Conceptual Drainage Report for:

3-Lot Short Plat for Aaron Janisko – File Number: Z-07-

February 1, 2007

2-1-07

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EXPIRES: 06/22/07

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Job #17371

Project Summary

Erosion Control Risk Assessment

Upstream & Downstream Analysis

Stormwater Quantity Control & Water Quality BMP's

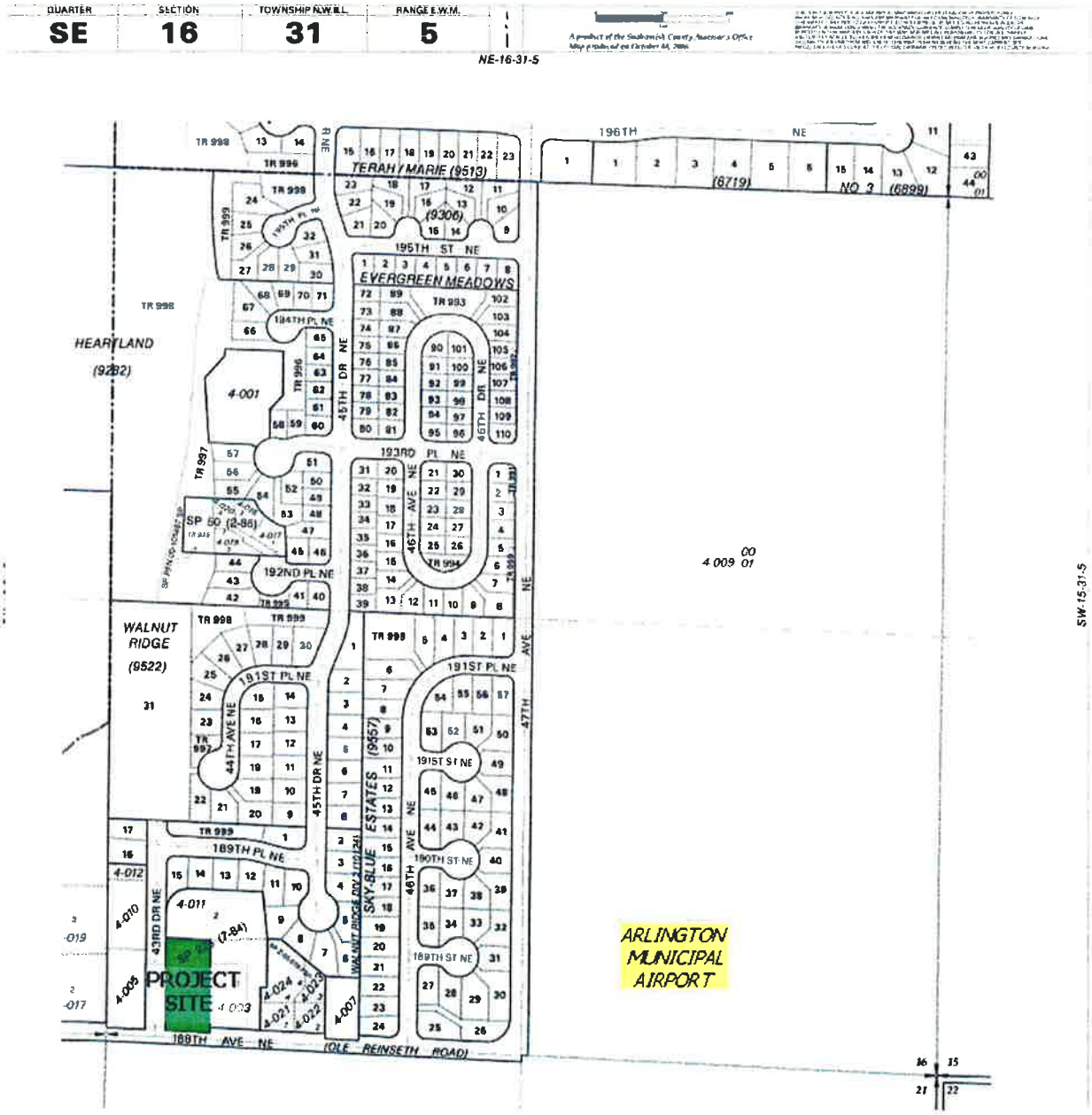
Appendix

BASIN MAP
DRAINAGE CALCULATIONS

Project Summary

PROPERTY DESCRIPTION

The site of proposed development is located in the SE ¼ of Section 16, Township 31 N, Range 5 E, W.M. The property is 0.87-acre in size and is located at the NE corner of the intersection of 188th Ave. NE and 43rd Dr. NE. The project site is identified by tax account number 310516-004-006-00.
(See vicinity map below).



EXISTING CONDITIONS

The subject property has a 1,520-sf house, 650-sf garage, and a 400-sf shed. Only the shed will be removed. This parcel fronts 188th Ave. NE and 43rd Dr. NE, and currently takes access from both streets. The area of development is vegetated with lawn and some trees. Site topography is generally flat, slightly falling off to the northeast at a grade ranging from 0-1.00%. A soils investigation performed on December 12, 2006, revealed the upper soil layer to be loamy sand followed by various layers of sand, as more specifically listed below. See Figure 1, page 13 for soil log locations.

SL-1.	0-1.5'	Red tan loamy sand
	1.5-4'	Tan gray loamy sand
	4-8'	Gray medium sand
	8-10'+	Gray coarse sand
		Roots at 50"
		No Water or Hard Pan
SL-2.	0-1'	Brown loamy sand
	1-4'	Red tan loamy sand
	4-7'	Tan gray medium sand
	7-10'	Gray coarse sand
		Roots at 60"
		No water or Hard Pan
SL-3.	0-1'	Brown loamy sand
	1-3'	Tan loamy sand
	3-5'	Gray medium sand
	5-8'	Gray fine sand
	8-10'+	Gray coarse sand
		Roots at 84"
		No Water or Hard Pan

No drainage facilities and or conveyance systems are located onsite. Site drainage consists of surface infiltration to groundwater, with partial drainage from the existing gravel driveway to an existing drainage facility along 43rd Dr. NE. The photographs on the following page show the project site from 43rd Dr. NE.


Looking East and Southeast Toward the Project Site From the Projected North Property Line.


Looking Northeast and East Toward the Project Site from the Projected South Property Line.

DEVELOPED CONDITIONS

The proposal is to subdivide the parcel into 2 duplex lots and 1 single family lot, which will take their access off of 43rd Dr. NE.

All stormwater generated along the 188th Ave. N.E. R/W from the crown of the road to the back of the proposed sidewalk for the subject short plat will be infiltrated in trenches within the planting strip. Runoff will be collected by an inlet along the proposed curb line near the S.W. corner of lot 1, and first directed to an infiltration trench lined with loamy sand for water quality treatment purposes, followed by an unlined infiltration trench to be utilized by larger storm volumes.

Lot drainage will be dealt with separately from the road frontage. Lot 2 and lot 3 will have individual infiltration systems with both a water quality trench, lined with a minimum 18 inches of loamy sand and sized to handle a 6-month storm event, and an unlined infiltration trench sized to handle a 100-year storm event. Each individual lot infiltration system is sized to handle the entire lot area. For design purposes, each lot is assumed to have a maximum of 40% site impervious.

