Description
9,882	61	>75% Grass cover, Good, HSG B
9,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	100	0.0150	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.87"
0.8	85	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.4	185	Total			

Summary for Reach 6R: Common Discarge Pt DAYCARE

Inflow Area = 1.108 ac, 0.00% Impervious, Inflow Depth > 0.83" for 10-Year event
Inflow = 0.24 cfs @ 12.23 hrs, Volume= 0.077 af
Outflow = 0.24 cfs @ 12.23 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: SWM Basin-1

Inflow Area = 0.790 ac, 0.00% Impervious, Inflow Depth = 1.25" for 10-Year event
Inflow = 1.11 cfs @ 12.21 hrs, Volume= 0.082 af
Outflow = 0.02 cfs @ 23.25 hrs, Volume= 0.042 af, Atten= 98%, Lag= 662.3 min
Primary = 0.02 cfs @ 23.25 hrs, Volume= 0.042 af
Routed to Reach 6R : Common Discarge Pt DAYCARE

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 488.64' @ 23.25 hrs Surf.Area= 2,603 sf Storage= 2,940 cf

Plug-Flow detention time= 1,049.6 min calculated for 0.042 af (51% of inflow)
Center-of-Mass det. time= 929.2 min (1,787.5 - 858.3)

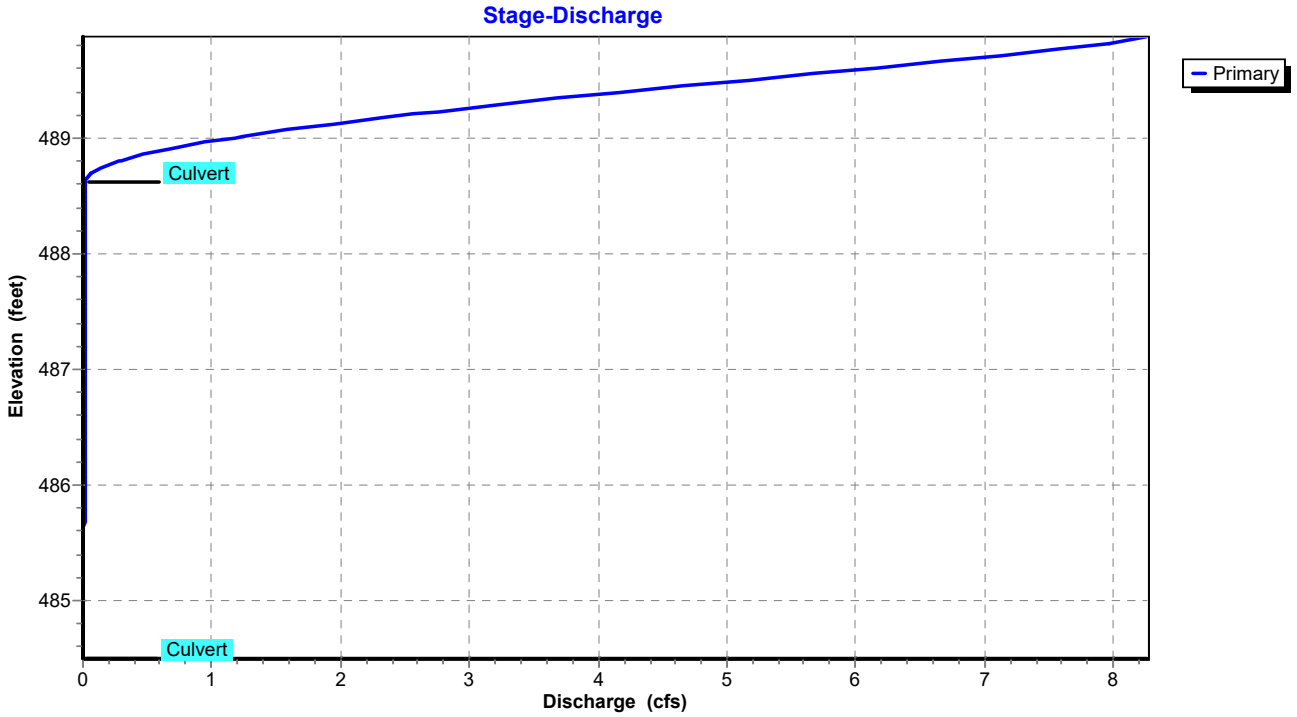
Volume	Invert	Avail.Storage	Storage Description
#1	484.50'	4,755 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
484.50	1,610	0.0	0	0
485.50	1,620	40.0	646	646
488.00	1,628	25.0	1,015	1,661
488.20	1,672	100.0	330	1,991
488.40	2,152	100.0	382	2,373
488.60	2,525	100.0	468	2,841
488.80	2,927	100.0	545	3,386
489.00	3,357	100.0	628	4,015
489.20	4,046	100.0	740	4,755

Device	Routing	Invert	Outlet Devices
#1	Primary	488.62'	**15.0" Round Culvert X 2.00** L= 104.8' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 488.62' / 487.97' S= 0.0062 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Primary	484.50'	**1.5" Round Culvert** L= 165.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 484.50' / 484.30' S= 0.0012 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.01 sf

Primary OutFlow Max=0.02 cfs @ 23.25 hrs HW=488.64' (Free Discharge)
1=Culvert (Barrel Controls 0.00 cfs @ 0.51 fps)
2=Culvert (Barrel Controls 0.01 cfs @ 1.17 fps)

Pond 2P: SWM Basin-1



Summary for Pond 4P: SWM Basin-2

Inflow Area = 0.091 ac, 0.00% Impervious, Inflow Depth = 2.27" for 10-Year event
Inflow = 0.34 cfs @ 12.05 hrs, Volume= 0.017 af
Outflow = 0.03 cfs @ 12.98 hrs, Volume= 0.017 af, Atten= 92%, Lag= 56.1 min
Primary = 0.03 cfs @ 12.98 hrs, Volume= 0.017 af
Routed to Reach 6R : Common Discarge Pt DAYCARE

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 488.18' @ 12.98 hrs Surf.Area= 330 sf Storage= 364 cf

Plug-Flow detention time= 149.8 min calculated for 0.017 af (100% of inflow)
Center-of-Mass det. time= 149.1 min (961.6 - 812.5)

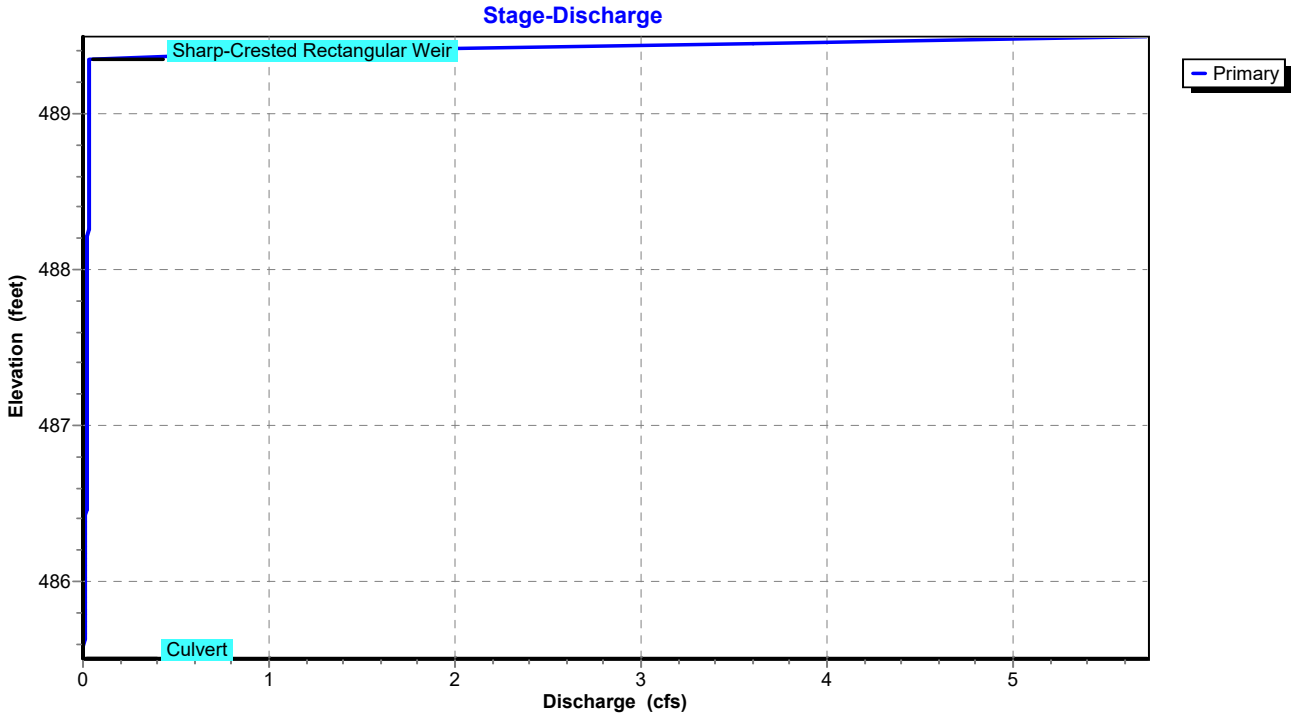
Volume	Invert	Avail.Storage	Storage Description
#1	485.50'	865 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
485.50	328	0.0	0	0
486.00	329	25.0	41	41
488.50	330	45.0	371	412
488.60	354	100.0	34	446
488.80	403	100.0	76	522
489.00	454	100.0	86	607
489.20	493	100.0	95	702
489.35	537	100.0	77	779
489.50	600	100.0	85	865

Device	Routing	Invert	Outlet Devices
#1	Primary	489.35'	**30.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	485.50'	**1.5" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 485.50' / 485.30' S= 0.0067 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.01 sf

Primary OutFlow Max=0.03 cfs @ 12.98 hrs HW=488.18' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)
2=Culvert (Barrel Controls 0.03 cfs @ 2.17 fps)

Pond 4P: SWM Basin-2



Events for Subcatchment 1S: Areas West

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
10-Year	**4.17**	**1.11**	**0.082**	**1.25**

Events for Subcatchment 3S: Areas East

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
10-Year	**4.17**	**0.34**	**0.017**	**2.27**

Events for Subcatchment 5S: Playground & Areas South/ UNCONTROLLED

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
10-Year	**4.17**	**0.21**	**0.017**	**0.90**

Events for Reach 6R: Common Discarge Pt DAYCARE

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
10-Year	**0.24**	**0.24**	**0.00**	**0**

Events for Pond 2P: SWM Basin-1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
10-Year	**1.11**	**0.02**	**488.64**	**2,940**

Events for Pond 4P: SWM Basin-2

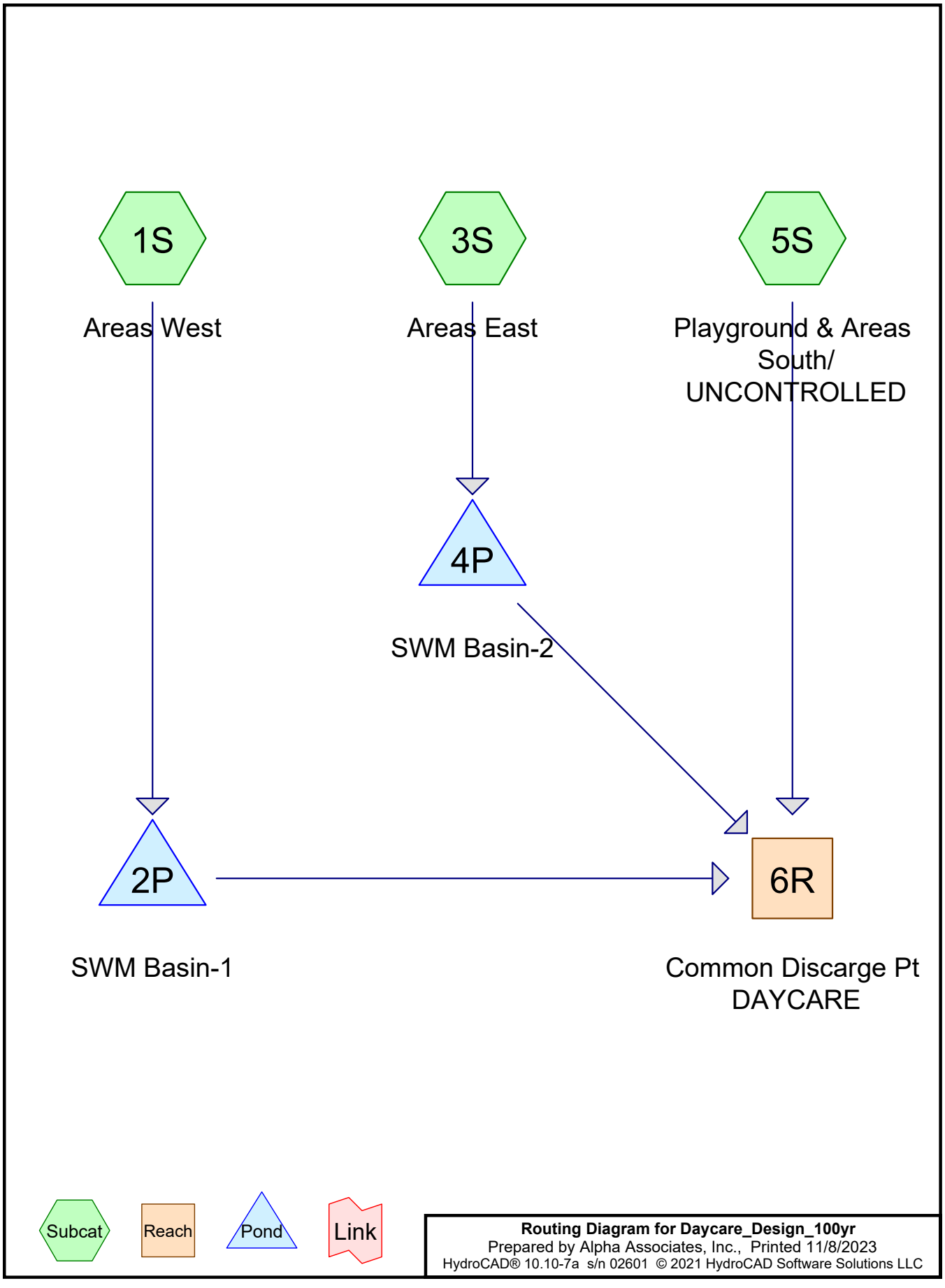
Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
10-Year	**0.34**	**0.03**	**488.18**	**364**

TABLE OF CONTENTS

Project Reports
1 Routing Diagram
2 Area Listing (all nodes)
3 Soil Listing (all nodes)
4 Ground Covers (all nodes)

10-Year Event
5 Subcat 1S: Areas West
6 Subcat 3S: Areas East
7 Subcat 5S: Playground & Areas South/ UNCONTROLLED
8 Reach 6R: Common Discarge Pt DAYCARE
9 Pond 2P: SWM Basin-1
11 Pond 4P: SWM Basin-2

Multi-Event Tables
13 Subcat 1S: Areas West
14 Subcat 3S: Areas East
15 Subcat 5S: Playground & Areas South/ UNCONTROLLED
16 Reach 6R: Common Discarge Pt DAYCARE
17 Pond 2P: SWM Basin-1
18 Pond 4P: SWM Basin-2



Routing Diagram for Daycare_Design_100yr
Prepared by Alpha Associates, Inc., Printed 11/8/2023
HydroCAD® 10.10-7a s/n 02601 © 2021 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.591	61	>75% Grass cover, Good, HSG B (1S, 5S)
0.326	98	Paved parking, HSG B (1S)
0.091	98	Roofs, HSG B (3S)
0.100	98	Unconnected roofs, HSG B (1S)
1.108	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.108	HSG B	1S, 3S, 5S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
1.108		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.591	0.000	0.000	0.000	0.591	>75% Grass cover, Good	1S, 5S
0.000	0.326	0.000	0.000	0.000	0.326	Paved parking	1S
0.000	0.091	0.000	0.000	0.000	0.091	Roofs	3S
0.000	0.100	0.000	0.000	0.000	0.100	Unconnected roofs	1S
0.000	**1.108**	**0.000**	**0.000**	**0.000**	**1.108**	**TOTAL AREA**	

Summary for Subcatchment 1S: Areas West

Runoff = 4.07 cfs @ 12.20 hrs, Volume= 0.292 af, Depth= 4.43"
Routed to Pond 2P : SWM Basin-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=6.60"

Area (sf)	CN	Description
14,210	98	Paved parking, HSG B
2,443	61	>75% Grass cover, Good, HSG B
11,097	61	>75% Grass cover, Good, HSG B
265	61	>75% Grass cover, Good, HSG B
392	61	>75% Grass cover, Good, HSG B
455	61	>75% Grass cover, Good, HSG B
1,216	61	>75% Grass cover, Good, HSG B
4,340	98	Unconnected roofs, HSG B
34,418	81	Weighted Average
15,868		46.10% Pervious Area
18,550		53.90% Impervious Area
4,340		23.40% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0220	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.87"
1.8	112	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
11.8	212	Total			

Summary for Subcatchment 3S: Areas East

Runoff = 0.80 cfs @ 12.04 hrs, Volume= 0.048 af, Depth> 6.36"
Routed to Pond 4P : SWM Basin-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=6.60"

Area (sf)	CN	Description
3,978	98	Roofs, HSG B
3,978		100.00% Impervious Area

Summary for Subcatchment 5S: Playground & Areas South/ UNCONTROLLED

Runoff = 0.63 cfs @ 12.21 hrs, Volume= 0.046 af, Depth= 2.42"
Routed to Reach 6R : Common Discarge Pt DAYCARE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
NOAA 24-hr B 100-Year Rainfall=6.60"

Area (sf)	CN	Description
9,882	61	>75% Grass cover, Good, HSG B
9,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	100	0.0150	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.87"
0.8	85	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
12.4	185	Total			

Summary for Reach 6R: Common Discarge Pt DAYCARE

Inflow Area = 1.108 ac, 46.66% Impervious, Inflow Depth > 3.74" for 100-Year event
Inflow = 3.20 cfs @ 12.31 hrs, Volume= 0.345 af
Outflow = 3.20 cfs @ 12.31 hrs, Volume= 0.345 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: SWM Basin-1

Inflow Area = 0.790 ac, 53.90% Impervious, Inflow Depth = 4.43" for 100-Year event
Inflow = 4.07 cfs @ 12.20 hrs, Volume= 0.292 af
Outflow = 2.56 cfs @ 12.33 hrs, Volume= 0.251 af, Atten= 37%, Lag= 8.0 min
Primary = 2.56 cfs @ 12.33 hrs, Volume= 0.251 af
Routed to Reach 6R : Common Discarge Pt DAYCARE

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 489.20' @ 12.33 hrs Surf.Area= 4,044 sf Storage= 4,752 cf

Plug-Flow detention time= 256.0 min calculated for 0.251 af (86% of inflow)
Center-of-Mass det. time= 198.1 min (1,004.9 - 806.9)

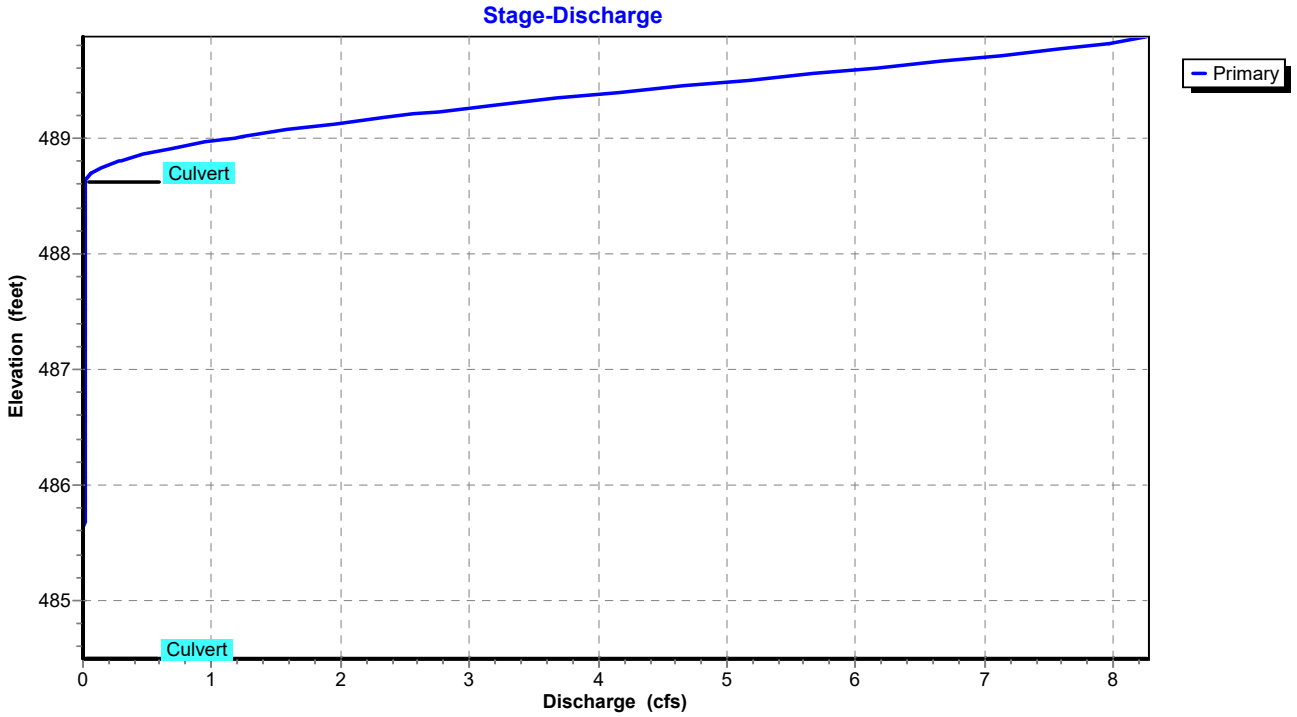
Volume	Invert	Avail.Storage	Storage Description
#1	484.50'	4,755 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
484.50	1,610	0.0	0	0
485.50	1,620	40.0	646	646
488.00	1,628	25.0	1,015	1,661
488.20	1,672	100.0	330	1,991
488.40	2,152	100.0	382	2,373
488.60	2,525	100.0	468	2,841
488.80	2,927	100.0	545	3,386
489.00	3,357	100.0	628	4,015
489.20	4,046	100.0	740	4,755

Device	Routing	Invert	Outlet Devices
#1	Primary	488.62'	**15.0" Round Culvert X 2.00** L= 104.8' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 488.62' / 487.97' S= 0.0062 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Primary	484.50'	**1.5" Round Culvert** L= 165.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 484.50' / 484.30' S= 0.0012 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.01 sf

Primary OutFlow Max=2.54 cfs @ 12.33 hrs HW=489.20' (Free Discharge)
1=Culvert (Inlet Controls 2.53 cfs @ 2.28 fps)
2=Culvert (Barrel Controls 0.02 cfs @ 1.25 fps)

Pond 2P: SWM Basin-1



Summary for Pond 4P: SWM Basin-2

Inflow Area = 0.091 ac,100.00% Impervious, Inflow Depth > 6.36" for 100-Year event
Inflow = 0.80 cfs @ 12.04 hrs, Volume= 0.048 af
Outflow = 0.70 cfs @ 12.10 hrs, Volume= 0.048 af, Atten= 13%, Lag= 3.6 min
Primary = 0.70 cfs @ 12.10 hrs, Volume= 0.048 af
Routed to Reach 6R : Common Discarge Pt DAYCARE

Routing by Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 489.39' @ 12.12 hrs Surf.Area= 554 sf Storage= 802 cf

Plug-Flow detention time= 194.3 min calculated for 0.048 af (100% of inflow)
Center-of-Mass det. time= 194.3 min (932.5 - 738.1)

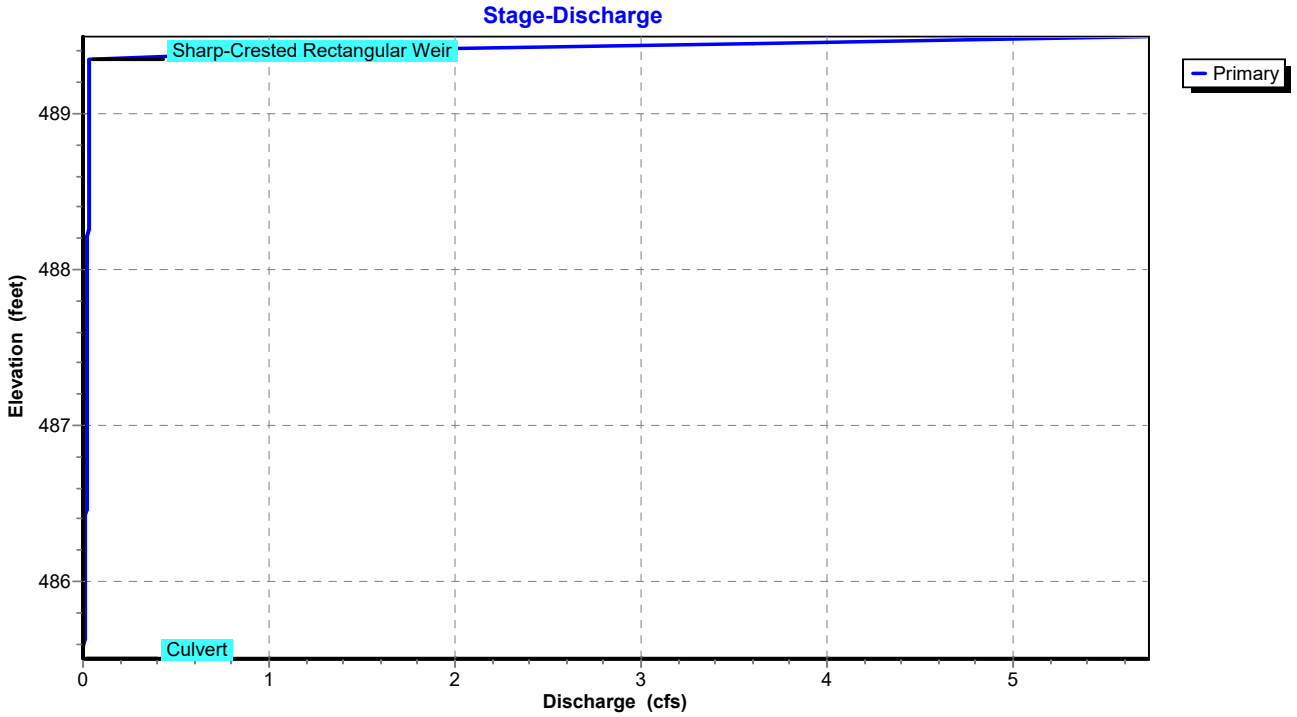
Volume	Invert	Avail.Storage	Storage Description
#1	485.50'	865 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
485.50	328	0.0	0	0
486.00	329	25.0	41	41
488.50	330	45.0	371	412
488.60	354	100.0	34	446
488.80	403	100.0	76	522
489.00	454	100.0	86	607
489.20	493	100.0	95	702
489.35	537	100.0	77	779
489.50	600	100.0	85	865

Device	Routing	Invert	Outlet Devices
#1	Primary	489.35'	**30.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	485.50'	**1.5" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 485.50' / 485.30' S= 0.0067 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.01 sf

Primary OutFlow Max=0.61 cfs @ 12.10 hrs HW=489.38' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 0.58 cfs @ 0.59 fps)
2=Culvert (Barrel Controls 0.03 cfs @ 2.61 fps)

Pond 4P: SWM Basin-2



Events for Subcatchment 1S: Areas West

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
100-Year	**6.60**	**4.07**	**0.292**	**4.43**

Events for Subcatchment 3S: Areas East

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
100-Year	**6.60**	**0.80**	**0.048**	**6.36**

Events for Subcatchment 5S: Playground & Areas South/ UNCONTROLLED

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
100-Year	**6.60**	**0.63**	**0.046**	**2.42**

Events for Reach 6R: Common Discarge Pt DAYCARE

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
100-Year	**3.20**	**3.20**	**0.00**	**0**

Events for Pond 2P: SWM Basin-1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
100-Year	**4.07**	**2.56**	**489.20**	**4,752**

Events for Pond 4P: SWM Basin-2

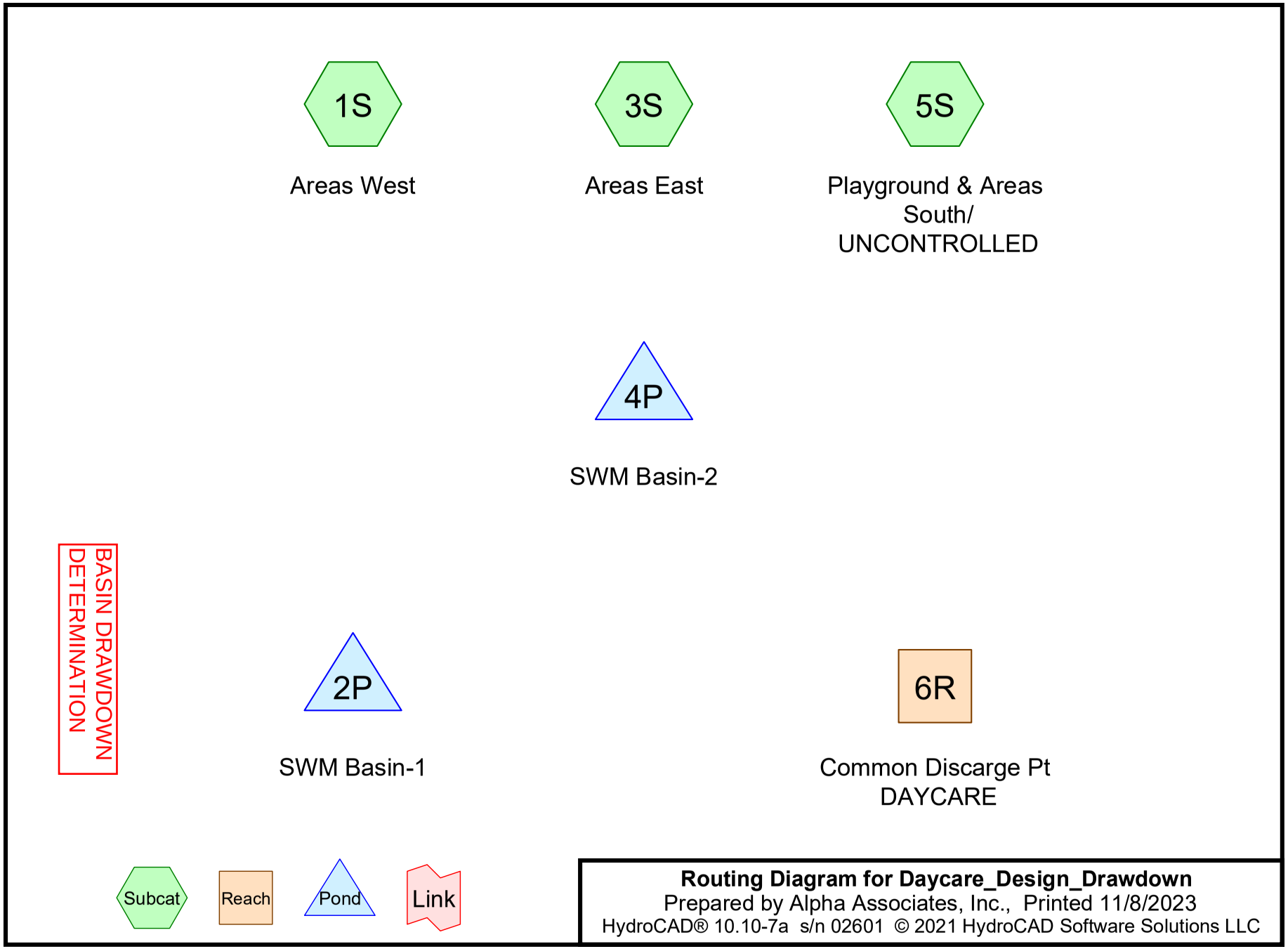
Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
100-Year	**0.80**	**0.70**	**489.39**	**802**

