

FAILED

BILL NO. 21-32

ORDINANCE NO.

AN ORDINANCE AMENDING ORDINANCE NO. 3.973 RELATED TO ZONING ORDINANCE REGULATIONS AND THE ESTABLISHMENT OF USE DISTRICTS WITHIN THE CITY OF GLADSTONE, MISSOURI, FOR PROPERTY LOCATED AT 2610 NORTHEAST 60TH STREET, GLADSTONE, MISSOURI.

WHEREAS, pursuant to applicable City Ordinances, a Petition has been submitted to the Gladstone City Council to rezone the following described property from CP-3 Planned District Commercial to CP-4 Planned District Small Warehouse and Storage. This property is described as 2610 Northeast 60th St. Kendallwood Commercial Center, Plat of Lands TR 7 in the City of Gladstone, Clay County, Missouri; and

WHEREAS, public hearings have been held after the publishing of the required notices.

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF GLADSTONE, MISSOURI, AS FOLLOWS:

THAT, the aforesaid land be rezoned from CP-3 to CP-4 as those district areas are set out in the applicable provision of Ordinance No. 3.973.

INTRODUCED, READ, PASSED AND ADOPTED BY THE COUNCIL OF THE CITY OF GLADSTONE, MISSOURI THIS 27TH DAY OF SEPTEMBER, 2021.

R.D. Mallams, Mayor

ATTEST:

Becky Jarrett, Deputy City Clerk

FIRST READING: September 27, 2021

SECOND READING: September 27, 2021

FAILED

BILL NO. 21-33

ORDINANCE NO.

AN ORDINANCE APPROVING A FINAL DEVELOPMENT PLAN FOR PROPERTY LOCATED AT 2610 NORTHEAST 60TH STREET, GLADSTONE, MISSOURI.

WHEREAS, pursuant to Section 32-37 of Ordinance No. 2.292 being the Gladstone Zoning Ordinance, public notice was made of a request for site plan approval at 2610 NE 60th Street, Gladstone, Missouri; and

WHEREAS, public hearings have been held after the publishing of the required notices; and

WHEREAS, the City Council finds that the planned development does not materially injure the property and the uses of the properties immediately adjacent to the proposed development; and

WHEREAS, the City Council finds that the site plan presents a unified and organized arrangement of buildings and facilities which have a functional relationship to the property comprising the development; and

WHEREAS, the City Council finds it is in the best interest of the citizens of the City of Gladstone that the site plan submitted by the applicant be approved subject to the terms and conditions set forth herein;

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF GLADSTONE, MISSOURI, AS FOLLOWS:

SECTION 1. FINAL DEVELOPMENT PLAN APPROVAL.

The Final Development Plan for the above described property is hereby approved subject to the terms and conditions set forth herein:

1. Keep an active Gladstone business license in perpetuity.
2. The facility and individual storage units shall not be used for temporary or permanent human occupancy.
3. All development signage shall comply with approved City standards.
4. All manicured grass and landscaped areas shall be irrigated and maintained in perpetuity.
5. Tractor trailers shall not be parked or stored overnight. Storage containers shall not be stored on site unless as part of a valid building permit.
6. Disabled or unlicensed vehicles shall not be stored on site.
7. Entry points of the facility shall be secured twenty-four hours/seven days of the week year round.
8. Dumpster and storage areas shall be enclosed on four (4) sides with materials consistent with the primary building and adequately screened from public view. Trash service shall be scheduled between the hours of 7:00 a.m. to 10:00 p.m.
9. All exterior fencing shall be aluminum.

10. Any and all exterior windows attached to a storage unit must be faux windows.
11. Hours of operation and access to the facility shall be between the hours of 6:00 a.m. and 10:00 p.m.
12. All mechanical equipment located on the roof and the ground shall be screened from public view similar in design to the rest of the structure. All screening will be reviewed via the building permit process.
13. Tractor trailers, storage containers, and other commercial vehicles shall not be parked or stored overnight on the premises.
14. Tenants of the storage facility shall not conduct a private business from their individual storage unit(s).
15. Enhance landscaping on the north and east sides of the property and submit the revised landscaping plan as part of the building permit.
16. A brick monument sign shall serve the development in accordance with city code.

SECTION 2. SEVERABILITY CLAUSE. The provisions of this ordinance are severable and if any provision hereof is declared invalid, unconstitutional or unenforceable, such determination shall not affect the validity of the remainder of this Ordinance.

INTRODUCED, READ, PASSED AND ADOPTED BY THE COUNCIL OF THE CITY OF GLADSTONE, MISSOURI THIS 27th DAY OF SEPTEMBER, 2021.

R. D. Mallams, Mayor

ATTEST:

Becky Jarrett, Deputy City Clerk

FIRST READING: September 27, 2021 SECOND READING: September 27, 2021

File #SITE21-00005 and REZON21-00002



**MID-CONTINENT
PUBLIC LIBRARY**

September 23, 2021

Gladstone City Council
Gladstone City Hall
7010 N Holmes Street
Gladstone, MO 64118

Mayor R.D. Mallams,

I understand that the City Council is considering the Final Development Plan for 2610 NE 60th St. on Monday. I was very happy to learn that there is a plan for redevelopment on this site.

As you likely know, our library is situated on land downhill from this lot. The entire time I've been associated with the library, we've had considerable ground water, storm water, erosion, and trash issues originating from that site.

I cannot tell you how happy I was to hear that a new developer was considering this site with a desire to address these issues correctly and properly. I spoke to the developer several times in recent months with assurances that the issues we've experienced over the past several decades will be addressed. Knowing there is a responsive and local developer wanting to eliminate this nuisance and address the dangerous condition. Personally, I hope this application will be considered favorably. Addressing erosion, stormwater and other trash issues gives me assurance that the library experience will be improved.

Thank you so much for your service and for all you do to help provide a stronger community.

Sincerely,

Steven V. Potter
Digitally signed by
Steven V. Potter
Date: 2021.09.23
19:18:41 -05'00'

Steven V. Potter
Library Director and CEO

Attn: Gladstone City Council and Planning Commission

Gladstone City Hall

7010 N Holmes St.

Gladstone, MO 64118

RE: 2610 NE 60th Street Climate Controlled Self Storage

Dear members of the City Council:

I am writing on behalf of Midas at 6003 N Antioch Rd. I would like to express my support for the proposed storage facility to be built on the former car wash site behind us.

We have reviewed all of the proposed plans and drawings and believe the facility will be good for this area. We also believe this will be a drastic aesthetic improvement to the area and also will reduce the damage done to our properties by transients.

I offer my full support and blessing to this project.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jason Howe', with a stylized flourish at the end.

Jason Howe



Request for Council Action

RES # City Clerk Only

BILL # 21-32
21-33

ORD #

Date: 9/22/2021

Department: Community Development

Meeting Date Requested: 9/27/2021

Public Hearing: Yes Date: 9/27/2021

Subject: Storage 1 KC – Climate Controlled Storage Facility at 2610 NE 60th Street

Background:

The Applicant is requesting a zoning change from CP-3 Planned District Commercial to CP-4 Planned District Small Warehouse and Storage District to build a brand new indoor climate controlled storage facility called Storage 1 KC.

Previously, this property was a dilapidated car wash that was recently demolished. Currently, this property is vacant.

This facility will be fully fenced, gated, have secure access, and 24-hour video surveillance.

Storage access hours will be from 6:00 a.m. to 10:00 p.m. seven days a week.

An underground stormwater retention system will be installed on the north side of the property to accommodate the development and site improvements.

Ellen Todd, President of Curry Real Estate submitted a letter to the Community Development Department stating their support for this project.

Steven Potter, Library Director and CEO sent an email to city staff stating their support for this project as well.

The developers have agreed to change the following details on the proposed project:

- Change the external EIFS color from white to gray
- Change the external red lettering/font color to white
- Remove the phone number from the building EIFS
- Add a brick monument sign that will demonstrate the business phone number, address, and name of the business

RCA DUE TO CITY CLERK WEDNESDAY 12:00 PM

- The lettering/font on the building is 36 inches tall
- The driveway on the south side of the property has been closed and significant landscaping has been added.

Renderings reflecting the new changes for the development have been added to the packet.

Budget Discussion: Funds are budgeted in the amount of \$ from the Fund. Ongoing costs are estimated to be \$ 0 annually. Previous years' funding was \$0

Public/Staff Input/Commission:

No public comments.

City Staff recommends that the request be approved contingent upon the conditions listed in the staff report.

The Planning Commission voted unanimously in favor of the project. 9 Yes – 0 No

Provide Original Contracts, Leases, Agreements, etc. to: City Clerk and Vendor

Austin Greer
Community Development Director

JM
City Attorney

SW
City Manager



Community Development Department

Staff Report

Date: 9/22/2021

File #: SITE21-00005/REZON21-00002

Requested Action: Zoning Change and Site Plan Revision

Date of PC Consideration: August 2, 2021

Date of Council Consideration: September 27, 2021

Applicant: Shane Danner, SDRE LLC

Owner: O.S.K Carwash

Architect/
Engineer: Garen Miller, AGM Inc.

Address of Property: 2610 NE 60th Street

Planning Information

- Current Zoning: CP-3 Planned Commercial District
- Zoning History: CP-3 Planned Commercial District
- Planned Land Use: Future study area according to the Comprehensive Plan
Surrounding Uses: All surrounding zoning districts are CP-3 Planned District Commercial. Surrounding business are the following: Burger King, Midas, Mid-Continent Public Library, Animal Clinic of the Woodlands, and a shopping center where Applebee's is the primary tenant.
- Applicable Regulations: Zoning and Subdivision Ordinance and Comprehensive Plan

Additional Information

- Public Utility Availability: Existing
- Ingress/Egress: Two access points on 60th Street
- Traffic Impacts: None
- Proposed Signage: On the building. See renderings.

Analysis

The Applicant is requesting a zoning change from CP-3 Planned District Commercial to CP-4 Planned District Small Warehouse and Storage District to build a brand new indoor climate controlled storage facility called Storage 1 KC.

Previously, this property was a dilapidated car wash that was recently demolished. Currently, this property is vacant.

This facility will be fully fenced, gated, have secure access, and 24-hour video surveillance.

Storage access hours will be from 6:00 a.m. to 10:00 p.m. seven days a week.

An underground stormwater retention system will be installed on the north side of the property to accommodate the development and site improvements.

Ellen Todd, President of Curry Real Estate submitted a letter to the Community Development Department stating their support for this project.

Steven Potter, Library Director and CEO sent an email to city staff stating their support for this project as well.

The developers have agreed to the following details on the proposed project:

- Change the external EIFS color from white to gray
- Change the external red lettering/font color to white
- Remove the phone number from the building EIFS
- Add a brick monument sign that will demonstrate the business phone number, address, and name of the business
- The lettering/font on the building is 36 inches tall
- The driveway on the south side of the property has been closed and significant landscaping has been added.

Renderings reflecting the new changes for the development have been added to the packet.

Recommended Conditions

City Staff recommends that the following conditions be considered if the City Council chooses to approve this project request:

1. Keep an active Gladstone business license in perpetuity.
2. The facility and individual storage units shall not be used for temporary or permanent human occupancy.
3. All development signage shall comply with approved City standards.
4. All manicured grass and landscaped areas shall be irrigated and maintained in perpetuity.
5. Tractor trailers shall not be parked or stored overnight. Storage containers shall not be stored on site unless as part of a valid building permit.
6. Disabled or unlicensed vehicles shall not be stored on site.
7. Entry points of the facility shall be secured twenty-four hours/seven days of the week year round.
8. Dumpster and storage areas shall be enclosed on four (4) sides with materials consistent with the primary building and adequately screened from public view. Trash service shall be scheduled between the hours of 7:00 a.m. to 10:00 p.m.
9. All exterior fencing shall be aluminum.
10. Any and all exterior windows attached to a storage unit must be faux windows.

11. Hours of operation and access to the facility shall be between the hours of 6:00 a.m. and 10:00 p.m.
12. All mechanical equipment located on the roof and the ground shall be screened from public view similar in design to the rest of the structure. All screening will be reviewed via the building permit process.
13. Tractor trailers, storage containers, and other commercial vehicles shall not be parked or stored overnight on the premises.
14. Tenants of the storage facility shall not conduct a private business from their individual storage unit(s).
15. Enhance landscaping on the north and east sides of the property and submit the revised landscaping plan as part of the building permit.
16. A brick monument sign shall serve the development in accordance with city code.

The Developers of this project have agreed to all conditions.

Recommendation

City Staff recommends that the request be **APPROVED** contingent upon the conditions listed above.

PLANNING COMMISSION
GLADSTONE, MISSOURI
Gladstone City Hall
Monday, August 2nd, 2021
7:00 pm

Item 1 on the Agenda: Roll Call.

Present: Chase Cookson
Mike Ebenroth, V-Chair
Gary Markenson
Kate Middleton
Kim Murch
James New
JN Hernandez
Bill Turnage
Alicia Hommon

Absent: Jennifer McGee, Chair
Larry Whitton
Brenda Lowe

Council & Staff Present:

Austin Greer, Community Development Director
Alan Napoli, Building Official
Angie Daugherty, Admin. Assistant
Jean B. Moore, Council Member

Item 2 on the Agenda: Pledge of Allegiance.