Risk Assessment Analysis And Erosion Control

Slope: Site slopes are 0-1.00 %, risk is low

Critical Areas: None

Soils: Soils consist of loamy sands at the surface and medium and fine sands below.

Ground Movement Potential: none.

Source of Water Erosion: Rainfall.

Measures Proposed to Prevent/Minimize Erosion:

During Construction: Temporary construction BMP's (see T.E.S.C. construction plan)
After Construction: Seeding and planting of exposed soils

Nearest Downstream body of water other than road ditches: Portage Creek (½-mile)

Nearest fish bearing water: Portage Creek (½-mile)

Conclusion: Potential for significant erosion/siltation impact onsite is **Low.**
Because of the following reason:

1. Flat site with high infiltrating soils.

Erosion Sedimentation Control Notes

Although the risk of erosion is low, erosion control should be taken seriously. The following list is an example of typical erosion control notes.

(a) Erosion On-and Off-Site. During and after construction, all persons engaging in developing activities shall prevent or minimize erosion and sedimentation on-site and shall protect properties and water courses downstream from the site from erosion due to increases, in the volume, velocity and peak flow rate of storm water runoff from the site:

(b) Transport of Sediment onto Adjacent Properties. The applicant shall prevent the transport of sediment onto adjacent properties.

(c) Transport of Sediment onto Paved Surfaces. The applicant shall apply BMP's from the City of Arlington Construction Standards or as approved by the City, to prevent or minimize the transport of sediment onto paved surfaces during construction. If sediment is transported onto a paved surface the contractor is to clean the paved surface at the end of each day.

(d) Stabilizing Exposed soil. The applicant shall stabilize denuded areas and soil stockpiles as follows:

(i) From October 1 to April 30, no soil may remain exposed for more than 2 days. From May 1 to September 30, no soil may remain exposed for more than 7 days. On portions of the site where active grading is in progress, the City may extend the deadline for soil stabilization upon determining that the likelihood of erosion impacts is low. Reasons for this determination may include, but are not limited to the following, the type and amount of soil exposed, site topography, or the potential for discharge to critical areas and lakes. Upon finding a risk of erosion, the applicant shall immediately apply soil stabilization, regardless of any previously established deadline, and the City may require immediate stabilization at any time for this purpose. The applicant shall keep materials, equipment, and other resources on site at all times, in adequate quantities to immediately stabilize all soil.

(ii) Denuded areas shall be covered with mulch, sod, plastic, or other BMP's described in City of Arlington Construction Standard G-4 or as approved by the City.

(iii) Soil stockpiles shall be stabilized or protected with sediment retention BMPs within 24 hours of formation to prevent soil loss; and

(iv) Grading and construction shall be timed and conducted in stages to minimize soil exposure.

(e) Removal of Temporary Erosion and Sedimentation Control Measures. The applicant may remove all temporary erosion and sedimentation control BMPs within 30 days after final site stabilization or after they are no longer necessary.

(f) Permanent Vegetative Cover. Before construction acceptance by the City, the applicant shall establish a permanent vegetative ground cover to control soil erosion and to survive severe weather conditions on all areas of land disturbance not otherwise permanently stabilized by impervious surfaces or other means.

(g) Maintenance and Repair of Erosion and Sedimentation Control Measures. The applicant shall maintain and repair as necessary all temporary and permanent erosion and sedimentation control BMPs to assure their continued performance through construction acceptance and the potential for on site erosion has passed.

(h) Field Marking. Before performing any grading or clearing, the applicant shall mark, in the filed, the limits of all proposed clearing and grading, critical areas and their buffers, trees to be retained, and drainage courses.

(i) Protecting Storm Sewer Inlets. The applicant shall protect storm sewer inlets receiving storm water runoff during construction so that water will not enter the inlet without first being filtered or otherwise treated to minimize the amount of sediment entering the inlet.

(j) Sediment Retention. The applicant shall route storm water runoff from disturbed areas of the site through sediment ponds, traps or other sediment retention BMPs prior to discharge from the site. The BMPs shall be installed as the first step in grading, and shall be in operation before any other site disturbance occurs. The applicant shall stabilize temporary earth structures within the time period specified in subparagraph (d)(i). If site conditions warrant, the City may require additional sediment controls, including but not limited to, preserving a vegetated buffer strip around the lower perimeter of the site.

(k) Temporary Sediment Ponds and Traps shall be constructed per City of Arlington Construction Standard (G-5). Periodic removal of trapped sediments shall be performed as necessary, however trapped sediment may also be permanently stabilized onsite.

(l) The applicant shall design and construct temporary and permanent BMPs adequate to prevent erosion of outlets, adjacent stream banks, slopes and downstream reaches.

(m) The installation of underground utility lines shall be subject to the following additional requirements.

(i) Between October 1 and March 31, no more than 500 feet of continuous trench may remain open at one time unless check dams to reduce flow velocities and prevent erosion are installed.

(ii) Excavated material shall be placed on the uphill side of trenches, unless inconsistent with safety or site constraints.

(n) Water from a de-watering device shall discharge into a sediment-retention BMP.

The applicant shall implement fully the erosion and sedimentation control plan at each stage of site development.

Upstream & Downstream Analysis

UPSTREAM ANALYSIS

Because the surrounding area is relatively flat and has good infiltrating soils, no stormwater runoff drains onto the project site from the upstream.

DOWNSTREAM ANALYSIS

Since infiltration is being proposed for this site there is no downstream receiving water. If any system fails, overflow water will either infiltrate into the surrounding soil, or flow into the existing storm water collection system within the right-of-way.

Stormwater Quantity Control & Water Quality B.M.P.'s

STORMWATER QUANTITY CONTROL BMP

The stormwater quantity control BMP specified for this site is infiltration to groundwater. Lot 2 and lot 3 will drain to individual lot infiltration trenches. Forty percent of each lot area is assumed to be impervious. Runoff generated by the frontage roadway, proposed landscaping strip, and proposed sidewalk along 188th Ave. NE will be directed to an infiltration trench located within the landscaping strip.

FRONTAGE INFILTRATION TRENCH

The lined (water quality) trench in the landscape strip will be 3-ft wide by 3-ft deep and 42-ft long with 6" perforated PVC pipe. The trench is sized to retain the 6-month (water quality) storm event. The trench will be back filled with drain rock. A void space of 32% was calculated for the trench assuming 30% void space for drain rock and 100% void space for the 6" perforated PVC pipe. The trench must be installed within the gray fine sand soil layer. The bottom of the trench is at approximately 115 ft. in elevation.

The unlined infiltration trench will be 3-ft wide by 4-ft deep and 63-ft long with 6" perforated PVC pipe. The trench is sized to retain the 100-yr storm event. The trench will be back filled with drain rock. A 32% voids for the trench was calculated assuming 30% void space for drain rock and 100% void space for the 6" perforated PVC pipe. The trench must be installed within the gray fine sand soil layer. The bottom of the trench is at approximately 115 ft. in elevation.

In modeling the storm drainage facility, an infiltration rate of 4.135in/hr (half the D.O.E. rate for sand, 8.27 in/hr) was used for the native soils and an infiltration rate of 1.205in/hr (half the D.O.E. rate for loamy sand, 2.41 in/hr) was used for the on site loamy sand soils.