TABLE OF CONTENTS

Project Reports
1 Routing Diagram
2 Area Listing (all nodes)
3 Soil Listing (all nodes)
4 Ground Covers (all nodes)

100-Year Event
5 Subcat 1S: Areas West
6 Subcat 3S: Areas East
7 Subcat 5S: Playground & Areas South/ UNCONTROLLED
8 Reach 6R: Common Discarge Pt DAYCARE
9 Pond 2P: SWM Basin-1
11 Pond 4P: SWM Basin-2

Multi-Event Tables
13 Subcat 1S: Areas West
14 Subcat 3S: Areas East
15 Subcat 5S: Playground & Areas South/ UNCONTROLLED
16 Reach 6R: Common Discarge Pt DAYCARE
17 Pond 2P: SWM Basin-1
18 Pond 4P: SWM Basin-2



Routing Diagram for Daycare_Design_Drawdown
Prepared by Alpha Associates, Inc., Printed 11/8/2023
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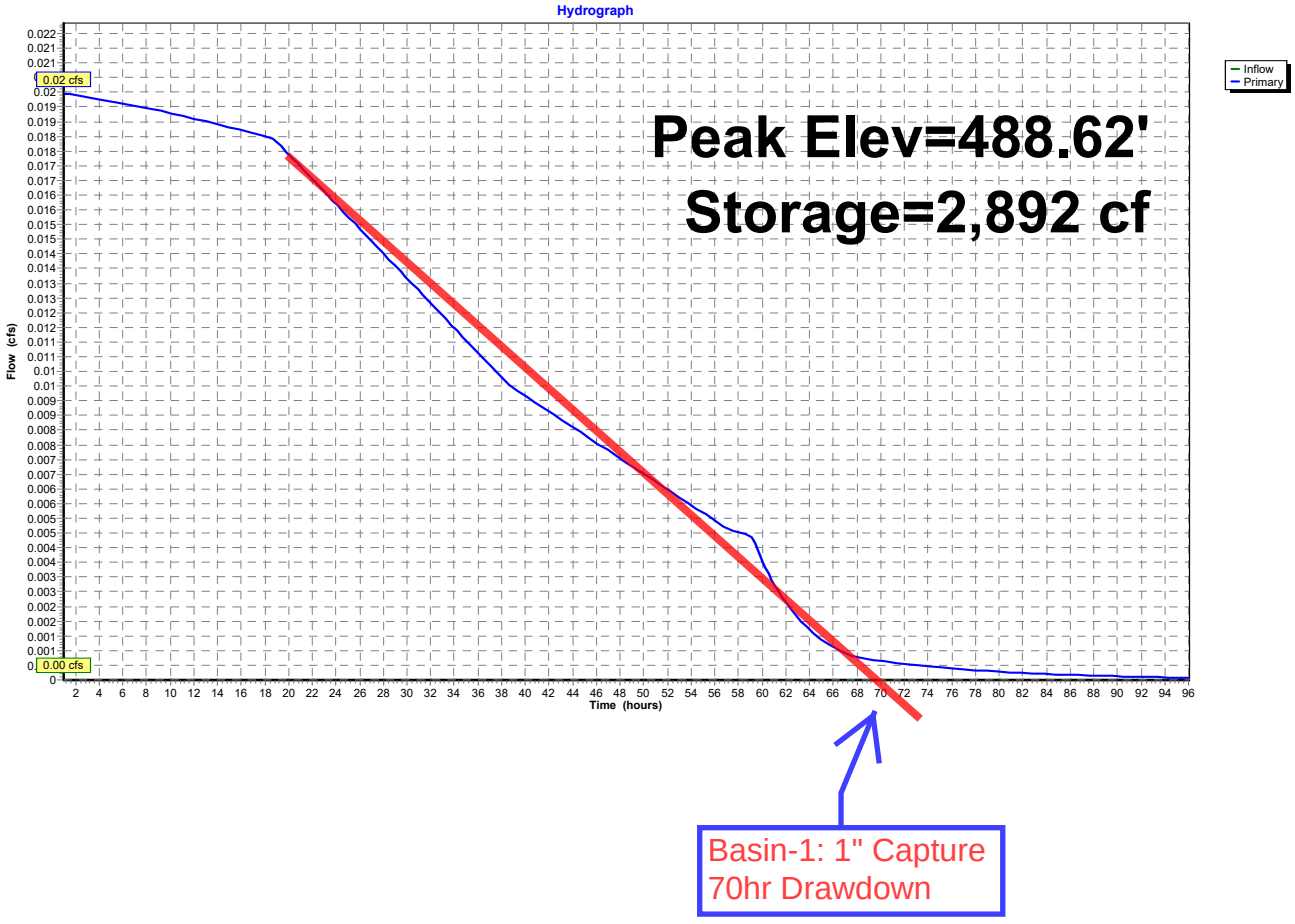
Pond 2P: SWM Pond-A



Summary for Pond 2P: SWM Pond-A

Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Outflow = 0.02 cfs @ 1.00 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min
Primary = 0.02 cfs @ 1.00 hrs, Volume= 0.066 af

Routing by Stor-Ind method, Time Span= 1.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 488.62' Surf.Area= 2,565 sf Storage= 2,892 cf
Peak Elev= 488.62' @ 1.00 hrs Surf.Area= 2,565 sf Storage= 2,892 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

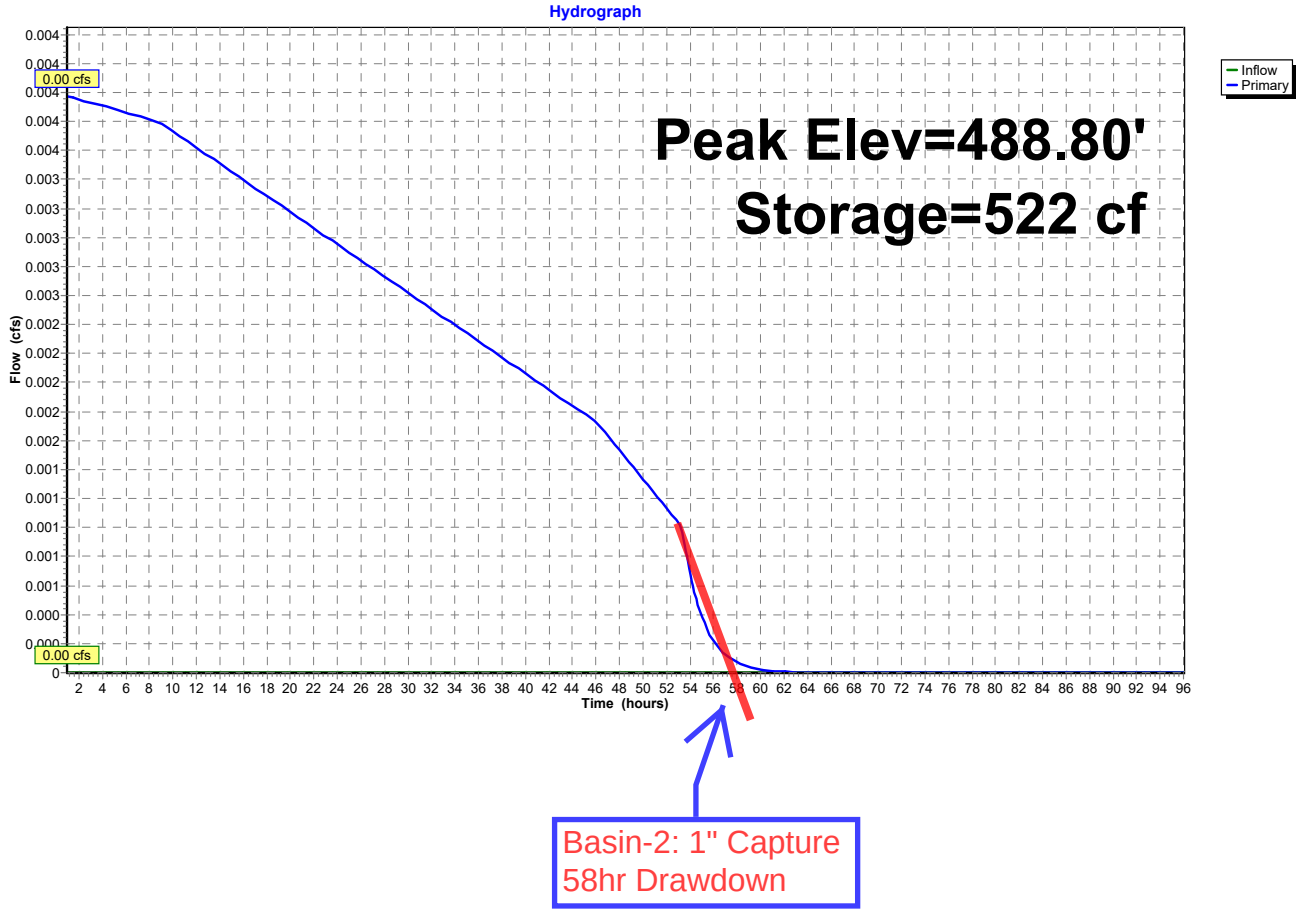
Volume	Invert	Avail.Storage	Storage Description
#1	484.50'	4,755 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
484.50	1,610	0.0	0	0
485.50	1,620	40.0	646	646
488.00	1,628	25.0	1,015	1,661
488.20	1,672	100.0	330	1,991
488.40	2,152	100.0	382	2,373
488.60	2,525	100.0	468	2,841
488.80	2,927	100.0	545	3,386
489.00	3,357	100.0	628	4,015
489.20	4,046	100.0	740	4,755

Device	Routing	Invert	Outlet Devices
#1	Primary	488.62'	**15.0" Round Culvert X 2.00** L= 104.8' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 488.62' / 487.97' S= 0.0062 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.23 sf
#2	Primary	484.50'	**1.7" Round Culvert** L= 165.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 484.50' / 484.30' S= 0.0012 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.02 sf

Primary OutFlow Max=0.02 cfs @ 1.00 hrs HW=488.62' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Culvert** (Barrel Controls 0.02 cfs @ 1.27 fps)

Pond 4P: SWM Pond-B



Summary for Pond 4P: SWM Pond-B

Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 1.00-96.00 hrs, dt= 0.01 hrs
Starting Elev= 488.80' Surf.Area= 403 sf Storage= 522 cf
Peak Elev= 488.80' @ 1.00 hrs Surf.Area= 403 sf Storage= 522 cf

Plug-Flow detention time= (not calculated: no plugs found)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	485.50'	865 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

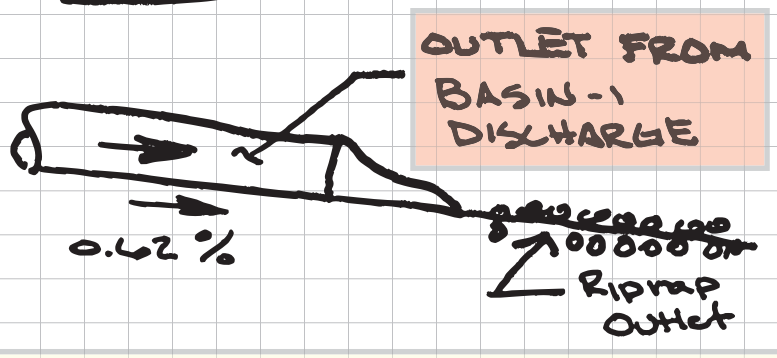
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
485.50	328	0.0	0	0
486.00	329	25.0	41	41
488.50	330	45.0	371	412
488.60	354	100.0	34	446
488.80	403	100.0	76	522
489.00	454	100.0	86	607
489.20	493	100.0	95	702
489.35	537	100.0	77	779
489.50	600	100.0	85	865

Device	Routing	Invert	Outlet Devices
#1	Primary	489.35'	**30.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Primary	485.50'	**0.7" Round Culvert** L= 30.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 485.50' / 485.30' S= 0.0067 '/' Cc= 0.900 n= 0.020 Corrugated PE, corrugated interior, Flow Area= 0.00 sf

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=488.80' (Free Discharge)
└**1=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└**2=Culvert** (Barrel Controls 0.00 cfs @ 1.49 fps)

- DETERMINE RIPRAP SIZE:

BASIN-1 OUTLET



$Q_{10} = 0.01$ cfs $V_{10} = 0.51$ fps $d = 0.01'$

$\Rightarrow Q_{100} = 2.53$ cfs $V_{100} = 2.28$ fps $d = 0.20'$

$$D_{50} = 0.001 V_a^3 / (d_{avg}^{1/2} \times K_1^{3/2})$$

K_1: From Chart 7-4 DOH

$Z = 3:1$ $\phi = 42°$ $K_1 = 0.88$

$D_{50} = .001 (2.28)^3 / (0.20^{1/2} \times 0.88^{3/2})$

$= 0.012 / (0.447 \times .8255)$

$= \Rightarrow 0.0325'$ (0.4")

$T = D_{50} \times 1.5_{min}$ → USE 4" ϕ (100yr)

*

Channel Report

<Name>

Trapezoidal

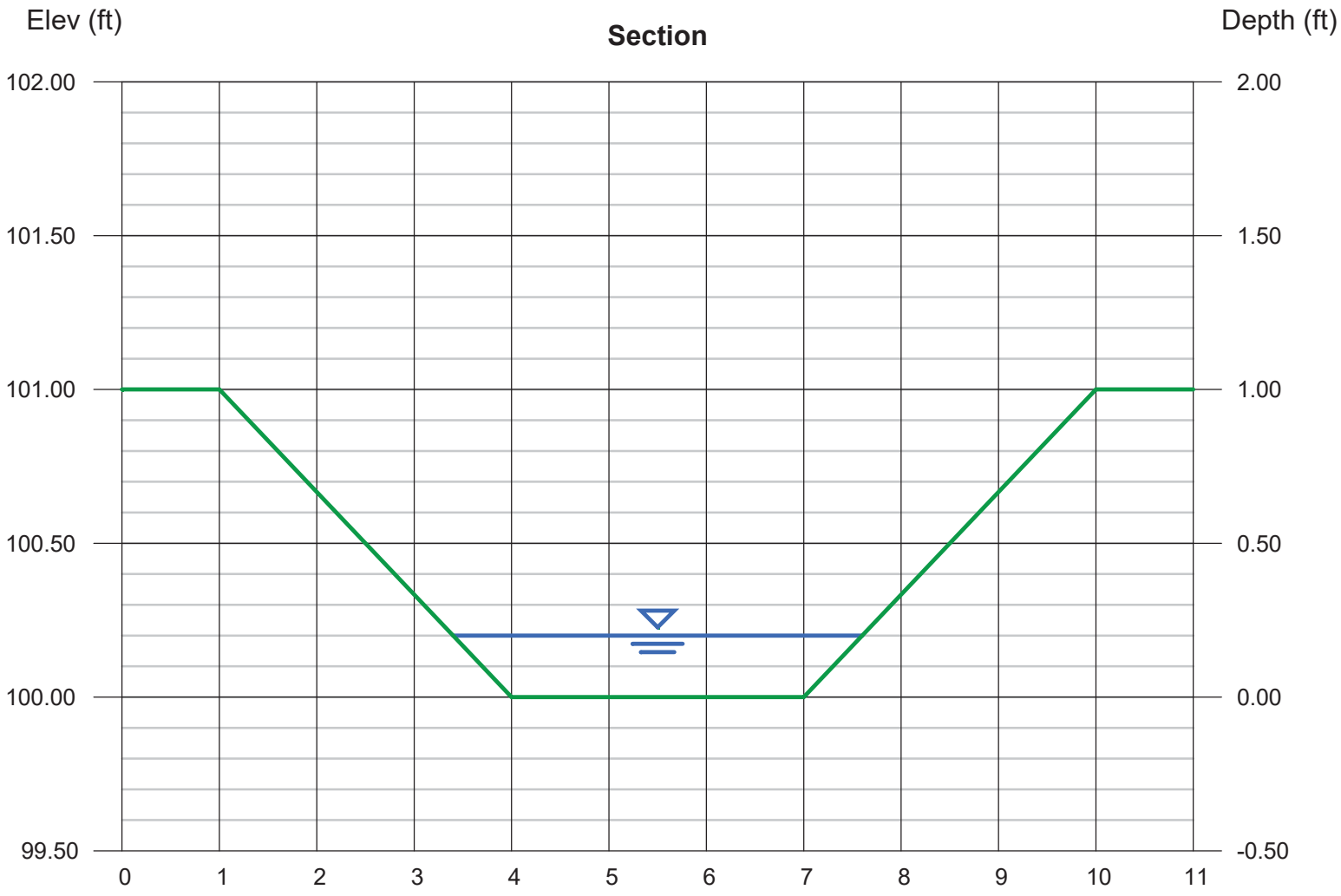
Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 100.00
Slope (%)	= 0.62
N-Value	= 0.010

Calculations

Compute by:	Known Q
Known Q (cfs)	= 2.53

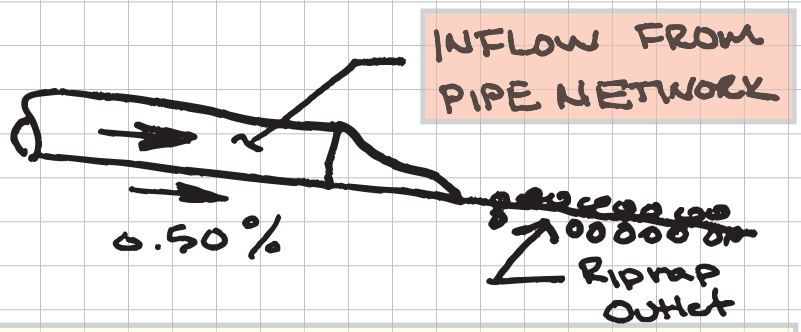
Highlighted

Depth (ft)	= 0.20
Q (cfs)	= 2.530
Area (sqft)	= 0.72
Velocity (ft/s)	= 3.51
Wetted Perim (ft)	= 4.26
Crit Depth, Yc (ft)	= 0.26
Top Width (ft)	= 4.20
EGL (ft)	= 0.39



• DETERMINE RIPRAP SIZE:

BASIN - 1 INLET



$\Rightarrow Q_{10} = 1.41$ cfs $\quad V_{10} = 3.49$ fps $\quad d = 0.16'$

$$D_{50} = 0.001 V_a^3 / (d_{avg}^{1/2} \times K_1^{3/2})$$

K_1 : From Chart 7-4 DOH

$Z = 3:1 \quad \phi = 42^\circ \quad K_1 = 0.88$

$$D_{50} = .001 (3.49)^3 / (0.16^{1/2} \times 0.88^{3/2})$$

$$= 0.043 / (0.400 \times .8255)$$

$$= \Rightarrow 0.13' \quad 1.54''$$

$T = D_{50} \times 1.5$ min $\rightarrow$ USE 3" ⌀ (10 yr)

*

Channel Report

<Name>

Trapezoidal

Bottom Width (ft)	= 3.00
Side Slopes (z:1)	= 3.00, 3.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 100.00
Slope (%)	= 0.50
N-Value	= 0.010

Calculations

Compute by:	Known Q
Known Q (cfs)	= 1.41

Highlighted

Depth (ft)	= 0.16
Q (cfs)	= 1.410
Area (sqft)	= 0.56
Velocity (ft/s)	= 2.53
Wetted Perim (ft)	= 4.01
Crit Depth, Yc (ft)	= 0.18
Top Width (ft)	= 3.96
EGL (ft)	= 0.26

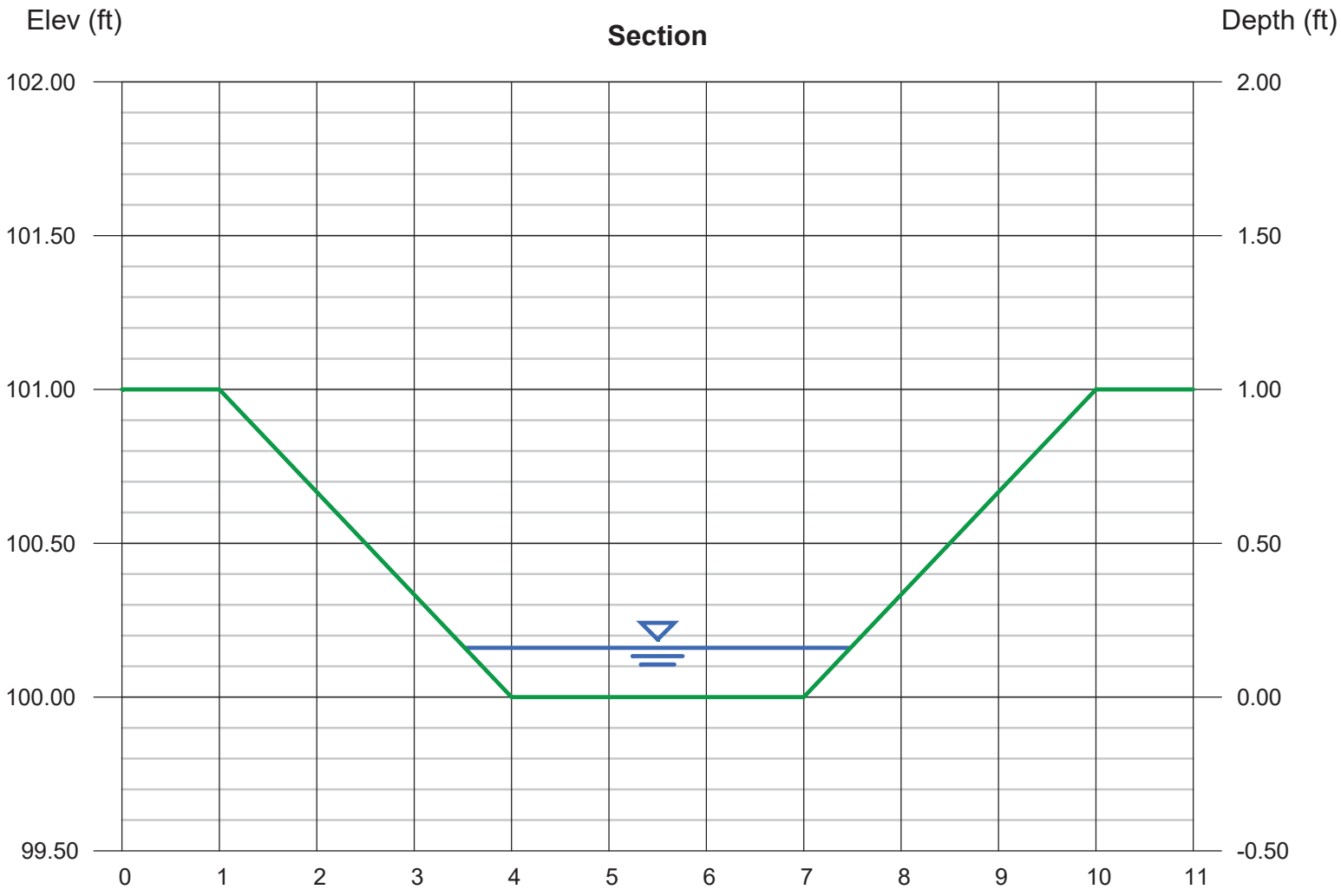


Chart 7-2
Riprap Size (D_{50}) Nomograph

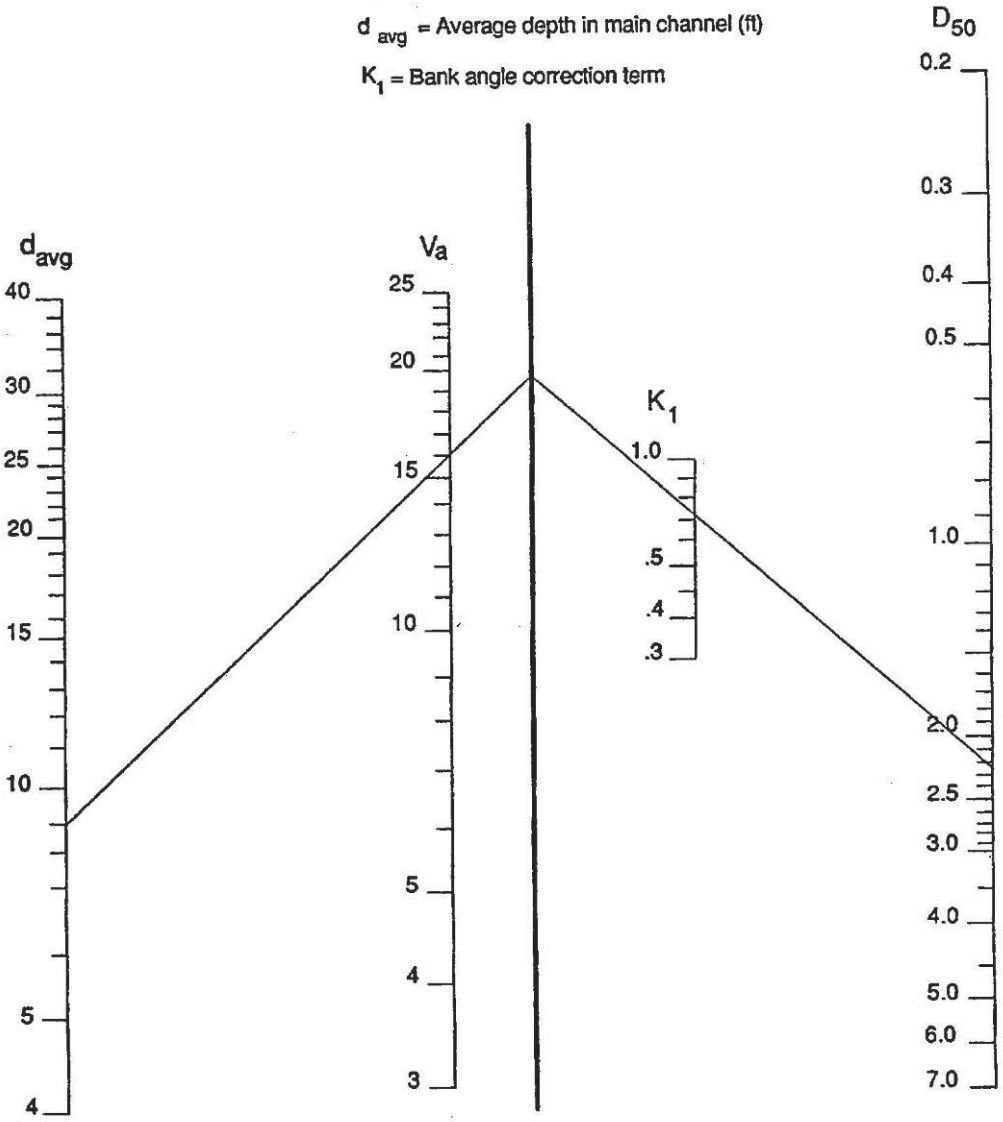
$$D_{50}=0.001\ V_a^3/(d_{avg}^{1/2}K_1^{3/2})$$

D_{50} = Median Riprap Size (ft.)

V_a = Average velocity in main channel (ft/sec)

d_{avg} = Average depth in main channel (ft)

K_1 = Bank angle correction term



Example

Given: V_a = 16 ft/sec, d_{avg} = 9 ft, K_1 = 0.72

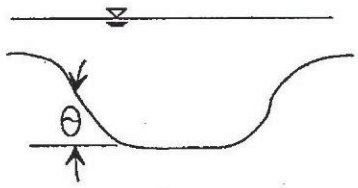
Find: D_{50}

Solution: D_{50} = 2.25

Source: Design of Riprap Revetment, HEC-11, FHWA, 1989

Chart 7-4

Nomograph for Bank Angle Correction Factor (K_1)

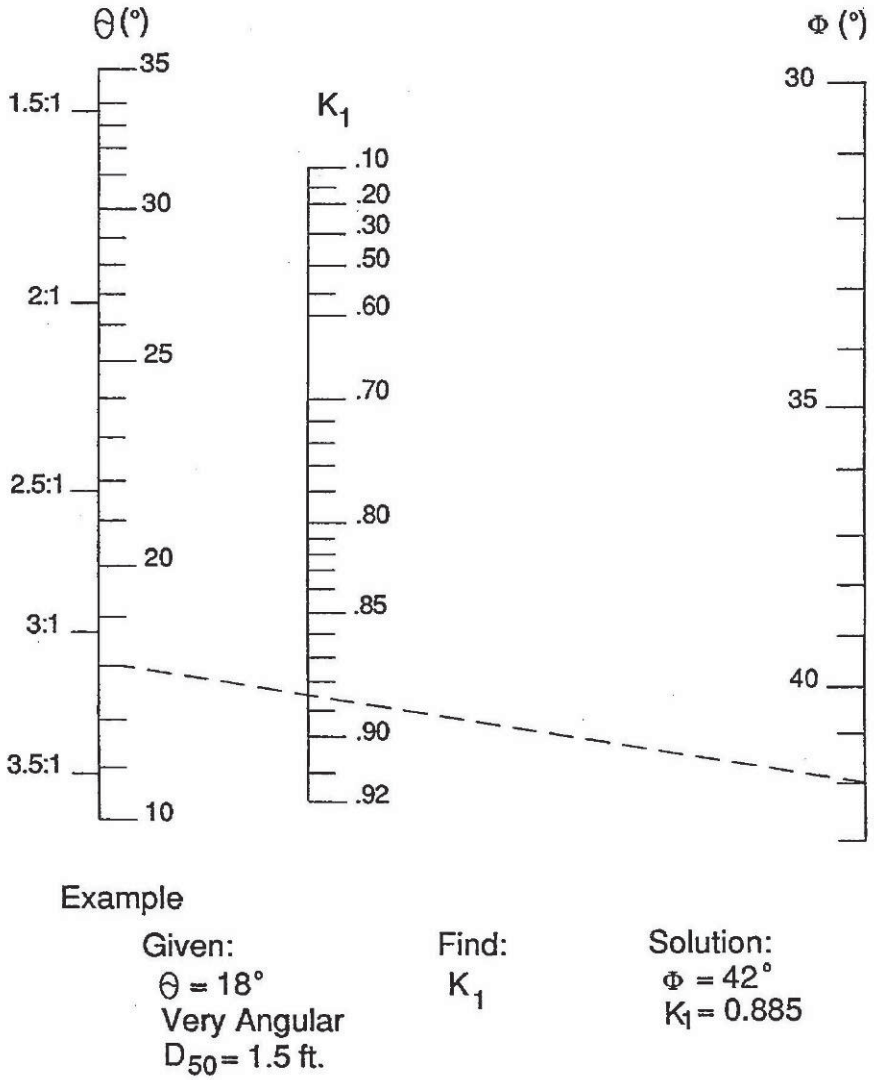


$$K_1 = \left[1 - \frac{\sin^2\theta}{\sin^2\Phi}\right]^{0.5}$$

θ = Bank angle with horizontal

Φ = Material angle of repose

See chart 7-5



Example

Given:
θ = 18°
Very Angular
D_{50} = 1.5 ft.