Vice Chair Ebenroth led the group in reciting the Pledge of Allegiance to the United States of America

Item 3 on the Agenda: Approval of the July 6th, 2021. Vice Chair Ebenroth asked if there was a motion to approve the minutes from the July 6th minutes.

Ms. Middleton moved to approve the minutes; Mr. Markenson seconded. The minutes were approved, 9-0.

Item 4 on the Agenda: Public Hearing: On a Zoning Change and Site Development Plan for property located at 2610 NE 60th St. Applicant: Shane Danner Owners: O.S.K. Carwash. The City Council Public Hearing is scheduled for August 23, 2021.

Mr. Greer read from the staff report.

The Applicant is requesting a zoning change from CP-3 Planned District Commercial to CP-4 Planned District Small Warehouse and Storage District to build a brand new indoor climate controlled storage facility called Storage 1 KC.

Previously, this property was a dilapidated car wash that was recently demolished. Currently, this property is vacant.

This facility will be fully fenced, gated, have secure access, and 24-hour video surveillance.

Storage access hours will be from 6:00 a.m. to 10:00 p.m. seven days a week.

An underground stormwater retention system will be installed on the north side of the property to accommodate the development and site improvements.

Ellen Todd, President of Curry Real Estate submitted a letter to the Community Development Department stating their support for this project.

Steven Potter, Library Director and CEO sent an email to city staff stating their support for this project as well.

City Staff recommends that the following conditions be considered if the Planning Commission and City Council choose to approve this project request:

1. Keep an active Gladstone business license in perpetuity.
2. The facility and individual storage units shall not be used for temporary or permanent human occupancy.
3. All development signage shall comply with approved City standards.
4. All manicured grass and landscaped areas shall be irrigated and maintained in perpetuity.
5. Tractor trailers shall not be parked or stored overnight. Storage containers shall not be stored on site unless as part of a valid building permit.
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9. All exterior fencing shall be aluminum.
10. Any and all exterior windows attached to a storage unit must be faux windows.
11. Hours of operation and access to the facility shall be between the hours of 6:00 a.m. and 10:00 p.m.
12. All mechanical equipment located on the roof and the ground shall be screened from public view similar in design to the rest of the structure. All screening will be reviewed via the building permit process.
13. Tractor trailers, storage containers, and other commercial vehicles shall not be parked or stored overnight on the premises.
14. Tenants of the storage facility shall not conduct a private business from their individual storage unit(s).

15. Enhance landscaping on the north and east sides of the property and submit the revised landscaping plan as part of the building permit.

The Developers of this project have agreed to all conditions.

City Staff recommends that the request be **APPROVED** contingent upon the conditions listed above.

Mr. Matthew Danner 5775 NW 64th Terr Suite 203 Kansas City Missouri 64151. Mr. Danner stated that Mr. Greer and Mr. Napoli have been working with them throughout this entire process. They have been helping us with Gladstone's requirements for this rezoning project. They have been back and forth with a few revisions that they have requested. They will have an office manager on site 7 days a week and store hours will be 9:00 a.m. to 6:00 p.m. As Mr. Greer mentioned, customers will have their own access codes to enter the facility. The exit gate will be motioned censored. They will have landscaping to the north side of the property. This property used to be a dilapidated car wash that was torn down. They plan on doing this site justice and hopefully will appeal to the library along with Curry Real-estate which owns a lot of land in this area. This property will be fenced on all four sides. Our fencing material is aluminum and the color will be black. The primary building material is white EIFS They will have black metal overhangs and brick that will be in the front of the building along with our HVAC enclosures. This will be a two story building and the lower level is situated into the side of the hill. The buildings will have a sprinkler system as required by the fire code.

Mr. Turnage asked how long the carwash has been inactive?

Mr. Danner stated two years.

Mr. New asked when they were planning on starting construction?

Mr. Danner stated as soon as possible but it is a bad time with construction materials and prices.

Mr. New asked about indoor entryway and the exterior doors.

Mr. Danner stated that there will be roll up doors on the exterior. Our other facility, just like this one is located at 8331 N. Green Hill Rd. If you would like to drive by this site to see the final product this is the project that we are trying to replicate here in Gladstone. People have been happy with the facility and the way that it looks.

Mr. New asked what the market is like in Gladstone to accommodate another storage unit facility?

Mr. Danner stated that there is only one storage unit facility in Gladstone with this type of storage. This particular project will be temperature and humidity controlled. People can store nice furniture or antiques and other things of value. They are also local to the city of Kansas City. They are close enough to drive by the site and make sure everything is ok and the property is well maintained. They take pride in making sure everything looks good and clean. Curb appeal and safety are top priorities for us.

Ms. Middleton asked how many storage units there are and what would be the total square footage. How much vehicle traffic do you all anticipate?

Mr. Danner stated that total gross square footage is approximately 57,000 feet. The storage unit square footage is approximately 42,000. We are anticipating 340 units as of right now. Unit count goes up when square footage gets smaller, so if you have 10x10 units or 5x10 units then you are doubling your units for the same square footage. Storage facilities are generally low impact on traffic. For example, our location at Green Hills Rd and Barry Rd, those facilities only see a few cars per day.

Mr. Markenson asked how much a medium size storage unit rents for?

Mr. Danner stated that a 10x10 rents for 140.00 per month.

Mx. Hernandez stated that the analysis indicated that there is going to be underground storm water retention on the north side of the development and asked if this retention would address the old run off that currently goes to the library. He did notice on the design that the hill is sloping towards the east. Is there any worry in regards to the water draining to the east?

Mr. Danner stated that they will have storm inlets along the east side of the property, which will carry the water back to the retention area.

Mx. Hernandez asked how many jobs are anticipated with this site location.

Mr. Danner stated that they will have two full-time managers.

Mr. Turnage asked if there were any restrictions as to what their customers can store based on their agreement?

Mr. Danner stated yes, they cannot store drugs, guns, flammable items and no batteries.

Vice Chair Ebenroth closed the public hearing.

MOTION: By Mr. Turnage, second by Ms. Hommon to approve a Zoning Change at property located at 2610 NE 60th St.

Vote: Mr. Cookson	Yes
Mr. Ebenroth	Yes
Mx. Hernandez	Yes
Ms. Hommon	Yes
Mr. Markenson	Yes
Mr. Murch	Yes
Mr. New	Yes
Mr. Turnage	Yes
Ms. Middleton	Yes

The motion carried. (9-0)

MOTION: By Mr. Markenson, second by Ms. Hommon to approve a Site Development Plan at property located at 2610 NE 60th St.

Vote: Mr. Cookson	Yes
Mr. Ebenroth	Yes
Mx. Hernandez	Yes
Ms. Hommon	Yes
Mr. Markenson	Yes
Ms. Middleton	Yes
Mr. Murch	Yes
Mr. New	Yes
Mr. Turnage	Yes

The motion carried. (9-0)

Item 5 on the Agenda: Communication from the City Council

Council Member Moore stated that there are plenty of things and events going on in Gladstone. This week starts the construction of the new Downtown Parking project located on 70th Street. The middle island will be taken out, the street widened, and angled parking will be installed for the downtown businesses. This project is scheduled to be completed before Gladfest in October. Also, the City Council approved the Parkside at Hobby Hill development that the Planning Commission unanimously supported.

Item 6 on the Agenda: Communication from the City Staff

Mr. Greer thanked Mr. Ebenroth for stepping in and running the meeting tonight. Regarding the downtown parking project, there was a major lighting and landscaping component to that project. Unfortunately, materials and labor have gone up significantly, so staff had to scale back the lighting and landscaping portions of the project. The infrastructure part of the project is certainly happening and should be completed before Gladfest the first weekend in October 2021. Also, the fire station #2 ground breaking is tomorrow at 10:30 am. Parking is limited there on site. Public parking will be at the North Kansas City Early Education Center just around the block.

Item 7 on the Agenda: Communications from the Planning Commission Members

No communication from the Planning Commission Members.

Item 8 on the Agenda: Adjournment

Vice-Chair Ebenroth adjourned the meeting at 7:24 pm.

Respectfully submitted:

Mike Ebenroth, Vice Chair

Approved as submitted _____

Angie Daugherty, Recording Secretary

Approved as corrected _____

DEVELOPMENT APPLICATION



CITY OF GLADSTONE
7010 N HOLMES STREET
GLADSTONE, MISSOURI 64118
PHONE: 436-4110 FAX: 436-2228

Rezeval-00002

File #: Site 21-00005
Application Date: 7-6-21
PC Date: 8-2-2021
CC Date: 8-23-21

Application Type:

- (PH) Special Use Permit (\$500)
- (PH) Zoning Change (\$500)
- (PH) Site Plan Revision (\$500)
- (PH) Right-of-Way Vacation (\$200)
- (PH) Variance - BZA (\$200)
- Final Plat/Replat (\$75)

Address of Action: 2610 NE 60th St.

Legal Description:
Attach under separate cover if needed.

Proposed Change:

Applicant/Property Owner Information:

Applicant(s) Shane Danner
 Company _____
 Address 201 NE 85th Ter., Kansas City, MO 64185
 Phone (816) 419-7895 Fax: _____ E-Mail: smdredcv@aol.com

Property Owner (if different than applicant) _____
 Company _____
 Address _____
 Phone _____ Fax: _____ E-Mail: _____

Architect/Engineer Garen Miller
 Company AGM, Inc.
 Address 5115 St. Charles Pl., St. Louis, MO 63119
 Phone (314) 960-6006 Fax: _____ E-Mail: garen@garenmiller.com

Please indicate in one box above which person is to be the contact.

Applicant's Signature [Signature] Date 7/6/21



July 8, 2021

Gladstone City Planning Commission & City Council
Gladstone City Hall
7010 N Holmes Street
Gladstone, MO 64118

RE: 2610 NE 60th Street

Members of the Planning Commission and members of the City Council,

I am writing on behalf of Curry Real Estate Services to support approval of the proposed zoning change from CP-3 to CP-4 at or about 2610 NE 60th St., Gladstone, MO 64119 (a former carwash) to accommodate the proposed Climate Controlled Self-Storage development. We have reviewed the renderings and site plan and believe this to be an excellent use of the property. Our company has had this carwash listed for sale for a significant amount of time and there had been no other viable offers that would add this kind of value to the city.

We are in full support of the proposal and we urge the Planning Commission and, subsequently, the City Council to approve the zoning change for this use.

Sincerely,

A handwritten signature in black ink that reads "Ellen M. Todd".

Ellen Todd, CCIM, CPM
President

Austin Greer

From: Steve Potter <spotter@mymcpl.org>
Sent: Wednesday, July 28, 2021 5:07 PM
To: Austin Greer
Cc: Scott Wingerson
Subject: Storage 1 KC

Mr. Greer,

Thank you for sending the information on Storage 1 KC. Mr. Danner has been in touch with me about this development, as well.

I am happy to see improvements on this site. You may or may not know that MCPL has difficulties with the carwash, especially with failure to retain stormwater, creating erosion on our hillside, trash, damage to our fence, and the like. Mr. Danner has assured me that the design will much better manage the stormwater and should help improve our conditions significantly. To that end, I think I can say that I do not oppose this use of the space and I look forward to having engaged and attentive neighbors.

If you have any questions, please feel free to reach out to me.

Steven V. Potter
Library Director and CEO
Mid-Continent Public Library
Administrative Headquarters
15616 E. US Hwy 24, Independence, MO 64050
Spotter@mymcpl.org | www.mymcpl.org
Phone: 816-836-5200

Unless explicitly attributed, the opinions expressed are personal and not that of Mid-Continent Public Library.