LOT TRENCHES

Each lined (water quality) trench will be 5-ft wide by 2.5-ft deep and 21-ft long with StormTech's SC-310 Chambers, or an approved equivalent. The trench is sized to retain the 6-month (water quality) storm event. The trench will be back filled with drain rock. A void space of 40% was calculated for the trench design assuming 30% voids for drain rock and 100% for the Chambers. The trench must be installed within the medium sand soil layer. The bottom of the trench is at approximately 113.5 ft. in elevation.

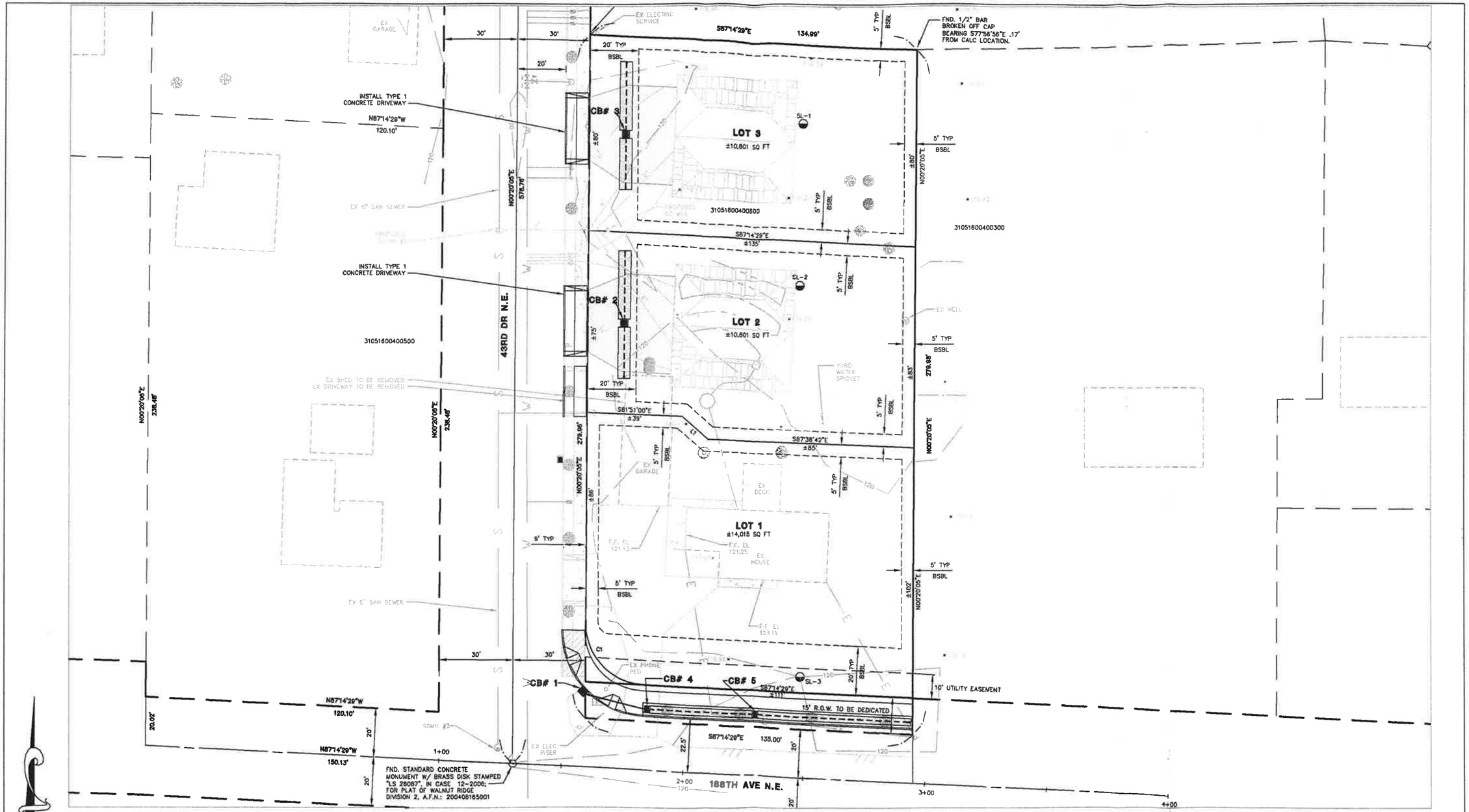
Each infiltration trench will be 5-ft wide by 2.5-ft. deep and 28-ft long with StormTech's SC-310 Chambers, or an approved equivalent. The trench is sized to retain the 100-yr storm event. The trench will be back filled with drain rock. A void space of 40% was calculated for the trench design assuming 30% voids for drain rock and 100% for the Chambers. The trench must be installed within the medium sand soil layer. The bottom of the trench is at approximately 115 ft. in elevation.

In modeling the storm drainage facility, an infiltration rate of 10.00 in/hr (half the D.O.E. rate for course sand, 20.0 in/hr) was used for the native soils and an infiltration rate of 1.205in/hr (half the D.O.E. rate for loamy sand, 2.41 in/hr) was used for the imported loamy sand soils.

WATER QUALITY BMP

The water quality BMP proposed for this site is infiltration. Both the frontage and lot trenches will provide water quality treatment via infiltration through a minimum of 18-inches of loamy sand placed in the bottom of the water quality trenches. Since loamy sand has a cation exchange capacity of 5 milliequivalents / 100 grams, each infiltration system will be capable of providing water quality treatment.