Find:
K_1

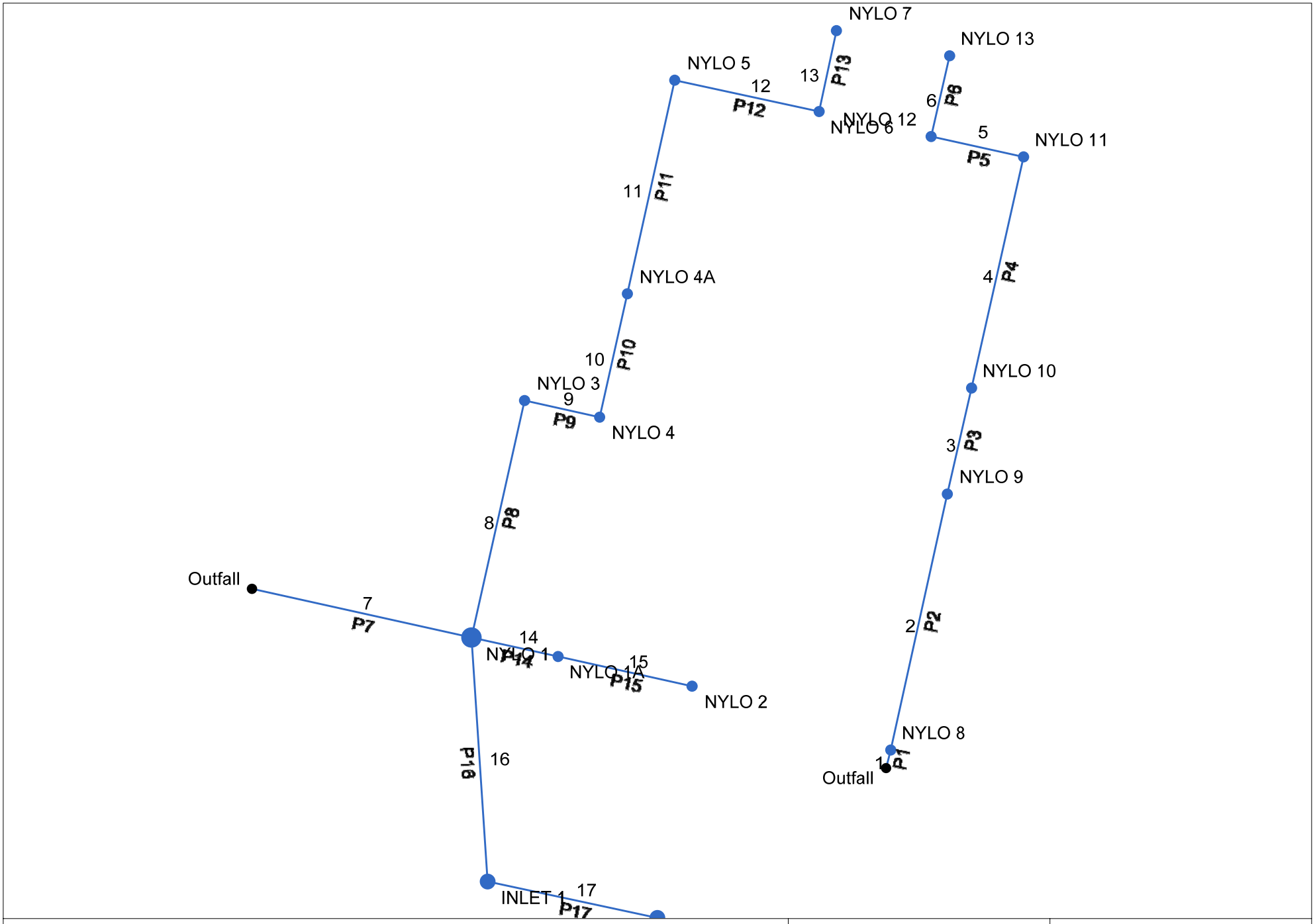
Solution:
Φ = 42°
K_1 = 0.885

Source: Design of Riprap Revetment, HEC-11, FHWA, 1989

APPENDIX F

PIPE CONVEYANCE NETWORK

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: STM_Net1.stm	Number of lines: 17	Date: 11/6/2023

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	P1	0.67	8	Cir	4.010	488.50	488.52	0.498	488.92	488.94	0.02	488.96	End	Manhole
2	P2	0.62	8	Cir	57.066	488.52	488.81	0.508	488.96	489.19	0.02	489.21	1	Manhole
3	P3	0.44	8	Cir	23.610	488.81	488.93	0.508	489.21	489.26	0.02	489.27	2	Manhole
4	P4	0.25	8	Cir	51.528	488.93	489.19	0.505	489.27	489.42	0.08	489.51	3	Manhole
5	P5	0.13	8	Cir	20.421	489.19	489.29	0.490	489.51	489.51	0.02	489.54	4	Manhole
6	P6	0.07	8	Cir	18.000	489.29	489.38	0.500	489.54	489.54	0.02	489.56	5	Manhole
7	P7	1.41	12	Cir	48.824	488.00	488.24	0.492	488.50	488.76	0.18	488.94	End	Manhole
8	P8	0.56	8	Cir	52.800	488.34	488.60	0.492	488.94	489.03	0.09	489.11	7	Manhole
9	P9	0.50	8	Cir	16.594	488.65	488.73	0.482	489.11	489.14	0.08	489.21	8	Manhole
10	P10	0.31	8	Cir	27.500	488.78	488.92	0.509	489.21	489.23	0.01	489.24	9	Manhole
11	P11	0.26	8	Cir	47.584	489.02	489.26	0.504	489.26	489.50	0.08	489.58	10	Manhole
12	P12	0.13	8	Cir	31.856	489.36	489.52	0.502	489.58	489.69	0.06	489.74	11	Manhole
13	P13	0.07	8	Cir	18.030	489.62	489.71	0.499	489.74	489.83	0.04	489.87	12	Manhole
14	P14	0.19	8	Cir	19.000	488.34	488.53	1.000	488.94	488.73	n/a	488.73	7	Manhole
15	P15	0.13	8	Cir	29.809	488.55	488.83	0.939	488.73	488.99	n/a	488.99 j	14	Manhole
16	P16	0.66	12	Cir	53.213	488.34	488.61	0.507	488.94	488.95	n/a	488.95	7	Manhole
17	P17	0.60	8	Cir	37.603	488.71	488.90	0.505	489.10	489.29	0.12	489.41	16	Manhole

Project File: STM_Net1.stm | Number of lines: 17 | Run Date: 11/6/2023

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	4.010	0.01	0.11	0.90	0.01	0.10	5.0	6.7	6.8	0.67	0.92	2.90	8	0.50	488.50	488.52	488.92	488.94	0.00	489.73	P1
2	1	57.066	0.03	0.10	0.90	0.03	0.09	5.0	6.4	6.9	0.62	0.93	2.76	8	0.51	488.52	488.81	488.96	489.19	489.73	490.38	P2
3	2	23.610	0.03	0.07	0.90	0.03	0.06	5.0	6.2	6.9	0.44	0.93	2.27	8	0.51	488.81	488.93	489.21	489.26	490.38	490.73	P3
4	3	51.528	0.02	0.04	0.90	0.02	0.04	5.0	5.7	7.0	0.25	0.93	1.86	8	0.50	488.93	489.19	489.27	489.42	490.73	490.73	P4
5	4	20.421	0.01	0.02	0.90	0.01	0.02	5.0	5.4	7.1	0.13	0.92	1.01	8	0.49	489.19	489.29	489.51	489.51	490.73	491.21	P5
6	5	18.000	0.01	0.01	0.90	0.01	0.01	5.0	5.0	7.2	0.07	0.93	0.77	8	0.50	489.29	489.38	489.54	489.54	491.21	491.01	P6
7	End	48.824	0.01	0.24	0.90	0.01	0.21	5.0	6.7	6.8	1.41	2.70	3.49	12	0.49	488.00	488.24	488.50	488.76	489.19	491.46	P7
8	7	52.800	0.01	0.09	0.90	0.01	0.08	5.0	6.3	6.9	0.56	0.92	2.01	8	0.49	488.34	488.60	488.94	489.03	491.46	492.57	P8
9	8	16.594	0.03	0.08	0.90	0.03	0.07	5.0	6.2	6.9	0.50	0.91	2.08	8	0.48	488.65	488.73	489.11	489.14	492.57	493.34	P9
10	9	27.500	0.01	0.05	0.90	0.01	0.05	5.0	5.9	7.0	0.31	0.93	1.63	8	0.51	488.78	488.92	489.21	489.23	493.34	491.00	P10
11	10	47.584	0.02	0.04	0.90	0.02	0.04	5.0	5.5	7.1	0.26	0.93	2.27	8	0.50	489.02	489.26	489.26	489.50	491.00	491.20	P11
12	11	31.856	0.01	0.02	0.90	0.01	0.02	5.0	5.2	7.2	0.13	0.93	1.60	8	0.50	489.36	489.52	489.58	489.69	491.20	491.56	P12
13	12	18.030	0.01	0.01	0.90	0.01	0.01	5.0	5.0	7.2	0.07	0.92	1.52	8	0.50	489.62	489.71	489.74	489.83	491.56	491.60	P13
14	7	19.000	0.01	0.03	0.90	0.01	0.03	5.0	5.3	7.2	0.19	1.31	1.38	8	1.00	488.34	488.53	488.94	488.73	491.46	491.50	P14
15	14	29.809	0.02	0.02	0.90	0.02	0.02	5.0	5.0	7.2	0.13	1.27	1.82	8	0.94	488.55	488.83	488.73	488.99	491.50	491.46	P15
16	7	53.213	0.01	0.11	0.90	0.01	0.09	5.0	5.2	7.2	0.66	2.75	2.08	12	0.51	488.34	488.61	488.94	488.95	491.46	491.14	P16
17	16	37.603	0.10	0.10	0.83	0.08	0.08	5.0	5.0	7.2	0.60	0.93	2.83	8	0.51	488.71	488.90	489.10	489.29	491.14	490.30	P17

Project File: STM_Net1.stm | Number of lines: 17 | Run Date: 11/6/2023

NOTES:Intensity = 88.24 / (Inlet time + 15.50) ^ 0.83; Return period =Yrs. 10 ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

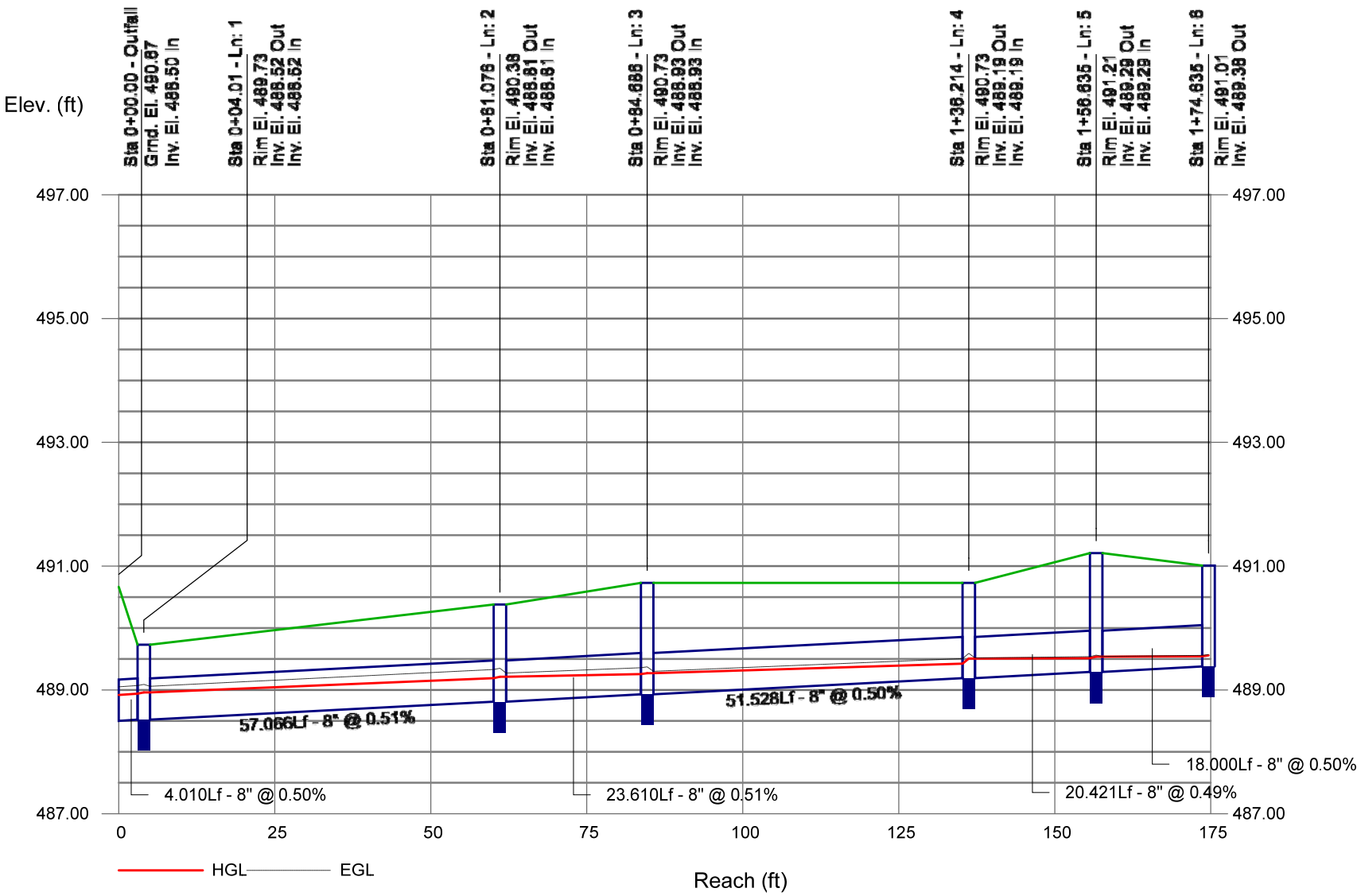
Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	8	0.67	488.50	488.92	0.42	0.23	2.90	0.13	489.05	0.503	4.010	488.52	488.94	0.42	0.23	2.90	0.13	489.07	0.503	0.503	0.020	0.15	0.02
2	8	0.62	488.52	488.96	0.44	0.24	2.53	0.10	489.06	0.374	57.066	488.81	489.19	0.38	0.21	3.00	0.14	489.33	0.574	0.474	0.271	0.15	0.02
3	8	0.44	488.81	489.21	0.40	0.22	1.98	0.06	489.27	0.242	23.610	488.93	489.26	0.33	0.17	2.57	0.10	489.36	0.478	0.360	0.085	0.15	0.02
4	8	0.25	488.93	489.27	0.34	0.11	1.41	0.03	489.30	0.138	51.528	489.19	489.42	0.23**	0.11	2.32	0.08	489.51	0.539	0.339	0.175	1.00	0.08
5	8	0.13	489.19	489.51	0.32	0.16	0.78	0.01	489.52	0.045	20.421	489.29	489.51	0.22	0.10	1.25	0.02	489.54	0.163	0.104	0.021	1.00	0.02
6	8	0.07	489.29	489.54	0.25	0.12	0.55	0.00	489.54	0.029	18.000	489.38	489.54	0.16	0.07	0.99	0.02	489.56	0.145	0.087	0.016	1.00	0.02
7	12	1.41	488.00	488.50	0.50*	0.40	3.57	0.20	488.70	0.527	48.824	488.24	488.76	0.52	0.42	3.40	0.18	488.94	0.462	0.494	0.241	1.00	0.18
8	8	0.56	488.34	488.94	0.60	0.33	1.68	0.04	488.99	0.159	52.800	488.60	489.03	0.43	0.24	2.35	0.09	489.11	0.327	0.243	0.128	1.00	0.09
9	8	0.50	488.65	489.11	0.46	0.26	1.92	0.06	489.17	0.209	16.594	488.73	489.14	0.41	0.22	2.24	0.08	489.21	0.306	0.258	0.043	1.00	0.08
10	8	0.31	488.78	489.21	0.43	0.24	1.31	0.03	489.24	0.101	27.500	488.92	489.23	0.31	0.16	1.95	0.06	489.29	0.284	0.192	0.053	0.15	0.01
11	8	0.26	489.02	489.26	0.24*	0.11	2.27	0.08	489.34	0.504	47.584	489.26	489.50	0.24**	0.11	2.26	0.08	489.58	0.500	0.502	0.239	1.00	0.08
12	8	0.13	489.36	489.58	0.22	0.07	1.29	0.03	489.61	0.180	31.856	489.52	489.69	0.17**	0.07	1.91	0.06	489.74	0.536	0.358	0.114	1.00	0.06
13	8	0.07	489.62	489.74	0.12	0.04	1.48	0.03	489.78	0.458	18.030	489.71	489.83	0.12**	0.04	1.56	0.04	489.87	0.529	0.494	0.089	1.00	0.04
14	8	0.19	488.34	488.94	0.60	0.09	0.58	0.07	489.02	0.000	19.000	488.53	488.73	0.20**	0.09	2.17	0.07	488.80	0.000	0.000	n/a	0.15	n/a
15	8	0.13	488.55	488.73	0.18	0.07	1.69	0.06	488.79	0.000	29.809	488.83	488.99 j	0.16**	0.07	1.94	0.06	489.05	0.000	0.000	n/a	1.00	n/a
16	12	0.66	488.34	488.94	0.60	0.23	1.33	0.12	489.07	0.000	53.213	488.61	488.95	0.34**	0.23	2.82	0.12	489.07	0.000	0.000	n/a	0.97	n/a
17	8	0.60	488.71	489.10	0.39*	0.21	2.83	0.12	489.22	0.505	37.603	488.90	489.29	0.39	0.21	2.83	0.12	489.41	0.503	0.504	0.189	1.00	0.12

Project File: STM_Net1.stm | Number of lines: 17 | Run Date: 11/6/2023

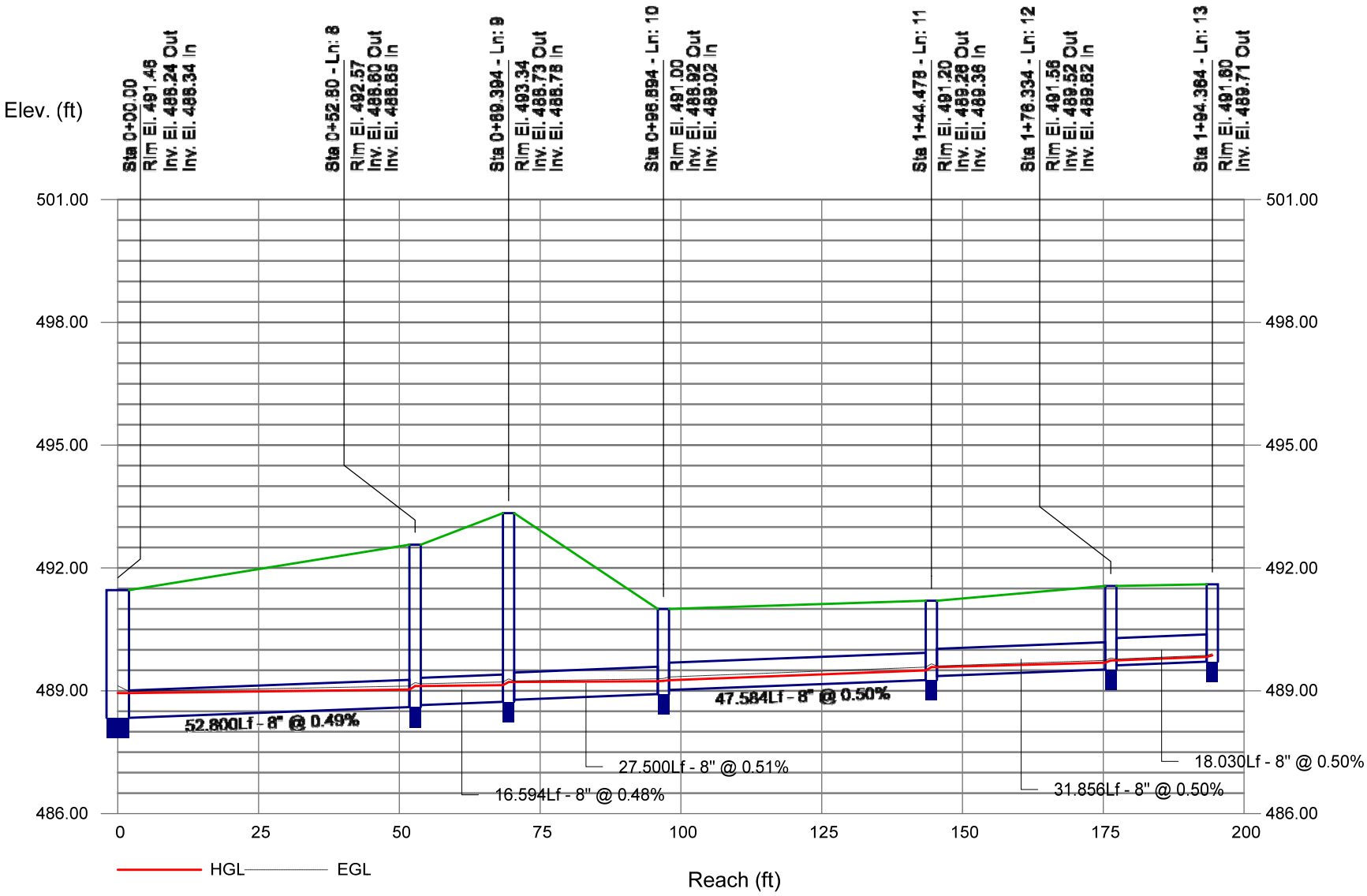
Notes: * Normal depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Storm Sewer Profile

Proj. file: STM_Net1.stm

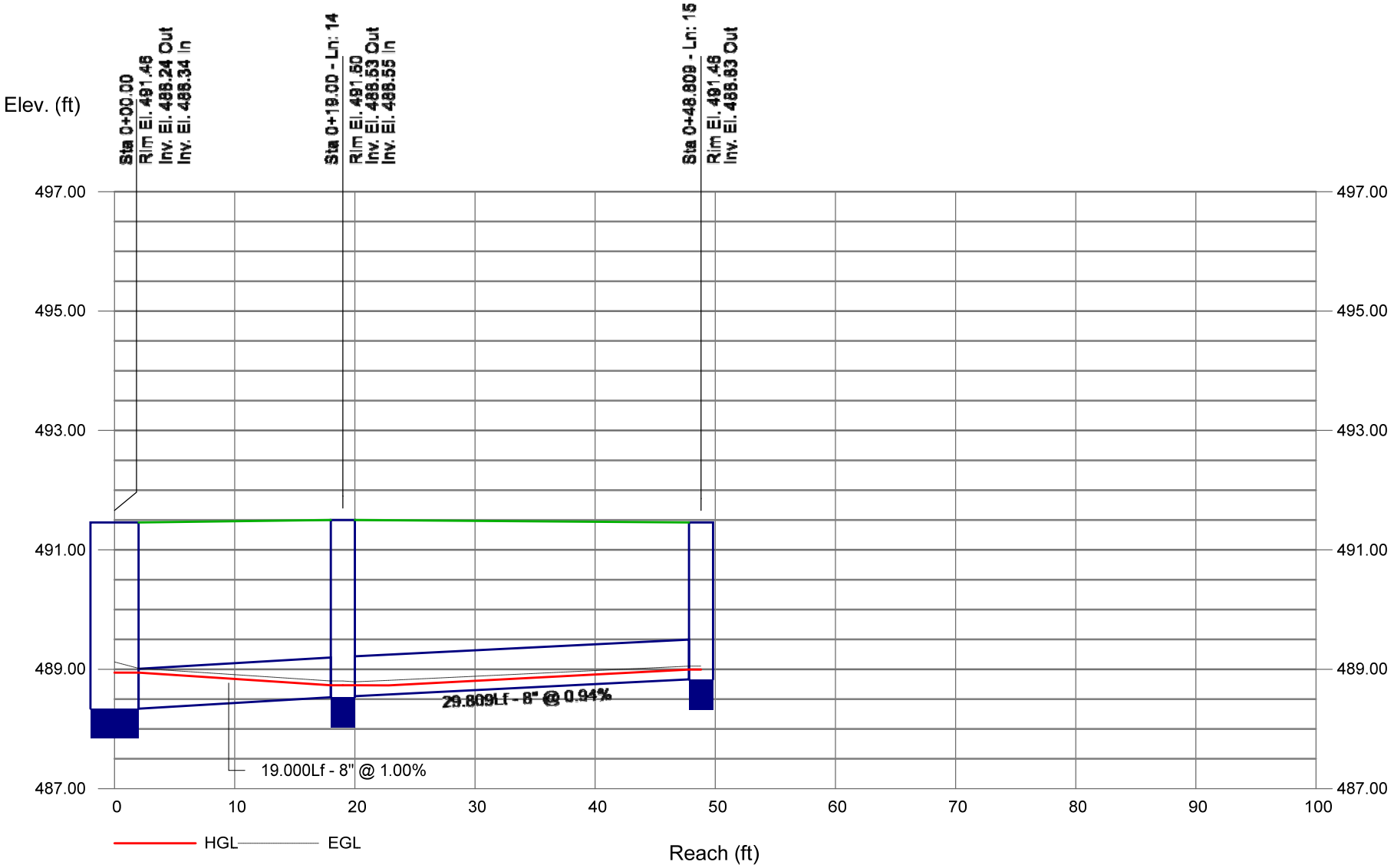


Storm Sewer Profile



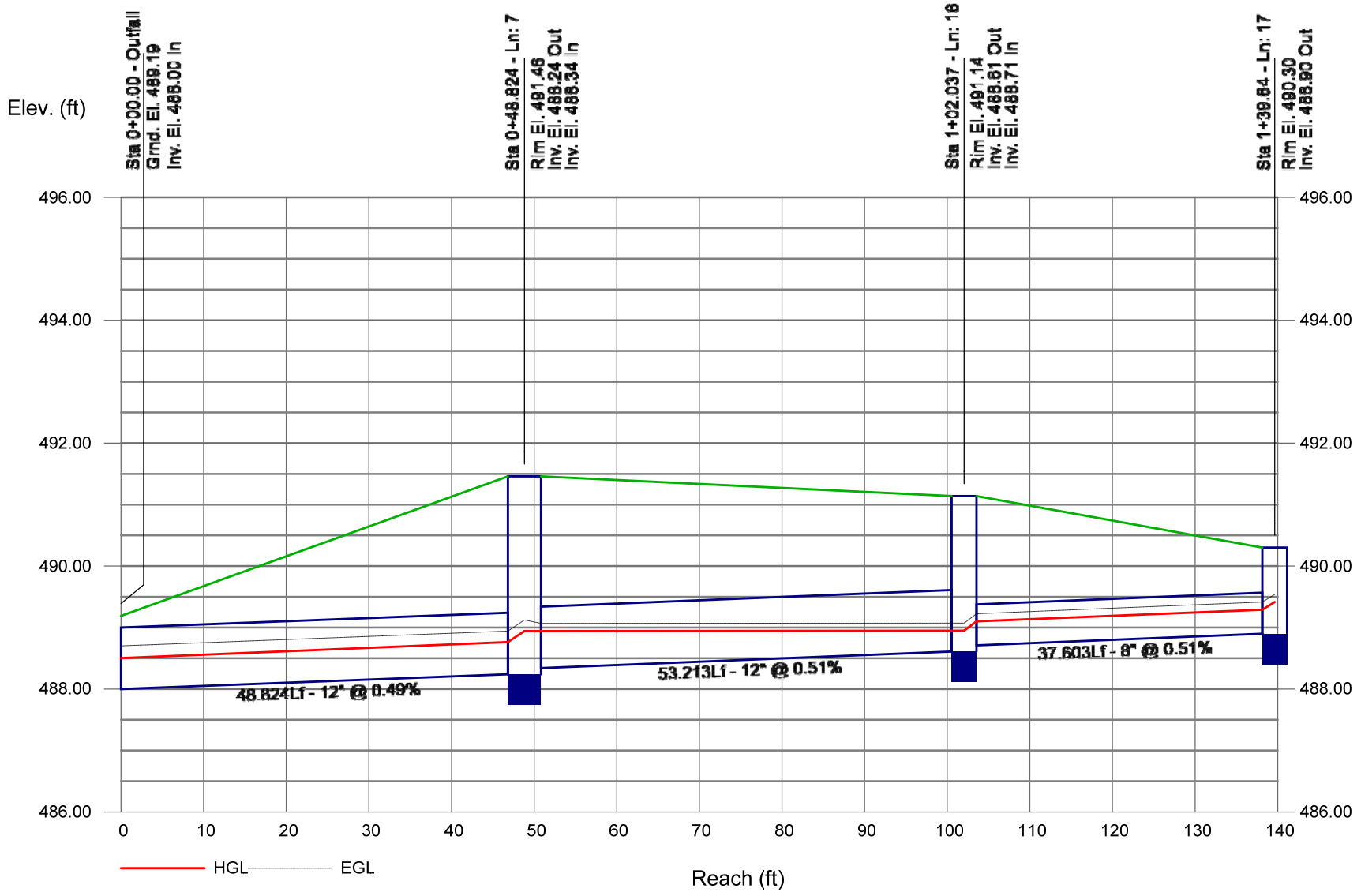
Storm Sewer Profile

Proj. file: STM_Net1.stm



Storm Sewer Profile

Proj. file: STM_Net1.stm



APPENDIX G

REFERENCE DATA

MATERIAL PROPERTY DATA SHEET

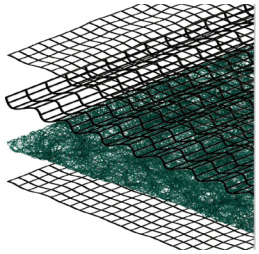
VMax® P550™

Permanent • Triple Net • Synthetic Fiber Matrix • Turf Reinforcement Mat

DESCRIPTION

P550 Turf Reinforcement Mat (TRM) is composed of 100% synthetic fibers mechanically (stitch) bound between a three-dimensional UV stabilized, heavy duty synthetic net structure. Stitching is secured on two-inch centers using UV stabilized, synthetic thread. P550 is a permanent, three-dimensional TRM that provides immediate erosion protection and long-term turf reinforcement and is intended for applications requiring erosion protection for greater than thirty-six months.