Qb 2

Ar 1

Qb 1

Qb 1

Ar 1

Qb 1

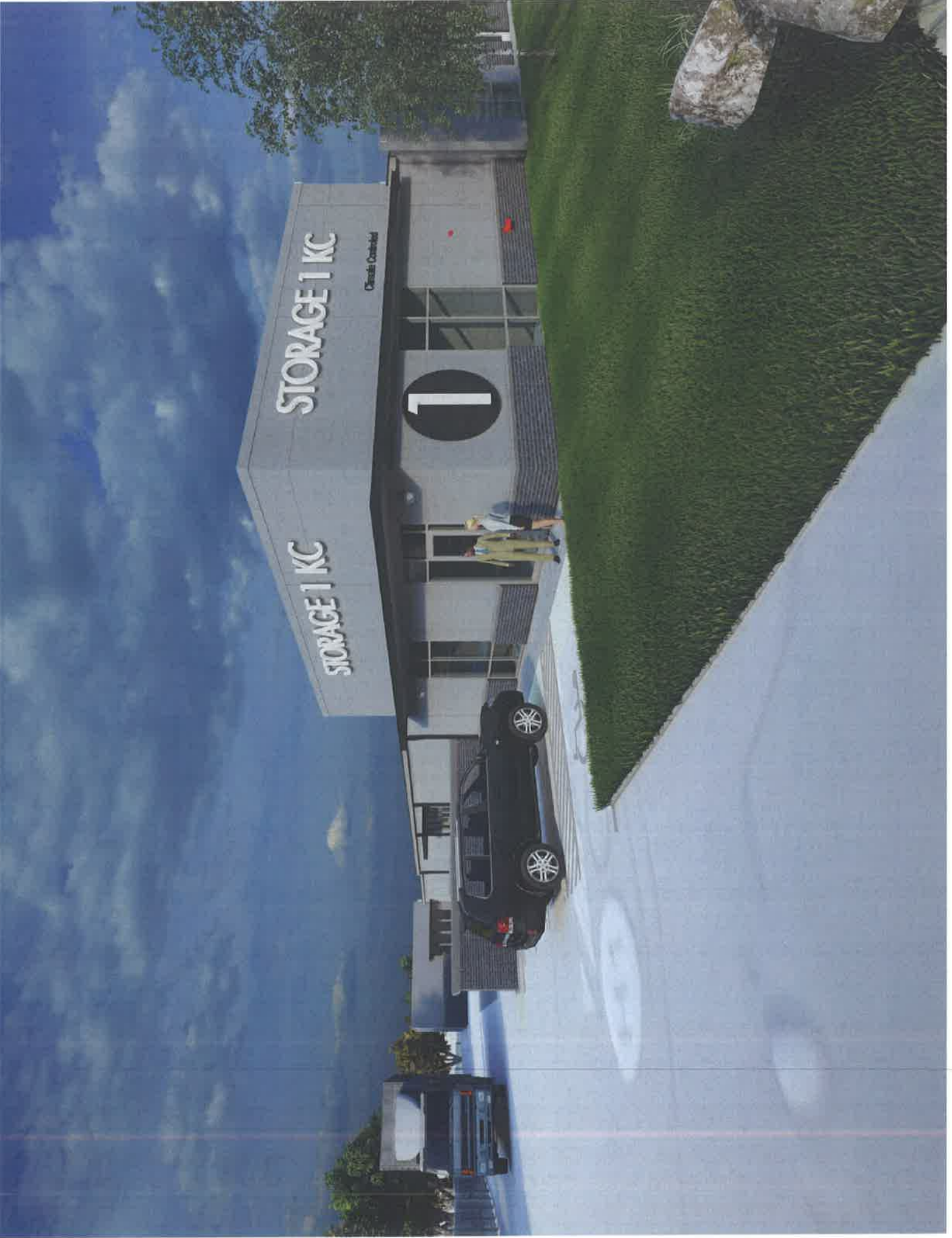
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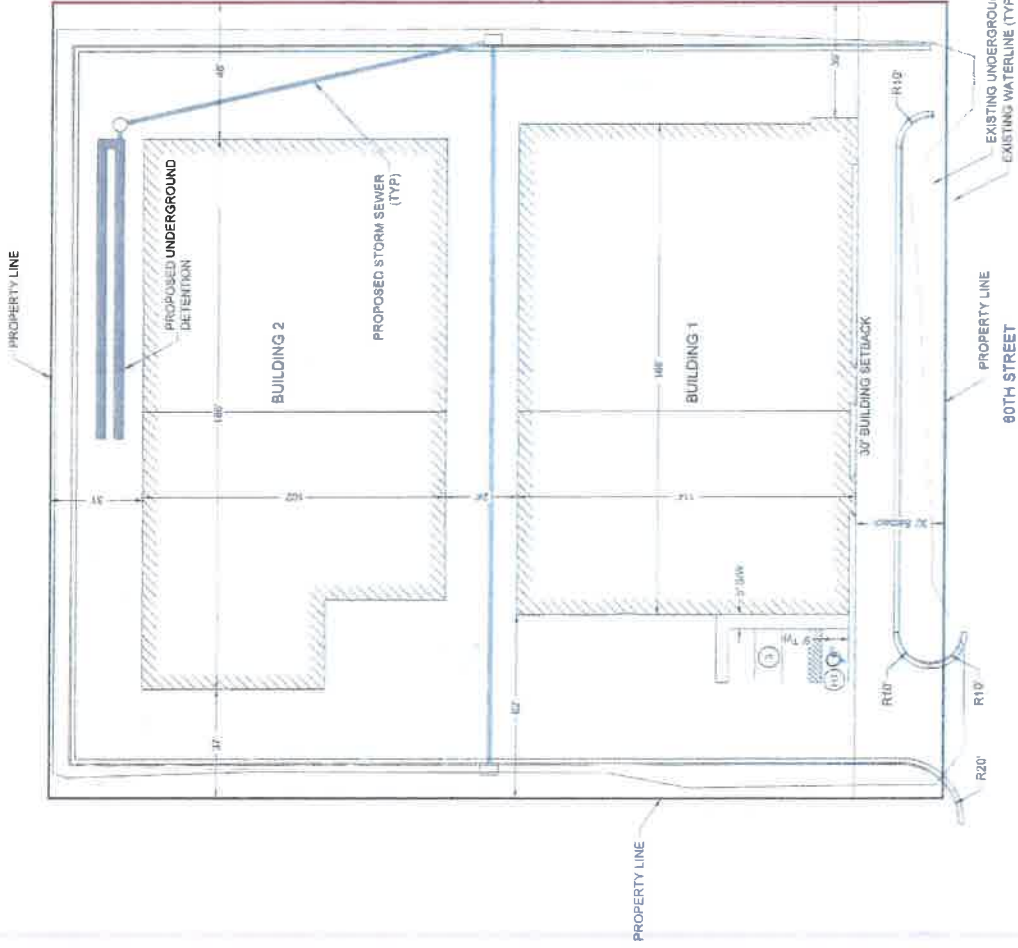
Qs 10

Qr 1

Trent St



STORAGE ONE OF KANSAS CITY GLADSTONE FACILITY



SUBLIME ENGINEERING
 6127 NW PINE RIDGE CIRCLE
 KANSAS CITY, KS 64119
 PHONE: (816) 331-8988
 RYAN.DUGDALE@SUBLIMEBUILD.COM



DEVELOPER INFO
 Shane Danner
 SMDReDev@aol.com
 816-419-9835

SITE DATA TABLE

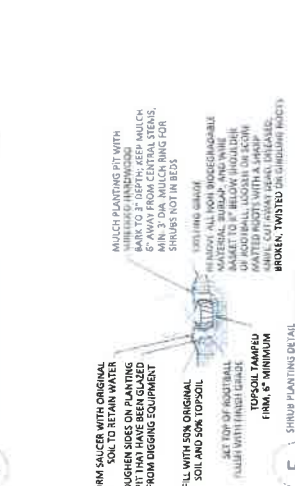
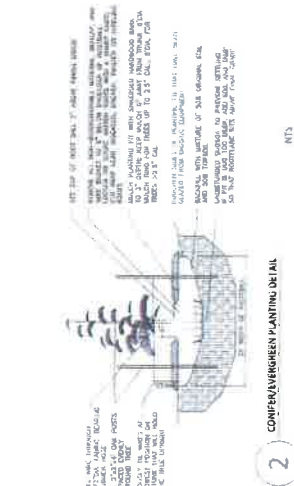
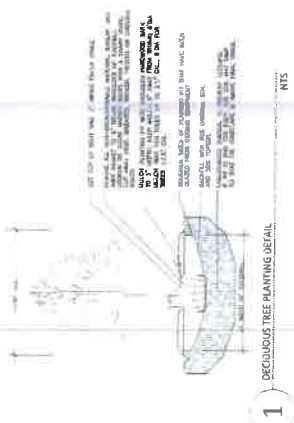
a	Total Area	1.86 Ac
b	Net Area	1.86 Ac
c	Existing Zoning	31 (Improved Commercial)
d	Proposed Zoning	31 (Improved Commercial)

Building Areas	
Building 1	10,927 SF
Building 2	18,677 SF
Total Area	29,604 SF

Building 2	
Bottom Floor	9,385 SF
Top Floor	17,703 SF
Total Area	27,088 SF



STORAGE ONE OF KANSAS CITY GLADSTONE FACILITY
 SITE PLAN
 SHEET C-1



LANDSCAPE NOTES

1. CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO INSTALLATION OF ANY PLANT MATERIAL. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS TO ENSURE THAT THE NEW WORK SHALL FIT INTO THE EXISTING SITE IN THE MANNER INTENDED AND AS SHOWN ON THE DRAWINGS. SHOULD ANY CONDITIONS EXIST THAT ARE CONTRARY TO THOSE ON THE DRAWINGS, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE PRIOR TO PERFORMING ANY WORK ON THE SITE.
2. THE CONTRACTOR SHALL MAKE SURE THAT ALL NOTES RELATING TO THE AREA DRAWING OR SKETCH INDICATING FIELD DEAS, DIMENSIONS AND NOTES RELATING TO THE AREA SHALL BE VERIFIED AND CORRECTED PRIOR TO CONSTRUCTION.
3. ALL LANDSCAPE MATERIAL QUANTITIES SHOWN SHALL BE VERIFIED BY THE LANDSCAPE ARCHITECT OF CONTRACTOR. CONTRACTOR SHALL VERIFY QUANTITIES PRIOR TO CONSTRUCTION.
4. ANY DISCREPANCIES IN WRITTEN/DRAWN CALCULATIONS PRIOR TO CONSTRUCTION SHALL BE CALLED TO THE OWNER'S ATTENTION IMMEDIATELY. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE CAUSED TO NEW PAVEMENT, CURBING, OR OTHER COMPLETED CONSTRUCTION ITEMS INCURRED DURING THE LANDSCAPE INSTALLATION.
5. NO PLANT MATERIAL SUBSTITUTIONS ARE ALLOWED WITHOUT THE PRIOR APPROVAL OF THE LANDSCAPE ARCHITECT OR OWNER.
6. MULCH SHALL BE COMPOSED OF CHIPPED OR SHREDDED HARDWOOD BARK (i.e. CYPRESS MULCH, CEDAR MULCH). MULCH SHALL COME FROM A REPUTABLE SOURCE FREE OF WEED SEEDS.
7. ALL SHRUB BEDS SHALL BE MULCHED TO A DEPTH OF 3\"-4\" INCHES.
8. DECIDUOUS, EVERGREEN, AND ORNAMENTAL TREES SHALL INCLUDE A MULCH RING NO LESS THAN 18\" IN DIAMETER AT THE TIME OF INSTALLATION. TREE MULCH RINGS SHALL BE MULCHED TO A DEPTH OF 3\"-4\" INCHES.
9. ALL MULCHED AREAS NEXT TO LAWN AREAS SHALL HAVE A MANICURED 4\"-6\" DEPTH EDGE.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR IRRIGATION DESIGN. DESIGN SHALL BE A MULTI-ZONED IRRIGATION SYSTEM THAT COMPLES WITH INDUSTRY STANDARDS FOR DESIGN AND PERFORMANCE TO PURCHASE OF IRRIGATION MATERIALS.
11. ALL PLANT MATERIAL DELIVERED ON SITE SHALL COMPLY WITH THE GENERAL STANDARDS FOR NURSERY STOCK AS DEFINED BY THE MOST RECENT EDITION OF \"AMERICAN STANDARD FOR NURSERY STOCK\" PUBLISHED BY AMERICANHORT, INCLUDING (BUT NOT EXCLUSIVELY INCLUDING) FORM, VIGOR, HEALTH, AND MEASURE.
12. ALL MATERIALS INSPECTED ON SITE AND FOUND TO BE UNACCEPTABLE DUE TO EVIDENCE OF DISEASE, INSECTS, OR FUNGAL GROWTH SHALL BE REMOVED FROM THE SITE ON THE DAY OF THE INSPECTION.
13. SPECIES INDICATED ON THE PLANT LIST ARE THE MINIMUM ACCEPTABLE SIZE. ALL MATERIAL SHALL MEET THE MINIMUM DIAMETERS, HEIGHTS, AND CUBIC VOLUMES PER THE \"AMERICAN STANDARD FOR NURSERY STOCK\" MATERIAL SPECIFICATIONS. THE MINIMUM ACCEPTED SIZE SHALL NOT BE ACCEPTED. ANY MATERIAL INSTALLED THAT DOES NOT MEET THESE MINIMUM SIZE REQUIREMENTS SHALL BE REMOVED AND REPLACED AT NO COST TO THE OWNER.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE PLANTS UNTIL THE DATE OF FINAL ACCEPTANCE OF THE LANDSCAPE WORK BY THE OWNER.
15. CONTRACTOR SHALL INCLUDE A ONE YEAR GUARANTEE PERIOD FOR ALL PLANT MATERIAL AND LANDSCAPE WORK. THIS PERIOD SHALL BEGIN FROM THE DATE OF FINAL ACCEPTANCE OF THE LANDSCAPE WORK BY THE OWNER AND CONTINUE FOR 365 DAYS FROM THIS DATE. PLANT MATERIAL WHICH IS NOT IN GOOD LIVING CONDITION (E.G. DEAD, SIGNIFICANT EVIDENCE OF DECLINE OR DIEBACK, SUBSTANTIAL DAMAGE FROM INSECTS OR DISEASES) DURING THE ONE YEAR GUARANTEE PERIOD SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR AND OWNER SHALL AGREE ON THE INSTALLATION TIMEFRAME FOR REPLACEMENT MATERIAL SO AS TO OCCUR DURING NORMAL PLANTING SEASONS.
16. THE LANDSCAPE CONTRACTOR IS TO PERFORM A THOROUGH CLEANUP AND QUALITY CONTROL INSPECTION.
17. \"CONTRACTOR\" SHALL REFER TO THE GENERAL CONTRACTOR AWARDED THIS SCOPE OF WORK TO COMPLETION, AND ANY SUBCONTRACTOR AWARDED THIS SCOPE OF WORK BY THE AWARDED CONTRACTOR. \"LANDSCAPE ARCHITECT\" SHALL REFER TO THE LICENSED LANDSCAPE ARCHITECT WHO HAS SEALED THESE CONSTRUCTION DOCUMENTS. \"OWNER\" SHALL REFER TO THE FINAL OWNER OF THIS PROPERTY AT ANY TIME DURING THE BIDDING, AWARD, CONSTRUCTION, AND MAINTENANCE PERIOD, OR THEIR ASSIGNED REPRESENTATIVE. IF THERE IS A DISCREPANCY IN THE DEFINITION OR TERMINOLOGY OF SAID TERMS PROVIDED IN THE GENERAL CONDITIONS OF THE CONTRACT, THE DEFINITION OR TERMINOLOGY STATED IN THE GENERAL CONDITIONS OF THE CONTRACT SHALL TAKE PRECEDENCE OVER ANY OTHER DEFINED TERMINOLOGY IN THIS NOTE.
18. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER MEASURED DIMENSIONS.
19. ALL WORK DESCRIBED IN THE LANDSCAPE CONSTRUCTION DOCUMENTS SHALL BE PERFORMED IN ACCORDANCE WITH THE PROPERTY MASTER PLAN UNLESS SPECIFICALLY MODIFIED BY AGREEMENT IN WRITING IN THE OWNER AND CITY OF GLADSTONE, MO, IN WHICH CASE THE MODIFIED AGREEMENT REQUIREMENTS SHALL TAKE PRECEDENCE.