Appendix



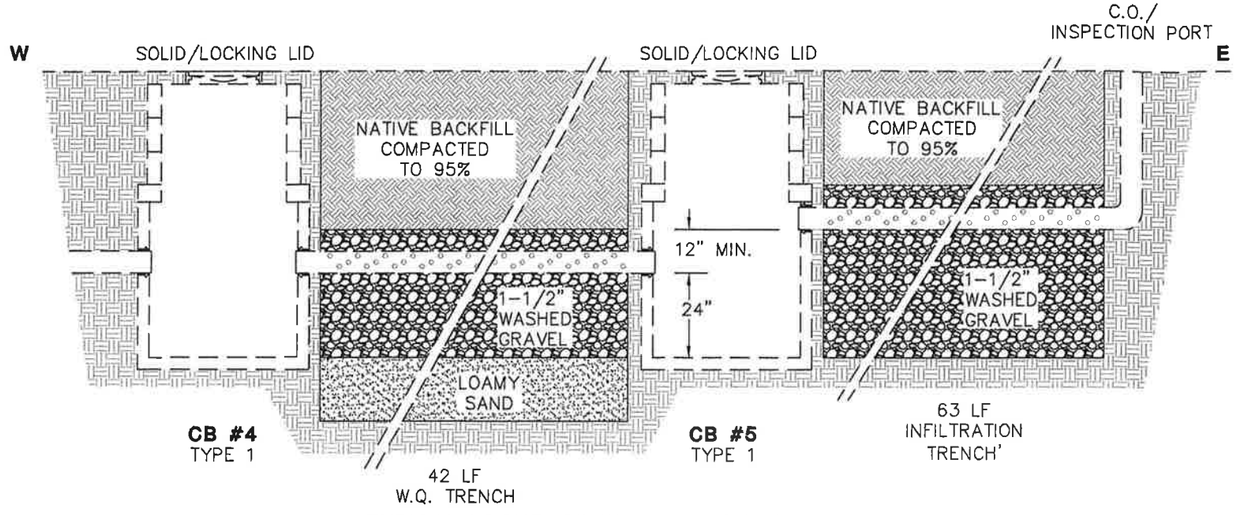
GRAPHIC SCALE

20 0 10 20 40

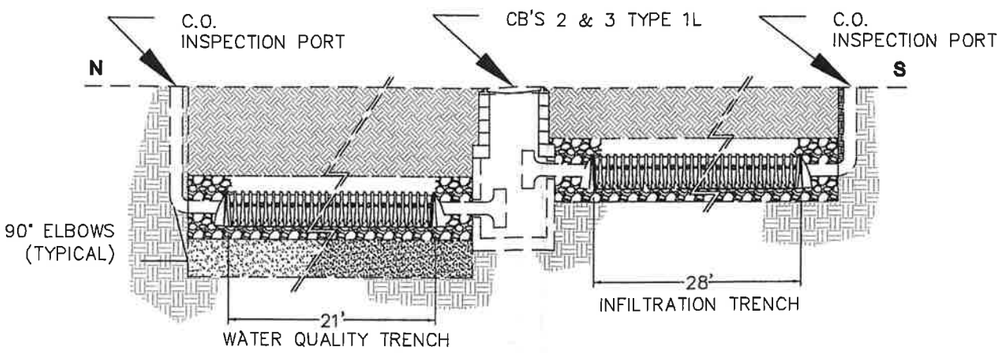
1 inch = 40 ft.

INFILTRATION PLAN
FIGURE 1

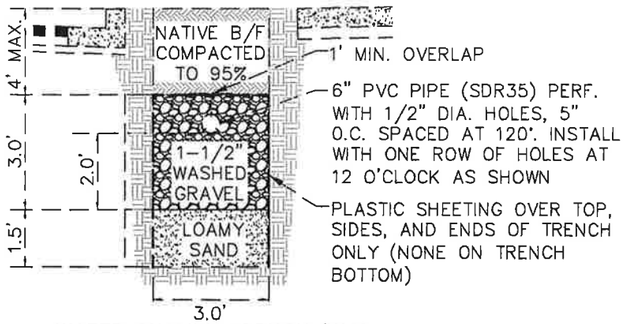
\17371-A\DWG\PRELIM17371 SD.DWG (FIG1)



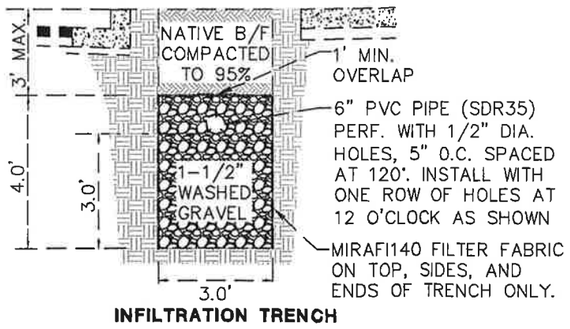
TYPICAL FRONTAGE INFILTRATION TRENCH PROFILE
NO SCALE



LOT INFILTRATION TRENCH PROFILE
NO SCALE



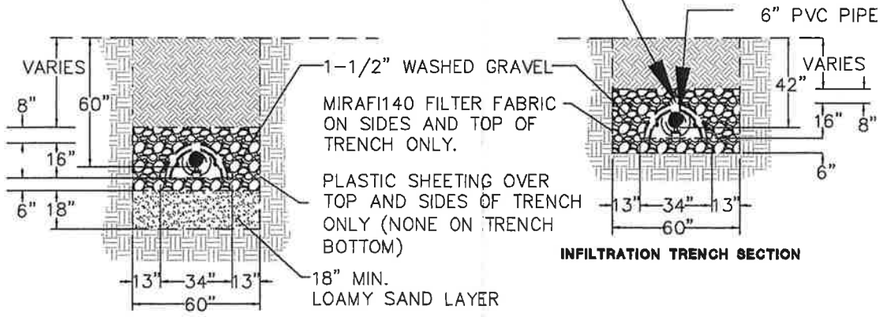
WATER QUALITY TRENCH (WQ)



INFILTRATION TRENCH

TRENCH SECTIONS

FRONTAGE INFILTRATION TRENCH DETAIL
NO SCALE



WATER QUALITY TRENCH SECTION

INFILTRATION TRENCH SECTION

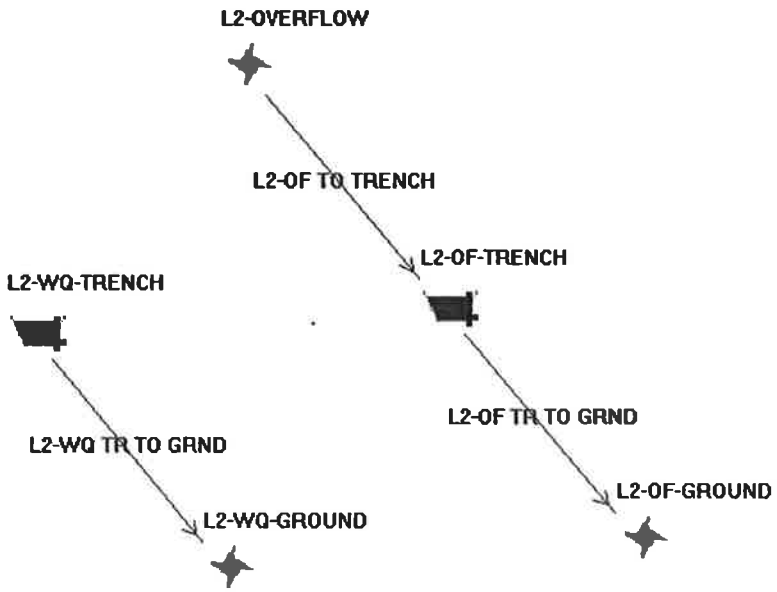
TYPICAL LOT INFILTRATION TRENCH DETAIL
NO SCALE

TYPICAL INFILTRATION TRENCH SECTIONS
NO SCALE

INFILTRATION TRENCH DETAIL
FIGURE 2

\17371\DWG\PRELIM17371 SD.DWG (FIG2)

FRONTAGE – TYPICAL INFILTRATION



Layout Report: FRONTAGE

PROJECT PRECIPS

Event	Precip (in)
6 month	1.1500
2 year	1.8000
10 year	2.7500
100 year	3.7500

Reach Records
Record Id: FR-OF TO TRENCH

Section Shape:	Circular		
Uniform Flow Method:	Manning's	Coefficient:	0.0120
Routing Method:	Travel Time Translation	Contributing Hyd	FR-OVERFLOW
DnNode	FR-OF-TRENCH	UpNode	FR-OF-TRENCH
Material	Smooth CDEP	Size	6" Diam
Ent Losses	Square Edge w/Headwall		
Length	0.0010 ft	Slope	100.00%
Up Invert	113.0000 ft	Dn Invert	112.9990 ft

Conduit Constraints				
Min Vel	Max Vel	Min Slope	Max Slope	Min Cover
2.00 ft/s	15.00 ft/s	0.50%	2.00%	3.00 ft

Drop across MH	0.0000 ft	Ex/Infil Rate	0.0000 in/hr
Up Invert	112.9990 ft	Dn Invert	113.0000 ft
Match inverts.			
DnNode	FR-OF-TRENCH	UpNode	FR-OF-TRENCH