Each roll of P550 is made in the USA and manufactured under Western Green's Quality Assurance Program to ensure a continuous distribution of fibers and consistent thickness.



Material Content	
Matrix	Synthetic
Netting	Top Net: Heavyweight, UV stable Middle Net: Corrugated Ultra-Heavyweight, UV stable Bottom Net: Heavyweight, UV stable
Thread	Synthetic, UV Stable

Standard Roll Sizes				
Width	8 ft	(2.4 m)	6.5 ft	(2.0 m)
Length	67.5 ft	(20.5 m)	55.5 ft	(17.0 m)
Weight ± 10%	78 lb	(36.0 kg)	52 lb	(24.0 kg)
Area	60 sy	(50.1 m^2)	40 sy	(33.4 m^2)

Material available in custom roll sizes

Approvals & Classification	
Classification	FHWA: Type 5.C / ECTC: 5.D
TTI Approvals	Class 2 Type H
NTPEP Number	ECP-2019-03-012

Index Property	Test Method	Typical	
Thickness	ASTM D6525	0.63 in.	(16 mm)
Mass/Unit Area	ASTM D6566	21.0 oz/sy	(700 g/sm)
Tensile Strength – MD	ASTM D6818	1,000 lbs/ft	(14.6 kN/m)
Tensile Strength – TD	ASTM D6818	1,000 lbs/ft	(14.6 kN/m)
Elongation - MD	ASTM D6818	25%	
Elongation – TD	ASTM D6818	20%	
UV Stability	ASTM D4355	90% @1000 hr	
Light Penetration	ASTM D6567	10%	
Biomass Improvement	ASTM D7322	400%	
Specific Gravity	ASTM D792	57.4 lb/ft^3	(0.92 g/cm^3)
Porosity	ECTC	95%	

Design Parameters		
Property	**Unvegetated**	**Vegetated[3]**
RUSLE C Factor[2]	0.03	N/A
Slope Maximum Gradient[1]	0.5H:1V	0.5H:1V
Permissible Shear Stress[2]	3.3 psf (160 Pa)	14.0 psf (670 Pa)
Permissible Velocity[2]	12.0 fps (3.7 m/s)	20.0 fps (6.1 m/s)
τ_{veg} / τ_{TRM} (HEC-15)	N/A	0.55

Manning's n Roughness (HEC-15)		
τ_{lower}	τ_{mid}	τ_{upper}
0.040	0.031	0.027

1 Maximum Gradient a recomendation for typical installations.
2 Hydraulic thresholds compliant with ASTM D6459/D6460 but generalized for typical applications.
3 Vegetated values dependent on established stand of vegetation

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NOAA's National Weather Service

Hydrometeorological Design Studies Center

Precipitation Frequency Data Server (PFDS)

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- Progress Reports
- FAQ
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- Time Series
- Temporals
- Documents

Probable Maximum Precipitation
- Documents

Miscellaneous
- Publications
- Storm Analysis
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NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: WV

Data description

Data type: Precipitation depth | Units: English | Time series type: Partial duration

Select location

1) Manually:

a) By location (decimal degrees, use "-" for S and W): Latitude: Longitude: Submit

b) By station (list of WV stations): Select station

c) By address: Search

2) Use map:



a) Select location
Move crosshair or double click

b) Click on station icon
Show stations on map

Location information:
Name: Charles Town, West Virginia, USA*
Latitude: 39.2905°
Longitude: -77.8414°
Elevation: 492 ft **

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
NOAA Atlas 14, Volume 2, Version 3

PF tabular | PF graphical | Supplementary information

Print page

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.331** (0.294-0.372)	**0.395** (0.352-0.444)	**0.478** (0.425-0.537)	**0.544** (0.482-0.609)	**0.629** (0.555-0.702)	**0.699** (0.614-0.778)	**0.767** (0.670-0.851)	**0.843** (0.731-0.933)	**0.945** (0.812-1.05)	**1.03** (0.873-1.14)
10-min	**0.517** (0.460-0.582)	**0.620** (0.552-0.697)	**0.749** (0.666-0.842)	**0.845** (0.749-0.946)	**0.972** (0.857-1.08)	**1.07** (0.940-1.19)	**1.17** (1.02-1.30)	**1.28** (1.11-1.41)	**1.41** (1.21-1.56)	**1.52** (1.29-1.68)
15-min	**0.637** (0.567-0.717)	**0.763** (0.680-0.859)	**0.925** (0.823-1.04)	**1.05** (0.930-1.17)	**1.21** (1.07-1.35)	**1.33** (1.17-1.48)	**1.46** (1.27-1.62)	**1.59** (1.38-1.76)	**1.77** (1.52-1.96)	**1.90** (1.62-2.10)
30-min	**0.851** (0.757-0.958)	**1.03** (0.917-1.16)	**1.28** (1.14-1.44)	**1.47** (1.30-1.64)	**1.73** (1.52-1.93)	**1.93** (1.69-2.14)	**2.14** (1.87-2.37)	**2.36** (2.05-2.61)	**2.66** (2.29-2.95)	**2.91** (2.47-3.22)
60-min	**1.04** (0.929-1.18)	**1.27** (1.13-1.43)	**1.62** (1.44-1.81)	**1.88** (1.67-2.11)	**2.26** (1.99-2.52)	**2.56** (2.25-2.85)	**2.88** (2.52-3.20)	**3.23** (2.80-3.57)	**3.72** (3.20-4.12)	**4.12** (3.51-4.56)
2-hr	**1.23** (1.10-1.38)	**1.50** (1.34-1.68)	**1.91** (1.70-2.15)	**2.25** (1.99-2.51)	**2.73** (2.41-3.04)	**3.13** (2.74-3.48)	**3.56** (3.10-3.94)	**4.03** (3.49-4.46)	**4.72** (4.04-5.20)	**5.29** (4.49-5.83)
3-hr	**1.33** (1.19-1.50)	**1.62** (1.44-1.82)	**2.05** (1.83-2.30)	**2.40** (2.13-2.69)	**2.91** (2.57-3.25)	**3.34** (2.94-3.72)	**3.81** (3.32-4.22)	**4.31** (3.73-4.77)	**5.06** (4.33-5.59)	**5.69** (4.82-6.28)
6-hr	**1.66** (1.50-1.87)	**2.00** (1.80-2.24)	**2.51** (2.25-2.81)	**2.93** (2.62-3.27)	**3.54** (3.14-3.94)	**4.06** (3.58-4.50)	**4.62** (4.04-5.10)	**5.24** (4.55-5.77)	**6.14** (5.27-6.75)	**6.90** (5.86-7.57)
12-hr	**2.04** (1.85-2.28)	**2.45** (2.22-2.73)	**3.06** (2.77-3.40)	**3.58** (3.22-3.97)	**4.35** (3.88-4.79)	**5.00** (4.42-5.49)	**5.73** (5.02-6.27)	**6.52** (5.67-7.12)	**7.72** (6.61-8.40)	**8.73** (7.39-9.49)
24-hr	**2.39** (2.22-2.59)	**2.87** (2.67-3.11)	**3.59** (3.33-3.88)	**4.19** (3.87-4.52)	**5.06** (4.65-5.44)	**5.80** (5.30-6.23)	**6.60** (5.99-7.07)	**7.46** (6.72-7.99)	**8.72** (7.76-9.34)	**9.77** (8.60-10.5)
2-day	**2.76** (2.56-2.98)	**3.31** (3.08-3.58)	**4.14** (3.84-4.46)	**4.82** (4.46-5.19)	**5.82** (5.35-6.25)	**6.67** (6.09-7.15)	**7.58** (6.88-8.13)	**8.57** (7.71-9.19)	**10.0** (8.90-10.7)	**11.2** (9.85-12.1)
3-day	**2.94** (2.74-3.17)	**3.53** (3.29-3.81)	**4.40** (4.08-4.74)	**5.12** (4.74-5.51)	**6.17** (5.68-6.62)	**7.05** (6.46-7.56)	**7.99** (7.28-8.57)	**9.02** (8.14-9.67)	**10.5** (9.35-11.3)	**11.7** (10.3-12.6)
4-day	**3.12** (2.91-3.37)	**3.75** (3.49-4.05)	**4.66** (4.33-5.02)	**5.42** (5.02-5.83)	**6.51** (6.01-7.00)	**7.42** (6.82-7.97)	**8.40** (7.67-9.01)	**9.46** (8.56-10.1)	**11.0** (9.81-11.8)	**12.2** (10.8-13.2)
7-day	**3.63** (3.39-3.90)	**4.35** (4.06-4.66)	**5.34** (4.98-5.73)	**6.14** (5.71-6.59)	**7.27** (6.73-7.79)	**8.19** (7.56-8.77)	**9.15** (8.40-9.80)	**10.2** (9.27-10.9)	**11.6** (10.5-12.4)	**12.7** (11.4-13.7)
10-day	**4.15** (3.89-4.43)	**4.94** (4.64-5.28)	**5.98** (5.61-6.39)	**6.82** (6.38-7.28)	**7.99** (7.44-8.52)	**8.92** (8.27-9.50)	**9.88** (9.12-10.5)	**10.9** (9.99-11.6)	**12.2** (11.1-13.1)	**13.3** (12.0-14.3)
20-day	**5.61** (5.30-5.94)	**6.62** (6.26-7.03)	**7.79** (7.36-8.26)	**8.70** (8.21-9.23)	**9.90** (9.32-10.5)	**10.8** (10.2-11.5)	**11.7** (11.0-12.5)	**12.6** (11.8-13.4)	**13.8** (12.8-14.7)	**14.7** (13.6-15.7)
30-day	**6.88** (6.55-7.25)	**8.09** (7.69-8.53)	**9.35** (8.89-9.86)	**10.3** (9.80-10.9)	**11.6** (11.0-12.2)	**12.6** (11.9-13.2)	**13.5** (12.7-14.2)	**14.4** (13.5-15.2)	**15.5** (14.5-16.4)	**16.3** (15.2-17.3)
45-day	**8.62** (8.23-9.03)	**10.1** (9.64-10.6)	**11.5** (11.0-12.1)	**12.6** (12.0-13.2)	**13.9** (13.3-14.6)	**14.9** (14.2-15.6)	**15.8** (15.0-16.5)	**16.6** (15.7-17.4)	**17.6** (16.6-18.5)	**18.3** (17.3-19.2)
60-day	**10.3** (9.86-10.8)	**12.0** (11.5-12.6)	**13.6** (13.0-14.2)	**14.7** (14.1-15.4)	**16.1** (15.4-16.8)	**17.1** (16.3-17.8)	**18.0** (17.1-18.8)	**18.8** (17.8-19.6)	**19.7** (18.7-20.6)	**20.3** (19.2-21.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Estimates from the table in CSV format: Precipitation frequency estimates Submit

Planning Commission
101 East Washington Street
Charles Town, WV 25414

SCHEDULED

Meeting: 01/18/24
Department: Planning Commission
Category: Report
Initiator:

AGENDA ITEM (ID #)

Commission Review: BR2023-08 : Tiny Treasures Daycare - Bond Establishment

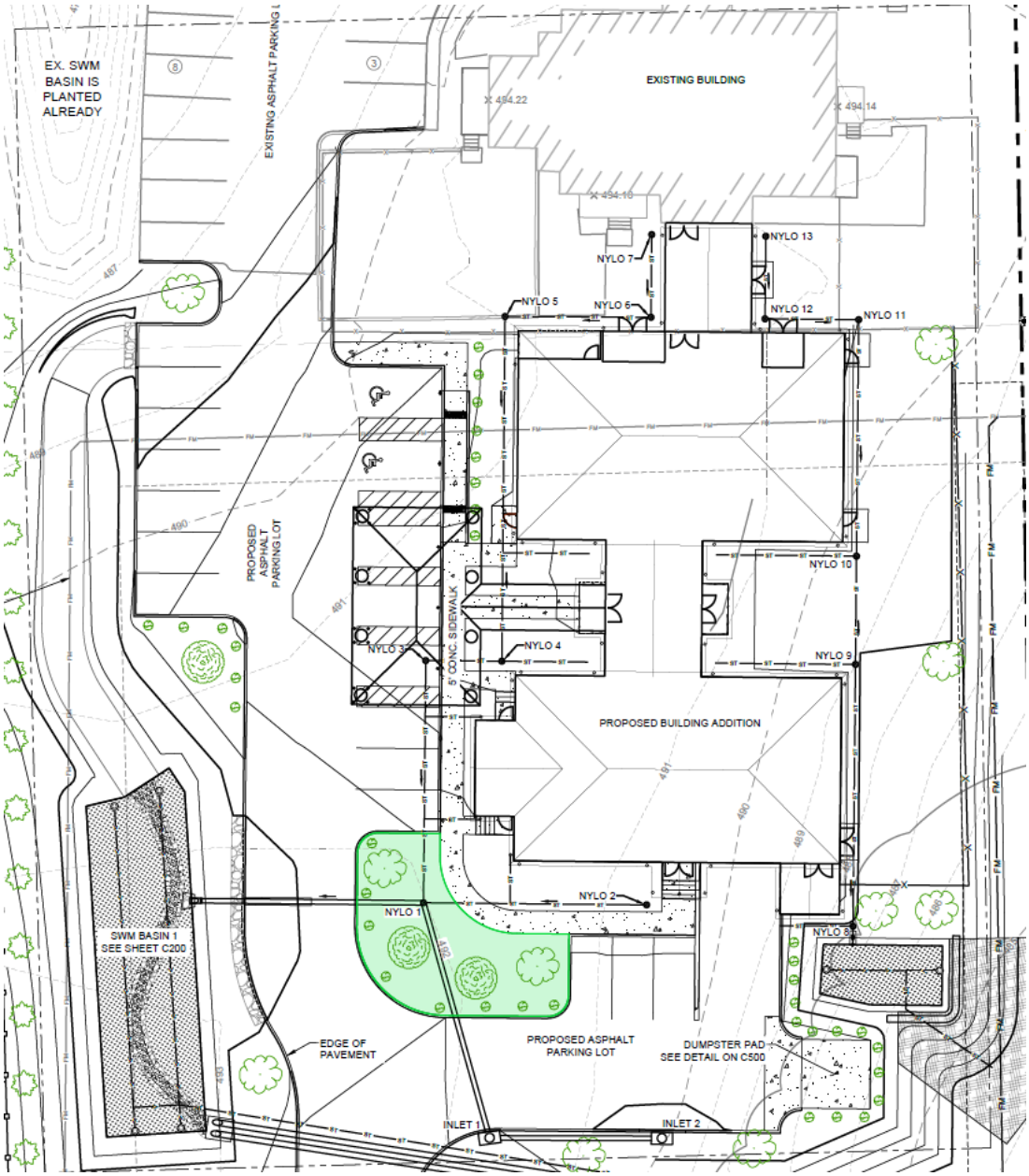
ATTACHMENTS:

- 1. Staff Report.pdf
- 2. Application.pdf
- 3. Estimate.PDF
- 4. KH Review.pdf

Bond Establishment Request
BR2023-07

Date: For the January 18, 2024 Planning Commission Special Meeting
Applicant: Tiny Treasures Daycare and Learning Center LLC
Report by: James Newman, City Planner, Zoning/Subdivision Administrator.
Proposal: A bond establishment of $381,013.97

Tiny Treasures – Planned Expansion



BACKGROUND
The applicant has submitted a bond establishment request for a parking lot to service a new building extension. The applicant is requesting a bond establishment of the **performance and land disturbance bond** in the amount of $381,013.97

Upon review of the request the City Engineer, Kimley-Horn, has determined that the bond amount is a reasonable assessment of the cost of the project.

BOND COMMITTEE
The Bond Committee reviewed this item at their December 14, 2023 meeting. The Committee recommended approval of the bond reduction request.

STAFF RECOMMENDATION
The City Engineer and City Staff have reviewed the bond reduction request and recommends the bond reduction request be **approved**.

Bond Request No._____

BOND REQUEST AND REDUCTION

To assist the Subdivision Administrator in the review of a Bond Request Application, the Applicant must utilize this form to supply the City with the information prescribed under Article 1335 and Section 1332 of the Subdivision and Land Development Ordinance. The submission of this form, along with the prescribed information and required fees, shall serve as the Applicant's Bond Request Application as required by Ordinance Article 1335.

1. DATE November 28, 20 23

2. APPLICATION TYPE ☒ Bond | Initiation ☐ Bond | Reduction

☐ Bond | Reallocation ☐ Bond | Release**

3. PROJECT NAME Tiny Treasures Daycare and Learning Center, LLC

Address 248 CHERRY TREE DRIVE CHARLES TOWN, WV 25414

4. APPLICANT'S NAME* Tri-State Investment Properties, LLC.

Address PO Box 1 Kearneysville, WV 25430

Telephone Number (410)206-4791 Fax Number (___)_____

Email Address chris@tristatewv.com

5. PROPERTY OWNER'S NAME Tri-State Investment Properties, LLC.

Address PO Box 1 Kearneysville, WV 25430

Telephone Number (410)206-4791 Fax Number (___)_____

Email Address chris@tristatewv.com

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

**Requires a Public Hearing and landscaping surety for one year after release

Bond Request No._____

6. DESCRIPTION OF REQUETED INITIATION, REDUCTION, OR RELEASE:

Bonding for parking lot extension to service new addition

7. A) CURRENT BOND AMOUNT $0.00

B) PROPOSED BOND AMOUNT $381,013.97

8. PARCEL INVENTORY: (List all parcels that are part of this application):

Tax Map No.	Parcel No.	Deed Book	Page No.	Zoning District
10	9.20	1228	138	CT

9. PARCEL HISTORY: (List all pending or previously approved applications on the subject parcels inventoried above, including previous plat applications if this application is an amendment)

Application No.	Project Name and Phase	Status	Approval Date

10. BOND RELEASE ATTACHMENTS.

The following shall be included with this request:

A. To the extent not previously submitted pursuant to bond reduction request, copies of inspection and test reports if work was inspected and tested by a third-party inspector.

B. Certification that all bonded Improvements, other than Improvements accepted by West Virginia Department of Highways (WVDOH), have been completed in accordance with the approved plans, profiles, and specifications and the requirements of any applicable manual. For Improvements to be accepted for maintenance by WVDOH, such Certification shall state that the Improvements have been installed and inspected in accordance with WVDOH's requirements.

C. A copy of the City-approved As-Built Drawings as required for facilities within public rights-of-way or Easements submitted pursuant to Section 1332.10 of this Ordinance.

Date of As-Builts _____ Prepared By _____

D. A letter from a Professional Engineer or Professional Land Surveyor certifying that property corners and Monuments have been set as required under this Ordinance.

E. Documentation of acceptance by WVDOH for public roadways and rights-of-way, or a maintenance and indemnification agreement and bond approved by the Planning Commission for public roadways that have been completed in accordance with WVDOH standards but which, due to factors other than their quality of construction, are not eligible for acceptance by WVDOH.

F. For private roadways, a letter of acceptance by the entity responsible for maintenance and a Latent Defects Indemnification Agreement and Bond in accordance with this Section.

G. Private Roadway Maintenance Bonds. Before a Performance Agreement and surety for private roadway construction shall be released, a Latent Defects Indemnification Agreement and Bond shall be provided by the applicant/Developer and approved by the Planning Commission. The guarantee provided by such Agreement and Bond must be for a period of two (2) years following the date of performance bond release, and must be in an amount equal to no less than 5% of the original performance bond estimate in accordance with Section 1335.07 (F) of the Subdivision Ordinance.

H. Landscaping Surety. Surety is required to ensure the landscaping shown on the Major S/LD plans is maintained for one (1) year. The one (1) year shall start from the date at which the surety for the site has been released, with the exception of this landscaping surety. The landscaping surety amount shall not be less than $5,000.00 or 10% of the total landscaping cost for the project, which every is greater.

Bond Request No._____

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Article 1335 of the S/LD Ordinance.

Signature of Applicant

_____ Date 11/28/2023

Signature of Property Owner (If different than Applicant)

_____ Date _____

Please submit an original completed Application, 1 digital copy and 1 paper copy of the As-Built Plans (if applicable) to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

Please also send a copy of the completed Application as well as the As-Builts to the following:

Hatch/Chester Engineers
Attn: Elizabeth Adamowicz
705 Quince Orchard Road, Suite 310
Gaithersburg, MD 20878

FOR CITY USE ONLY

Application Number:_____ Date Application Received:_____

Fee: $_____ Check No._____

Receipt No._____

Site Inspection Date:_____ Inspector:_____

Subdivision Administrator Approval:_____ Date:_____

Engineer Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

City Council Approval:_____ Date:_____

Comments:_____

_____

_____

_____

_____

CITY OF CHARLES TOWN

PUBLIC IMPROVEMENT BOND UNIT COST LIST AND BOND REDUCTION FORM

This form shall be used to calculate the amount of the bond required to guarantee public improvements to be constructed under the approved Final S/LD Application. This form shall also be used in calculating the amount of bond reductions to be approved by the Planning Commission. **Note**: No bond shall be reduced until completion of at least thirty (30) percent of the physical Improvements secured by the bond.

PROJECT NAME:	TINY TREASURES DAYCARE AND LEARNING CENTER BUILDING EXPANSION
PREPARED BY:	ALPHA ASSOCIATES
DATE OF SUBMISSION	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
MOBILIZATION GENERAL								
Mobilization	LS	$6,250.00	1	6,250				
Field Office	EA	$3,000.00						
Job Sign	EA	$1,150.00						
SURVEYING								
Steel Pipe Property Corner Marker Incl. Survey	EA	$275.00	4	1,100				
R.O.W. MONUMENTS SURVEYED IN PLACE								
RM -- 1	EA	$825.00						
RM -- 2	EA	$575.00						
EARTHWORK EXCAVATION								
Regular Bulk used as Fill	CY	$3.86	805	3,107.30				
Rock, Rip	CY	$17.30	201	3,477.30				
Rock, Blast	CY	$38.48						
BORROW MATERIAL								
Buy, Load, Haul 10 Mi. Select Material	CY	$28.90	942	27,223.80				
Fill and Compaction of On-site Borrow	CY	$5.95	942	5,604.90				
UNSUITABLE MATERIAL								
Load and Haul, 20 mi R/T	CY	$21.95						
Dump Charge	CY	$37.50						
Site Grading	SY	$0.75						
CLEAR & GRUB								
Light	AC	$6,675.00	1.0902	7,277.09				
Moderate	AC	$9,750.00						

Pg 5T 54,040.39

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Heavy	AC	$12,250.00						
Very Heavy	AC	$14,250.00						
LANDSCAPING								
Seeding	SY	$0.77	2,860	2,202.2				
Sodding	SY	$3.64						
PLANTING SHRUBS								
18"	EA	$40.00	36	1,440				
24"	EA	$70.00						
TREES								
6' – 8' (1-2 in. Caliper)	EA	$400.00	31	12,400				
8' – 10' (2.5-3 in. Caliper)	EA	$700.00						
Tree Protection	LF	$9.00						
MISCELLANEOUS SITE IMPROVEMENTS								
RETAINING WALLS								
Timber Wall (Less Than 6 ft)	LF	$325.00						
Dry Rubble RW-1 (H=6')	LF	$450.00						
Mortared Rubble RW-1A (H=6')	LF	$535.00						
Concrete Gravity RW-2 (H=6')	LF	$339.00						
Concrete Gravity RW-3 (H=6')	LF	$378.00						
FENCING								
Std. Fence (H=5') FR-5	LF	$9.31						
Farm Fence (H=5') FR-3A	LF	$10.90						
Chain Link Fence (H=6')FR 2-B	LF	$14.52						
Board Fence (H=6')	LF	$19.35	318	6,153				
Board Fence (Ht=3')	LF	10.00	150	1,500				

Pg ST 23,695.20

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
TOT LOTS									
Tot Lot	EA	$16,495.00							
STORM DRAINAGE									
STORM SEWER									
NOTE: All pipe unit prices include trench, excavation, bedding, pipe, & backfill									
Rock Excavation for All Pipe Types									
Less than 1,500 CY (Blasting)	CY	$110.00							
More than 1,500 CY (Blasting)	CY	$90.00							
Less than 1,500 CY (Hoe Ram)	CY	$135.00							
More than 1,500 CY (Hoe Ram)	CY	$110.00							
Trench De-watering									
Trench De-watering	LF	$2.95							
RCP CLASS III ROUND T & G W/MASTIC									
12" Pipe (RCP III)									
0' – 8' Cut	LF	$44.50							
8' – 14' Cut	LF	$62.50							
Add cost for Class IV	LF	$0.85							
O-Ring	LF	$5.50							
15" Pipe (RCP III)									
0' – 10' Cut	LF	$49.75							
10' – 16'	LF	$77.50							
Add Cost for Class IV	LF	$0.95							
O-Ring	LF	$5.50							
18" Pipe (RCP III)									
0' – 10' Cut	LF	$50.00							
10' – 16' Cut	LF	$80.00							

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Add Cost for Class IV	LF	$2.00						
O-Ring	LF	$7.00						
21" Pipe (RCP III)								
0' – 10' Cut	LF	$57.50						
10' – 16' Cut	LF	$87.50						
Add Cost for Class IV	LF	$2.75						
O-Ring	LF	$13.00						
24" Pipe (RCP III)								
0' – 10' Cut	LF	$67.50						
10' – 16' Cut	LF	$95.00						
Add Cost for Class IV	LF	$3.15						
O-Ring	LF	$14.00						
27" Pipe (RCP III)								
0' – 10' Cut	LF	$60.00						
10' – 16' Cut	LF	$95.00						
Add Cost for Class IV	LF	$4.00						
O-Ring	LF	$15.00						
30" Pipe (RCP III)								
0' – 10' Cut	LF	$82.50						
10' – 16' Cut	LF	$125.00						
Add Cost for Class IV	LF	$6.00						
O-Ring	LF	$17.25						
33" Pipe (RCP III)								
0' – 12' Cut	LF	$115.00						
10' – 18' Cut	LF	$160.00						
Add Cost for Class IV	LF	$6.50						
O-Ring	LF	$21.95						
36" Pipe (RCP III)								
0' – 12' Cut	LF	$120.00						

5

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
12' – 18' Cut	LF	$175.00						
Add Cost for Class IV	LF	$7.75						
O-Ring	LF	$22.75						
42" Pipe (RCP III)								
0' – 12' Cut	LF	$140.00						
12' – 18' Cut	LF	$200.00						
Add Cost for Class IV	LF	$12.00						
O-Ring	LF	$35.45						
48" Pipe (RCP III)								
0' – 12' Cut	LF	$155.00						
12' – 18' Cut	LF	$215.00						
Add Cost for Class IV	LF	$12.50						
O-Ring	LF	$43.35						
54" Pipe (RCP III)								
0' – 12' Cut	LF	$190.00						
12' – 18' Cut	LF	$275.00						
Add Cost for Class IV	LF	$18.75						
O-Ring	LF	$44.45						
60" Pipe (RCP III)								
0' – 12' Cut	LF	$225.00						
12' – 18' Cut	LF	$335.00						
Add Cost for Class IV	LF	$22.50						
O-Ring	LF	$48.65						
ELLIPTICAL PIPE – RCP CLASS III								
23" X 14" (18" Equiv-RCP III								
0' – 10' Cut	LF	$75.00						
10' – 16' Cut	LF	$110.00						
Add Cost for Class IV	LF	$16.45						
O-Ring	LF	$43.35						

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
30" X 19" (24" Equiv-RCP III)								
0' – 10' Cut	LF	$90.00						
10' – 16' Cut	LF	$130.00						
Add Cost for Class IV	LF	$5.95						
O-Ring	LF	$43.35						
38" X 24" (30" Equiv-RCP III)								
0' – 10' Cut	LF	$120.00						
10' – 16' Cut	LF	$167.50						
Add Cost for Class IV	LF	$8.45						
O-Ring	LF	$51.35						
45" X 29" (36" Equiv-RCP III)								
0' – 10' Cut	LF	$165.00						
10' – 16' Cut	LF	$235.00						
Add Cost for Class IV	LF	$11.35						
O-Ring	LF	$53.35						
53" X 34" (42" Equiv-RCP III)								
0' – 12' Cut	LF	$210.00						
10' – 18' Cut	LF	$300.00						
Add Cost for Class IV	LF	$15.35						
O-Ring	LF	$58.95						
60" X 38" (48" Equiv-RCP III)								
0' – 12' Cut	LF	$255.00						
10' – 18' Cut	LF	$375.00						
Add Cost for Class IV	LF	$18.35						
O-Ring	LF	$69.95						
HDPE PIPE								
8" Pipe								
0'-8' Cut	LF	$28.65	573	16,416.45				
8'-14' Cut	LF	$43.15						