STORAGE ONE GLADSTONE
INITIAL SUBMITTAL
LANDSCAPE DETAILS
GLADSTONE, MO 64139

L 1.1



Micro-Storm Water Management Study Shoal Creek Watershed

Storage One KC

2610 NE 60th Street, Gladstone, Clay County, Missouri, 64119
Section 30, Township 51N, Range 32W

Prepared On:
June 17, 2021

Prepared For:
Storage One KC
Gladstone Facility

Approval _____

Prepared by:

Sublime Engineering, LLC
1141 Southwest Boulevard
Kansas City, Kansas 66103

913.321.8100



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BIBLIOGRAPHY

February 16, 2011 edition of the Kansas City Metropolitan Chapter, American Public Works Association, Construction and Material Specifications, Section 5600, Storm Drainage Systems and Facilities

APWA 5600 SPECIFICATIONS

<http://kcmetro.apwa.net/chapters/kcmetro/specs/APWA5600.pdf>

APWA 5600 SUPPLEMENT(S)

http://www.kcmo.org/idc/groups/publicworks/documents/publicworks/specifications_apwa5600supp1.pdf

APWA MARC BMP MANUAL 2012

October 2012 edition of the Kansas City Metropolitan Chapter, American Public Works Association, Manual for Best Management Practices for Stormwater Quality

Best Management Practices (BMP) Manual Addendum #1 Accepted November 10, 2016

http://kcmetro.apwa.net/content/chapters/kcmetro.apwa.net/file/Specifications/BMPManual_Oct2012.pdf

GOOGLE MAP

<https://maps.google.com/maps?hl=en>

FEMA MAP SERVICE CENTER -

<https://msc.fema.gov/webapp/wcs/stores/servlet/CategoryDisplay?catalogId=10001&storeId=10001&categoryId=12001&langId=-1&userType=G&type=1&dfirmCatId=12009&future=false>

UNITED STATES OF AGRICULTURE – NATURAL RESOURCES CONSERVATION SERVICE

<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

- Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2016
 - TR-55 SCS Method
 - 1yr, 2yr, 10yr and 100yr Return Frequency storms
 - AMC Type II Soil Moisture conditions
 - 24-Hour SCS Type II Rainfall Distribution
 - SCS Runoff Curve Numbers per APWA Sec.5602.2
 - SCS TR-55 Methods for determination of Time of Concentration.

Methodology

The proposed development will be analyzed in accordance with the February 16, 2011 edition of the Kansas City Metropolitan Chapter, American Public Works Association (KCAPWA), Construction and Material Specifications, Section 5600, Storm Drainage Systems and Facilities, as currently adopted by the City of Gladstone, Missouri.

Per Section 5608, proposed detention facilities will be designed to limit release rates from the site as follows:

- 50% storm peak rate less than or equal to 0.5 cubic feet per second (cfs) per site acre
- 10% storm peak rate less than or equal to 2.0 cfs per site acre
- 1% storm peak rate less than or equal to 3.0 cfs per site acre

We completed a detention design using the comprehensive control release rate. This resulted in a detention design that required 1,000 linear feet of 5'-0" diameter perforated pipe, encased in rock. Due to the site slope and site layout, the resulting design was cost prohibitive. We are requesting an exception to the comprehensive control release rates, and we are proposing to provide detention to meet the existing site discharge rates.

Variations in quantity and rate of stormwater discharge between these models will represent the hydrologic impact generated by the proposed development. Runoff rates and detention were analyzed using Hydroflow Hydrographs, which utilizes the following approved methods to model existing and proposed conditions for stormwater runoff. The BMP manual used for the design of the Water Quality components is BMP – MANUAL OF BEST MANAGEMENT PRACTICES FOR STORMWATER QUALITY, OCTOBER 2012, MARC. The following approved methods were used in this report.

- NRCS TR-55 Unit Hydrograph Method
- 50 percent, 10 percent, and 1 percent chance, 24-hour Storm Precipitation Depths
- ARC Type II Soil Moisture Conditions
- 24-Hour NRCS Type II Rainfall Distribution
- Runoff Curve Numbers per NRCS TR-55 (Tables 2-2a – 2-2c) and KCAPWA Section 5602.3
- NRCS TR-55 Methods for determination of Time of Concentration and Travel Time.
- Hydroflow Hydrographs uses "Time of Concentration" rather than "Lag Time" for computing subarea hydrology.

Table 1. Rainfall Depths

Storm	Percent	Rainfall Depth (in)
2 Year	50%	3.50
10 Year	10%	5.34
100 Year	1%	8.55

General Information

The proposed Storage One KC development is a proposed 1.86 acre commercial development at 2610 NE 60th Street, Gladstone, Clay County, Missouri. Once completed, the development will include 2 commercial buildings, paving, private utilities, and associated landscaping. Site runoff is routed to existing public storm sewers.

The proposed development is located entirely in the City of Gladstone, Missouri. The property is bounded by commercial properties on the east, west, and north, and NE 60th Street on the south. Development areas, as described above, and the project location are shown in Appendix 1.

Table 2: Existing Conditions Outfalls

Sub Basin Description	Corresponding Outfall Description	Outfall Summary	Watershed
South Basin	Existing South	South Property Line	Shoal Creek

Curve Numbers

The land use designation for the site under existing conditions Pasture – Fair Condition. Based on the land use designation and the information obtained from the NRCS Web Soil Survey, the curve numbers specified in Table 3 have been used to develop a composite curve number for each sub basin. The composite curve numbers calculated for each sub basin are provided in Table 3.

Soil Classification

Soil classifications published by the United States Department of Agriculture/Natural Resources Conservation Service (USDA/NRCS) indicate the existing site is made up of two soil types:

- 10129 Sharpsburg-Urban Land Complex, 5 to 9 percent slopes
Hydrologic Soils Group (HSG) Type D

See Appendix B for a detailed soil report of the proposed development.

Table 3. Existing Curve Numbers

Sub Basin Description	CN (Area (Ac.))	CN (Area (Ac.))	Weighted CN
Existing South	80 (0.78)	98 (1.08)	90

Times of Concentration

Runoff from sub basins reach their corresponding outfall locations via a combination of sheet flow. Refer to Table 4 for details regarding how the times of concentration were analyzed under existing conditions.

Table 4. Existing Time of Concentration Calculations

Sub Basin	Overland Flow	Shallow Concentrated Flow	Channel Flow	Tc (Min.)
Existing South	Length=300 ft Slope=4.00% N Value=0.20	NA	NA	5.00

See Exhibit D for an existing drainage map, detailing sub basins, soil boundaries, and flow paths used for time of concentration determination. The results from the existing conditions model have been provided in Exhibit E. A summary of the analysis and results has been provided in Table 5.

Table 5. Existing Conditions Outfall Summary

Outfall	Q_{1%} (cfs)	Q_{10%} (cfs)	Q_{50%} (cfs)
Existing South	22.63	13.44	8.08

Proposed Conditions Analysis

One sub basin has been analyzed under proposed conditions. The sub basin has been designated as follows: South Detained. The outfall designations corresponding to each sub basin are provided in Table 6. In the storm events analyzed, a higher runoff will be generated due to the increase in impervious area and shorter times of concentration due to the increase in impervious area.

Table 6: Proposed Conditions Outfalls

Sub Basin Description	Corresponding Outfall Description
South Detained	Proposed South Outlet

Curve Numbers

Impervious areas have been given a CN designation of 98.00. Grass areas have been given a CN designation of 80.00, as recommended for >75% grass cover with soils classified as Type D.

Table 7. Proposed Curve Numbers

Sub Basin Description	CN (Area (Ac.))	CN (Area (Ac.))	Weighted CN
South Detained	80 (0.28)	98 (1.58)	95

Table 8. Proposed Time of Concentration Calculations

Sub Basin	Overland Flow	Shallow Concentrated Flow	Channel Flow	T_c (Min.)
South Detained	Length=300 ft Slope=4% N Value=0.20	NA	NA	5.00

See Exhibit A for a drainage map detailing the site under proposed conditions. Refer to Table 9 for a summary of the sub basins under proposed conditions assuming no detention.

Table 9. Proposed Conditions Hydrology Summary (No Detention)

Sub Basin	Q_{1%} (cfs)	Q_{10%} (cfs)	Q_{50%} (cfs)
South Detained	23.37	14.37	9.15

A. Identification of Downstream Drainage Issues

To date we are not aware of any drainage issues with the downstream storm sewer system. There are no current downstream flooding issues. The site discharges to a public storm sewer system. The proposed project will increase impervious area, therefore, to assure no adverse impact is anticipated in the downstream drainage system, we are proposing to provide detention.

B. Preliminary Onsite Drainage System

See Appendix A for the existing and proposed drainage boundaries. A series of curb inlet, junction box, area inlet drainage structures will be required to collect surface runoff along to a detention basin. A summary of existing and proposed discharge rates is included in Table 11.

C. Drainage Computations

See Appendix D for drainage computations for the 50%, 10%, and 1%-year design flows for the proposed site and for each downstream outfall. A summary of existing and proposed discharge rates is included in Table 11, Section D. There are not any upstream tributary areas to our proposed site. Water quality event flows and volumes for each proposed stormwater treatment facility are outlined later in the study under Item F. Stormwater Treatment Requirements.

D. Flood Control Detention

The proposed project does increase the runoff from the site to the south. Therefore, it is our recommendation that detention should be provided on the site for the east sub basin. The detention design is a 5'-0" diameter perforated pipe, 250 linear feet, encased in rock. A summary of the proposed detention can be found in Tables 10 & 11.

Table 10: Summary of Detention Basin Design – South Sub Basin

Self Storage	50%	10%	1%
Drainage Area	1.86 ac		
Curve Number	95		
Detained Discharge	7.03 cfs	11.38 cfs	19.91 cfs
Storage Volume	1,158 cft	2,885 cft	4,905 cft
Storage Elevation	928.38	929.82	931.85
Basin Flow Line Outflow	925.50		
Outlet Structure	1 – 24" Culvert @ 925.50 1 – 15" Orifice @ 925.50 1 – 15" Orifice @ 929.00		
100-Year Emergency Weir	NA		
Basin Top Elevation	933.50		

Table 11: Allowable/Existing and Proposed Discharge Rates

Eagle Heights - East	50%, cfs	10%, cfs	1%, cfs
Allowable/Existing	8.08	13.44	22.63
Proposed	7.03	11.38	19.91

E. Stream Corridors

This section is not applicable.

F. Stormwater Treatment Requirements

Worksheet 1 from the MARC BMP Manual was completed for each lot and is included in Appendix E. The Stormwater Quality for requires a Level of Service of 5.9. BMP stormwater requirements for this site will be met by installing: infiltration, see Appendix E for mitigation package.

G. Corps of Engineers Requirements

The project site does not contain "wetlands" or "waters of the U.S." therefore a 404 permit will not be required.

H. FEMA/DWR Requirements

The existing site is located outside of the 100-year flood plain. This area lies in Zone X per the Flood Insurance Rate Map, FIRM 29047C0208E, Map Effective August 3, 2015 for Clay County, Missouri, and Incorporated Areas. The FIRM identifies Zone X as "Areas determined to be outside the 0.2% annual chance floodplain."