Record Id: FR-OF TR TO GRND

Section Shape:	Circular		
Uniform Flow Method:	Manning's	Coefficient:	0.0120
Routing Method:	Travel Time Translation		
DnNode	FR-OF-GROUND	UpNode	FR-OF-TRENCH
Material	Smooth CDEP	Size	48" Diam
Ent Losses	Groove End Projecting		
Length	0.0010 ft	Slope	100.00%
Up Invert	100.0000 ft	Dn Invert	99.9990 ft

Conduit Constraints				
Min Vel	Max Vel	Min Slope	Max Slope	Min Cover
2.00 ft/s	15.00 ft/s	0.50%	2.00%	3.00 ft

Drop across MH	0.0000 ft	Ex/Infil Rate	0.0000 in/hr
Up Invert	99.9990 ft	Dn Invert	100.0000 ft
Match inverts.			
DnNode	FR-OF-GROUND	UpNode	FR-OF-TRENCH

Record Id: FR-WQ TR TO GRND

Section Shape:	Circular		
Uniform Flow Method:	Manning's	Coefficient:	0.0120
Routing Method:	Travel Time Translation		
DnNode	FR-WQ-GROUND	UpNode	FR-WQ-TRENCH
Material	Smooth CDEP	Size	48" Diam
Ent Losses	Groove End Projecting		
Length	0.0010 ft	Slope	100.00%
Up Invert	110.0000 ft	Dn Invert	109.9990 ft

Conduit Constraints				
Min Vel	Max Vel	Min Slope	Max Slope	Min Cover
2.00 ft/s	15.00 ft/s	0.50%	2.00%	3.00 ft

Drop across MH	0.0000 ft	Ex/Infil Rate	0.0000 in/hr
Up Invert	109.9990 ft	Dn Invert	110.0000 ft

Match inverts.			
DnNode	FR-WQ-GROUND	UpNode	FR-WQ-TRENCH

Node Records
Record Id: FR-OF-GROUND

Descrip:	bottom of of trench	Increment	0.10 ft
Start El.	114.0000 ft	Max El.	118.0000 ft
Dummy Type Node			

Record Id: FR-OF-TRENCH

Descrip:	of trench/vault	Increment	0.10 ft
Start El.	114.0000 ft	Max El.	118.0000 ft
Storage Node	FR-OF-STORAGE	Discharge Node	FR-OF-SAND

Record Id: FR-OF-STORAGE

Descrip:		Increment	0.10 ft
Start El.	114.0000 ft	Max El.	118.0000 ft
Length	63.0000 ft	Width	3.0000 ft
Catch	32.0000	Consider Bottom Only	

Record Id: FR-OF-SAND

Descrip:	sand layer	Increment	0.10 ft
Start El.	114.0000 ft	Max El.	105.0000 ft
Infiltration rate	4.1350 in/hr	WP Multiplier	1.00

Record Id: FR-OVERFLOW

Descrip:	overflow from wq trench	Increment	0.10 ft
Start El.	117.0000 ft	Max El.	117.5000 ft
Dummy Type Node			

Record Id: FR-WQ-GROUND

Descrip:	bottom of wq trench	Increment	0.10 ft
Start El.	114.0000 ft	Max El.	117.0000 ft
Dummy Type Node			

Record Id: FR-WQ-TRENCH

Descrip:	wq trench/vault	Increment	0.10 ft
Start El.	114.0000 ft	Max El.	117.5000 ft
Storage Node	FR-WQ-STORAGE	Discharge Node	FR-COMBO

Record Id: FR-WQ-STORAGE

Descrip:		Increment	0.10 ft
Start El.	114.0000 ft	Max El.	117.0000 ft

Length	42.0000 ft	Width	3.0000 ft
Catch	32.0000	Consider Bottom Only	

Record Id: FR-COMBO

Descrip:		Increment	0.10 ft
Start El.	114.0000 ft	Max El.	117.5000 ft
List of Discharge Structures:		FR-OVERFLOW FR-WQ-LOAMY-SAND	

Record Id: FR-OVERFLOW

Descrip:		Increment	0.10 ft
Start El.	117.0000 ft	Max El.	117.5000 ft
Weir Area	0.1963 sf	Weir Coeff	0.6100

Record Id: FR-WQ-LOAMY-SAND

Descrip:	loamy sand layer	Increment	0.10 ft
Start El.	114.0000 ft	Max El.	105.0000 ft
Infiltration rate	1.2050 in/hr	WP Multiplier	1.00

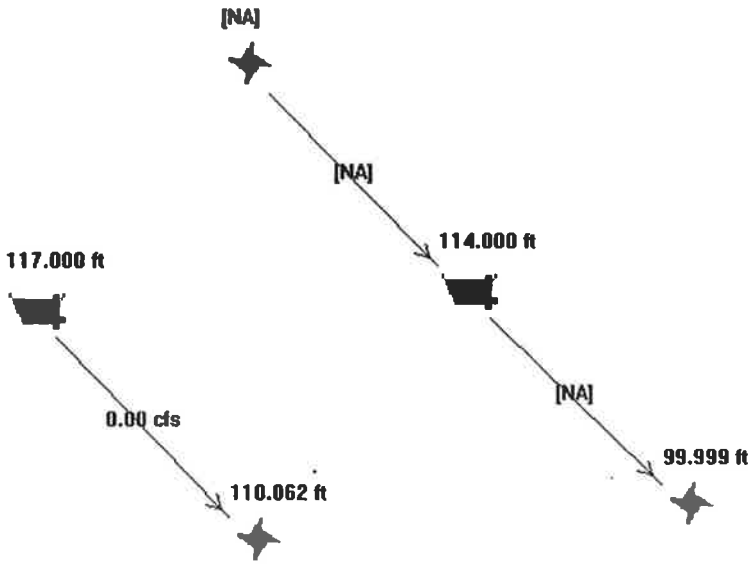
Contributing Drainage Areas
Record Id: FRONTAGE

Design Method	SBUH	**Rainfall type**	TYPE1A
Hyd Intv	10.00 min	**Peaking Factor**	484.00
		Abstraction Coeff	0.20
Pervious Area (AMC 2)	0.00 ac	**DCIA**	0.11 ac
Pervious CN	0.00	**DC CN**	98.00
Pervious TC	0.00 min	**DC TC**	4.77 min

Directly Connected CN Calc		
Description	**SubArea**	**Sub cn**
Impervious surfaces (pavements)	0.11 ac	98.00
DC Composited CN (AMC 2)		98.00

Directly Connected TC Calc						
Type	**Description**	**Length**	**Slope**	**Coeff**	**Misc**	**TT**
Sheet	street and gutter	150.00 ft	0.30%	0.0110	1.80 in	4.77 min
Directly Connected TC						4.77min