Pg. 5F 16,416.45

7

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
12" Pipe									
0'-8' Cut	LF	$38.95	140	5,453					
8'-14' Cut	LF	$57.75							
15" Pipe									
0'-8' Cut	LF	$50.25	210	10,552.50					
8'-16' Cut	LF	$74.85							
18" Pipe									
0'-8' Cut	LF	$66.00							
8'-16' Cut	LF	$98.55							
24" Pipe									
0'-8' Cut	LF	$76.90							
8'-16' Cut	LF	$115.25							
30" Pipe									
0'-8' Cut	LF	$91.33							
8'-16' Cut	LF	$137.27							
36" Pipe									
0'-8' Cut	LF	$101.68							
8'-16' Cut	LF	$152.33							
42" Pipe									
0'-8' Cut	LF	$113.99							
8'-16' Cut	LF	$171.00							
48" Pipe									
0'-8' Cut	LF	$129.55							
8'-16' Cut	LF	$195.66							
STORM STRUCTURES									
END SECTIONS									
End Section (ES-1), ~~Concrete Pipe Size~~									
15" FOR HDPE	EA	~~$485.00~~ 300 00	1	300 00					

Pg. ST 16,305.50

8

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
18"	EA	$565.00						
21"	EA	$645.00						
24"	EA	$755.00						
27"	EA	$1,065.00						
30"	EA	$1,195.00						
36"	EA	$1,765.00						
42"	EA	$1,795.00						
48"	EA	$2,135.00						
54"	EA	$2,795.00						
60"	EA	$3,455.00						
ENDWALLS								
EW-1(Pre-cast) Round Pipe Size								
15"	EA	$800.00						
18"	EA	$1,337.00						
24"	EA	$2,021.00						
30"	EA	$2,133.00						
36"	EA	$2,366.00						
EW-1 Cast in Place [Round Pipe Size]								
15"	EA	$852.00						
18"	EA	$1,053.00						
24"	EA	$1,495.00						
30"	EA	$2,144.00						
36"	EA	$2,383.00						
EW-1A (Pre-Cast) Elliptical Pipe Size								
23" X 14" (18")	EA	$695.00						
30" X 19" (24")	EA	$969.00						
38" X 24" (30")	EA	$1,165.00						
45" X 29" (36")	EA	$1,445.00						

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
53" X 34" (42")	EA	$1,840.00							
EW-1A (Cast in Place) Elliptical Pipe Size									
23" X 14" (18")	EA	$667.00							
30" X 19" (24")	EA	$939.00							
38" X 24" (30")	EA	$1,247.00							
45" X 29" (36")	EA	$1,618.00							
53" X 34" (42")	EA	$2,109.00							
EW-2 (PreCast) Round Pipe Size									
42"	EA	$5,445.00							
48"	EA	$5,695.00							
54"	EA	$6,660.00							
60"	EA	$7,140.00							
72"	EA	$7,990.00							
84"	EA	$9,490.00							
EW-2 (Cast in Place) Round Pipe Size									
42"	EA	$4,723.00							
48"	EA	$6,039.00							
54"	EA	$6,972.00							
60"	EA	$8,179.00							
72"	EA	$10,713.00							
84"	EA	$12,288.00							
(EW-6PC) [Double Pipe] Pipe Size									
2-15"	EA	$999.00							
2-18"	EA	$1,235.00							
2-24"	EA	$1,510.00							
2-30"	EA	$2,165.00							
2-36"	EA	$2,647.00							
MANHOLES									

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
Standard Brick Manhole Std Frame & Cover (MH-1)									
6' Depth	EA	$3,750.00							
Depth below 6'	VF	$163.00							
Standard Precast Manhole Std Frame & Cover (MH-2)									
6' Depth	EA	$3,100.00							
Depth below 6'	VF	$177.00							
Additional Cost (Amounts in parentheses to be added to the above unit costs)									
Watertight Fr/Cover (Add 110)	EA	$579.00							
Heavy Duty Fr/Cover (Add 82)	EA	$599.00							
DROP INLETS									
Cast in Place 48"									
Drop Inlet (DI-1) 12" – 24" Pipe0-10 VF	EA	$3,697.00							
Drop Inlet (DI-1A) 12" – 24" Pipe 10-20 VF	EA	$5,593.00							
Drop Inlet (DI-2) 12" – 24" Pipe0-10 VF, 10' throat	EA	$6,911.00							
Drop Inlet (DI-2A) 12" – 24" Pipe 10-20 VF, 10' throat	EA	$8,833.00							
CURB DROP INLETS									
Curb Drop Inlet (DI-3A)									
12"-30" Pipe (Invert Depth (H) =0'-8') Inlet Length 2'-6"	EA	$4,088.00							
Curb Drop Inlet (DI-3AA)									
12"-30" Pipe (Invert Depth (H) =8'-20') Inlet Length 2'-6"	EA	$5,357.00							
Curb Drop Inlet (DI-3B & DI-12) 12"-30" Pipe (Invert Depth (H) =0'-8') Inlet Length									
4'	EA	$4,279.00	2	8,558.00					

pg. 5T 8,558.00

11

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
6’	EA	$4,573.00						
8’	EA	$4,889.00						
10'	EA	$5,052.00						
12’	EA	$5,227.00						
16’	EA	$5,543.00						
20’	EA	$5,859.00						
Curb Drop Inlet (DI-3BB) 12”-30” Pipe (Invert Depth (H) =8’-20’) Inlet Length								
4’	EA	$4,276.00						
6’	EA	$4,848.00						
8’	EA	$5,429.00						
10'	EA	$5,732.00						
12’	EA	$6,011.00						
16’	EA	$6,296.00						
20’	EA	$6,599.00						
Curb Drop Inlet (DI-3C) 12”-30” Pipe (Invert Depth (H) =0’-8’) Inlet Length								
6’	EA	$4,013.00						
8’	EA	$4,588.00						
10'	EA	$4,893.00						
12’	EA	$5,178.00						
16’	EA	$5,766.00						
20’	EA	$6,339.00						
Curb Drop Inlet (DI-3CC) 12”-30” Pipe (Invert Depth (H) =8’-20’) Inlet Length								
6’	EA	$4,746.00						
8’	EA	$5,293.00						
10'	EA	$5,627.00						
12’	EA	$5,988.00						
16’	EA	$6,772.00						
20’	EA	$7,465.00						

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
Curb Drop Inlet (DI-3D)									
12"-30" Pipe (Invert Depth (H) =0'-8') Inlet Length 2'-6"	EA	$3,633.00							
Curb Drop Inlet (DI-3DD)									
12"-30" Pipe (Invert Depth (H) =8'-20') Inlet Length 2'-6"	EA	$4,367.00							
Curb Drop Inlet (DI-3E) 12"-30" Pipe (Invert Depth (H) =0'-8') Inlet Length									
4'	EA	$4,093.00							
8'	EA	$4,756.00							
10'	EA	$5,724.00							
12'	EA	$5,833.00							
16'	EA	$6,072.00							
20'	EA	$6,709.00							
Curb Drop Inlet (DI-3EE) 12"-30" Pipe (Invert Depth (H) =8'-20') Inlet Length									
6'	EA	$7,562.00							
8'	EA	$7,869.00							
10'	EA	$7,999.00							
12'	EA	$8,166.00							
16'	EA	$8,471.00							
20'	EA	$8,767.00							
Curb Drop Inlet (DI-3F) 12"-30" Pipe Inlet Length (Invert Depth (H)=0'-8')									
6'	EA	$3,765.00							
8'	EA	$4,419.00							
10'	EA	$4,749.00							
12'	EA	$5,085.00							
16'	EA	$5,742.00							
20'	EA	$6,395.00							
Curb Drop Inlet (DI-3FF) 12"-30" Pipe (Invert Depth (H) =8'-20') Inlet Length									

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
6'	EA	$8,077.00						
8'	EA	$8,288.00						
10'	EA	$8,480.00						
12'	EA	$8,669.00						
16'	EA	$9,047.00						
20'	EA	$9,446.00						
Curb Drop Inlet (DI-4A) 36"–48" Pipe (Invert Depth (H)=0'-8') Inlet Length								
4'	EA	$4,868.00						
Curb Drop Inlet (DI-4AA) 36"–48" Pipe (Invert Depth (H)=0'-8') Inlet Length								
4'	EA	$6,817.00						
Curb Drop Inlet (DI-4B) 36"-48" Pipe (Invert Depth (H) =0'-8') Inlet Length								
6'	EA	$5,172.00						
8'	EA	$5,499.00						
10'	EA	$5,698.00						
12'	EA	$5,870.00						
16'	EA	$6,221.00						
20'	EA	$6,571.00						
Curb Drop Inlet (DI-4BB) 36"-48" Pipe (Invert Depth (H) =8'-20') Inlet Length								
6'	EA	$10,292.00						
8'	EA	$10,643.00						
10'	EA	$10,810.00						
12'	EA	$10,974.00						
16'	EA	$11,309.00						
20'	EA	$11,669.00						
Curb Drop Inlet (DI-4C) 36"-48" Pipe (Invert Depth (H) =0'-8') Inlet Length								
8'	EA	$5,612.00						
10'	EA	$5,794.00						
12'	EA	$5,968.00						
16'	EA	$6,315.00						

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
20'	EA	$6,657.00						
Curb Drop Inlet (DI-4CC) 36"-48" Pipe (Invert Depth (H) =8'-20') Inlet Length								
8'	EA	$13,371.00						
10'	EA	$13,693.00						
12'	EA	$14,097.00						
16'	EA	$14,712.00						
20'	EA	$15,365.00						
Curb Drop Inlet (DI-4D)								
36"-48" Pipe (Invert Depth (H) =0'-8') Inlet Length 4'	EA	$4,933.00						
Curb Drop Inlet (DI-4DD)								
36"-48" Pipe (Invert Depth (H) =8'-16') Inlet Length 4'	EA	$9,455.00						
Curb Drop Inlet (DI-4E) 36"-48" Pipe (Invert Depth (H) =0'-8') Inlet Length								
6'	EA	$5,267.00						
8'	EA	$5,605.00						
10'	EA	$5,896.00						
12'	EA	$6,233.00						
16'	EA	$6,996.00						
20'	EA	$7,695.00						
Curb Drop Inlet (DI-4EE) 36"-48" Pipe (Invert Depth (H) =8'-16') Inlet Length								
6'	EA	$9,165.00						
8'	EA	$9,495.00						
10'	EA	$9,839.00						
12'	EA	$10,167.00						
16'	EA	$10,838.00						
20'	EA	$11,483.00						
Curb Drop Inlet (DI-4F) 36"-48" Pipe Inlet Length (Invert Depth (H)=0'-8')								

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
8'	EA	$5,877.00						
10'	EA	$6,209.00						
12'	EA	$6,568.00						
16'	EA	$7,259.00						
20'	EA	$7,963.00						
Curb Drop Inlet (DI-4FF) 36"-48" Pipe (Invert Depth (H) =8'-16') Inlet Length								
8'	EA	$8,866.00						
10'	EA	$9,147.00						
12'	EA	$9,435.00						
16'	EA	$9,997.00						
20'	EA	$10,584.00						
Median Drop Inlets - CIP								
Median Drop Inlet **(DI-6A)** 12"-24" Pipe Inlet (H=8')	EA	$4,205.00						
Median Drop Inlet **(DI-6B)** 12"-24" Pipe Inlet (H=8')	EA	$4,267.00						
Median Drop Inlet **(DI-6C)** 30"-48" Pipe Inlet (H=10')	EA	$5,589.00						
Median Drop Inlet **(DI-6D)** 30"-48" Pipe Inlet (H=10')	EA	$5,692.00						
Median Drop Inlet **(DI-7)** Type III Top 12"-42" Pipe Inlet (H=10')	EA	$5,748.00						
Median Drop Inlet **(DI-7A)** Type III Top 12"-42" Pipe Inlet (H=10')	EA	$6,338.00						
Median Drop Inlet **(DI-7B)** Type III Top 12"-42" Pipe Inlet (H=10')	EA	$6,797.00						

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
MISCELLANEOUS INLETS								
Ditch Drop Inlet, **(DI-5)** Type III Tip 12"-42" Pipe Inlet (H=8')	EA	$5,226.00						
Standard Yard Inlet **(YI-1)** 12"-48" Pipe (Invert Depth (H)=0'-8') Inlet Length 4'(No Aprons)	EA	$4,749.00						
Add Yard Inlet Apron	THROAT	$255.00						
Standard Yard Inlet **(YI-3)** 12"-48" Pipe (Invert Depth (H)=0'-8') Inlet Length 4'(No Aprons)	EA	$5,127.00						
Add Yard Inlet Apron	THROAT	$255.00						
CULVERTS								
Single Box Culvert (BC-1A) Fills to 25'								
4' X 4'	LF	$336.00						
5' x 5"	LF	$410.00						
6' X 6'	LF	$498.00						
8' X 8'	LF	$699.00						
10' X 10'	LF	$845.00						
Double Box Culvert (BC-2b) Fills to 25'								
4' X 4'	LF	$566.00						
5' x 5"	LF	$705.00						
6' X 6'	LF	$854.00						
8' X 8'	LF	$1,148.00						
10' X 10'	LF	$1,411.00						
Oversized Single Box Culvert (BBC-1) Fills to 25'								

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
12' X 6'	LF	$1,026.00						
12' X 8'	LF	$1,144.00						
12' X 10'	LF	$1,239.00						
12' X 12'	LF	$1,348.00						
Triple Box Culvert (BC-3B) Fills to 25'								
4' X 4'	LF	$779.00						
5' x 5"	LF	$965.00						
6' X 6'	LF	$1,211.00						
8' X 8'	LF	$1,633.00						
10' X 10'	LF	$2,488.00						
Quadruple Box Culvert (BC-4B) Fills to 25'								
4' X 4'	LF	$987.00						
5' x 5"	LF	$1,225.00						
6' X 6'	LF	$1,523.00						
8' X 8'	LF	$1,497.00						
10' X 10'	LF	$2,835.00						
Standard Wing for Box Culvert (1 Side Only) Height of Box								
4'	EA	$675.00						
5'	EA	$995.00						
6'	EA	$1,337.00						
8'	EA	$2,489.00						
10'	EA	$3,315.00						
Standard Wing for Oversized Box Culvert(BBC-W) Height of Box								
6'	EA	$1,351.00						
8'	EA	$2,189.00						
10'	EA	$3,269.00						
12'	EA	$4,763.00						
MISCELLANEOUS STORM								

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Connection to Existing Structure								
15"-36" Pipe	EA	$735.00						
42"- 60" Pipe	EA	$1,125.00						
Casing Pipe, Bore and Jack (3/8" wall)								
22" ID (6"-8" Carrier Pipe)	LF	$411.00						
24" ID (10" Carrier Pipe)	LF	$451.00						
30" ID (12" Carrier Pipe)	LF	$569.00						
Plug Pipe								
6" –12" Pipe	EA	$142.00						
15"-36" Pipe	EA	$323.00						
42"- 60" Pipe	EA	$522.00						
Pavement Edge Pipe								
Standard Pipe Underdrain	LF	$19.00						
Riprap								
Dry, Class I, 18"	SY	$47.87	30	1,436.10				
Dry, Class II, 18"	SY	$51.46						
Grouted, Class I, 18"	SY	$69.97						
Filter Fabric								
Class I	SY	$3.50						
Class II	SY	$3.00						
Class III	SY	$2.25						
Gabions (No excavation)								
Mattress	CY	$130.00						
Revetment	CY	$164.33						
Wall	CY	$212.25						
Paved Ditch (4" Thick)								
Concrete (Non-reinforced)	SY	$62.00						
Bituminous Concrete(4")	SY	$30.00						
Sodded Ditch								

Pg. ST 1,436.10

19

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Sodded Ditch (Incl Fine Grading)	SY	$9.86						
STREET CONSTRUCTION								
ROADS AND PARKING								
Soil Stabilization	**Inches**							
Cement 6%	SY/Inch Depth	$2.70						
Depth (in Inches):								
Lime 6%	SY/Inch Depth	$1.89						
Depth (in Inches):								
Subbase, Aggregated Material								
Base Type I	SY/Inch Depth	$1.75	1337	18,718				
Depth (in Inches):	8"							
Bituminous Concrete								
Base Course	SY/Inch Depth	$5.59	1337	33,632.24				
Depth (in Inches):	4½"							
Intermediate Course	SY/Inch Depth	$5.49	0					
Depth (in Inches):	0							
Top Course	SY/Inch Depth	$5.49	1337	11,010.20				
Depth (in Inches):	1½"							
Prime Coat	SY	$1.10						
Tack Coat	SY	$1.10						
Driveway Restoration								
4" Concrete & 4" Gravel	SY	$79.95						

Pg. 5T 63,360.44

20

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
2" S-5 & 7 6" Gravel	SY	$31.96						
Shoulders, Type I								
Aggregated Base, 4"	SY	$11.50						
Concrete Curbing								
Curb & Gutter CG6 & CG7	LF	$22.50	715	16,087.50				
Curb Cut, CG-12 Detectable Surf.	EA	$569.00						
Entrances/Driveways								
Commercial Entrance CG-11	SY	$52.88						
Commercial Entrance CG-13	SY	$64.67						
Residential Driveway Apron	SY	$51.79						
Guardrails								
Std. Blocked-out W beam (GR2)	LF	$42.50						
Std. W beam, Weak Post GR8	LF	$28.50						
Terminal, GR-6 (L=12'-6")	EA	$2,929.00						
Terminal, GR-7 (L=6'-3")	EA	$2,659.00						
Type I, GR-8 Terminal (L=25')	EA	$1,399.00						
Type II, GR-8 Terminal (L=13'-6")	EA	$695.00						
Terminal, MB-4 (L=37'-6")	EA	$3,495.00						
Type I, MB-5 Terminal (L=27'-1)	EA	$2,925.00						
Type II, MB-5 Terminal (L=13'-6)	EA	$1,675.00						
Miscellaneous wood Fence								
Trash enclosure - ~~Brick~~ 6' high	LF	200 ~~$325.00~~	~~50~~ 60	12,000				
Reinforced Concrete Pad 6" to 8"	SY	$62.00	43	2,666				
Striping 4" width (VDOT Type	LF	$2.25	572	1,287				

B.S.T. 32,040.50

21

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
B)								
Concrete Wheel Stops	EA	$70.00						
Parking Lot Striping	EA	$50.00						
Sign Island	EA	$850.00						
Traffic Barricade	LF	$43.45						
Street Name Signs	EA	$435.00						
Traffic Control Signs	EA	$375.00						
Street Light (pole, bracket, light)	EA	$4,285.00						
SIDEWALKS AND TRAILS								
Sidewalk								
Concrete 4" w/WWF, No base	SY	$45.23	169	7,643.87				
Bitum. Conc, 2" w/4" Base	SY	$30.00						
4" Conc, No Reinf., No Base	SY	$41.00						
HANDRAIL								
Handrail 3 Rail 1-1/4" #4 Finish	LF	$96.50						
Wood Chip Trail								
Trails(Incl Excavation & Grading) Wood chip, 4' wide	SY	$17.69						
Bituminous Trail								
6' to 10' wide	SY	$49.25						
CRITICAL SLOPE STABILIZATION								
Paved Flume	SY	$67.00						
Stmwtr Conc Channel-Excav	SY	$7.75						
ADD Grass Lined-seeded	SY	$5.37						
ADD Grass Lined-sodded	SY	$10.89						
Outlet Protection								
Non-grouted Riprap 18"	SY	$52.00						
Concrete 4"	SY	$53.50						

Pgst 7,643.87

22

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Level Spreader	SY	$4.44	13	57.72				
Struc Streambank Protection								
Non-grouted Riprap 18"	SY	$58.00						
Gabions	CY	$147.00						
Vegetative Erosion Control								
Sodding incl Fertilizing – Banks	SY	$7.77						
Sodding incl Fertilizing – Flat	SY	$5.36						
Seeding incl Fertilizing	SY	$2.44						
Soding W/Soil Treat & Watering	SY	$3.25						
Seeding W/Soil Treat & Watering	SY	$6.46						
Straw Mulch w/Tack	SY	$1.40						
Jute Mesh	SY	$1.77						
SPECIAL ITEMS								
FEMA Processing LOMR/CLOMR	EA	$7,500.00						
As Built (Record Drawings)	EA	$9,500.00	1	9,500				
SWM/BMP POND	LS	See Note 1	~~1~~ 1	100,000				
SIGNALIZATION	LS	See Note 2						
Subtotal								

TOTAL ESTIMATE OF COMPLETED WORK:

Pg Sub. 109,557.72

Pg	SubTOTAL
2	54,040.39
3	23,695.20
7	16,416.45
8	16,305.50
11	8,558.00
19	1,436.10
20	63,360.44
21	32,040.50
22	7,643.87
23	109,557.72
	333,054.17

TOTAL:	$ 333,054.17
+ 10% CONTINGENCIES:	$ 33,305.42
GRAND TOTAL:	$ 366,359.59
+ 4% INFLATION FACTOR:	$ 381,013.97

24

Kimley»Horn

1Memorandum

To: Christopher Hill
Tri-State Investment Properties, LLC
PO Box 1
Kearneysville, WV 25430

From: Mark Phillips, P.E.

Through: Mr. James Newman, AICP
City Planner, Zoning/Subdivision Administrator
City of Charles Town
101 E Washington Street
Charles Town, WV 25414

Date: December 11, 2023

Subject: Tiny Treasures Day Care and Learning Center Expansion Bond Initiation Review

This memorandum summarizes our review of the Bond Initiation Application for the expansion of the Tine Treasures Day Care establishment (dated November 28, 2023, prepared by Alpha Associates) for a bond initiation of $381,013.97. Using the Site Plan dated November 9, 2023, it is our opinion that the application represents a reasonable representation of work to be done to construct the project.

Thank you for the opportunity to review this Bond Initiation Application. In the meantime, please feel free to contact us at 703-870-3631 should you have any questions.

KIMLEY-HORN & ASSOCIATES, INC.



Mark Phillips, P.E.
Project Manager
Associate

Planning Commission
101 East Washington Street
Charles Town, WV 25414

SCHEDULED

Meeting: 01/18/24
Department: Planning Commission
Category: Report
Initiator:

AGENDA ITEM (ID #)

Commission Review: BR2023-09: Joan and Joe's Coffee - Bond Establishment

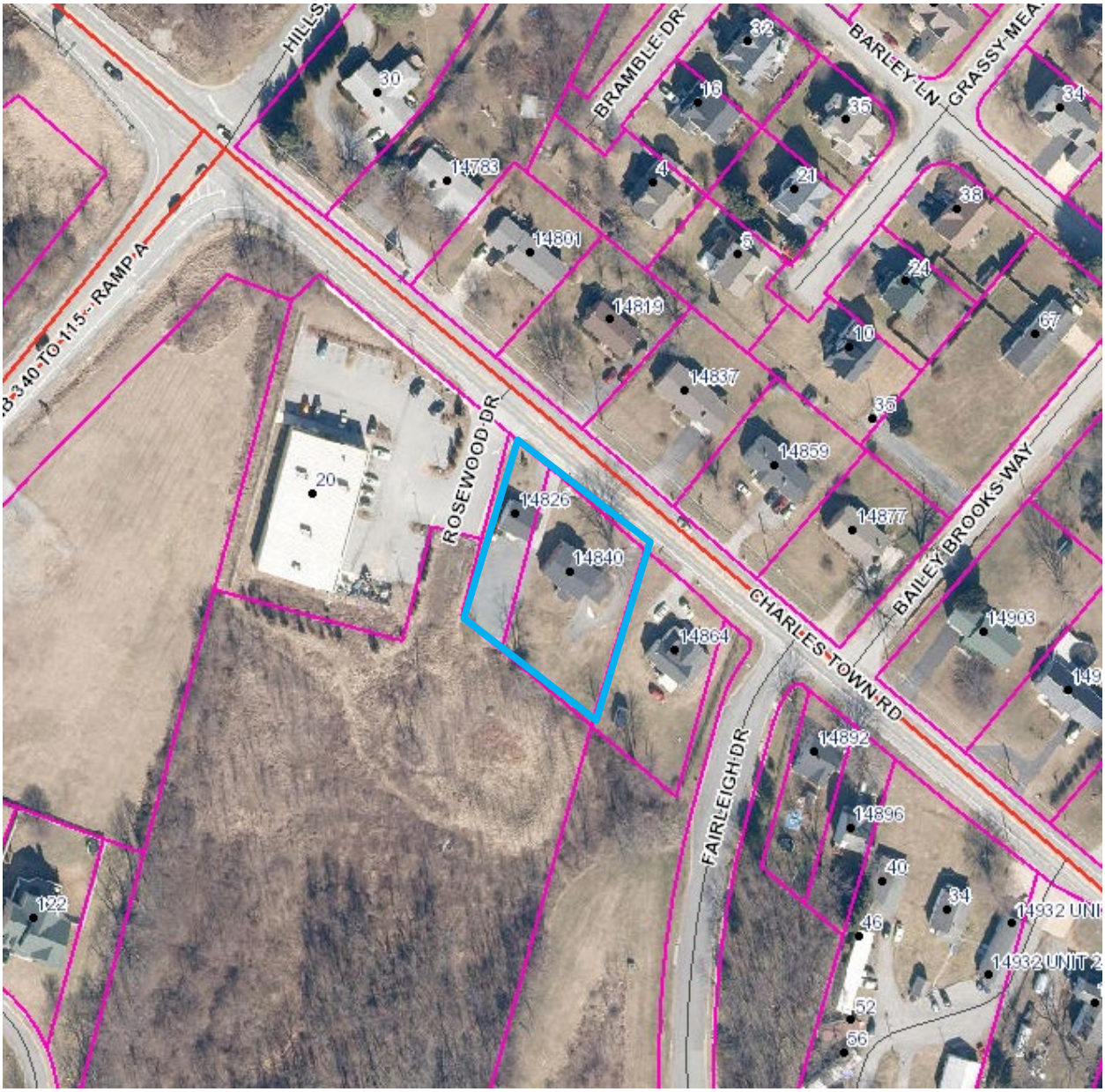
ATTACHMENTS:

- 1. Staff Report.pdf
- 2. Application.pdf
- 3. Estimate.pdf
- 4. KH Comments pt1.pdf
- 5._KH_Comments_pt_2.pdf

Bond Establishment Request
BR2023-09

Date: For the January 18, 2024 Planning Commission Special Meeting
Applicant: Robert Mead on behalf of Joan and Joe's Coffee
Report by: James Newman, City Planner, Zoning/Subdivision Administrator.
Proposal: A bond establishment of $86,287.53

Joan and Joe's Coffee - Site



BACKGROUND
The applicant has submitted a bond establishment request for a parking lot extension with sidewalks and stormwater management facilities. The applicant is requesting a bond establishment of the **performance and land disturbance bond** in the amount of $86,287.53

Upon review of the request the City Engineer, Kimley-Horn, has determined that the bond amount is a reasonable assessment of the cost of the project.

BOND COMMITTEE
The Bond Committee reviewed this item at their December 14, 2023 meeting. The Committee recommended approval of the bond reduction request.

STAFF RECOMMENDATION
The City Engineer and City Staff have reviewed the bond reduction request and recommends the bond reduction request be **approved**.

Bond Request No._____

BOND REQUEST AND REDUCTION

To assist the Subdivision Administrator in the review of a Bond Request Application, the Applicant must utilize this form to supply the City with the information prescribed under Article 1335 and Section 1332 of the Subdivision and Land Development Ordinance. The submission of this form, along with the prescribed information and required fees, shall serve as the Applicant's Bond Request Application as required by Ordinance Article 1335.

1. DATE November 15, 2023

2. APPLICATION TYPE ☑ Bond | Initiation ☐ Bond | Reduction

☐ Bond | Reallocation ☐ Bond | Release**

3. PROJECT NAME Joan and Joe's Coffee

Address 14840 Charles Town Road Charles Town, WV 25414

4. APPLICANT'S NAME* Robert Mead

Address 14826 Charles Town Road Charles Town, WV 25414

Telephone Number (681) 252-1033 Fax Number (___)

Email Address rmead@onedigital.com

5. PROPERTY OWNER'S NAME Robert Mead

Address 14826 Charles Town Road Charles Town, WV 24414

Telephone Number (681) 252-1033 Fax Number (___)

Email Address rmead@onedigital.com

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

**Requires a Public Hearing and landscaping surety for one year after release

Bond Request No._____

6. DESCRIPTION OF REQUETED INITIATION, REDUCTION, OR RELEASE:

This bond estimate was prepared for the public improvements to be constructed for the proposed coffee shop, including sidewalk, access, parking areas, landscaping, lighting, and stormwater bioretention areas.

7. A) CURRENT BOND AMOUNT $79,137.53

B) PROPOSED BOND AMOUNT $79,137.53

8. PARCEL INVENTORY: (List all parcels that are part of this application):

Tax Map No.	Parcel No.	Deed Book	Page No.	Zoning District
17	12.3	1275	458	General Commercial
12	12.1	1255	466	General Commercial

9. PARCEL HISTORY: (List all pending or previously approved applications on the subject parcels inventoried above, including previous plat applications if this application is an amendment)

Application No.	Project Name and Phase	Status	Approval Date

Bond Request No._____

10. BOND RELEASE ATTACHMENTS.

The following shall be included with this request:

A. To the extent not previously submitted pursuant to bond reduction request, copies of inspection and test reports if work was inspected and tested by a third-party inspector.

B. Certification that all bonded Improvements, other than Improvements accepted by West Virginia Department of Highways (WVDOH), have been completed in accordance with the approved plans, profiles, and specifications and the requirements of any applicable manual. For Improvements to be accepted for maintenance by WVDOH, such Certification shall state that the Improvements have been installed and inspected in accordance with WVDOH's requirements.

C. A copy of the City-approved As-Built Drawings as required for facilities within public rights-of-way or Easements submitted pursuant to Section 1332.10 of this Ordinance.

Date of As-Builts _____ Prepared By _____

D. A letter from a Professional Engineer or Professional Land Surveyor certifying that property corners and Monuments have been set as required under this Ordinance.

E. Documentation of acceptance by WVDOH for public roadways and rights-of-way, or a maintenance and indemnification agreement and bond approved by the Planning Commission for public roadways that have been completed in accordance with WVDOH standards but which, due to factors other than their quality of construction, are not eligible for acceptance by WVDOH.

F. For private roadways, a letter of acceptance by the entity responsible for maintenance and a Latent Defects Indemnification Agreement and Bond in accordance with this Section.

G. Private Roadway Maintenance Bonds. Before a Performance Agreement and surety for private roadway construction shall be released, a Latent Defects Indemnification Agreement and Bond shall be provided by the applicant/Developer and approved by the Planning Commission. The guarantee provided by such Agreement and Bond must be for a period of two (2) years following the date of performance bond release, and must be in an amount equal to no less than 5% of the original performance bond estimate in accordance with Section 1335.07 (F) of the Subdivision Ordinance.

H. Landscaping Surety. Surety is required to ensure the landscaping shown on the Major S/LD plans is maintained for one (1) year. The one (1) year shall start from the date at which the surety for the site has been released, with the exception of this landscaping surety. The landscaping surety amount shall not be less than $5,000.00 or 10% of the total landscaping cost for the project, which every is greater.