Conclusions and Recommendations

The proposed project will cause an increase of peak discharge and volume after the improvements are made to the site. We have reduced the 50%, 10%, and 1% storm events discharge rates to below the allowable discharge rates for each event. We are also meeting the BMP Level of Service.

The proposed development project meets the existing discharge rate for the existing site. Based on this information, Sublime Engineering recommends approval of this Micro-Stormwater Management Study, based upon the information provided herein, we request your approval of the Micro-Storm drainage Study for Storage One KC, Gladstone Facility. If you have any questions, please do not hesitate to contact us.

Appendix A - Figures

STORAGE ONE OF KANSAS CITY GLADSTONE FACILITY



LOCATION MAP
(Not to Scale)

PROPERTY LINE

DEVELOPER INFO
 Shana Danner
 SMDReceiv@red.com
 916-419-8635

SITE DATA TABLE

Category	Value
Total Area	1.86 Ac
Net Area	1.86 Ac
Existing Zoning	33 (Improved Commercial)
Proposed Zoning	31 (Improved Commercial)
Building Areas	
Building 1	10,927 SF
Bottom Floor	18,677 SF
Top Floor	29,604 SF
Total Area	9,385 SF
Building 2	17,903 SF
Bottom Floor	27,086 SF
Top Floor	
Total Area	



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NO.	DESCRIPTION	DATE

STORAGE ONE
 OF KANSAS CITY
 GLADSTONE
 FACILITY

SITE PLAN

SHEET C-1

Appendix B - Soils Report



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Clay County, Missouri

Self Storage



June 18, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Soil data may not be visible at this scale.



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clay County, Missouri
 Survey Area Data: Version 21, May 29, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 17, 2019—Sep 25, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

MAP LEGEND

- | | | | |
|--|------------------------|--|-----------------------|
| | Area of Interest (AOI) | | Soil Area |
| | Soils | | Stony Spot |
| | Soil Map Unit Polygons | | Very Stony Spot |
| | Soil Map Unit Lines | | Wet Spot |
| | Soil Map Unit Points | | Other |
| | Special Point Features | | Special Line Features |
| | Blowout | | Water Features |
| | Borrow Pit | | Streams and Canals |
| | Clay Spot | | Transportation |
| | Closed Depression | | Rails |
| | Gravel Pit | | Interstate Highways |
| | Gravelly Spot | | US Routes |
| | Landfill | | Major Roads |
| | Lava Flow | | Local Roads |
| | Marsh or swamp | | Background |
| | Mine or Quarry | | Aerial Photography |
| | Miscellaneous Water | | |
| | Perennial Water | | |
| | Rock Outcrop | | |
| | Saline Spot | | |
| | Sandy Spot | | |
| | Severely Eroded Spot | | |
| | Sinkhole | | |
| | Slide or Slip | | |
| | Sodic Spot | | |

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10129	Sharpsburg-Urban land complex, 5 to 9 percent slopes	1.9	100.0%
Totals for Area of Interest		1.9	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

Custom Soil Resource Report

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Clay County, Missouri

10129—Sharpsburg-Urban land complex, 5 to 9 percent slopes

Map Unit Setting

National map unit symbol: 2q10b
Elevation: 1,000 to 1,300 feet
Mean annual precipitation: 33 to 41 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 177 to 220 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Sharpsburg and similar soils: 60 percent
Urban land: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sharpsburg

Setting

Landform: Ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

A - 0 to 7 inches: silt loam
Bt - 7 to 48 inches: silty clay loam
C - 48 to 60 inches: silty clay loam

Properties and qualities

Slope: 5 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 35 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: R109XY002MO - Loess Upland Prairie
Other vegetative classification: Grass/Prairie (Herbaceous Vegetation)
Hydric soil rating: No

Custom Soil Resource Report

Description of Urban Land

Setting

Landform: Ridges

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Crest

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydric soil rating: No

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Appendix C - FEMA – Firmette

Appendix D - Detention Report

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	9.154	1	717	20,464	----	----	----	South Detained
2	Reservoir	0.723	1	748	20,463	1	928.80	8,362	Self Storage Basin
3	SCS Runoff	8.084	1	717	17,045	----	----	----	Existing Site
4	Reservoir	7.026	1	721	20,464	1	928.38	1,158	Existing Discharge
2021.06.17 Self Storage.gpw					Return Period: 2 Year			Friday, 06 / 25 / 2021	

Hydrograph Report

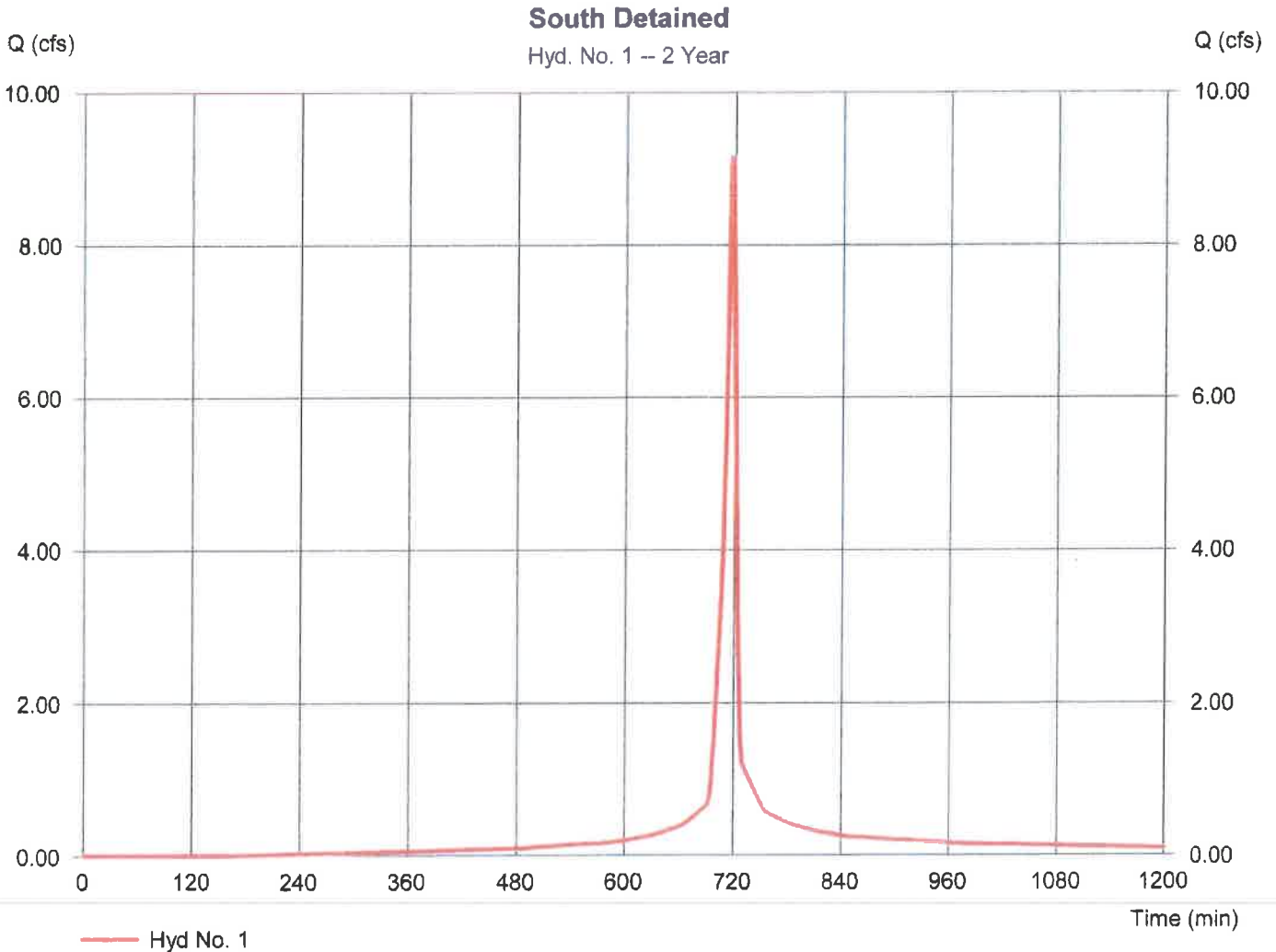
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Friday, 06 / 25 / 2021

Hyd. No. 1

South Detained

Hydrograph type	= SCS Runoff	Peak discharge	= 9.154 cfs
Storm frequency	= 2 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 20,464 cuft
Drainage area	= 1.860 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

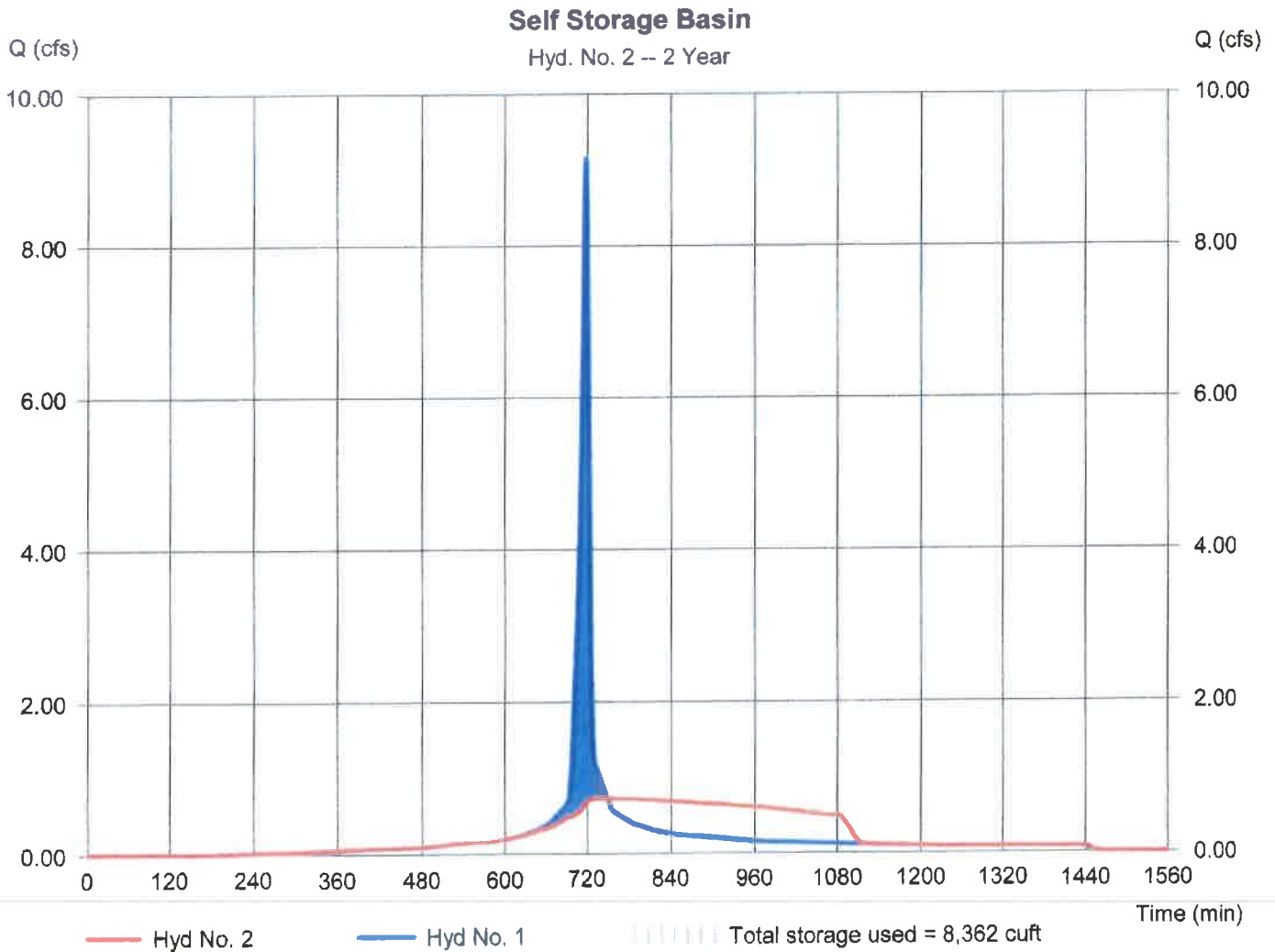
Friday, 06 / 25 / 2021

Hyd. No. 2

Self Storage Basin

Hydrograph type	= Reservoir	Peak discharge	= 0.723 cfs
Storm frequency	= 2 yrs	Time to peak	= 748 min
Time interval	= 1 min	Hyd. volume	= 20,463 cuft
Inflow hyd. No.	= 1 - South Detained	Max. Elevation	= 928.80 ft
Reservoir name	= Self Storage	Max. Storage	= 8,362 cuft

Storage Indication method used



Pond Report

Pond No. 1 - Self Storage

Pond Data

UG Chambers -Invert elev. = 927.00 ft, Rise x Span = 5.00 x 5.00 ft, Barrel Len = 250.00 ft, No. Barrels = 4, Slope = 0.00%, Headers = Yes