6-MONTH DRAINAGE CALCULATIONS



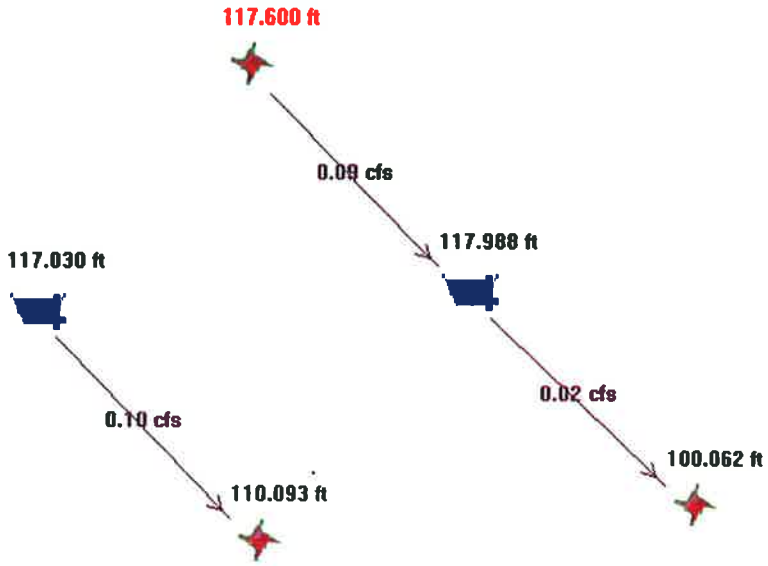
ROUTEHYD [] THRU [FRONTAGE] USING TYPE1A AND [6 month] NOTZERO RELATIVE SCS/SBUH

Routing split hyd [6 month-FR-OVERFLOW-OutHyd] through FR-OF TO TRENCH

Reach ID	Area (ac)	Flow (cfs)	Full Q (cfs)	Full ratio	nDepth (ft)	Size	nVel (ft/s)	fVel (ft/s)	CBasin / Hyd
LPOOLCOMPUTE [FR-OF-TRENCH] SUMMARY using Puls									
Event	**Match Q (cfs)**	**Peak Q (cfs)**	**Peak Stg (ft)**	**Vol (cf)**	**Vol (acft)**	**Time to Empty**			
6 month	0.0000	0.0000	114.0000	0.00	0.0000	0.00			
FR-OF TO TRENCH	0.0000	0.0000	6.0950	0.00	0.0000	6" Diam	0.0000	31.0417	
LPOOLCOMPUTE [FR-OF-TRENCH] SUMMARY using Puls									
Event	**Match Q (cfs)**	**Peak Q (cfs)**	**Peak Stg (ft)**	**Vol (cf)**	**Vol (acft)**	**Time to Empty**			
6 month	0.0000	0.0000	114.0000	0.00	0.0000	33.17			
FR-OF TR TO GRND	0.0000	0.0000	1560.32	0.00	0.0000	48" Diam	0.0000	124.1667	
LPOOLCOMPUTE [FR-WQ-TRENCH] SUMMARY using Puls									
Event	**Match Q (cfs)**	**Peak Q (cfs)**	**Peak Stg (ft)**	**Vol (cf)**	**Vol (acft)**	**Time to Empty**			
6 month	0.0260	0.0035	117.0000	120.96	0.0028	33.17			
FR-WQ TR TO GRND	0.1100	0.0035	1560.32	0.00	0.0054	48" Diam	3.3495	124.1667	FRONTAGE

From Node	To Node	Rch Loss (ft)	App (ft)	Bend (ft)	Junct Loss (ft)	HW Loss Elev (ft)	Max El (ft)
							99.9990
FR-OF-TRENCH	FR-OF-GROUND	0.0000	--na--	--na--	--na--	114.0000	118.0000
FR-OVERFLOW	FR-OF-TRENCH	0.0000	--na--	--na--	--na--	0.0000	117.5000
FR-WQ-TRENCH	FR-WQ-GROUND	108.0626	--na--	--na--	--na--	117.0000	117.0000

100-YEAR DRAINAGE CALCULATIONS



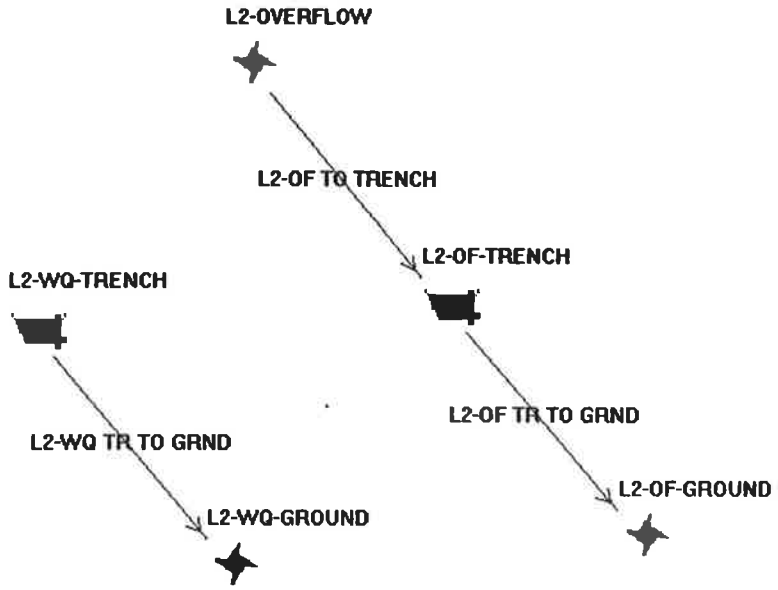
ROUTEHYD [] THRU [FRONTAGE] USING TYPE1A AND [100 year] NOTZERO RELATIVE SCS/SBUH

Routing split hyd [100 year-FR-OVERFLOW-OutHyd] through FR-OF TO TRENCH

Reach ID	Area (ac)	Flow (cfs)	Full Q (cfs)	Full ratio	nDepth (ft)	Size	nVel (ft/s)	fVel (ft/s)	CBasin / Hyd
LPOOLCOMPUTE [FR-OF-TRENCH] SUMMARY using Puls									
Event	**Match Q (cfs)**	**Peak Q (cfs)**	**Peak Stg (ft)**	**Vol (cf)**	**Vol (acft)**	**Time to Empty**			
100 year	0.0000	0.0000	114.0000	0.00	0.0000	0.00			
FR-OF TO TRENCH	0.0000	0.0918	6.0950	0.02	0.0425	6" Diam	11.4175	31.0417	
LPOOLCOMPUTE [FR-OF-TRENCH] SUMMARY using Puls									
Event	**Match Q (cfs)**	**Peak Q (cfs)**	**Peak Stg (ft)**	**Vol (cf)**	**Vol (acft)**	**Time to Empty**			
100 year	0.0918	0.0181	117.9875	241.16	0.0055	34.33			
FR-OF TR TO GRND	0.0000	0.0181	1560.32	0.00	0.0122	48" Diam	5.0346	124.1667	
LPOOLCOMPUTE [FR-WQ-TRENCH] SUMMARY using Puls									
Event	**Match Q (cfs)**	**Peak Q (cfs)**	**Peak Stg (ft)**	**Vol (cf)**	**Vol (acft)**	**Time to Empty**			
100 year	0.0945	0.0953	117.0302	122.18	0.0028	34.33			
FR-WQ TR TO GRND	0.1100	0.0953	1560.32	0.00	0.0259	48" Diam	8.6032	124.1667	FRONTAGE