Bond Request No._____

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Article 1335 of the S/LD Ordinance.

Signature of Applicant

Robert Mead Date 11 / 16 / 2023

Signature of Property Owner (If different than Applicant)

_____ Date _____

Please submit an original completed Application, 1 digital copy and 1 paper copy of the As-Built Plans (if applicable) to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

Please also send a copy of the completed Application as well as the As-Builts to the following:

Hatch/Chester Engineers
Attn: Elizabeth Adamowicz
705 Quince Orchard Road, Suite 310
Gaithersburg, MD 20878

FOR CITY USE ONLY

Application Number:_____ Date Application Received:_____

Fee: $_____ Check No._____

Receipt No._____

Site Inspection Date:_____ Inspector:_____

Subdivision Administrator Approval:_____ Date:_____

Engineer Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

City Council Approval:_____ Date:_____

Comments:_____

_____

_____

_____

_____

Signature Certificate

Reference number: PFXBA-8JTRZ-YCEU4-NKXMJ

Signer	Timestamp	Signature
Robert Mead Email: rmead@onedigital.com Shared via link		
Sent:	16 Nov 2023 20:37:14 UTC	
Viewed:	16 Nov 2023 20:48:05 UTC	IP address: 71.206.41.194
Signed:	16 Nov 2023 21:32:56 UTC	Location: Harpers Ferry, United States

Document completed by all parties on:
16 Nov 2023 21:32:56 UTC

Signed with PandaDoc

PandaDoc is a document workflow and certified eSignature solution trusted by 40,000+ companies worldwide.

CITY OF CHARLES TOWN

PUBLIC IMPROVEMENT BOND UNIT COST LIST AND BOND REDUCTION FORM

This form shall be used to calculate the amount of the bond required to guarantee public improvements to be constructed under the approved Final S/LD Application. This form shall also be used in calculating the amount of bond reductions to be approved by the Planning Commission. **Note**: No bond shall be reduced until completion of at least thirty (30) percent of the physical Improvements secured by the bond.

PROJECT NAME:	Joan and Joe's Coffee
PREPARED BY:	JHA Companies
DATE OF SUBMISSION	11/15/2023

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
MOBILIZATION GENERAL									
Mobilization	LS	$6,250.00	1						
Field Office	EA	$3,000.00							
Job Sign	EA	$1,150.00							
SURVEYING									
Steel Pipe Property Corner Marker Incl. Survey	EA	$275.00							
R.O.W. MONUMENTS SURVEYED IN PLACE									
RM -- 1	EA	$825.00							
RM -- 2	EA	$575.00							
EARTHWORK EXCAVATION									
Regular Bulk used as Fill	CY	$3.86	313						
Rock, Rip	CY	$17.30							
Rock, Blast	CY	$38.48							
BORROW MATERIAL									
Buy, Load, Haul 10 Mi. Select Material	CY	$28.90							
Fill and Compaction of On-site Borrow	CY	$5.95							
UNSUITABLE MATERIAL									
Load and Haul, 20 mi R/T	CY	$21.95							
Dump Charge	CY	$37.50							
Site Grading	SY	$0.75							
CLEAR & GRUB									
Light	AC	$6,675.00							
Moderate	AC	$9,750.00							

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Heavy	AC	$12,250.00						
Very Heavy	AC	$14,250.00						
LANDSCAPING								
Seeding	SY	$0.77						
Sodding	SY	$3.64						
PLANTING SHRUBS								
18”	EA	$40.00	4					
24”	EA	$70.00						
TREES								
6’ – 8’ (1-2 in. Caliper)	EA	$400.00	4					
8’ – 10’ (2.5-3 in. Caliper)	EA	$700.00						
Tree Protection	LF	$9.00						
MISCELLANEOUS SITE IMPROVEMENTS								
RETAINING WALLS								
Timber Wall (Less Than 6 ft)	LF	$325.00						
Dry Rubble RW-1 (H=6')	LF	$450.00						
Mortared Rubble RW-1A (H=6')	LF	$535.00						
Concrete Gravity RW-2 (H=6')	LF	$339.00						
Concrete Gravity RW-3 (H=6')	LF	$378.00						
FENCING								
Std. Fence (H=5’) FR-5	LF	$9.31						
Farm Fence (H=5’) FR-3A	LF	$10.90						
Chain Link Fence (H=6’)FR 2-B	LF	$14.52						
Board Fence (H=6’)	LF	$19.35	130					

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
TOT LOTS									
Tot Lot	EA	$16,495.00							
STORM DRAINAGE									
STORM SEWER									
NOTE: All pipe unit prices include trench, excavation, bedding, pipe, & backfill									
Rock Excavation for All Pipe Types									
Less than 1,500 CY (Blasting)	CY	$110.00							
More than 1,500 CY (Blasting)	CY	$90.00							
Less than 1,500 CY (Hoe Ram)	CY	$135.00							
More than 1,500 CY (Hoe Ram)	CY	$110.00							
Trench De-watering									
Trench De-watering	LF	$2.95							
RCP CLASS III ROUND T & G W/MASTIC									
12" Pipe (RCP III)									
0' – 8' Cut	LF	$44.50							
8' – 14' Cut	LF	$62.50							
Add cost for Class IV	LF	$0.85							
O-Ring	LF	$5.50							
15" Pipe (RCP III)									
0' – 10' Cut	LF	$49.75							
10' – 16'	LF	$77.50							
Add Cost for Class IV	LF	$0.95							
O-Ring	LF	$5.50							
18" Pipe (RCP III)									
0' – 10' Cut	LF	$50.00							
10' – 16' Cut	LF	$80.00							

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
Add Cost for Class IV	LF	$2.00							
O-Ring	LF	$7.00							
21" Pipe (RCP III)									
0' – 10' Cut	LF	$57.50							
10' – 16' Cut	LF	$87.50							
Add Cost for Class IV	LF	$2.75							
O-Ring	LF	$13.00							
24" Pipe (RCP III)									
0' – 10' Cut	LF	$67.50							
10' – 16' Cut	LF	$95.00							
Add Cost for Class IV	LF	$3.15							
O-Ring	LF	$14.00							
27" Pipe (RCP III)									
0' – 10' Cut	LF	$60.00							
10' – 16' Cut	LF	$95.00							
Add Cost for Class IV	LF	$4.00							
O-Ring	LF	$15.00							
30" Pipe (RCP III)									
0' – 10' Cut	LF	$82.50							
10' – 16' Cut	LF	$125.00							
Add Cost for Class IV	LF	$6.00							
O-Ring	LF	$17.25							
33" Pipe (RCP III)									
0' – 12' Cut	LF	$115.00							
10' – 18' Cut	LF	$160.00							
Add Cost for Class IV	LF	$6.50							
O-Ring	LF	$21.95							
36" Pipe (RCP III)									
0' – 12' Cut	LF	$120.00							

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
12’ – 18’ Cut	LF	$175.00							
Add Cost for Class IV	LF	$7.75							
O-Ring	LF	$22.75							
42” Pipe (RCP III)									
0’ – 12’ Cut	LF	$140.00							
12’ – 18’ Cut	LF	$200.00							
Add Cost for Class IV	LF	$12.00							
O-Ring	LF	$35.45							
48” Pipe (RCP III)									
0’ – 12’ Cut	LF	$155.00							
12’ – 18’ Cut	LF	$215.00							
Add Cost for Class IV	LF	$12.50							
O-Ring	LF	$43.35							
54” Pipe (RCP III)									
0’ – 12’ Cut	LF	$190.00							
12’ – 18’ Cut	LF	$275.00							
Add Cost for Class IV	LF	$18.75							
O-Ring	LF	$44.45							
60” Pipe (RCP III)									
0’ – 12’ Cut	LF	$225.00							
12’ – 18’ Cut	LF	$335.00							
Add Cost for Class IV	LF	$22.50							
O-Ring	LF	$48.65							
ELLIPTICAL PIPE – RCP CLASS III									
23” X 14” (18” Equiv-RCP III									
0’ – 10’ Cut	LF	$75.00							
10’ – 16’ Cut	LF	$110.00							
Add Cost for Class IV	LF	$16.45							
O-Ring	LF	$43.35							

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
30" X 19" (24" Equiv-RCP III)									
0' – 10' Cut	LF	$90.00							
10' – 16' Cut	LF	$130.00							
Add Cost for Class IV	LF	$5.95							
O-Ring	LF	$43.35							
38" X 24" (30" Equiv-RCP III)									
0' – 10' Cut	LF	$120.00							
10' – 16' Cut	LF	$167.50							
Add Cost for Class IV	LF	$8.45							
O-Ring	LF	$51.35							
45" X 29" (36" Equiv-RCP III)									
0' – 10' Cut	LF	$165.00							
10' – 16' Cut	LF	$235.00							
Add Cost for Class IV	LF	$11.35							
O-Ring	LF	$53.35							
53" X 34" (42" Equiv-RCP III)									
0' – 12' Cut	LF	$210.00							
10' – 18' Cut	LF	$300.00							
Add Cost for Class IV	LF	$15.35							
O-Ring	LF	$58.95							
60" X 38" (48" Equiv-RCP III)									
0' – 12' Cut	LF	$255.00							
10' – 18' Cut	LF	$375.00							
Add Cost for Class IV	LF	$18.35							
O-Ring	LF	$69.95							
HDPE PIPE									
8" Pipe									
0'-8' Cut	LF	$28.65							
8'-14' Cut	LF	$43.15							

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
12" Pipe									
0'-8' Cut	LF	$38.95							
8'-14' Cut	LF	$57.75							
15" Pipe									
0'-8' Cut	LF	$50.25							
8'-16' Cut	LF	$74.85							
18" Pipe									
0'-8' Cut	LF	$66.00							
8'-16' Cut	LF	$98.55							
24" Pipe									
0'-8' Cut	LF	$76.90							
8'-16' Cut	LF	$115.25							
30" Pipe									
0'-8' Cut	LF	$91.33							
8'-16' Cut	LF	$137.27							
36" Pipe									
0'-8' Cut	LF	$101.68							
8'-16' Cut	LF	$152.33							
42" Pipe									
0'-8' Cut	LF	$113.99							
8'-16' Cut	LF	$171.00							
48" Pipe									
0'-8' Cut	LF	$129.55							
8'-16' Cut	LF	$195.66							
STORM STRUCTURES									
END SECTIONS									
End Section (ES-1), Concrete Pipe Size									
15”	EA	$485.00							

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
18”	EA	$565.00							
21”	EA	$645.00							
24”	EA	$755.00							
27”	EA	$1,065.00							
30”	EA	$1,195.00							
36”	EA	$1,765.00							
42”	EA	$1,795.00							
48”	EA	$2,135.00							
54”	EA	$2,795.00							
60”	EA	$3,455.00							
ENDWALLS									
EW-1(Pre-cast) Round Pipe Size									
15”	EA	$800.00							
18”	EA	$1,337.00							
24”	EA	$2,021.00							
30”	EA	$2,133.00							
36”	EA	$2,366.00							
EW-1 Cast in Place [Round Pipe Size]									
15”	EA	$852.00							
18”	EA	$1,053.00							
24”	EA	$1,495.00							
30”	EA	$2,144.00							
36”	EA	$2,383.00							
EW-1A (Pre-Cast) Elliptical Pipe Size									
23” X 14” (18”)	EA	$695.00							
30” X 19” (24”)	EA	$969.00							
38” X 24” (30”)	EA	$1,165.00							
45” X 29” (36”)	EA	$1,445.00							

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
53” X 34” (42”)	EA	$1,840.00							
EW-1A (Cast in Place) Elliptical Pipe Size									
23” X 14” (18”)	EA	$667.00							
30” X 19” (24”)	EA	$939.00							
38” X 24” (30”)	EA	$1,247.00							
45” X 29” (36”)	EA	$1,618.00							
53” X 34” (42”)	EA	$2,109.00							
EW-2 (PreCast) Round Pipe Size									
42”	EA	$5,445.00							
48”	EA	$5,695.00							
54”	EA	$6,660.00							
60”	EA	$7,140.00							
72”	EA	$7,990.00							
84”	EA	$9,490.00							
EW-2 (Cast in Place) Round Pipe Size									
42”	EA	$4,723.00							
48”	EA	$6,039.00							
54”	EA	$6,972.00							
60”	EA	$8,179.00							
72”	EA	$10,713.00							
84”	EA	$12,288.00							
(EW-6PC) [Double Pipe] Pipe Size									
2-15”	EA	$999.00							
2-18”	EA	$1,235.00							
2-24”	EA	$1,510.00							
2-30”	EA	$2,165.00							
2-36”	EA	$2,647.00							
MANHOLES									

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
Standard Brick Manhole Std Frame & Cover (MH-1)									
6' Depth	EA	$3,750.00							
Depth below 6'	VF	$163.00							
Standard Precast Manhole Std Frame & Cover (MH-2)									
6' Depth	EA	$3,100.00							
Depth below 6'	VF	$177.00							
Additional Cost (Amounts in parentheses to be added to the above unit costs)									
Watertight Fr/Cover (Add 110)	EA	$579.00							
Heavy Duty Fr/Cover (Add 82)	EA	$599.00							
DROP INLETS									
Cast in Place 48"									
Drop Inlet (DI-1) 12" – 24" Pipe0-10 VF	EA	$3,697.00							
Drop Inlet (DI-1A) 12" – 24" Pipe 10-20 VF	EA	$5,593.00							
Drop Inlet (DI-2) 12" – 24" Pipe0-10 VF, 10' throat	EA	$6,911.00							
Drop Inlet (DI-2A) 12" – 24" Pipe 10-20 VF, 10' throat	EA	$8,833.00							
CURB DROP INLETS									
Curb Drop Inlet (DI-3A)									
12"-30" Pipe (Invert Depth (H) =0'-8') Inlet Length 2'-6"	EA	$4,088.00							
Curb Drop Inlet (DI-3AA)									
12"-30" Pipe (Invert Depth (H) =8'-20') Inlet Length 2'-6"	EA	$5,357.00							
Curb Drop Inlet (DI-3B & DI-12) 12"-30" Pipe (Invert Depth (H) =0'-8') Inlet Length									
4'	EA	$4,279.00							

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
6’	EA	$4,573.00						
8’	EA	$4,889.00						
10'	EA	$5,052.00						
12’	EA	$5,227.00						
16’	EA	$5,543.00						
20’	EA	$5,859.00						
Curb Drop Inlet (DI-3BB) 12”-30” Pipe (Invert Depth (H) =8’-20’) Inlet Length								
4’	EA	$4,276.00						
6’	EA	$4,848.00						
8’	EA	$5,429.00						
10'	EA	$5,732.00						
12’	EA	$6,011.00						
16’	EA	$6,296.00						
20’	EA	$6,599.00						
Curb Drop Inlet (DI-3C) 12”-30” Pipe (Invert Depth (H) =0’-8’) Inlet Length								
6’	EA	$4,013.00						
8’	EA	$4,588.00						
10'	EA	$4,893.00						
12’	EA	$5,178.00						
16’	EA	$5,766.00						
20’	EA	$6,339.00						
Curb Drop Inlet (DI-3CC) 12”-30” Pipe (Invert Depth (H) =8’-20’) Inlet Length								
6’	EA	$4,746.00						
8’	EA	$5,293.00						
10'	EA	$5,627.00						
12’	EA	$5,988.00						
16’	EA	$6,772.00						
20’	EA	$7,465.00						

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
Curb Drop Inlet (DI-3D)									
12”-30” Pipe (Invert Depth (H) =0’-8’) Inlet Length 2’-6”	EA	$3,633.00							
Curb Drop Inlet (DI-3DD)									
12”-30” Pipe (Invert Depth (H) =8’-20’) Inlet Length 2’-6”	EA	$4,367.00							
Curb Drop Inlet (DI-3E) 12”-30” Pipe (Invert Depth (H) =0’-8’) Inlet Length									
4’	EA	$4,093.00							
8’	EA	$4,756.00							
10'	EA	$5,724.00							
12'	EA	$5,833.00							
16’	EA	$6,072.00							
20’	EA	$6,709.00							
Curb Drop Inlet (DI-3EE) 12”-30” Pipe (Invert Depth (H) =8’-20’) Inlet Length									
6’	EA	$7,562.00							
8’	EA	$7,869.00							
10'	EA	$7,999.00							
12’	EA	$8,166.00							
16’	EA	$8,471.00							
20’	EA	$8,767.00							
Curb Drop Inlet (DI-3F) 12”-30” Pipe Inlet Length (Invert Depth (H)=0’-8’)									
6’	EA	$3,765.00							
8’	EA	$4,419.00							
10'	EA	$4,749.00							
12’	EA	$5,085.00							
16’	EA	$5,742.00							
20’	EA	$6,395.00							
Curb Drop Inlet (DI-3FF) 12”-30” Pipe (Invert Depth (H) =8’-20’) Inlet Length									

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
6’	EA	$8,077.00							
8’	EA	$8,288.00							
10'	EA	$8,480.00							
12’	EA	$8,669.00							
16’	EA	$9,047.00							
20’	EA	$9,446.00							
Curb Drop Inlet (DI-4A) 36”–48” Pipe (Invert Depth (H)=0’-8’) Inlet Length									
4’	EA	$4,868.00							
Curb Drop Inlet (DI-4AA) 36”–48” Pipe (Invert Depth (H)=0’-8’) Inlet Length									
4'	EA	$6,817.00							
Curb Drop Inlet (DI-4B) 36”-48” Pipe (Invert Depth (H) =0’-8’) Inlet Length									
6’	EA	$5,172.00							
8’	EA	$5,499.00							
10'	EA	$5,698.00							
12’	EA	$5,870.00							
16’	EA	$6,221.00							
20’	EA	$6,571.00							
Curb Drop Inlet (DI-4BB) 36”-48” Pipe (Invert Depth (H) =8’-20') Inlet Length									
6’	EA	$10,292.00							
8’	EA	$10,643.00							
10'	EA	$10,810.00							
12’	EA	$10,974.00							
16’	EA	$11,309.00							
20’	EA	$11,669.00							
Curb Drop Inlet (DI-4C) 36”-48” Pipe (Invert Depth (H) =0’-8’) Inlet Length									
8’	EA	$5,612.00							
10'	EA	$5,794.00							
12’	EA	$5,968.00							
16’	EA	$6,315.00							

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
20’	EA	$6,657.00							
Curb Drop Inlet (DI-4CC) 36”-48” Pipe (Invert Depth (H) =8’-20’) Inlet Length									
8’	EA	$13,371.00							
10'	EA	$13,693.00							
12’	EA	$14,097.00							
16’	EA	$14,712.00							
20’	EA	$15,365.00							
Curb Drop Inlet (DI-4D)									
36”-48” Pipe (Invert Depth (H) =0’-8’) Inlet Length 4'	EA	$4,933.00							
Curb Drop Inlet (DI-4DD)									
36”-48” Pipe (Invert Depth (H) =8’-16’) Inlet Length 4'	EA	$9,455.00							
Curb Drop Inlet (DI-4E) 36”-48” Pipe (Invert Depth (H) =0’-8’) Inlet Length									
6'	EA	$5,267.00							
8’	EA	$5,605.00							
10'	EA	$5,896.00							
12'	EA	$6,233.00							
16’	EA	$6,996.00							
20’	EA	$7,695.00							
Curb Drop Inlet (DI-4EE) 36”-48” Pipe (Invert Depth (H) =8’-16’) Inlet Length									
6’	EA	$9,165.00							
8’	EA	$9,495.00							
10'	EA	$9,839.00							
12’	EA	$10,167.00							
16’	EA	$10,838.00							
20’	EA	$11,483.00							
Curb Drop Inlet (DI-4F) 36”-48" Pipe Inlet Length (Invert Depth (H)=0’-8’)									

BOND ESTIMATE						BOND REDUCTION		City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
8’	EA	$5,877.00						
10'	EA	$6,209.00						
12’	EA	$6,568.00						
16’	EA	$7,259.00						
20’	EA	$7,963.00						
Curb Drop Inlet (DI-4FF) 36”-48” Pipe (Invert Depth (H) =8’-16’) Inlet Length								
8’	EA	$8,866.00						
10'	EA	$9,147.00						
12’	EA	$9,435.00						
16’	EA	$9,997.00						
20’	EA	$10,584.00						
Median Drop Inlets - CIP								
Median Drop Inlet **(DI-6A)** 12”-24” Pipe Inlet (H=8’)	EA	$4,205.00						
Median Drop Inlet **(DI-6B)** 12”-24” Pipe Inlet (H=8’)	EA	$4,267.00						
Median Drop Inlet **(DI-6C)** 30”-48” Pipe Inlet (H=10’)	EA	$5,589.00						
Median Drop Inlet **(DI-6D)** 30”-48” Pipe Inlet (H=10’)	EA	$5,692.00						
Median Drop Inlet **(DI-7)** Type III Top 12”-42” Pipe Inlet (H=10’)	EA	$5,748.00						
Median Drop Inlet **(DI-7A)** Type III Top 12”-42” Pipe Inlet (H=10’)	EA	$6,338.00						
Median Drop Inlet **(DI-7B)** Type III Top 12”-42” Pipe Inlet (H=10’)	EA	$6,797.00						

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
MISCELLANEOUS INLETS								
Ditch Drop Inlet, **(DI-5)** Type III Tip 12"-42" Pipe Inlet (H=8')	EA	$5,226.00						
Standard Yard Inlet **(YI-1)** 12"-48" Pipe (Invert Depth (H)=0'-8') Inlet Length 4'(No Aprons)	EA	$4,749.00						
Add Yard Inlet Apron	THROAT	$255.00						
Standard Yard Inlet **(YI-3)** 12"-48" Pipe (Invert Depth (H)=0'-8') Inlet Length 4'(No Aprons)	EA	$5,127.00						
Add Yard Inlet Apron	THROAT	$255.00						
CULVERTS								
Single Box Culvert (BC-1A) Fills to 25'								
4' X 4'	LF	$336.00						
5' x 5"	LF	$410.00						
6' X 6'	LF	$498.00						
8' X 8'	LF	$699.00						
10' X 10'	LF	$845.00						
Double Box Culvert (BC-2b) Fills to 25'								
4' X 4'	LF	$566.00						
5' x 5"	LF	$705.00						
6' X 6'	LF	$854.00						
8' X 8'	LF	$1,148.00						
10' X 10'	LF	$1,411.00						
Oversized Single Box Culvert (BBC-1) Fills to 25'								

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
12' X 6'	LF	$1,026.00						
12' X 8'	LF	$1,144.00						
12' X 10'	LF	$1,239.00						
12' X 12'	LF	$1,348.00						
Triple Box Culvert (BC-3B) Fills to 25'								
4' X 4'	LF	$779.00						
5' x 5"	LF	$965.00						
6' X 6'	LF	$1,211.00						
8' X 8'	LF	$1,633.00						
10' X 10'	LF	$2,488.00						
Quadruple Box Culvert (BC-4B) Fills to 25'								
4' X 4'	LF	$987.00						
5' x 5"	LF	$1,225.00						
6' X 6'	LF	$1,523.00						
8' X 8'	LF	$1,497.00						
10' X 10'	LF	$2,835.00						
Standard Wing for Box Culvert (1 Side Only) Height of Box								
4'	EA	$675.00						
5'	EA	$995.00						
6'	EA	$1,337.00						
8'	EA	$2,489.00						
10'	EA	$3,315.00						
Standard Wing for Oversized Box Culvert(BBC-W) Height of Box								
6'	EA	$1,351.00						
8'	EA	$2,189.00						
10'	EA	$3,269.00						
12'	EA	$4,763.00						
MISCELLANEOUS STORM								

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
Connection to Existing Structure									
15”-36” Pipe	EA	$735.00							
42”- 60” Pipe	EA	$1,125.00							
Casing Pipe, Bore and Jack (3/8” wall)									
22” ID (6”-8” Carrier Pipe)	LF	$411.00							
24” ID (10” Carrier Pipe)	LF	$451.00							
30” ID (12” Carrier Pipe)	LF	$569.00							
Plug Pipe									
6” –12” Pipe	EA	$142.00							
15”-36” Pipe	EA	$323.00							
42”- 60” Pipe	EA	$522.00							
Pavement Edge Pipe									
Standard Pipe Underdrain	LF	$19.00							
Riprap									
Dry, Class I, 18”	SY	$47.87							
Dry, Class II, 18”	SY	$51.46							
Grouted, Class I, 18”	SY	$69.97							
Filter Fabric									
Class I	SY	$3.50							
Class II	SY	$3.00							
Class III	SY	$2.25							
Gabions (No excavation)									
Mattress	CY	$130.00							
Revetment	CY	$164.33							
Wall	CY	$212.25							
Paved Ditch (4” Thick)									
Concrete (Non-reinforced)	SY	$62.00							
Bituminous Concrete(4”)	SY	$30.00							
Sodded Ditch									

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
Sodded Ditch (Incl Fine Grading)	SY	$9.86							
STREET CONSTRUCTION									
ROADS AND PARKING									
Soil Stabilization	**Inches**								
Cement 6%	SY/Inch Depth	$2.70							
Depth (in Inches):									
Lime 6%	SY/Inch Depth	$1.89							
Depth (in Inches):									
Subbase, Aggregated Material									
Base Type I	SY/Inch Depth	$1.75	1188						
Depth (in Inches):	6								
Bituminous Concrete									
Base Course	SY/Inch Depth	$5.59	1188						
Depth (in Inches):	2.5								
Intermediate Course	SY/Inch Depth	$5.49							
Depth (in Inches):									
Top Course	SY/Inch Depth	$5.49	1188						
Depth (in Inches):	1.5								
Prime Coat	SY	$1.10							
Tack Coat	SY	$1.10							
Driveway Restoration									
4” Concrete & 4” Gravel	SY	$79.95							

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
2” S-5 & 7 6” Gravel	SY	$31.96							
Shoulders, Type I									
Aggregated Base, 4”	SY	$11.50							
Concrete Curbing									
Curb & Gutter CG6 & CG7	LF	$22.50							
Curb Cut, CG-12 Detectable Surf.	EA	$569.00							
Entrances/Driveways									
Commercial Entrance CG-11	SY	$52.88	46						
Commercial Entrance CG-13	SY	$64.67							
Residential Driveway Apron	SY	$51.79							
Guardrails									
Std. Blocked-out W beam (GR2)	LF	$42.50							
Std. W beam, Weak Post GR8	LF	$28.50							
Terminal, GR-6 (L=12’-6”)	EA	$2,929.00							
Terminal, GR-7 (L=6’-3”)	EA	$2,659.00							
Type I, GR-8 Terminal (L=25’)	EA	$1,399.00							
Type II, GR-8 Terminal (L=13’-6”)	EA	$695.00							
Terminal, MB-4 (L=37’-6”)	EA	$3,495.00							
Type I, MB-5 Terminal (L=27’-1)	EA	$2,925.00							
Type II, MB-5 Terminal (L=13’-6)	EA	$1,675.00							
Miscellaneous									
Trash enclosure - Brick 6' high	LF	$325.00	31						
Reinforced Concrete Pad 6" to 8"	SY	$62.00							
Striping 4" width (VDOT Type	LF	$2.25							

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
B)									
Concrete Wheel Stops	EA	$70.00	7						
Parking Lot Striping	EA	$50.00	21						
Sign Island	EA	$850.00							
Traffic Barricade	LF	$43.45							
Street Name Signs	EA	$435.00							
Traffic Control Signs	EA	$375.00	4						
Street Light (pole, bracket, light)	EA	$4,285.00	1						
SIDEWALKS AND TRAILS									
Sidewalk									
Concrete 4” w/WWF, No base	SY	$45.23							
Bitum. Conc, 2” w/4” Base	SY	$30.00							
4” Conc, No Reinf., No Base	SY	$41.00	93						
HANDRAIL									
Handrail 3 Rail 1-1/4” #4 Finish	LF	$96.50	40						
Wood Chip Trail									
Trails(Incl Excavation & Grading) Wood chip, 4’ wide	SY	$17.69							
Bituminous Trail									
6’ to 10' wide	SY	$49.25							
CRITICAL SLOPE STABILIZATION									
Paved Flume	SY	$67.00							
Stmwtr Conc Channel-Excav	SY	$7.75							
ADD Grass Lined-seeded	SY	$5.37							
ADD Grass Lined-sodded	SY	$10.89							
Outlet Protection									
Non-grouted Riprap 18”	SY	$52.00							
Concrete 4”	SY	$53.50							

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Level Spreader	SY	$4.44						
Struc Streambank Protection								
Non-grouted Riprap 18”	SY	$58.00						
Gabions	CY	$147.00						
Vegetative Erosion Control								
Sodding incl Fertilizing – Banks	SY	$7.77						
Sodding incl Fertilizing – Flat	SY	$5.36						
Seeding incl Fertilizing	SY	$2.44	434					
Soding W/Soil Treat & Watering	SY	$3.25						
Seeding W/Soil Treat & Watering	SY	$6.46						
Straw Mulch w/Tack	SY	$1.40						
Jute Mesh	SY	$1.77						
SPECIAL ITEMS								
FEMA Processing LOMR/CLOMR	EA	$7,500.00						
As Built (Record Drawings)	EA	$9,500.00	1					
SWM/BMP POND	LS	See Note 1	$10,386.00					
SIGNALIZATION	LS	See Note 2						
Subtotal		$69,176.16						
TOTAL ESTIMATE OF COMPLETED WORK:								

TOTAL:	**$75,426.16**
+ 10% CONTINGENCIES:	$7,542.62
GRAND TOTAL:	$82,968.78
+ 4% INFLATION FACTOR:	$86,287.53

Kimley»Horn

Memorandum

To: Robert Mead
14826 Charles Town Rd
Charles Town, WV 25414

From: Mark Phillips, P.E.

Through: Mr. James Newman, AICP
City Planner, Zoning/Subdivision Administrator
City of Charles Town
101 E Washington Street
Charles Town, WV 25414

Date: December 7, 2023

Subject: Joan and Joe's Coffee Shop Bond Initiation Review

This memorandum summarizes our review of the Bond Initiation Application for the entrance and parking improvements to the Joan and Joe's Coffee establishment (dated November 15, 2023, prepared by Robert Mead) for a bond initiation of $79,137.53. Using the Site Plan dated July 7, 2023, based on Kimley-Horn's review, we have the following comments.

1. We request the Applicant clarify if they omitted the mobilization cost intentionally.
2. Kimley-Horn finds the remainder of the Bond initiation request to align with the approved Plat.

Kimley-Horn requests the Applicant address the first comment.

Thank you for the opportunity to review this Bond Initiation Application. Please feel free to contact us at 703-870-3631 should you have any questions.