Encasement -Invert elev. = 925.50 ft, Width = 30.00 ft, Height = 8.00 ft, Voids = 0.40%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	925.50	n/a	0	0
0.80	926.30	n/a	119	119
1.60	927.10	n/a	235	354
2.40	927.90	n/a	2,974	3,328
3.20	928.70	n/a	4,426	7,754
4.00	929.50	n/a	4,971	12,725
4.80	930.30	n/a	4,977	17,703
5.60	931.10	n/a	4,417	22,120
6.40	931.90	n/a	2,971	25,091
7.20	932.70	n/a	235	25,325
8.00	933.50	n/a	119	25,444

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (In)	= 24.00	4.00	12.00	0.00
Span (In)	= 24.00	4.00	12.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 925.50	925.50	929.00	0.00
Length (ft)	= 10.00	1.00	1.00	0.00
Slope (%)	= 2.00	2.00	2.00	n/a
N-Value	= 013	013	013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	0.00	0.00	0.00
Crest El. (ft)	= 930.30	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s)

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Civ A cfs	Civ B cfs	Civ C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	925.50	0.00	0.00	0.00	---	0.00	---	---	---	---	---	0.000
0.80	119	926.30	0.32 ic	0.32 ic	0.00	---	0.00	---	---	---	---	---	0.320
1.60	354	927.10	0.48 ic	0.48 ic	0.00	---	0.00	---	---	---	---	---	0.483
2.40	3,328	927.90	0.61 ic	0.61 ic	0.00	---	0.00	---	---	---	---	---	0.607
3.20	7,754	928.70	0.73 ic	0.71 ic	0.00	---	0.00	---	---	---	---	---	0.711
4.00	12,725	929.50	1.73 ic	0.78 ic	0.95 ic	---	0.00	---	---	---	---	---	1.728
4.80	17,703	930.30	4.24 oc	0.82 ic	3.38 ic	---	0.00	---	---	---	---	---	4.206
5.60	22,120	931.10	5.67 oc	0.88 ic	4.78 ic	---	0.00	---	---	---	---	---	5.664
6.40	25,091	931.90	6.80 oc	0.94 ic	5.86 ic	---	0.00	---	---	---	---	---	6.796
7.20	25,325	932.70	7.77 oc	0.99 ic	6.76 ic	---	0.00	---	---	---	---	---	7.757
8.00	25,444	933.50	8.62 oc	1.04 ic	7.56 ic	---	0.00	---	---	---	---	---	8.605

Hydrograph Report

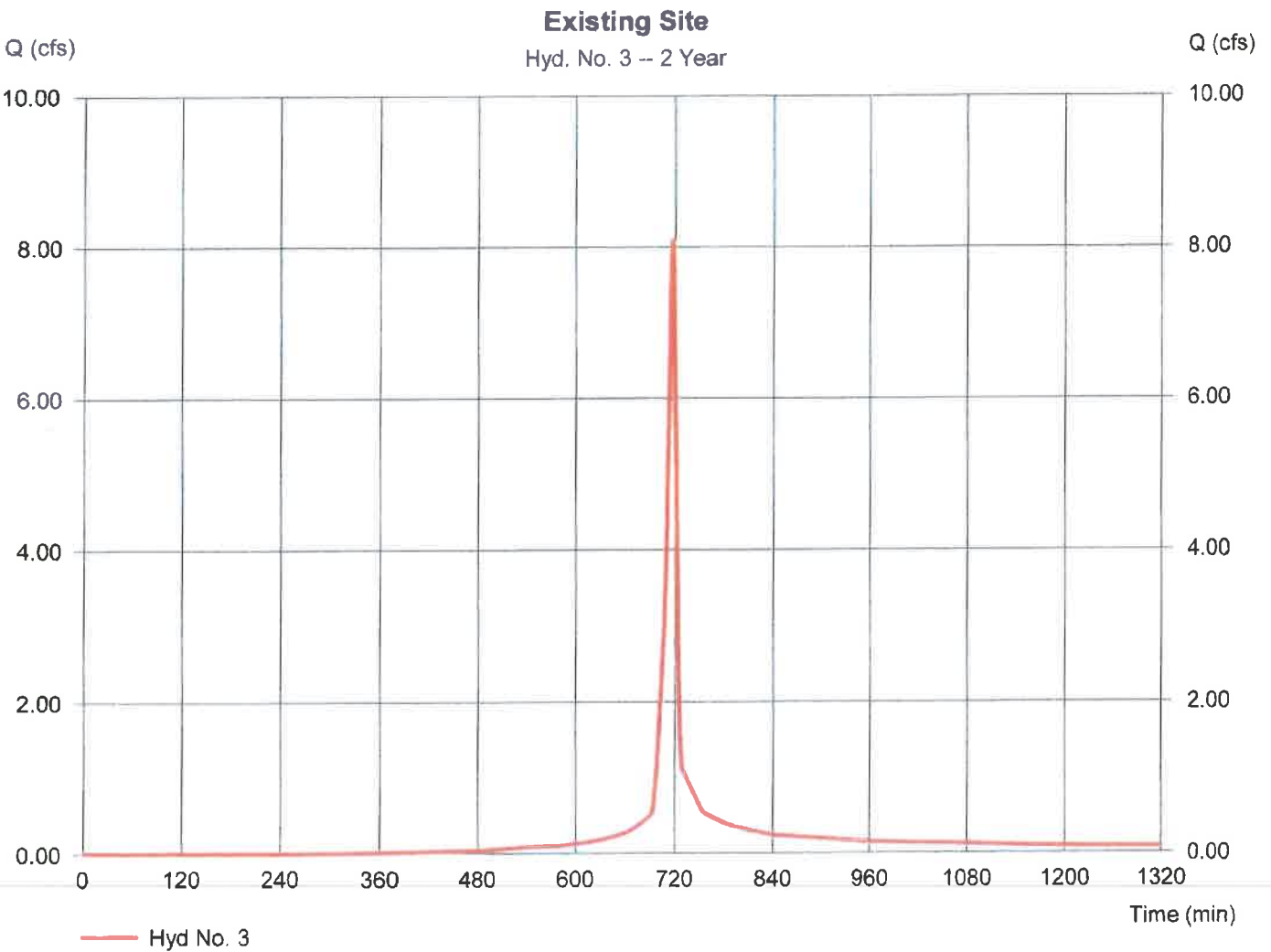
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Friday, 06 / 25 / 2021

Hyd. No. 3

Existing Site

Hydrograph type	= SCS Runoff	Peak discharge	= 8.084 cfs
Storm frequency	= 2 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 17,045 cuft
Drainage area	= 1.860 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

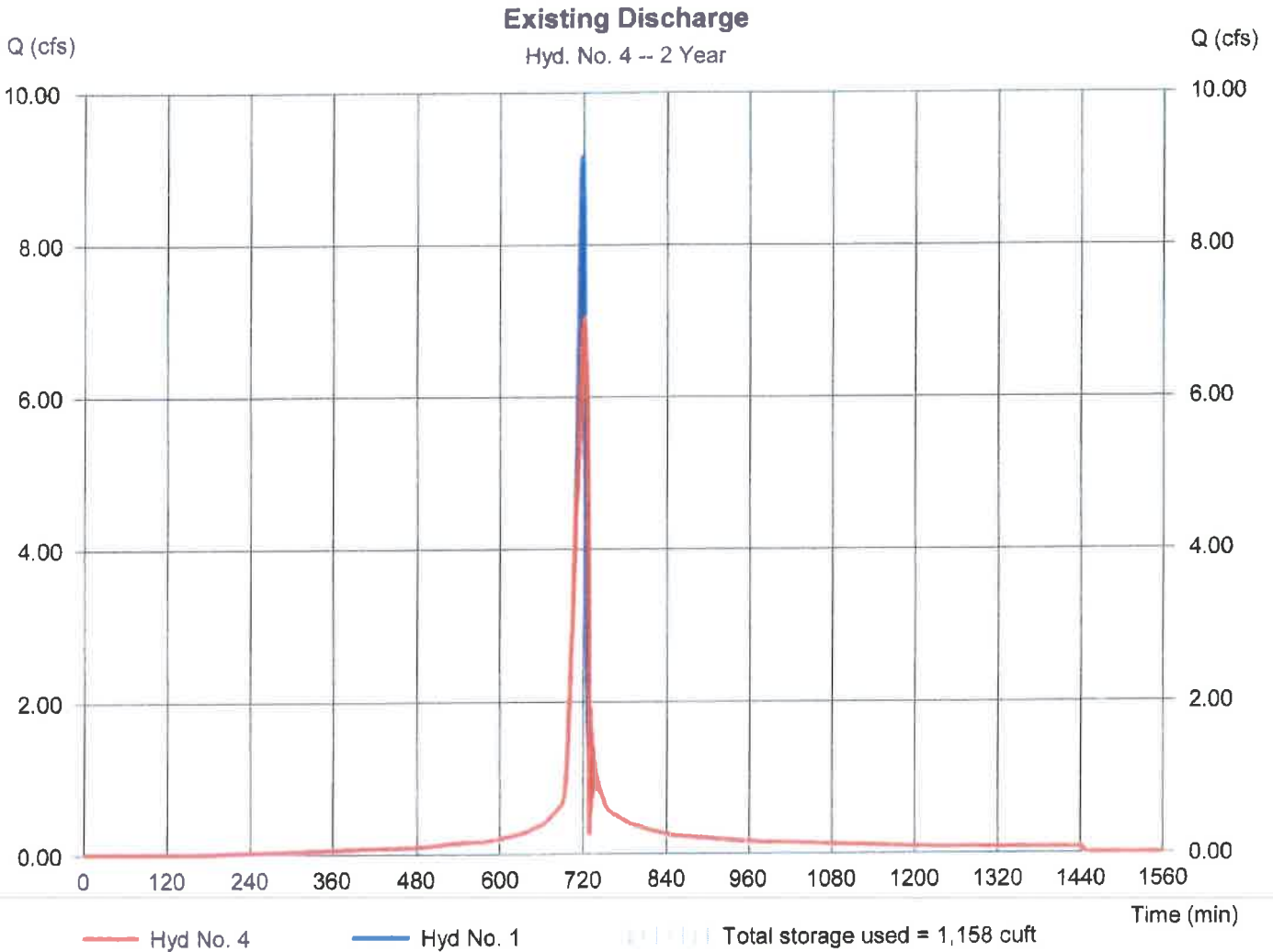
Friday, 06 / 25 / 2021

Hyd. No. 4

Existing Discharge

Hydrograph type	= Reservoir	Peak discharge	= 7.026 cfs
Storm frequency	= 2 yrs	Time to peak	= 721 min
Time interval	= 1 min	Hyd. volume	= 20,464 cuft
Inflow hyd. No.	= 1 - South Detained	Max. Elevation	= 928.38 ft
Reservoir name	= Self Storage 2	Max. Storage	= 1,158 cuft

Storage Indication method used



Pond Report

Pond No. 2 - Self Storage 2

Pond Data

UG Chambers -Invert elev. = 927.00 ft, Rise x Span = 5.00 x 5.00 ft, Barrel Len = 250.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 925.50 ft, Width = 12.00 ft, Height = 8.00 ft, Voids = 0.40%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	925.50	n/a	0	0
0.80	926.30	n/a	10	10
1.60	927.10	n/a	33	43
2.40	927.90	n/a	585	628
3.20	928.70	n/a	878	1,506
4.00	929.50	n/a	988	2,494
4.80	930.30	n/a	989	3,483
5.60	931.10	n/a	876	4,359
6.40	931.90	n/a	585	4,944
7.20	932.70	n/a	33	4,976
8.00	933.50	n/a	10	4,986

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	15.00	15.00	0.00
Span (in)	= 24.00	15.00	15.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 925.50	925.50	929.00	0.00
Length (ft)	= 10.00	1.00	1.00	0.00
Slope (%)	= 2.00	2.00	2.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	0.00	0.00	0.00
Crest El. (ft)	= 930.30	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= Yes	No	No	No
Exfil. (in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (lc) and submergence (s)

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	925.50	0.00	0.00	0.00	---	0.00	---	---	---	---	---	0.000
0.80	10	926.30	1.92 ic	1.92 ic	0.00	---	0.00	---	---	---	---	---	1.923
1.60	43	927.10	4.61 oc	4.52 ic	0.00	---	0.00	---	---	---	---	---	4.516
2.40	628	927.90	6.18 oc	6.18 ic	0.00	---	0.00	---	---	---	---	---	6.179
3.20	1,506	928.70	7.54 oc	7.54 ic	0.00	---	0.00	---	---	---	---	---	7.541
4.00	2,494	929.50	9.43 oc	8.30 ic	1.13 ic	---	0.00	---	---	---	---	---	9.426
4.80	3,483	930.30	14.17 oc	9.32 ic	4.85 ic	---	0.00	---	---	---	---	---	14.17
5.60	4,359	931.10	17.45 oc	10.27 ic	7.18 ic	---	0.00	---	---	---	---	---	17.45
6.40	4,944	931.90	20.08 oc	11.16 ic	8.91 ic	---	0.00	---	---	---	---	---	20.08
7.20	4,976	932.70	22.23 ic	11.87 ic	10.36 ic	---	0.00	---	---	---	---	---	22.23
8.00	4,986	933.50	24.11 ic	12.48 ic	11.63 ic	---	0.00	---	---	---	---	---	24.11