From Node	To Node	Rch Loss (ft)	App (ft)	Bend (ft)	Junct Loss (ft)	HW Loss Elev (ft)	Max El (ft)
							100.0615
FR-OF-TRENCH	FR-OF-GROUND	98.0655	--na--	--na--	--na--	117.9875	118.0000
FR-OVERFLOW	FR-OF-TRENCH	117.9926	--na--	--na--	--na--	117.6000	117.5000
FR-WQ-TRENCH	FR-WQ-GROUND	108.1182	--na--	--na--	--na--	117.0302	117.5000

LOT INFILTRATION – TYPICAL EACH LOT



Layout Report: LOT 2

PROJECT PRECIPS

Event	Precip (in)
6 month	1.1500
2 year	1.8000
10 year	2.7500
100 year	3.7500

Reach Records
Record Id: L2-OF TO TRENCH

Section Shape:	Circular		
Uniform Flow Method:	Manning's	Coefficient:	0.0120
Routing Method:	Travel Time Translation	Contributing Hyd	L2-OVERFLOW
DnNode	L2-OF-TRENCH	UpNode	L2-OVERFLOW
Material	Smooth CDEP	Size	6" Diam
Ent Losses	Square Edge w/Headwall		
Length	0.0010 ft	Slope	100.00%
Up Invert	113.0000 ft	Dn Invert	112.9990 ft

Conduit Constraints

2.00 ft/s	15.00 ft/s	0.50%	2.00%	3.00 ft

Drop across MH	0.0000 ft	Ex/Infil Rate	0.0000 in/hr
Up Invert	112.9990 ft	Dn Invert	113.0000 ft
Match inverts.			
DnNode	L2-OF-TRENCH	UpNode	L2-OVERFLOW

Record Id: L2-OF TR TO GRND

Section Shape:	Circular		
Uniform Flow Method:	Manning's	Coefficient:	0.0120
Routing Method:	Travel Time Translation		
DnNode	L2-OF-GROUND	UpNode	L2-OF-TRENCH
Material	Smooth CDEP	Size	48" Diam
Ent Losses	Groove End Projecting		
Length	0.0010 ft	Slope	100.00%
Up Invert	100.0000 ft	Dn Invert	99.9990 ft

Conduit Constraints				
Min Vel	Max Vel	Min Slope	Max Slope	Min Cover
2.00 ft/s	15.00 ft/s	0.50%	2.00%	3.00 ft

Drop across MH	0.0000 ft	Ex/Infil Rate	0.0000 in/hr
Up Invert	99.9990 ft	Dn Invert	100.0000 ft
Match inverts.			
DnNode	L2-OF-GROUND	UpNode	L2-OF-TRENCH

Record Id: L2-WQ TR TO GRND

Section Shape:	Circular		
Uniform Flow Method:	Manning's	Coefficient:	0.0120
Routing Method:	Travel Time Translation		
DnNode	L2-WQ-GROUND	UpNode	L2-WQ-TRENCH
Material	Smooth CDEP	Size	48" Diam
Ent Losses	Groove End Projecting		
Length	0.0010 ft	Slope	100.00%
Up Invert	110.0000 ft	Dn Invert	109.9990 ft

Conduit Constraints				
Min Vel	Max Vel	Min Slope	Max Slope	Min Cover
2.00 ft/s	15.00 ft/s	0.50%	2.00%	3.00 ft

Drop across MH	0.0000 ft	Ex/Infil Rate	0.0000 in/hr
Up Invert	109.9990 ft	Dn Invert	110.0000 ft
Match inverts.			
DnNode	L2-WQ-GROUND	UpNode	L2-WQ-TRENCH

Node Records

Record Id: L2-OF-GROUND

Descrip:	bottom of of trench	Increment	0.10 ft
Start El.	115.0000 ft	Max El.	117.5000 ft
Dummy Type Node			

Record Id: L2-OF-TRENCH

Descrip:	of trench/vault	Increment	0.10 ft
Start El.	115.0000 ft	Max El.	117.5000 ft
Storage Node	L2-OF-STORAGE	Discharge Node	L2-OF-MED-SAND

Record Id: L2-OF-STORAGE

Descrip:		Increment	0.10 ft
Start El.	115.0000 ft	Max El.	117.5000 ft
Length	28.0000 ft	Width	5.0000 ft
Catch	40.0000	Consider Bottom Only	

Record Id: L2-OF-MED-SAND

Descrip:	medium sand layer	Increment	0.10 ft
Start El.	115.0000 ft	Max El.	105.0000 ft
Infiltration rate	10.0000 in/hr	WP Multiplier	1.00

Record Id: L2-OVERFLOW

Descrip:	overflow from wq trench	Increment	0.10 ft
Start El.	116.0000 ft	Max El.	116.5000 ft
Dummy Type Node			

Record Id: L2-WQ-GROUND

Descrip:	bottom of wq trench	Increment	0.10 ft
Start El.	113.5000 ft	Max El.	116.0000 ft
Dummy Type Node			

Record Id: L2-WQ-TRENCH

Descrip:	wq trench/vault	Increment	0.10 ft
Start El.	113.5000 ft	Max El.	117.5000 ft
Storage Node	L2-WQ-STORAGE	Discharge Node	L2-COMBO

Record Id: L2-WQ-STORAGE

Descrip:		Increment	0.10 ft
Start El.	113.5000 ft	Max El.	116.0000 ft
Length	21.0000 ft	Width	5.0000 ft
Catch	40.0000	Consider Bottom Only	

Record Id: L2-COMBO

Descrip:		Increment	0.10 ft
Start El.	114.5000 ft	Max El.	117.5000 ft
List of Discharge Structures:		L2-OVERFLOW L2-WQ-LOAMY-SAND	

Record Id: L2-OVERFLOW

Descrip:		Increment	0.10 ft
Start El.	116.0000 ft	Max El.	116.5000 ft
Weir Area	0.1963 sf	Weir Coeff	0.6100

Record Id: L2-WQ-LOAMY-SAND

Descrip:	loamy sand layer	Increment	0.10 ft
Start El.	113.5000 ft	Max El.	105.0000 ft
Infiltration rate	1.2050 in/hr	WP Multiplier	1.00

Contributing Drainage Areas

Record Id: LOT 2

Design Method	SBUH	**Rainfall type**	TYPE1A
Hyd Intv	10.00 min	**Peaking Factor**	484.00
		Abstraction Coeff	0.20
Pervious Area (AMC 2)	0.15 ac	**DCIA**	0.09 ac
Pervious CN	68.00	**DC CN**	98.00
Pervious TC	27.50 min	**DC TC**	1.57 min

Pervious CN Calc

Description	SubArea	Sub cn
Open spaces, lawns,parks (>75% grass)	0.15 ac	68.00
Pervious Composited CN (AMC 2)		68.00