KIMLEY-HORN & ASSOCIATES, INC.



Mark Phillips, P.E.
Project Manager
Associate

From: Phillips, Mark
To: James Newman
Subject: RE: Bond Review - Joan Joe Coffee
Date: Tuesday, December 12, 2023 4:44:21 PM
Attachments: image001.png

Hey James,

No further comments and no cost. Was only 15 minutes of time.

Mark R Phillips, P.E. (VA,WV)
Kimley-Horn | 19775 Belmont Executive Plaza, Suite 250, Ashburn, VA 20147
Direct: 703-870-3631 | Mobile: 540-454-6294
Connect with us: Twitter | LinkedIn | Facebook | Instagram | Kimley-Horn.com

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From: James Newman <JNewman@charlestownwv.us>
Sent: Friday, December 8, 2023 8:29 AM
To: Phillips, Mark <Mark.Phillips@kimley-horn.com>
Subject: FW: Bond Review - Joan Joe Coffee

Hi Mark,

Please see the revised bond establishment for Joan and Joes Coffee

James Newman
City Planner, Zoning/Subdivision Administrator, AICP
City of Charles Town, WV
304-724-3251

Disclaimer: This email does NOT constitute a zoning or subdivision determination. To obtain an official determination, please contact the Zoning Administrator.

From: Joe Hague, PE <jhague@jhacompanies.com>
Sent: Thursday, December 7, 2023 5:03 PM
To: James Newman <JNewman@charlestownwv.us>; Robert Mead [redacted]
Cc: Robert mead [redacted]
Subject: Re: Bond Review

James,
Here is the updated Bond Estimate with Mobilization. Let me know if you need anything else.
Thank you,

Planning Commission
101 East Washington Street
Charles Town, WV 25414

Meeting: 01/18/24
Department: Planning Commission
Category: Report
Initiator:

SCHEDULED

AGENDA ITEM (ID #)

Commission Review: BR2023-07: Norborne-Glebe Phases 9, 10A - Bond Reduction

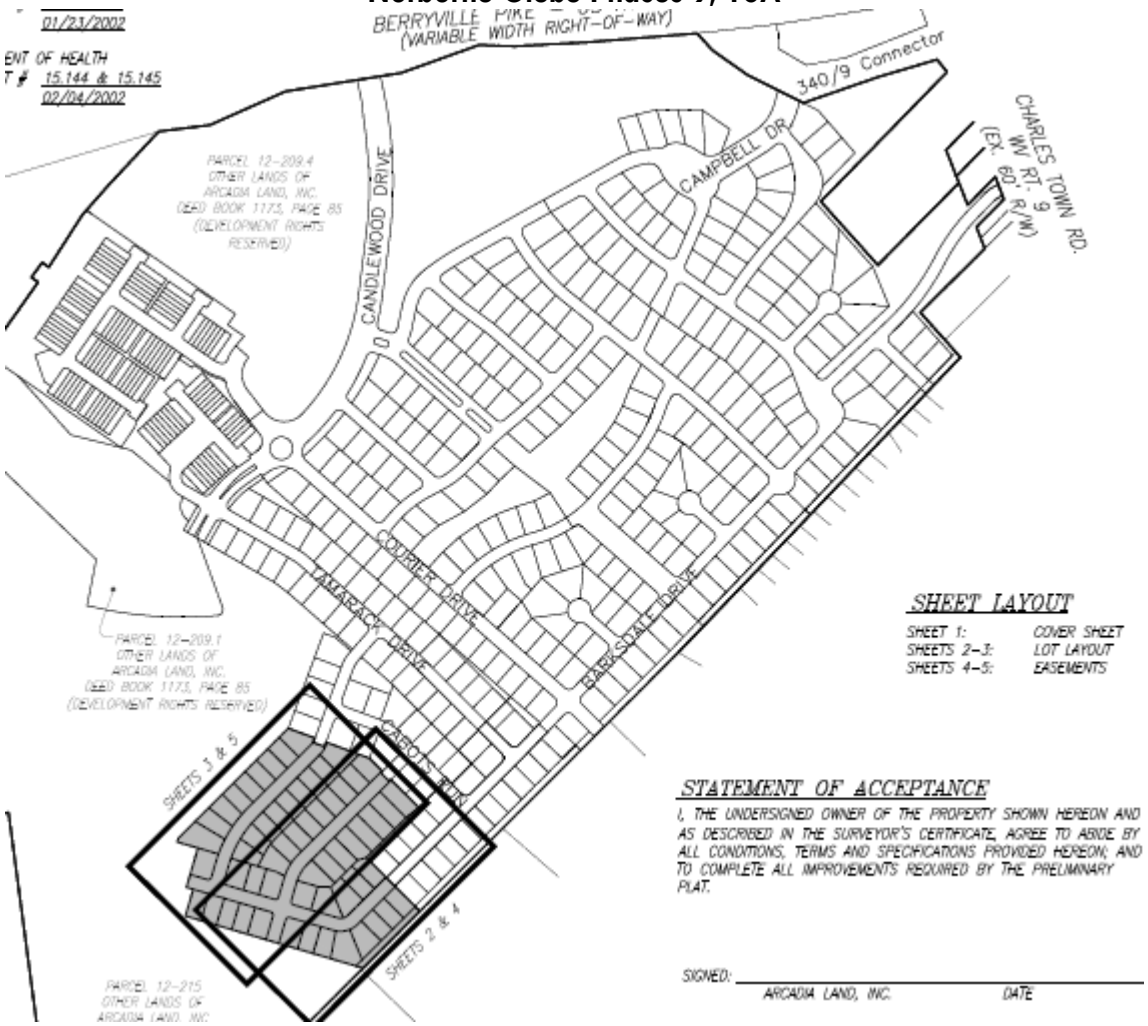
ATTACHMENTS:

- 1. Staff Report.pdf
- 2. Performance Bond Application.pdf
- 3. Performance Estimate.pdf
- 4. Land Disturbance Application.pdf
- 5. Land Disturbance Estimate.pdf
- 6. KH Review.pdf

Bond Reduction Request
BR2023-07

Date: For the January 18, 2024 Planning Commission Special Meeting
Applicant: Gary Endler on behalf of Arcadia Land Inc.
Report by: James Newman, City Planner, Zoning/Subdivision Administrator.
Proposal: Bond reductions for performance and land disturbance bonds

Norborne-Glebe Phases 9, 10A



BACKGROUND
The applicant has submitted a bond reduction request for their performance and land disturbance bonds for Norborne-Glebe subdivision Phases 9 and 10A.

Upon review of the request the City Engineer, Kimley-Horn, has determined that the bond amount is a reasonable assessment of the work completed thus far.

Existing Performance Bond: $1,679,755.40
Proposed Performance Bond: $430,013.25
Reduction Amount: $1,249,742.15

Existing Land Disturbance Bond Amount: $404,531.03
Proposed Land Disturbance Bond Amount: $152,918.17
Reduction Amount: $251,612.86

BOND COMMITTEE
The Bond Committee reviewed this item at their December 14, 2023 meeting. The Committee recommended approval of the bond reduction request.

STAFF RECOMMENDATION
The City Engineer and City Staff have reviewed the bond reduction request and recommends the bond reduction request be **approved**.

Bond Request No._____

Norborne Glebe - Phase 9&10A
Performance Bond Reduction

RECEIVED
NOV 14 2023
BY:_____

BOND REQUEST AND REDUCTION

To assist the Subdivision Administrator in the review of a Bond Request Application, the Applicant must utilize this form to supply the City with the information prescribed under Article 1335 and Section 1332 of the Subdivision and Land Development Ordinance. The submission of this form, along with the prescribed information and required fees, shall serve as the Applicant's Bond Request Application as required by Ordinance Article 1335.

1. DATE November 15, 2023

2. APPLICATION TYPE ☐ Bond | Initiation ☒ Bond | Reduction

☐ Bond | Reallocation ☐ Bond | Release**

3. PROJECT NAME Norborne Glebe Subdivision - Phase 9&10A

Address N/A

4. APPLICANT'S NAME* Arcadia Land, Inc. Attn: Gary Endler

Address 108 N. George Street - 2nd Floor Charles Town, WV 25414

Telephone Number ( ) Fax Number ( )

Email Address 703-771-8000, gendler@arcadiacompanies.com

5. PROPERTY OWNER'S NAME Arcadia Land, Inc, Attn: Gary Endler

Address 108 N George Street - 2nd Floor Charles Town, WV 25414

Telephone Number ( ) Fax Number ( )

Email Address 703-771-8000, gendler@arcadiacompanies.com

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

**Requires a Public Hearing and landscaping surety for one year after release

Bond Request No._____

6. DESCRIPTION OF REQUETED INITIATION, REDUCTION, OR RELEASE:

Requesting Bond Reduction for the Performance Bond for Phase 9&10A, Norborne Glebe Subdivision

7. A) CURRENT BOND AMOUNT $1,679,755.4

B) PROPOSED BOND AMOUNT $430,013.25

8. PARCEL INVENTORY: (List all parcels that are part of this application):

Tax Map No.	Parcel No.	Deed Book	Page No.	Zoning District
Phase 14A	03120209004 and 031220209001	1173	85	

9. PARCEL HISTORY: (List all pending or previously approved applications on the subject parcels inventoried above, including previous plat applications if this application is an amendment)

Application No.	Project Name and Phase	Status	Approval Date

Bond Request No._____

10. BOND RELEASE ATTACHMENTS.

The following shall be included with this request:

A. To the extent not previously submitted pursuant to bond reduction request, copies of inspection and test reports if work was inspected and tested by a third-party inspector.

B. Certification that all bonded Improvements, other than Improvements accepted by West Virginia Department of Highways (WVDOH), have been completed in accordance with the approved plans, profiles, and specifications and the requirements of any applicable manual. For Improvements to be accepted for maintenance by WVDOH, such Certification shall state that the Improvements have been installed and inspected in accordance with WVDOH's requirements.

C. A copy of the City-approved As-Built Drawings as required for facilities within public rights-of-way or Easements submitted pursuant to Section 1332.10 of this Ordinance.

Date of As-Builts _____ Prepared By _____

D. A letter from a Professional Engineer or Professional Land Surveyor certifying that property corners and Monuments have been set as required under this Ordinance.

E. Documentation of acceptance by WVDOH for public roadways and rights-of-way, or a maintenance and indemnification agreement and bond approved by the Planning Commission for public roadways that have been completed in accordance with WVDOH standards but which, due to factors other than their quality of construction, are not eligible for acceptance by WVDOH.

F. For private roadways, a letter of acceptance by the entity responsible for maintenance and a Latent Defects Indemnification Agreement and Bond in accordance with this Section.

G. Private Roadway Maintenance Bonds. Before a Performance Agreement and surety for private roadway construction shall be released, a Latent Defects Indemnification Agreement and Bond shall be provided by the applicant/Developer and approved by the Planning Commission. The guarantee provided by such Agreement and Bond must be for a period of two (2) years following the date of performance bond release, and must be in an amount equal to no less than 5% of the original performance bond estimate in accordance with Section 1335.07 (F) of the Subdivision Ordinance.

H. Landscaping Surety. Surety is required to ensure the landscaping shown on the Major S/LD plans is maintained for one (1) year. The one (1) year shall start from the date at which the surety for the site has been released, with the exception of this landscaping surety. The landscaping surety amount shall not be less than $5,000.00 or 10% of the total landscaping cost for the project, which every is greater.

Bond Request No._____

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Article 1335 of the S/LD Ordinance.

Signature of Applicant George Endler
Asst. Treasurer Date 11/14/2023

Signature of Property Owner (If different than Applicant)

_____ Date _____

Please submit an original completed Application, 1 digital copy and 1 paper copy of the As-Built Plans (if applicable) to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

Please also send a copy of the completed Application as well as the As-Builts to the following:

Hatch/Chester Engineers
Attn: Elizabeth Adamowicz
705 Quince Orchard Road, Suite 310
Gaithersburg, MD 20878

FOR CITY USE ONLY

Application Number:_____ Date Application Received:_____

Fee: $_____ Check No._____

Receipt No._____

Site Inspection Date:_____ Inspector:_____

Subdivision Administrator Approval:_____ Date:_____

Engineer Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

City Council Approval:_____ Date:_____

Comments:_____

_____

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CITY OF CHARLES TOWN

PERFORMANCE BOND UNIT COST LIST AND BOND REDUCTION FORM

This form shall be used to calculate the amount of the bond required to guarantee public improvements to be constructed under the approved Final S/LD Application. This form shall also be used in calculating the amount of bond reductions to be approved by the Planning Commission. **Note**: No bond shall be reduced until completion of at least thirty (30) percent of the physical improvements secured by the bond.

PROJECT NAME:	Norborne Glebe - Phase 9&10A
PREPARED BY:	Greenway Engineering
DATE OF SUBMISSION	8/9/2022 - Reduction 11/15/2023

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
MOBILIZATION GENERAL								
Mobilization	LS	$6,250.00	1	$6,250.00	0.5	$3,125.00	50%	
Field Office	EA	$3,000.00			0.0	$0.00	0%	
Job Sign	EA	$1,150.00			0.0	$0.00	0%	
SURVEYING								
Steel Pipe Property Corner Marker Incl. Survey	EA	$275.00	119	$32,725.00	0.0	$0.00	0%	
R.O.W. MONUMENTS SURVEYED IN PLACE								
RM -- 1	EA	$825.00			0.0	$0.00	0%	
RM -- 2	EA	$575.00			0.0	$0.00	0%	
EARTHWORK EXCAVATION								
Regular Bulk used as Fill	CY	3.86	27,075.00	$104,509.50	27,075.0	$104,509.50	100%	
Rock, Rip	CY	17.30			0.0	$0.00	0%	
Rock, Blast	CY	38.48			0.0	$0.00	0%	
BORROW MATERIAL								
Buy, Load, Haul 10 Mi. Select Material	CY	28.90			0.0	$0.00	0%	
Fill and Compaction of On-site Borrow	CY	5.95	48,592.00	$289,122.40	48,592.0	$289,122.40	100%	
UNSUITABLE MATERIAL								
Load and Haul, 20 mi R/T	CY	$21.95			0.0	$0.00	0%	
Dump Charge	CY	37.50			0.0	$0.00	0%	
Site Grading	SY	0.75			0.0	$0.00	0%	
CLEAR & GRUB								
Light	AC	6,675.00	17	$113,475.00	17.0	$113,475.00	100%	
Moderate	AC	9,750.00			0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Heavy	AC	$12,250.00			0.0	$0.00	0%	
Very Heavy	AC	$14,250.00			0.0	$0.00	0%	
LANDSCAPING								
Seeding	SY	$0.77	33,880.00	$26,087.60	16,940.0	$13,043.80	50%	
Sodding	SY	$3.64	33,881.00	$123,326.84	16,940.5	$61,663.42	50%	
PLANTING SHRUBS								
18"	EA	$40.00			0.0	$0.00	0%	
24"	EA	$70.00			0.0	$0.00	0%	
TREES								
6' – 8' (1-2 in. Caliper)	EA	$400.00	151	$60,400.00	0.0	$0.00	0%	
8' – 10' (2.5-3 in. Caliper)	EA	$700.00			0.0	$0.00	0%	
Tree Protection	LF	$9.00			0.0	$0.00	0%	
MISCELLANEOUS SITE IMPROVEMENTS								
RETAINING WALLS								
Timber Wall (Less Than 6 ft)	LF	$325.00			0.0	$0.00	0%	
Dry Rubble RW-1 (H=6')	LF	$450.00			0.0	$0.00	0%	
Mortared Rubble RW-1A (H=6')	LF	$535.00			0.0	$0.00	0%	
Concrete Gravity RW-2 (H=6')	LF	$339.00			0.0	$0.00	0%	
Concrete Gravity RW-3 (H=6')	LF	$378.00			0.0	$0.00	0%	
FENCING								
Std. Fence (H=5') FR-5	LF	$9.31			0.0	$0.00	0%	
Farm Fence (H=5') FR-3A	LF	$10.90			0.0	$0.00	0%	
Chain Link Fence (H=6')FR 2-B	LF	$14.52			0.0	$0.00	0%	
Board Fence (H=6')	LF	$19.35			0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
TOT LOTS								
Tot Lot	EA	$16,495.00			0.0	$0.00	0%	
STORM DRAINAGE								
STORM SEWER								
NOTE: All pipe unit prices include trench, excavation, bedding, pipe, & backfill								
Rock Excavation for All Pipe Types								
Less than 1,500 CY (Blasting)	CY	$110.00			0.0	$0.00	0%	
More than 1,500 CY (Blasting)	CY	$90.00			0.0	$0.00	0%	
Less than 1,500 CY (Hoe Ram)	CY	$135.00			0.0	$0.00	0%	
More than 1,500 CY (Hoe Ram)	CY	$110.00			0.0	$0.00	0%	
Trench De-watering								
Trench De-watering	LF	$2.95			0.0	$0.00	0%	
RCP CLASS III ROUND T & G W/MASTIC								
12" Pipe (RCP III)								
0' – 8' Cut	LF	$44.50			0.0	$0.00	0%	
8' – 14' Cut	LF	$62.50			0.0	$0.00	0%	
Add cost for Class IV	LF	$0.85			0.0	$0.00	0%	
O-Ring	LF	$5.50			0.0	$0.00	0%	
15" Pipe (RCP III)								
0' – 10' Cut	LF	$49.75			0.0	$0.00	0%	
10' – 16'	LF	$77.50			0.0	$0.00	0%	
Add Cost for Class IV	LF	$0.95			0.0	$0.00	0%	
O-Ring	LF	$5.50			0.0	$0.00	0%	
18" Pipe (RCP III)								
0' – 10' Cut	LF	$50.00			0.0	$0.00	0%	
10' – 16' Cut	LF	$80.00			0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Add Cost for Class IV	LF	$2.00			0.0	$0.00	0%	
O-Ring	LF	$7.00			0.0	$0.00	0%	
21" Pipe (RCP III)								
0' – 10' Cut	LF	$57.50			0.0	$0.00	0%	
10' – 16' Cut	LF	$87.50			0.0	$0.00	0%	
Add Cost for Class IV	LF	$2.75			0.0	$0.00	0%	
O-Ring	LF	$13.00			0.0	$0.00	0%	
24" Pipe (RCP III)								
0' – 10' Cut	LF	$67.50			0.0	$0.00	0%	
10' – 16' Cut	LF	$95.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$3.15			0.0	$0.00	0%	
O-Ring	LF	$14.00			0.0	$0.00	0%	
27" Pipe (RCP III)								
0' – 10' Cut	LF	$60.00			0.0	$0.00	0%	
10' – 16' Cut	LF	$95.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$4.00			0.0	$0.00	0%	
O-Ring	LF	$15.00			0.0	$0.00	0%	
30" Pipe (RCP III)								
0' – 10' Cut	LF	$82.50			0.0	$0.00	0%	
10' – 16' Cut	LF	$125.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$6.00			0.0	$0.00	0%	
O-Ring	LF	$17.25			0.0	$0.00	0%	
33" Pipe (RCP III)								
0' – 12' Cut	LF	$115.00			0.0	$0.00	0%	
10' – 18' Cut	LF	$160.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$6.50			0.0	$0.00	0%	
O-Ring	LF	$21.95			0.0	$0.00	0%	
36" Pipe (RCP III)								
0' – 12' Cut	LF	$120.00			0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
12' – 18' Cut	LF	$175.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$7.75			0.0	$0.00	0%	
O-Ring	LF	$22.75			0.0	$0.00	0%	
42" Pipe (RCP III)								
0' – 12' Cut	LF	$140.00			0.0	$0.00	0%	
12' – 18' Cut	LF	$200.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$12.00			0.0	$0.00	0%	
O-Ring	LF	$35.45			0.0	$0.00	0%	
48" Pipe (RCP III)								
0' – 12' Cut	LF	$155.00			0.0	$0.00	0%	
12' – 18' Cut	LF	$215.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$12.50			0.0	$0.00	0%	
O-Ring	LF	$43.35			0.0	$0.00	0%	
54" Pipe (RCP III)								
0' – 12' Cut	LF	$190.00			0.0	$0.00	0%	
12' – 18' Cut	LF	$275.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$18.75			0.0	$0.00	0%	
O-Ring	LF	$44.45			0.0	$0.00	0%	
60" Pipe (RCP III)								
0' – 12' Cut	LF	$225.00			0.0	$0.00	0%	
12' – 18' Cut	LF	$335.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$22.50			0.0	$0.00	0%	
O-Ring	LF	$48.65			0.0	$0.00	0%	
ELLIPTICAL PIPE – RCP CLASS III								
23" X 14" (18" Equiv-RCP III								
0' – 10' Cut	LF	$75.00			0.0	$0.00	0%	
10' – 16' Cut	LF	$110.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$16.45			0.0	$0.00	0%	
O-Ring	LF	$43.35			0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
30" X 19" (24" Equiv-RCP III)								
0' – 10' Cut	LF	$90.00			0.0	$0.00	0%	
10' – 16' Cut	LF	$130.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$5.95			0.0	$0.00	0%	
O-Ring	LF	$43.35			0.0	$0.00	0%	
38" X 24" (30" Equiv-RCP III)								
0' – 10' Cut	LF	$120.00			0.0	$0.00	0%	
10' – 16' Cut	LF	$167.50			0.0	$0.00	0%	
Add Cost for Class IV	LF	$8.45			0.0	$0.00	0%	
O-Ring	LF	$51.35			0.0	$0.00	0%	
45" X 29" (36" Equiv-RCP III)								
0' – 10' Cut	LF	$165.00			0.0	$0.00	0%	
10' – 16' Cut	LF	$235.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$11.35			0.0	$0.00	0%	
O-Ring	LF	$53.35			0.0	$0.00	0%	
53" X 34" (42" Equiv-RCP III)								
0' – 12' Cut	LF	$210.00			0.0	$0.00	0%	
10' – 18' Cut	LF	$300.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$15.35			0.0	$0.00	0%	
O-Ring	LF	$58.95			0.0	$0.00	0%	
60" X 38" (48" Equiv-RCP III)								
0' – 12' Cut	LF	$255.00			0.0	$0.00	0%	
10' – 18' Cut	LF	$375.00			0.0	$0.00	0%	
Add Cost for Class IV	LF	$18.35			0.0	$0.00	0%	
O-Ring	LF	$69.95			0.0	$0.00	0%	
HDPE PIPE								
8" Pipe					0.0	$0.00	0%	
0'-8' Cut	LF	$28.65			0.0	$0.00	0%	
8'-14' Cut	LF	$43.15			0.0	$0.00	0%	

BOND ESTIMATE						BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION		QUANTITY	EXTENSION	%COMPLETE	% Approved
12" Pipe									
0'-8' Cut	LF	$38.95	90.00	$3,505.50		90.0	$3,505.50	100%	
8'-14' Cut	LF	$57.75				0.0	$0.00	0%	
15" Pipe									
0'-8' Cut	LF	$50.25	808.00	$40,602.00		808.0	$40,602.00	100%	
8'-16' Cut	LF	$74.85				0.0	$0.00	0%	
18" Pipe									
0'-8' Cut	LF	$66.00		$0.00		0.0	$0.00	0%	
8'-16' Cut	LF	$98.55				0.0	$0.00	0%	
24" Pipe									
0'-8' Cut	LF	$76.90	683	$52,522.70		683.0	$52,522.70	100%	
8'-16' Cut	LF	$115.25				0.0	$0.00	0%	
30" Pipe									
0'-8' Cut	LF	$91.33	240	$21,919.20		240.0	$21,919.20	100%	
8'-16' Cut	LF	$137.27				0.0	$0.00	0%	
36" Pipe									
0'-8' Cut	LF	$101.68				0.0	$0.00	0%	
8'-16' Cut	LF	$152.33				0.0	$0.00	0%	
42" Pipe									
0'-8' Cut	LF	$113.99				0.0	$0.00	0%	
8'-16' Cut	LF	$171.00				0.0	$0.00	0%	
48" Pipe									
0'-8' Cut	LF	$129.55				0.0	$0.00	0%	
8'-16' Cut	LF	$195.66				0.0	$0.00	0%	
STORM STRUCTURES									
END SECTIONS									
End Section (ES-1), Concrete Pipe Size									
15"	EA	$485.00		$0.00		0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
18"	EA	$565.00		$0.00	0.0	$0.00	0%	
21"	EA	$645.00			0.0	$0.00	0%	
24"	EA	$755.00		$0.00	0.0	$0.00	0%	
27"	EA	$1,065.00			0.0	$0.00	0%	
30"	EA	$1,195.00	1	$1,195.00	1.0	$1,195.00	100%	
36"	EA	$1,765.00			0.0	$0.00	0%	
42"	EA	$1,795.00			0.0	$0.00	0%	
48"	EA	$2,135.00			0.0	$0.00	0%	
54"	EA	$2,795.00			0.0	$0.00	0%	
60"	EA	$3,455.00			0.0	$0.00	0%	
ENDWALLS								
EW-1(Pre-cast) Round Pipe Size								
15"	EA	$800.00			0.0	$0.00	0%	
18"	EA	$1,337.00			0.0	$0.00	0%	
24"	EA	$2,021.00			0.0	$0.00	0%	
30"	EA	$2,133.00			0.0	$0.00	0%	
36"	EA	$2,366.00			0.0	$0.00	0%	
EW-1 Cast in Place [Round Pipe Size]								
15"	EA	$852.00			0.0	$0.00	0%	
18"	EA	$1,053.00			0.0	$0.00	0%	
24"	EA	$1,495.00			0.0	$0.00	0%	
30"	EA	$2,144.00			0.0	$0.00	0%	
36"	EA	$2,383.00			0.0	$0.00	0%	
EW-1A (Pre-Cast) Elliptical Pipe Size								
23" X 14" (18")	EA	$695.00			0.0	$0.00	0%	
30" X 19" (24")	EA	$969.00			0.0	$0.00	0%	
38" X 24" (30")	EA	$1,165.00			0.0	$0.00	0%	
45" X 29" (36")	EA	$1,445.00			0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
53" X 34" (42")	EA	$1,840.00			0.0	$0.00	0%	
EW-1A (Cast in Place) Elliptical Pipe Size								
23" X 14" (18")	EA	$667.00			0.0	$0.00	0%	
30" X 19" (24")	EA	$939.00			0.0	$0.00	0%	
38" X 24" (30")	EA	$1,247.00			0.0	$0.00	0%	
45" X 29" (36")	EA	$1,618.00			0.0	$0.00	0%	
53" X 34" (42")	EA	$2,109.00			0.0	$0.00	0%	
EW-2 (PreCast) Round Pipe Size								
42"	EA	$5,445.00			0.0	$0.00	0%	
48"	EA	$5,695.00			0.0	$0.00	0%	
54"	EA	$6,660.00			0.0	$0.00	0%	
60"	EA	$7,140.00			0.0	$0.00	0%	
72"	EA	$7,990.00			0.0	$0.00	0%	
84"	EA	$9,490.00			0.0	$0.00	0%	
EW-2 (Cast in Place) Round Pipe Size								
42"	EA	$4,723.00			0.0	$0.00	0%	
48"	EA	$6,039.00			0.0	$0.00	0%	
54"	EA	$6,972.00			0.0	$0.00	0%	
60"	EA	$8,179.00			0.0	$0.00	0%	
72"	EA	$10,713.00			0.0	$0.00	0%	
84"	EA	$12,288.00			0.0	$0.00	0%	
(EW-6PC) [Double Pipe] Pipe Size								
2-15"	EA	$999.00			0.0	$0.00	0%	
2-18"	EA	$1,235.00			0.0	$0.00	0%	
2-24"	EA	$1,510.00			0.0	$0.00	0%	
2-30"	EA	$2,165.00			0.0	$0.00	0%	
2-36"	EA	$2,647.00			0.0	$0.00	0%	

MANHOLES								
BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Standard Brick Manhole Std Frame & Cover (MH-1)								
6' Depth	EA	$3,750.00			0.0	$0.00	0%	
Depth below 6'	VF	$163.00			0.0	$0.00	0%	
Standard Precast Manhole Std Frame & Cover (MH-2)								
6' Depth	EA	$3,100.00	2	$6,200.00	2.0	$6,200.00	100%	
Depth below 6'	VF	$177.00	6.000	$1,062.00	6.0	$1,062.00	100%	
Additional Cost (Amounts in parentheses to be added to the above unit costs)								
Watertight Fr/Cover (Add 110)	EA	$579.00			0.0	$0.00	0%	
Heavy Duty Fr/Cover (Add 82)	EA	$599.00			0.0	$0.00	0%	
DROP INLETS								
Cast in Place 48"								
Drop Inlet (DI-1) 12" – 24" Pipe0-10 VF	EA	$3,697.00	6	$22,182.00	6.0	$22,182.00	100%	
Drop Inlet (DI-1A) 12" – 24" Pipe 10-20 VF	EA	$5,593.00			0.0	$0.00	0%	
Drop Inlet (DI-2) 12" – 24" Pipe0-10 VF, 10' throat	EA	$6,911.00			0.0	$0.00	0%	
Drop Inlet (DI-2A) 12" – 24" Pipe 10-20 VF, 10' throat	EA	$8,833.00			0.0	$0.00	0%	
CURB DROP INLETS								
Curb Drop Inlet (DI-3A)								
12"-30" Pipe (Invert Depth (H) =0'-8') Inlet Length 2'-6"	EA	$4,088.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-3AA)								
12"-30" Pipe (Invert Depth (H) =8'-20') Inlet Length 2'-6"	EA	$5,357.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-3B & DI-12) 12"-30" Pipe (Invert Depth (H) =0'-8') Inlet Length								
4'	EA	$4,279.00	4	$17,116.00	4.0	$17,116.00	100%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
6'	EA	$4,573.00			0.0	$0.00	0%	
8'	EA	$4,889.00			0.0	$0.00	0%	
MH	EA	$5,052.00	3	$15,156.00	3.0	$15,156.00	100%	
12'	EA	$5,227.00			0.0	$0.00	0%	
16'	EA	$5,543.00			0.0	$0.00	0%	
20'	EA	$5,859.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-3BB) 12"-30" Pipe (Invert Depth (H) =8'-20') Inlet Length								
4'	EA	$4,276.00			0.0	$0.00	0%	
6'	EA	$4,848.00	8	$38,784.00	8.0	$38,784.00	100%	
8'	EA	$5,429.00	1	$5,429.00	1.0	$5,429.00	100%	
10'	EA	$5,732.00	1	$5,732.00	1.0	$5,732.00	100%	
12'	EA	$6,011.00			0.0	$0.00	0%	
16'	EA	$6,296.00			0.0	$0.00	0%	
20'	EA	$6,599.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-3C) 12"-30" Pipe (Invert Depth (H) =0'-8') Inlet Length								
6'	EA	$4,013.00	2	$8,026.00	2.0	$8,026.00	100%	
8'	EA	$4,588.00			0.0	$0.00	0%	
10'	EA	$4,893.00			0.0	$0.00	0%	
12'	EA	$5,178.00			0.0	$0.00	0%	
16'	EA	$5,766.00			0.0	$0.00	0%	
20'	EA	$6,339.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-3CC) 12"-30" Pipe (Invert Depth (H) =8'-20') Inlet Length								
6'	EA	$4,746.00			0.0	$0.00	0%	
8'	EA	$5,293.00			0.0	$0.00	0%	
10'	EA	$5,627.00			0.0	$0.00	0%	
12'	EA	$5,988.00			0.0	$0.00	0%	
16'	EA	$6,772.00			0.0	$0.00	0%	
20'	EA	$7,465.00			0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Curb Drop Inlet (DI-3D)								
12"-30" Pipe (Invert Depth (H) =0'-8') Inlet Length 2'-6"	EA	$3,633.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-3DD)								
12"-30" Pipe (Invert Depth (H) =8'-20') Inlet Length 2'-6"	EA	$4,367.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-3E) 12"-30" Pipe (Invert Depth (H) =0'-8') Inlet Length								
4'	EA	$4,093.00			0.0	$0.00	0%	
8'	EA	$4,756.00			0.0	$0.00	0%	
10'	EA	$5,724.00			0.0	$0.00	0%	
12'	EA	$5,833.00			0.0	$0.00	0%	
16'	EA	$6,072.00			0.0	$0.00	0%	
20'	EA	$6,709.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-3EE) 12"-30" Pipe (Invert Depth (H) =8'-20') Inlet Length								
6'	EA	$7,562.00			0.0	$0.00	0%	
8'	EA	$7,869.00			0.0	$0.00	0%	
10'	EA	$7,999.00			0.0	$0.00	0%	
12'	EA	$8,166.00			0.0	$0.00	0%	
16'	EA	$8,471.00			0.0	$0.00	0%	
20'	EA	$8,767.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-3F) 12"-30" Pipe Inlet Length (Invert Depth (H)=0'-8')								
6'	EA	$3,765.00			0.0	$0.00	0%	
8'	EA	$4,419.00			0.0	$0.00	0%	
10'	EA	$4,749.00			0.0	$0.00	0%	
12'	EA	$5,085.00			0.0	$0.00	0%	
16'	EA	$5,742.00			0.0	$0.00	0%	
20'	EA	$6,395.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-3FF) 12"-30" Pipe (Invert Depth (H) =8'-20') Inlet Length								