Hydrograph Summary Report

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Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	14.37	1	717	33,119	---	---	---	South Detained	
2	Reservoir	2.093	1	728	33,118	1	929.60	13,339	Self Storage Basin	
3	SCS Runoff	13.44	1	717	29,278	---	---	---	Existing Site	
4	Reservoir	11.38	1	720	33,119	1	929.82	2,885	Existing Discharge	
2021.06.17 Self Storage.gpw					Return Period: 10 Year			Friday, 06 / 25 / 2021		

Hydrograph Report

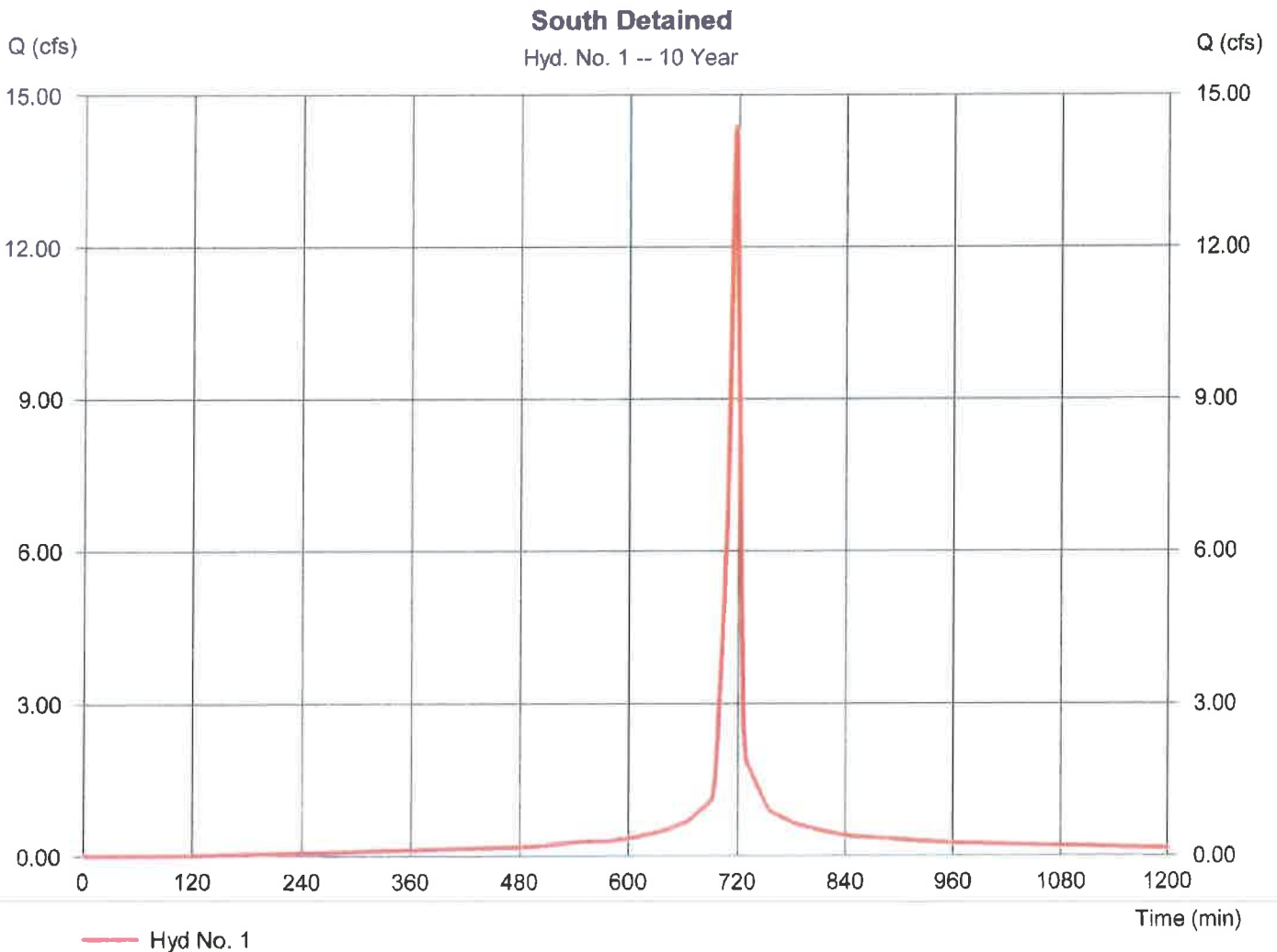
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Friday, 06 / 25 / 2021

Hyd. No. 1

South Detained

Hydrograph type	= SCS Runoff	Peak discharge	= 14.37 cfs
Storm frequency	= 10 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 33,119 cuft
Drainage area	= 1.860 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.34 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc v2022

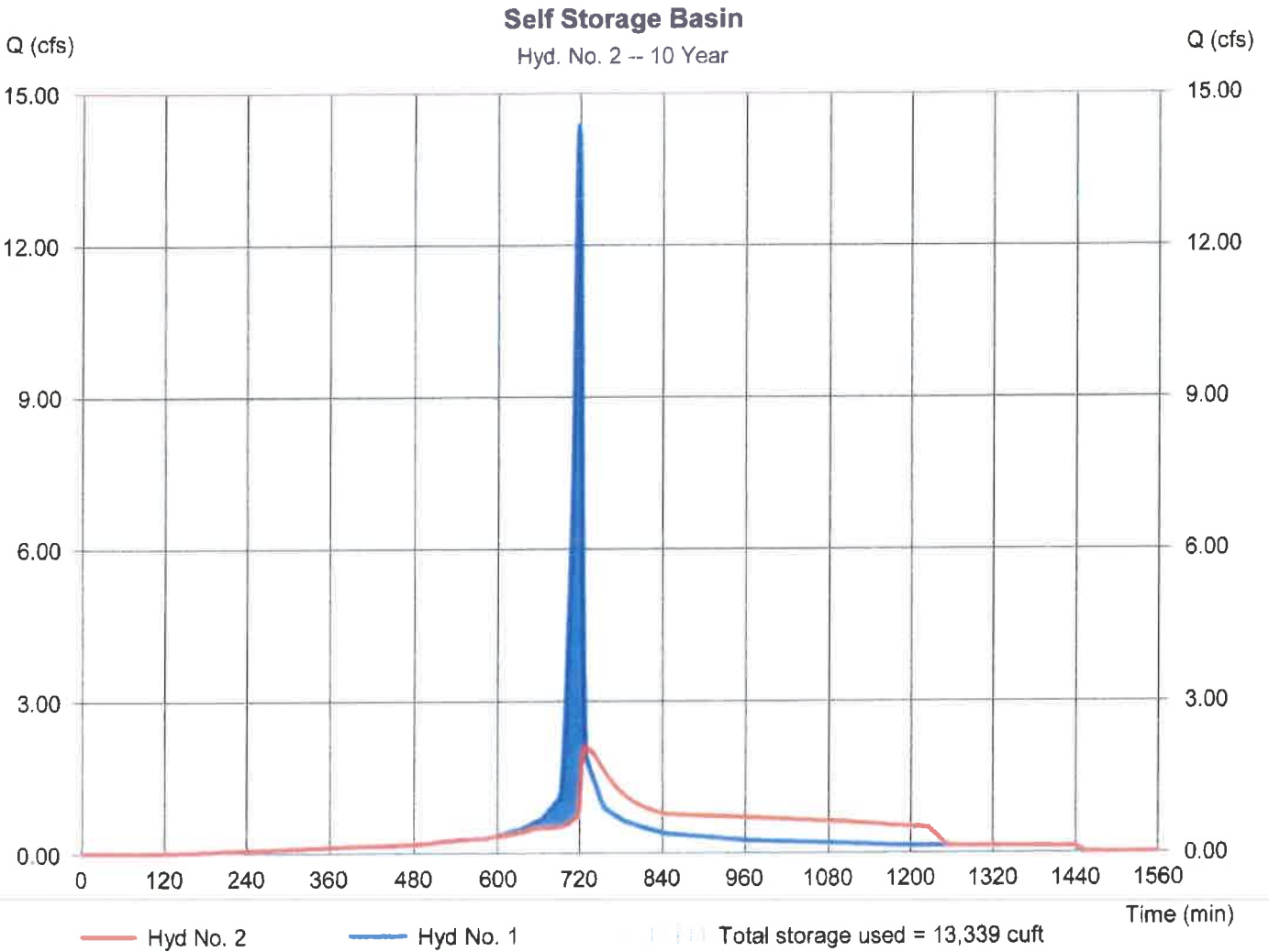
Friday, 06 / 25 / 2021

Hyd. No. 2

Self Storage Basin

Hydrograph type	= Reservoir	Peak discharge	= 2.093 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 1 min	Hyd. volume	= 33,118 cuft
Inflow hyd. No.	= 1 - South Detained	Max. Elevation	= 929.60 ft
Reservoir name	= Self Storage	Max. Storage	= 13,339 cuft

Storage Indication method used



Hydrograph Report

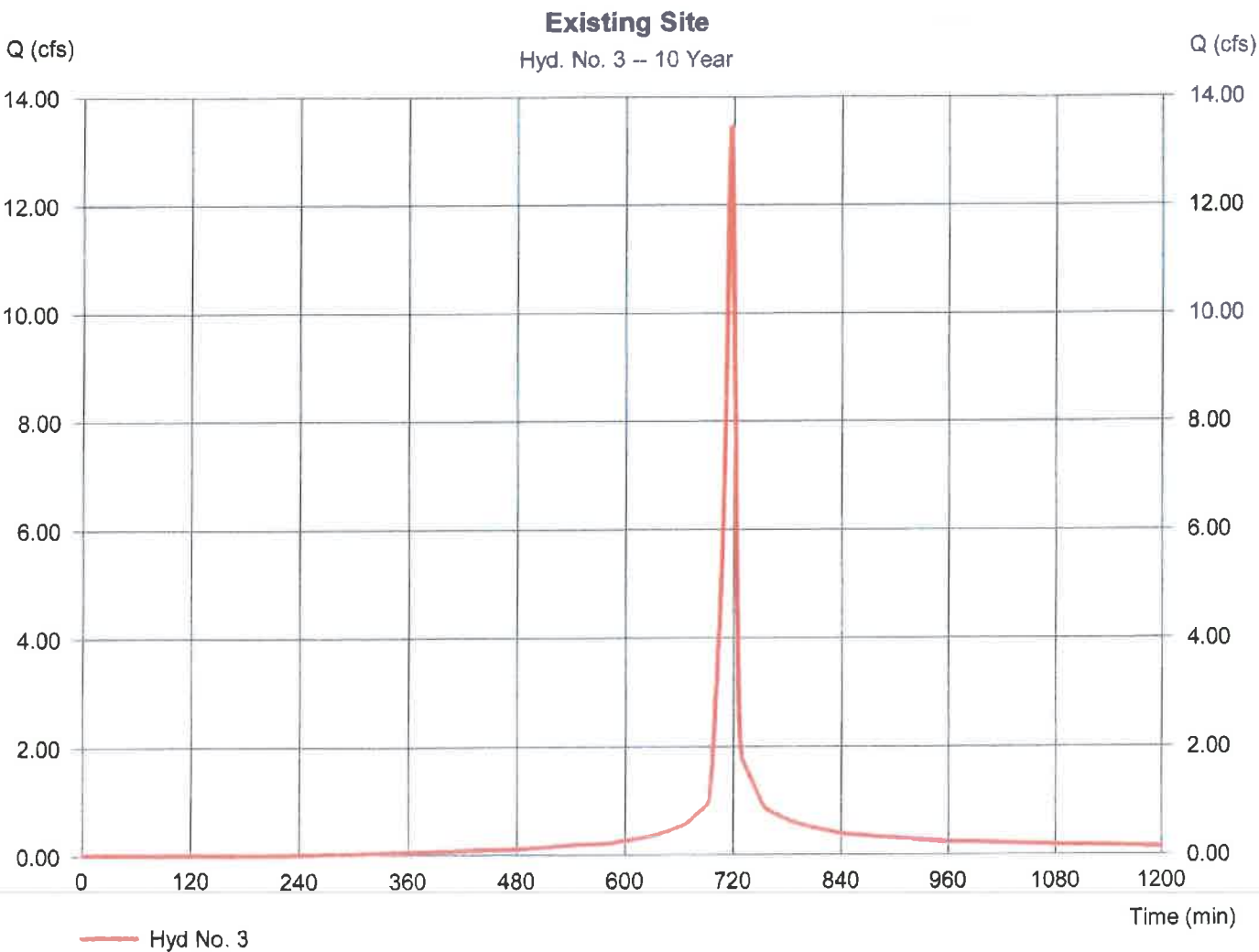
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Friday, 06 / 25 / 2021

Hyd. No. 3

Existing Site

Hydrograph type	= SCS Runoff	Peak discharge	= 13.44 cfs
Storm frequency	= 10 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 29,278 cuft
Drainage area	= 1.860 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.34 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