Pervious TC Calc

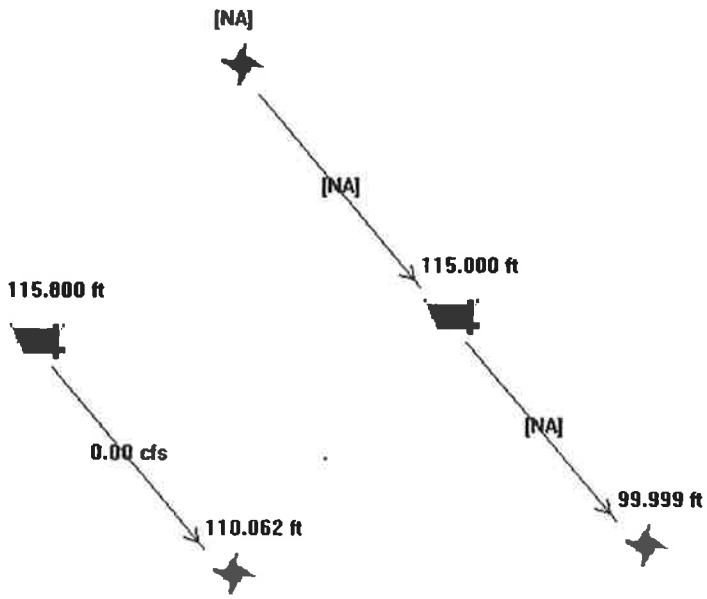
Type	Description	Length	Slope	Coeff	Misc	TT
Sheet	Short prairie grass and lawns.: 0.15	150.00 ft	0.70%	0.1500	1.80 in	27.50 min
Pervious TC						27.50 min

Directly Connected CN Calc

Description	SubArea	Sub cn
Impervious surfaces (pavements)	0.03 ac	98.00
Impervious surfaces (roofs)	0.06 ac	98.00
DC Composited CN (AMC 2)		98.00

Directly Connected TC Calc						
Type	**Description**	**Length**	**Slope**	**Coeff**	**Misc**	**TT**
Sheet	roof	50.00 ft	5.00%	0.0110	1.80 in	0.64 min
Sheet	driveway	25.00 ft	0.50%	0.0110	1.80 in	0.93 min
Directly Connected TC						1.57min

6-MONTH DRAINAGE CALCULATIONS



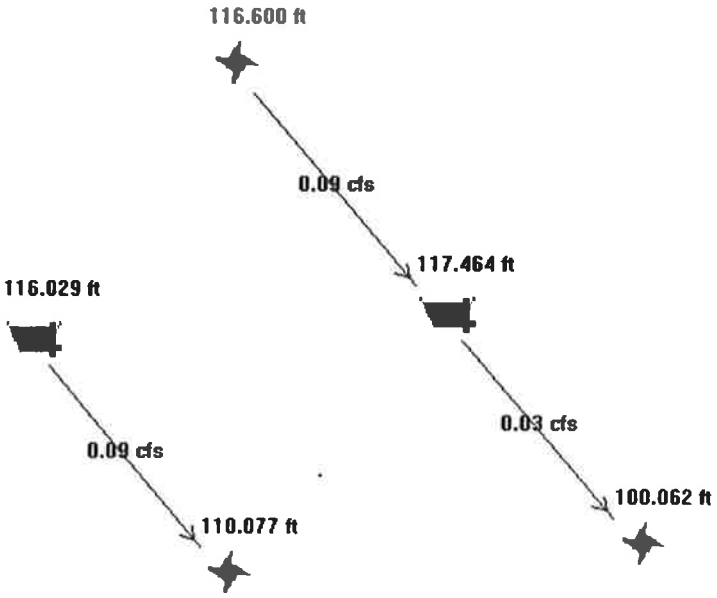
ROUTEHYD [] THRU [LOT 2] USING TYPE1A AND [6 month] NOTZERO RELATIVE SCS/SBUH

Routing split hyd [6 month-L2-OVERFLOW-OutHyd] through L2-OF TO TRENCH

Reach ID	Area (ac)	Flow (cfs)	Full Q (cfs)	Full ratio	nDepth (ft)	Size	nVel (ft/s)	fVel (ft/s)	CBasin / Hyd
LPOOLCOMPUTE [L2-WQ-TRENCH] SUMMARY using Puls									
Event	**Match Q (cfs)**	**Peak Q (cfs)**	**Peak Stg (ft)**	**Vol (cf)**	**Vol (acft)**	**Time to Empty**			
6 month	0.0226	0.0029	115.8000	96.60	0.0022	33.00			
L2-WQ TR TO GRND	0.2400	0.0029	1560.32	0.00	0.0054	48" Diam	2.7913	124.1667	LOT 2
L2-OF TO TRENCH	0.0000	0.0000	6.0950	0.00	0.0000	6" Diam	0.0000	31.0417	
LPOOLCOMPUTE [L2-OF-TRENCH] SUMMARY using Puls									
Event	**Match Q (cfs)**	**Peak Q (cfs)**	**Peak Stg (ft)**	**Vol (cf)**	**Vol (acft)**	**Time to Empty**			
6 month	0.0000	0.0000	115.0000	0.00	0.0000	33.00			
L2-OF TR TO GRND	0.0000	0.0000	1560.32	0.00	0.0000	48" Diam	0.0000	124.1667	

From Node	To Node	Rch Loss (ft)	App (ft)	Bend (ft)	Junct Loss (ft)	HW Loss Elev (ft)	Max El (ft)
							110.0615
L2-WQ-TRENCH	L2-WQ-GROUND	108.0626	--na--	--na--	--na--	115.8000	116.0000
L2-OF-TRENCH	L2-OF-GROUND	0.0000	--na--	--na--	--na--	115.0000	117.5000
L2-OVERFLOW	L2-OF-TRENCH	0.0000	--na--	--na--	--na--	0.0000	116.5000

100-YEAR DRAINAGE CALCULATIONS



ROUTEHYD [] THRU [LOT 2] USING TYPE1A AND [100 year] NOTZERO RELATIVE SCS/SBUH

Routing split hyd [100 year-L2-OVERFLOW-OutHyd] through L2-OF TO TRENCH

Reach ID	Area (ac)	Flow (cfs)	Full Q (cfs)	Full ratio	nDepth (ft)	Size	nVel (ft/s)	fVel (ft/s)	CBasin / Hyd
LPOOLCOMPUTE [L2-WQ-TRENCH] SUMMARY using Puls									
Event	**Match Q (cfs)**		**Peak Q (cfs)**		**Peak Stg (ft)**	**Vol (cf)**	**Vol (acft)**		**Time to Empty**
100 year	0.0912		0.0899		116.0286	106.20	0.0024		35.33
L2-WQ TR TO GRND	0.2400	0.0899	1560.32	0.00	0.0259	48" Diam	8.1167	124.1667	LOT 2
L2-OF TO TRENCH	0.0000	0.0870	6.0950	0.01	0.0415	6" Diam	11.1971	31.0417	
LPOOLCOMPUTE [L2-OF-TRENCH] SUMMARY using Puls									
Event	**Match Q (cfs)**		**Peak Q (cfs)**		**Peak Stg (ft)**	**Vol (cf)**	**Vol (acft)**		**Time to Empty**
100 year	0.0870		0.0324		117.4641	137.99	0.0032		35.33
L2-OF TR TO GRND	0.0000	0.0324	1560.32	0.00	0.0161	48" Diam	5.9487	124.1667	

From Node	To Node	Rch Loss (ft)	App (ft)	Bend (ft)	Junct Loss (ft)	HW Loss Elev (ft)	Max El (ft)
							110.0771
L2-WQ-TRENCH	L2-WQ-GROUND	108.1156	--na--	--na--	--na--	116.0286	117.5000
L2-OF-TRENCH	L2-OF-GROUND	98.0720	--na--	--na--	--na--	117.4641	117.5000
L2-OVERFLOW	L2-OF-TRENCH	117.4687	--na--	--na--	--na--	116.6000	116.5000