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
6'	EA	$8,077.00			0.0	$0.00	0%	
8'	EA	$8,288.00			0.0	$0.00	0%	
10'	EA	$8,480.00			0.0	$0.00	0%	
12'	EA	$8,669.00			0.0	$0.00	0%	
16'	EA	$9,047.00			0.0	$0.00	0%	
20'	EA	$9,446.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-4A) 36"–48" Pipe (Invert Depth (H)=0'-8') Inlet Length								
4'	EA	$4,868.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-4AA) 36"–48" Pipe (Invert Depth (H)=0'-8') Inlet Length								
4'	EA	$6,817.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-4B) 36"-48" Pipe (Invert Depth (H) =0'-8') Inlet Length								
6'	EA	$5,172.00			0.0	$0.00	0%	
8'	EA	$5,499.00			0.0	$0.00	0%	
10'	EA	$5,698.00			0.0	$0.00	0%	
12'	EA	$5,870.00			0.0	$0.00	0%	
16'	EA	$6,221.00			0.0	$0.00	0%	
20'	EA	$6,571.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-4BB) 36"-48" Pipe (Invert Depth (H) =8'-20') Inlet Length								
6'	EA	$10,292.00			0.0	$0.00	0%	
8'	EA	$10,643.00			0.0	$0.00	0%	
10'	EA	$10,810.00			0.0	$0.00	0%	
12'	EA	$10,974.00			0.0	$0.00	0%	
16'	EA	$11,309.00			0.0	$0.00	0%	
20'	EA	$11,669.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-4C) 36"-48" Pipe (Invert Depth (H) =0'-8') Inlet Length								
8'	EA	$5,612.00			0.0	$0.00	0%	
10'	EA	$5,794.00			0.0	$0.00	0%	
12'	EA	$5,968.00			0.0	$0.00	0%	
16'	EA	$6,315.00			0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
20'	EA	$6,657.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-4CC) 36"-48" Pipe (Invert Depth (H) =8'-20') Inlet Length								
8'	EA	$13,371.00			0.0	$0.00	0%	
10'	EA	$13,693.00			0.0	$0.00	0%	
12'	EA	$14,097.00			0.0	$0.00	0%	
16'	EA	$14,712.00			0.0	$0.00	0%	
20'	EA	$15,365.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-4D)								
36"-48" Pipe (Invert Depth (H) =0'-8') Inlet Length 4'	EA	$4,933.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-4DD)								
36"-48" Pipe (Invert Depth (H) =8'-16') Inlet Length 4'	EA	$9,455.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-4E) 36"-48" Pipe (Invert Depth (H) =0'-8') Inlet Length								
6'	EA	$5,267.00			0.0	$0.00	0%	
8'	EA	$5,605.00			0.0	$0.00	0%	
10'	EA	$5,896.00			0.0	$0.00	0%	
12'	EA	$6,233.00			0.0	$0.00	0%	
16'	EA	$6,996.00			0.0	$0.00	0%	
20'	EA	$7,695.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-4EE) 36"-48" Pipe (Invert Depth (H) =8'-16') Inlet Length								
6'	EA	$9,165.00			0.0	$0.00	0%	
8'	EA	$9,495.00			0.0	$0.00	0%	
10'	EA	$9,839.00			0.0	$0.00	0%	
12'	EA	$10,167.00			0.0	$0.00	0%	
16'	EA	$10,838.00			0.0	$0.00	0%	
20'	EA	$11,483.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-4F) 36"-48" Pipe Inlet Length (Invert Depth (H)=0'-8')								

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
8'	EA	$5,877.00			0.0	$0.00	0%	
10'	EA	$6,209.00			0.0	$0.00	0%	
12'	EA	$6,568.00			0.0	$0.00	0%	
16'	EA	$7,259.00			0.0	$0.00	0%	
20'	EA	$7,963.00			0.0	$0.00	0%	
Curb Drop Inlet (DI-4FF) 36"-48" Pipe (Invert Depth (H) =8'-16') Inlet Length								
8'	EA	$8,866.00			0.0	$0.00	0%	
10'	EA	$9,147.00			0.0	$0.00	0%	
12'	EA	$9,435.00			0.0	$0.00	0%	
16'	EA	$9,997.00			0.0	$0.00	0%	
20'	EA	$10,584.00			0.0	$0.00	0%	
Median Drop Inlets - CIP								
Median Drop Inlet **(DI-6A)** 12"-24" Pipe Inlet (H=8')	EA	$4,205.00			0.0	$0.00	0%	
Median Drop Inlet **(DI-6B)** 12"-24" Pipe Inlet (H=8')	EA	$4,267.00			0.0	$0.00	0%	
Median Drop Inlet **(DI-6C)** 30"-48" Pipe Inlet (H=10')	EA	$5,589.00			0.0	$0.00	0%	
Median Drop Inlet **(DI-6D)** 30"-48" Pipe Inlet (H=10')	EA	$5,692.00			0.0	$0.00	0%	
Median Drop Inlet **(DI-7)** Type III Top 12"-42" Pipe Inlet (H=10')	EA	$5,748.00		$0.00	0.0	$0.00	100%	
Median Drop Inlet **(DI-7A)** Type III Top 12"-42" Pipe Inlet (H=10')	EA	$6,338.00			0.0	$0.00	0%	
Median Drop Inlet **(DI-7B)** Type III Top 12"-42" Pipe Inlet (H=10')	EA	$6,797.00			0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
MISCELLANEOUS INLETS								
Ditch Drop Inlet, (DI-5) Type III Tip 12"-42" Pipe Inlet (H=8')	EA	$5,226.00			0.0	$0.00	0%	
Standard Yard Inlet (YI-1) 12"-48" Pipe (Invert Depth (H)=0'-8') Inlet Length 4'(No Aprons)	EA	$4,749.00		$0.00	0.0	$0.00	0%	
Add Yard Inlet Apron	THROAT	$255.00			0.0	$0.00	0%	
Standard Yard Inlet (YI-3) 12"-48" Pipe (Invert Depth (H)=0'-8') Inlet Length 4'(No Aprons)	EA	$5,127.00			0.0	$0.00	0%	
Add Yard Inlet Apron	THROAT	$255.00			0.0	$0.00	0%	
CULVERTS								
Single Box Culvert (BC-1A) Fills to 25'								
4' X 4'	LF	$336.00			0.0	$0.00	0%	
5' x 5"	LF	$410.00			0.0	$0.00	0%	
6' X 6'	LF	$498.00			0.0	$0.00	0%	
8' X 8'	LF	$699.00			0.0	$0.00	0%	
10' X 10'	LF	$845.00			0.0	$0.00	0%	
Double Box Culvert (BC-2b) Fills to 25'								
4' X 4'	LF	$566.00			0.0	$0.00	0%	
5' x 5"	LF	$705.00			0.0	$0.00	0%	
6' X 6'	LF	$854.00			0.0	$0.00	0%	
8' X 8'	LF	$1,148.00			0.0	$0.00	0%	
10' X 10'	LF	$1,411.00			0.0	$0.00	0%	
Oversized Single Box Culvert (BBC-1) Fills to 25'								

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
12' X 6'	LF	$1,026.00			0.0	$0.00	0%	
12' X 8'	LF	$1,144.00			0.0	$0.00	0%	
12' X 10'	LF	$1,239.00			0.0	$0.00	0%	
12' X 12'	LF	$1,348.00			0.0	$0.00	0%	
Triple Box Culvert (BC-3B) Fills to 25'								
4' X 4'	LF	$779.00			0.0	$0.00	0%	
5' x 5"	LF	$965.00			0.0	$0.00	0%	
6' X 6'	LF	$1,211.00			0.0	$0.00	0%	
8' X 8'	LF	$1,633.00			0.0	$0.00	0%	
10' X 10'	LF	$2,488.00			0.0	$0.00	0%	
Quadruple Box Culvert (BC-4B) Fills to 25'								
4' X 4'	LF	$987.00			0.0	$0.00	0%	
5' x 5"	LF	$1,225.00			0.0	$0.00	0%	
6' X 6'	LF	$1,523.00			0.0	$0.00	0%	
8' X 8'	LF	$1,497.00			0.0	$0.00	0%	
10' X 10'	LF	$2,835.00			0.0	$0.00	0%	
Standard Wing for Box Culvert (1 Side Only) Height of Box								
4'	EA	$675.00			0.0	$0.00	0%	
5'	EA	$995.00			0.0	$0.00	0%	
6'	EA	$1,337.00			0.0	$0.00	0%	
8'	EA	$2,489.00			0.0	$0.00	0%	
10'	EA	$3,315.00			0.0	$0.00	0%	
Standard Wing for Oversized Box Culvert(BBC-W) Height of Box								
6'	EA	$1,351.00			0.0	$0.00	0%	
8'	EA	$2,189.00			0.0	$0.00	0%	
10'	EA	$3,269.00			0.0	$0.00	0%	
12'	EA	$4,763.00			0.0	$0.00	0%	

MISCELLANEOUS STORM								
BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Connection to Existing Structure								
15"-36" Pipe	EA	$735.00			0.0	$0.00	0%	
42"- 60" Pipe	EA	$1,125.00			0.0	$0.00	0%	
Casing Pipe, Bore and Jack (3/8" wall)								
22" ID (6"-8" Carrier Pipe)	LF	$411.00			0.0	$0.00	0%	
24" ID (10" Carrier Pipe)	LF	$451.00			0.0	$0.00	0%	
30" ID (12" Carrier Pipe)	LF	$569.00			0.0	$0.00	0%	
Plug Pipe								
6" –12" Pipe	EA	$142.00			0.0	$0.00	0%	
15"-36" Pipe	EA	$323.00			0.0	$0.00	0%	
42"- 60" Pipe	EA	$522.00			0.0	$0.00	0%	
Pavement Edge Pipe								
Standard Pipe Underdrain	LF	$19.00			0.0	$0.00	0%	
Riprap								
Dry, Class I, 18"	SY	$47.87	11.00	$526.57	11.0	$526.57	100%	
Dry, Class II, 18"	SY	$51.46			0.0	$0.00	0%	
Grouted, Class I, 18"	SY	$69.97			0.0	$0.00	0%	
Filter Fabric								
Class I	SY	$3.50			0.0	$0.00	0%	
Class II	SY	$3.00			0.0	$0.00	0%	
Class III	SY	$2.25			0.0	$0.00	0%	
Gabions (No excavation)								
Mattress	CY	$130.00			0.0	$0.00	0%	
Revetment	CY	$164.33			0.0	$0.00	0%	
Wall	CY	$212.25			0.0	$0.00	0%	
Paved Ditch (4" Thick)								
Concrete (Non-reinforced)	SY	$62.00			0.0	$0.00	0%	
Bituminous Concrete(4")	SY	$30.00			0.0	$0.00	0%	
Sodded Ditch								

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Sodded Ditch (Incl Fine Grading)	SY	$9.86			0.0	$0.00	0%	
STREET CONSTRUCTION								
ROADS AND PARKING								
Soil Stabilization	**Inches**							
Cement 6%	SY/Inch Depth	$2.70			0.0	$0.00	0%	
Depth (in Inches):								
Lime 6%	SY/Inch Depth	$1.89			0.0	$0.00	0%	
Depth (in Inches):								
Subbase, Aggregated Material								
Base Type I	SY/Inch Depth	$1.75	9,342	$130,788.00	9,342.0	$16,348.50	100%	
Depth (in Inches):		8						
Bituminous Concrete								
Base Course	SY/Inch Depth	$5.59	9,342	$156,665.34	9,342.0	$52,221.78	100%	
Depth (in Inches):		3						
Intermediate Course	SY/Inch Depth	$5.49			0.0	$0.00	0%	
Depth (in Inches):								
Top Course	SY/Inch Depth	$5.49	9,342	$102,575.16	9,342.0	$51,287.58	100%	
Depth (in Inches):		2						
Prime Coat	SY	$1.10			0.0	$0.00	0%	
Tack Coat	SY	$1.10			0.0	$0.00	0%	
Driveway Restoration								
4" Concrete & 4" Gravel	SY	$79.95			0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
2" S-5 & 7 6" Gravel	SY	$31.96			0.0	$0.00	0%	
Shoulders, Type I								
Aggregated Base, 4" (Sidewalk)	SY	$11.50	2,800.00	$32,200.00	2,800.0	$32,200.00	100%	
Concrete Curbing								
Curb & Gutter CG6 & CG7	LF	$22.50	4,858.00	$109,305.00	4,858.0	$109,305.00	100%	
Curb Cut, CG-12 Detectable Surf.	EA	$569.00	8	$4,552.00	8.0	$4,552.00	100%	
Entrances/Driveways								
Commercial Entrance CG-11	SY	$52.88			0.0	$0.00	0%	
Commercial Entrance CG-13	SY	$64.67			0.0	$0.00	0%	
Residential Driveway Apron	SY	$51.79			0.0	$0.00	0%	
Guardrails								
Std. Blocked-out W beam (GR2)	LF	$42.50			0.0	$0.00	0%	
Std. W beam, Weak Post GR8	LF	$28.50			0.0	$0.00	0%	
Terminal, GR-6 (L=12'-6")	EA	$2,929.00			0.0	$0.00	0%	
Terminal, GR-7 (L=6'-3")	EA	$2,659.00			0.0	$0.00	0%	
Type I, GR-8 Terminal (L=25')	EA	$1,399.00			0.0	$0.00	0%	
Type II, GR-8 Terminal (L=13'-6")	EA	$695.00			0.0	$0.00	0%	
Terminal, MB-4 (L=37'-6")	EA	$3,495.00			0.0	$0.00	0%	
Type I, MB-5 Terminal (L=27'-1)	EA	$2,925.00			0.0	$0.00	0%	
Type II, MB-5 Terminal (L=13'-6)	EA	$1,675.00			0.0	$0.00	0%	
Miscellaneous								
Trash enclosure - Brick 6' high	LF	$325.00			0.0	$0.00	0%	
Reinforced Concrete Pad 6" to 8"	SY	$62.00			0.0	$0.00	0%	
Striping 4" width (VDOT Type	LF	$2.25			0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
B)					0.0	$0.00	0%	
Concrete Wheel Stops	EA	$70.00			0.0	$0.00	0%	
Parking Lot Striping	EA	$50.00			0.0	$0.00	0%	
Sign Island	EA	$850.00			0.0	$0.00	0%	
Traffic Barricade	LF	$43.45			0.0	$0.00	0%	
Street Name Signs	EA	$435.00	2	$870.00	2.0	$870.00	100%	
Traffic Control Signs	EA	$375.00	2	$750.00	2.0	$750.00	100%	
Street Light (pole, bracket, light)	EA	$4,285.00	24	$102,840.00	0.0	$0.00	0%	
SIDEWALKS AND TRAILS								
Sidewalk								
Concrete 4" w/WWF, No base	SY	$45.23		$0.00	0.0	$0.00	0%	
Bitum. Conc, 2" w/4" Base	SY	$30.00			0.0	$0.00	0%	
4" Conc, No Reinf., No Base	SY	$41.00			0.0	$0.00	0%	
HANDRAIL								
Handrail 3 Rail 1-1/4" #4 Finish	LF	$96.50			0.0	$0.00	0%	
Wood Chip Trail								
Trails(Incl Excavation & Grading) Wood chip, 4' wide	SY	$17.69			0.0	$0.00	0%	
Bituminous Trail								
6' to 10' wide	SY	$49.25	121	$5,959.25	0.0	$0.00	0%	
CRITICAL SLOPE STABILIZATION								
Paved Flume	SY	$67.00			0.0	$0.00	0%	
Stmwtr Conc Channel-Excav	SY	$7.75			0.0	$0.00	0%	
ADD Grass Lined-seeded	SY	$5.37			0.0	$0.00	0%	
ADD Grass Lined-sodded	SY	$10.89			0.0	$0.00	0%	
Outlet Protection								
Non-grouted Riprap 18"	SY	$52.00		$0.00	0.0	$0.00	0%	
Concrete 4"	SY	$53.50			0.0	$0.00	0%	

BOND ESTIMATE					BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
Level Spreader	SY	$4.44			0.0	$0.00	0%	
Struc Streambank Protection								
Non-grouted Riprap 18"	SY	$58.00			0.0	$0.00	0%	
Gabions	CY	$147.00			0.0	$0.00	0%	
Vegetative Erosion Control								
Sodding incl Fertilizing – Banks	SY	$7.77			0.0	$0.00	0%	
Sodding incl Fertilizing – Flat	SY	$5.36			0.0	$0.00	0%	
Seeding incl Fertilizing	SY	$2.44			0.0	$0.00	0%	
Soding W/Soil Treat & Watering	SY	$3.25			0.0	$0.00	0%	
Seeding W/Soil Treat & Watering	SY	$6.46			0.0	$0.00	0%	
Straw Mulch w/Tack	SY	$1.40			0.0	$0.00	0%	
Jute Mesh	SY	$1.77			0.0	$0.00	0%	
SPECIAL ITEMS								
FEMA Processing LOMR/CLOMR	EA	$7,500.00			0.0	$0.00	0%	
As Built (Record Drawings)	EA	$9,500.00	1	$9,500.00	0.0	$0.00	0%	
SWM/BMP POND	LS				0.0	$0.00	0%	
SIGNALIZATION	LS				0.0	$0.00	0%	
Subtotal				$1,468,317.66				

TOTAL ESTIMATE OF COMPLETED WORK:		
SubTOTAL:		$1,468,317.66
CONTINGENCIES:	10.0%	$146,831.77
TOTAL:		$1,615,149.43
INFLATION FACTOR:	4.0%	$64,605.98
Grand Total:		$1,679,755.40

TOTAL ESTIMATE OF REDUCTION:	
SubTOTAL:	$1,092,431.95
CONTINGENCIES:	$109,243.20
TOTAL:	$1,201,675.15
INFLATION :	$48,067.01
Grand Total:	$1,249,742.15
Bond Remaining:	**$430,013.25**

Bond Request No._____

Norborne Glebe - Phase 9&10A
Land Disturbance Bond Reduction

RECEIVED
NOV 14 2023
BY:_____

BOND REQUEST AND REDUCTION

To assist the Subdivision Administrator in the review of a Bond Request Application, the Applicant must utilize this form to supply the City with the information prescribed under Article 1335 and Section 1332 of the Subdivision and Land Development Ordinance. The submission of this form, along with the prescribed information and required fees, shall serve as the Applicant's Bond Request Application as required by Ordinance Article 1335.

1. DATE November 15, 2023

2. APPLICATION TYPE ☐ Bond | Initiation ☒ Bond | Reduction

☐ Bond | Reallocation ☐ Bond | Release**

3. PROJECT NAME Norborne Glebe Subdivision - Phase 9&10A

Address N/A

4. APPLICANT'S NAME* Arcadia Land, Inc. Attn: Gary Endler

Address 108 N. George Street - 2nd Floor Charles Town, WV 25414

Telephone Number ( ) Fax Number ( )

Email Address 703-771-8000, gendler@arcadiacompanies.com

5. PROPERTY OWNER'S NAME Arcadia Land, Inc, Attn: Gary Endler

Address 108 N George Street - 2nd Floor Charles Town, WV 25414

Telephone Number ( ) Fax Number ( )

Email Address 703-771-8000, gendler@arcadiacompanies.com

*Applicants include: Property owner(s), Engineer(s), Surveyor(s), or Consultant(s)

**Requires a Public Hearing and landscaping surety for one year after release

Bond Request No._____

6. DESCRIPTION OF REQUETED INITIATION, REDUCTION, OR RELEASE:

Requesting Bond Reduction for the Land Disturbance Bond for Phase 9&10A, Norborne Glebe Subdivision

7. A) CURRENT BOND AMOUNT $404,531.02

B) PROPOSED BOND AMOUNT $152,918.17

8. PARCEL INVENTORY: (List all parcels that are part of this application):

Tax Map No.	Parcel No.	Deed Book	Page No.	Zoning District
Phase 14A	03120209004 and 031220209001	1173	85	

9. PARCEL HISTORY: (List all pending or previously approved applications on the subject parcels inventoried above, including previous plat applications if this application is an amendment)

Application No.	Project Name and Phase	Status	Approval Date

10. BOND RELEASE ATTACHMENTS.

The following shall be included with this request:

A. To the extent not previously submitted pursuant to bond reduction request, copies of inspection and test reports if work was inspected and tested by a third-party inspector.

B. Certification that all bonded Improvements, other than Improvements accepted by West Virginia Department of Highways (WVDOH), have been completed in accordance with the approved plans, profiles, and specifications and the requirements of any applicable manual. For Improvements to be accepted for maintenance by WVDOH, such Certification shall state that the Improvements have been installed and inspected in accordance with WVDOH's requirements.

C. A copy of the City-approved As-Built Drawings as required for facilities within public rights-of-way or Easements submitted pursuant to Section 1332.10 of this Ordinance.

Date of As-Builts _____ Prepared By _____

D. A letter from a Professional Engineer or Professional Land Surveyor certifying that property corners and Monuments have been set as required under this Ordinance.

E. Documentation of acceptance by WVDOH for public roadways and rights-of-way, or a maintenance and indemnification agreement and bond approved by the Planning Commission for public roadways that have been completed in accordance with WVDOH standards but which, due to factors other than their quality of construction, are not eligible for acceptance by WVDOH.

F. For private roadways, a letter of acceptance by the entity responsible for maintenance and a Latent Defects Indemnification Agreement and Bond in accordance with this Section.

G. Private Roadway Maintenance Bonds. Before a Performance Agreement and surety for private roadway construction shall be released, a Latent Defects Indemnification Agreement and Bond shall be provided by the applicant/Developer and approved by the Planning Commission. The guarantee provided by such Agreement and Bond must be for a period of two (2) years following the date of performance bond release, and must be in an amount equal to no less than 5% of the original performance bond estimate in accordance with Section 1335.07 (F) of the Subdivision Ordinance.

H. Landscaping Surety. Surety is required to ensure the landscaping shown on the Major S/LD plans is maintained for one (1) year. The one (1) year shall start from the date at which the surety for the site has been released, with the exception of this landscaping surety. The landscaping surety amount shall not be less than $5,000.00 or 10% of the total landscaping cost for the project, which every is greater.

Bond Request No._____

APPLICANT CERTIFICATION

I certify that, to the best of my knowledge, the submitted information and statements are true and correct. I also certify that I have received and read Article 1335 of the S/LD Ordinance.

Signature of Applicant

Vice President Date 11/14/2023

Signature of Property Owner (If different than Applicant)

_____ Date _____

Please submit an original completed Application, 1 digital copy and 1 paper copy of the As-Built Plans (if applicable) to the following:

Subdivision Administrator
City of Charles Town
101 E. Washington Street
Charles Town, WV 25414

Please also send a copy of the completed Application as well as the As-Builts to the following:

Hatch/Chester Engineers
Attn: Elizabeth Adamowicz
705 Quince Orchard Road, Suite 310
Gaithersburg, MD 20878

FOR CITY USE ONLY

Application Number:_____ Date Application Received:_____

Fee: $_____ Check No._____

Receipt No._____

Site Inspection Date:_____ Inspector:_____

Subdivision Administrator Approval:_____ Date:_____

Engineer Approval:_____ Date:_____

Planning Commission Approval:_____ Date:_____

City Council Approval:_____ Date:_____

Comments:_____

_____

_____

_____

_____

CITY OF CHARLES TOWN

LAND DISTURBANCE BOND UNIT COST LIST AND BOND REDUCTION FORM

This form shall be used to calculate the amount of the bond required to guarantee public improvements to be constructed under the approved Final S/LD Application. This form shall also be used in calculating the amount of bond reductions to be approved by the Planning Commission. **Note:** No bond shall be reduced until completion of at least thirty (30) percent of the physical Improvements secured by the bond.

PROJECT NAME:	Norborne Glebe - Phase 9 & 10A
PREPARED BY:	Greenway Engineering
DATE OF SUBMISSION	08/09/2022 Reduction 11/15/2023

	BOND ESTIMATE				BOND REDUCTION			City Use Only
ITEM	UNIT	UNIT COST	QUANTITY	EXTENSION	QUANTITY	EXTENSION	%COMPLETE	% Approved
MOBILIZATION GENERAL								
Mobilization	LS	$6,250.00	1	$6,250.00	0.5	$3,125.00	50%	
Field Office	EA	$3,000.00			0.0	$0.00		
Job Sign	EA	$1,150.00			0.0	$0.00		
EROSION & SEDIMENT CONTROL								
Curb Inlet Protection	EA	$176.80	15	$2,652.00	15.0	$2,652.00	100%	
Grate Inlet Protection	EA	$200.00	16	$3,200.00	16.0	$3,200.00	100%	
Rock Check Dam	EA	$150.00	9	$1,350.00	9.0	$1,350.00	100%	
Outlet Protection (18" Thick)	SY	$210.00	10.42	$2,188.20	10.4	$2,188.20	100%	
Temporary Seeding	SY	$0.77		$0.00	0.0	$0.00	0%	
Permanent Seeding	SY	$0.77	33,880	$26,087.60	16,940.0	$13,043.80	50%	
Permanent Sodding	SY	$3.64	33,881	$123,326.84	16,940.5	$61,663.42	50%	
Clearing and Grubbing (Light)	AC	$6675.00	17	$113,475.00	17.0	$113,475.00	100%	
Silt Fence	LF	$3.25	1,480	$4,810.00	1,480.0	$4,810.00	100%	
Sediment Trap	EA	$3500.00	3	$10,500.00	3.0	$10,500.00	100%	
Level Spreader	SY	$3500.00		$0.00	0.0	$0.00	0%	
Stabilized Construction Entrance	EA	$2500.00	1	$2,500.00	1.0	$2,500.00	100%	
TOPSOIL REPLACEMENT								
Fine Grading	SY	$1.01	8,603.34	$8,689.37	8,603.3	$8,689.37	100%	
Respread Topsoil	CY	$1.00	1,433.89	$1,433.89	1,433.9	$1,433.89	100%	
SPECIAL ITEMS								
Sediment Basin	LS			$0.00	0.0	$0.00		
Subtotal				$306,462.90				

TOTAL ESTIMATE OF COMPLETED WORK:			TOTAL ESTIMATE OF REDUCTION:	
SubTOTAL:		$306,462.90	SubTOTAL:	$219,941.31
CONTINGENCIES:	10.0%	$30,646.29	CONTINGENCIES:	$21,994.13
TOTAL W/ CONTINGENCY:		$337,109.19	TOTAL:	$241,935.44
BOND PERIOD:	5	Years	INFLATION :	$9,677.42
ANNUAL INFLATION FACTOR:	4.00%	$67,421.84	Grand Total:	$251,612.86
Grand Total:		$404,531.03	Bond Remaining:	**$152,918.17**

Kimley»Horn

Memorandum

To: Gary Endler
Attorney
Arcadia Land, Inc.
108 N George Street – 2nd Floor
Charles Town, WV 25414

From: Mark Phillips, P.E.

Through: James Newman
City Planner, Zoning/Subdivision Administrator, AICP
City of Charles Town
101 E Washington Street
Charles Town, WV 25414

Date: December 12, 2023

Subject: Norborne Glebe Subdivision Phase 9, 10A Bond Reduction Request Review

This memorandum summarizes our review of the Bond Reduction Request for the Norborne Glebe Subdivision Phase 9, 10A Bond Reduction Application (dated November 15, 2023, prepared by Arcadia Land, Inc.) for a performance bond reduction of $1,249,742.15 and a land disturbance bond reduction of $251,612.85. Using the Final Subdivision/Land Development Plat dated December 6, 2022 and conducting a site visit to observe the current built conditions, it is our opinion that the quantities of work that have been presented on the bond reduction are a reasonable representation of the work completed in the field. It should be noted that the major outstanding items include street lights, trees, landscaping, and an asphalt path.

Thank you for the opportunity to review this Bond Reduction Application. In the meantime, please feel free to contact us at 703-870-3631 should you have any questions.

KIMLEY-HORN & ASSOCIATES, INC.



Mark Phillips, P.E.
Project Manager
Associate