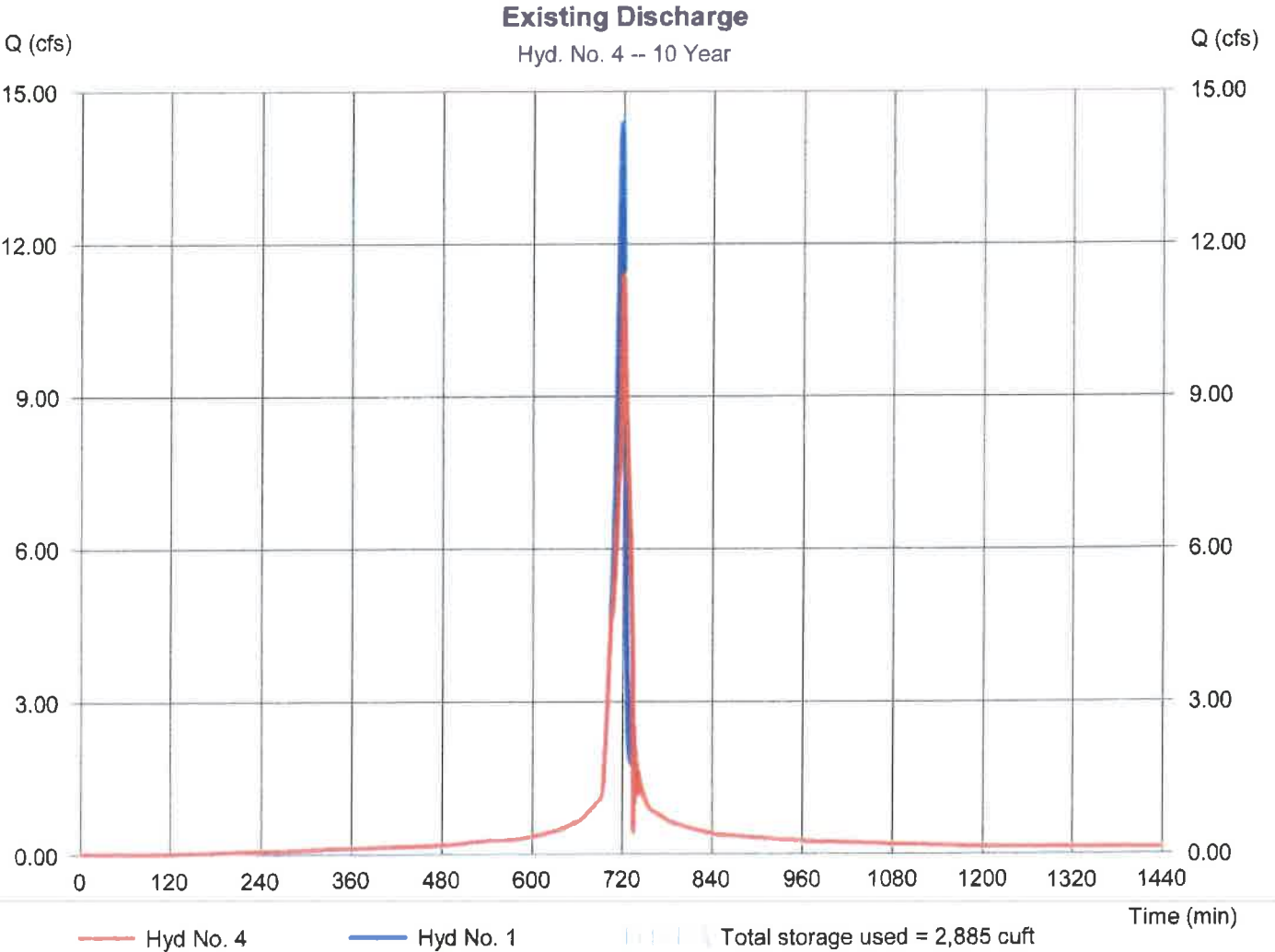
Friday, 06 / 25 / 2021

Hyd. No. 4

Existing Discharge

Hydrograph type	= Reservoir	Peak discharge	= 11.38 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 1 min	Hyd. volume	= 33,119 cuft
Inflow hyd. No.	= 1 - South Detained	Max. Elevation	= 929.82 ft
Reservoir name	= Self Storage 2	Max. Storage	= 2,885 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	23.37	1	717	55,349	---	---	---	South Detained
2	Reservoir	5.539	1	725	55,349	1	931.02	21,687	Self Storage Basin
3	SCS Runoff	22.63	1	717	51,159	---	---	---	Existing Site
4	Reservoir	19.91	1	720	55,349	1	931.85	4,905	Existing Discharge

2021.06.17 Self Storage.gpw

Return Period: 100 Year

Friday, 06 / 25 / 2021

Hydrograph Report

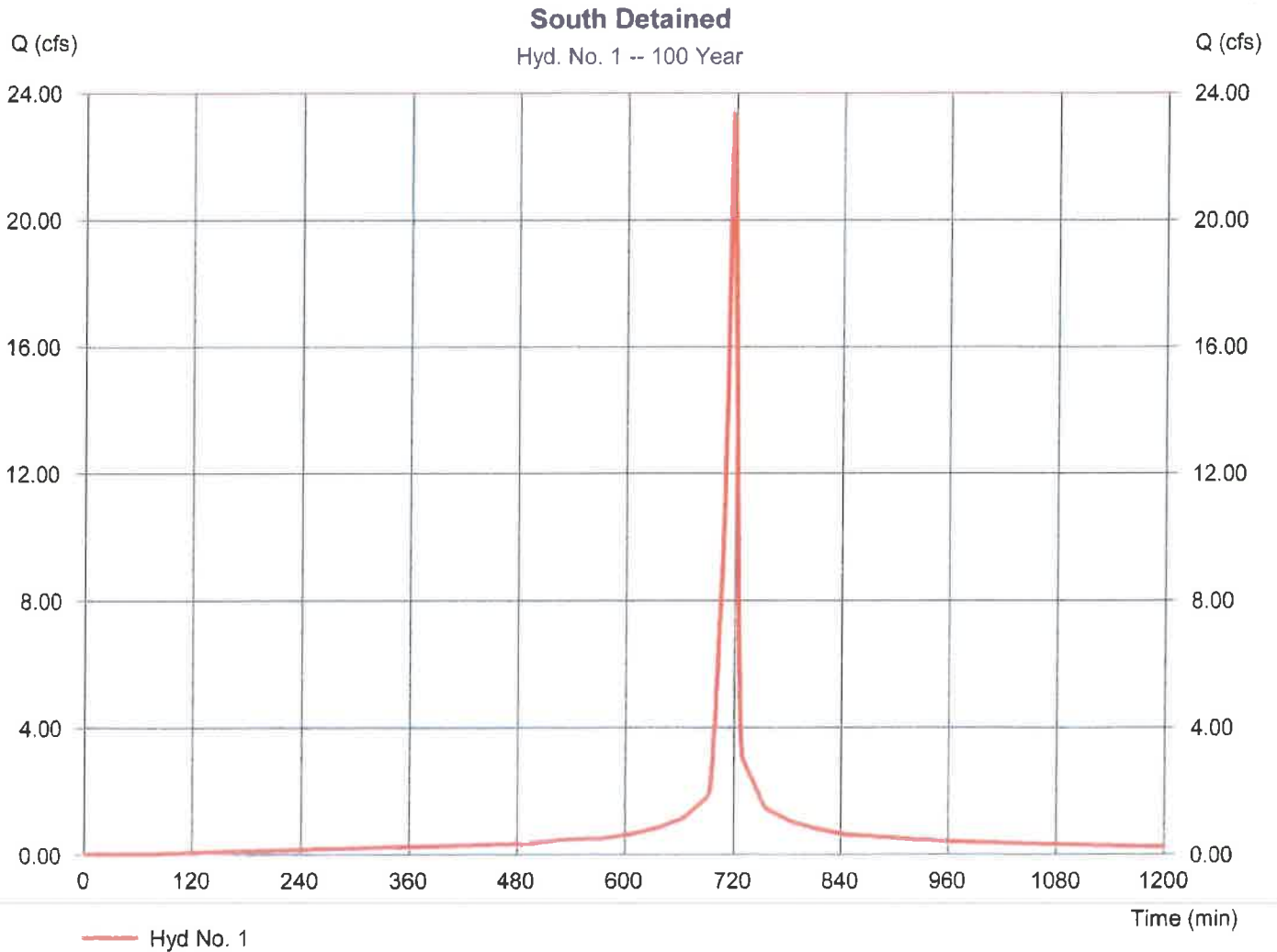
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Friday, 06 / 25 / 2021

Hyd. No. 1

South Detained

Hydrograph type	= SCS Runoff	Peak discharge	= 23.37 cfs
Storm frequency	= 100 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 55,349 cuft
Drainage area	= 1.860 ac	Curve number	= 95
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 8.55 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc v2022

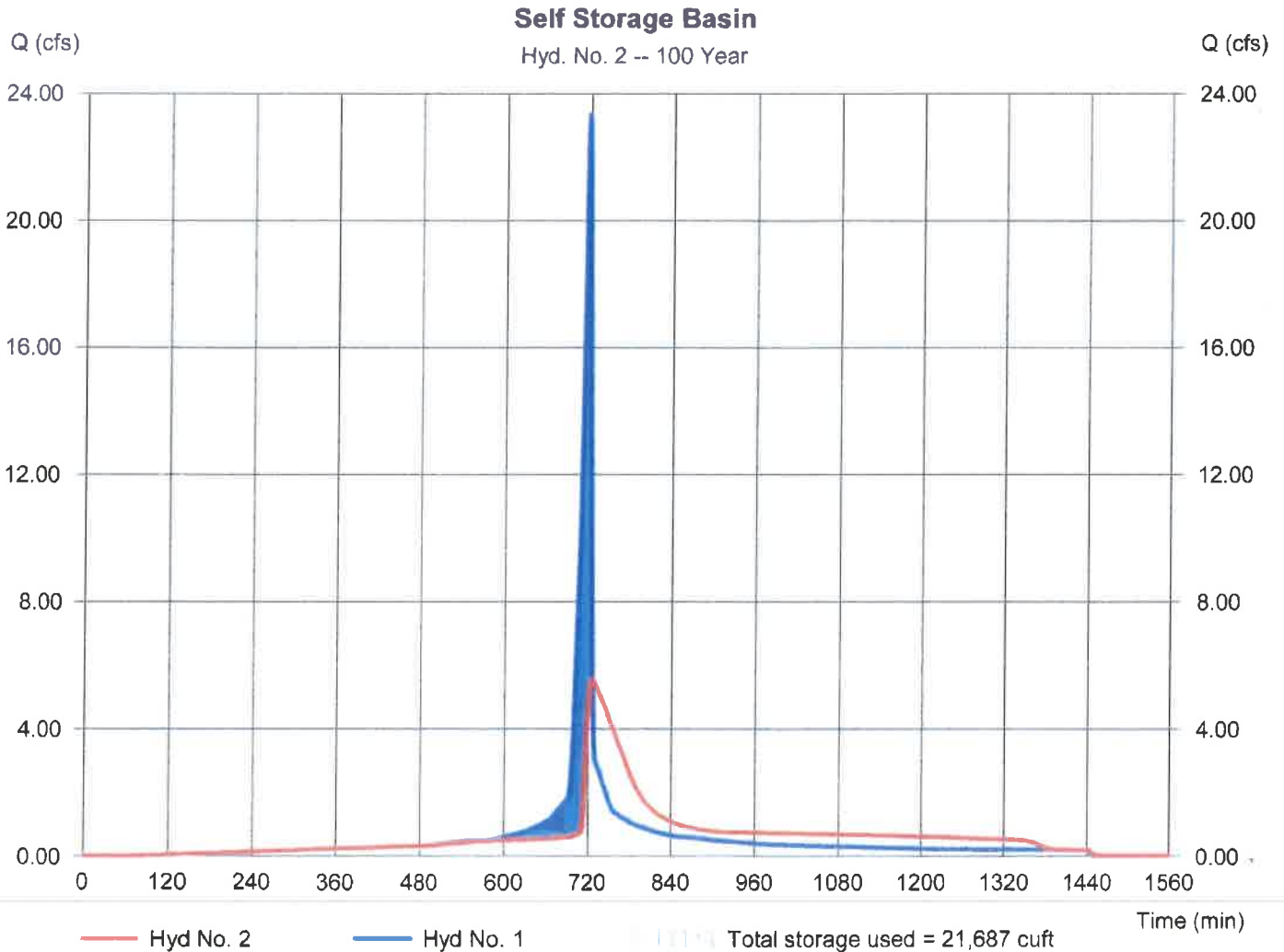
Friday, 06 / 25 / 2021

Hyd. No. 2

Self Storage Basin

Hydrograph type	= Reservoir	Peak discharge	= 5.539 cfs
Storm frequency	= 100 yrs	Time to peak	= 725 min
Time interval	= 1 min	Hyd. volume	= 55,349 cuft
Inflow hyd. No.	= 1 - South Detained	Max. Elevation	= 931.02 ft
Reservoir name	= Self Storage	Max. Storage	= 21,687 cuft

Storage Indication method used



Hydrograph Report

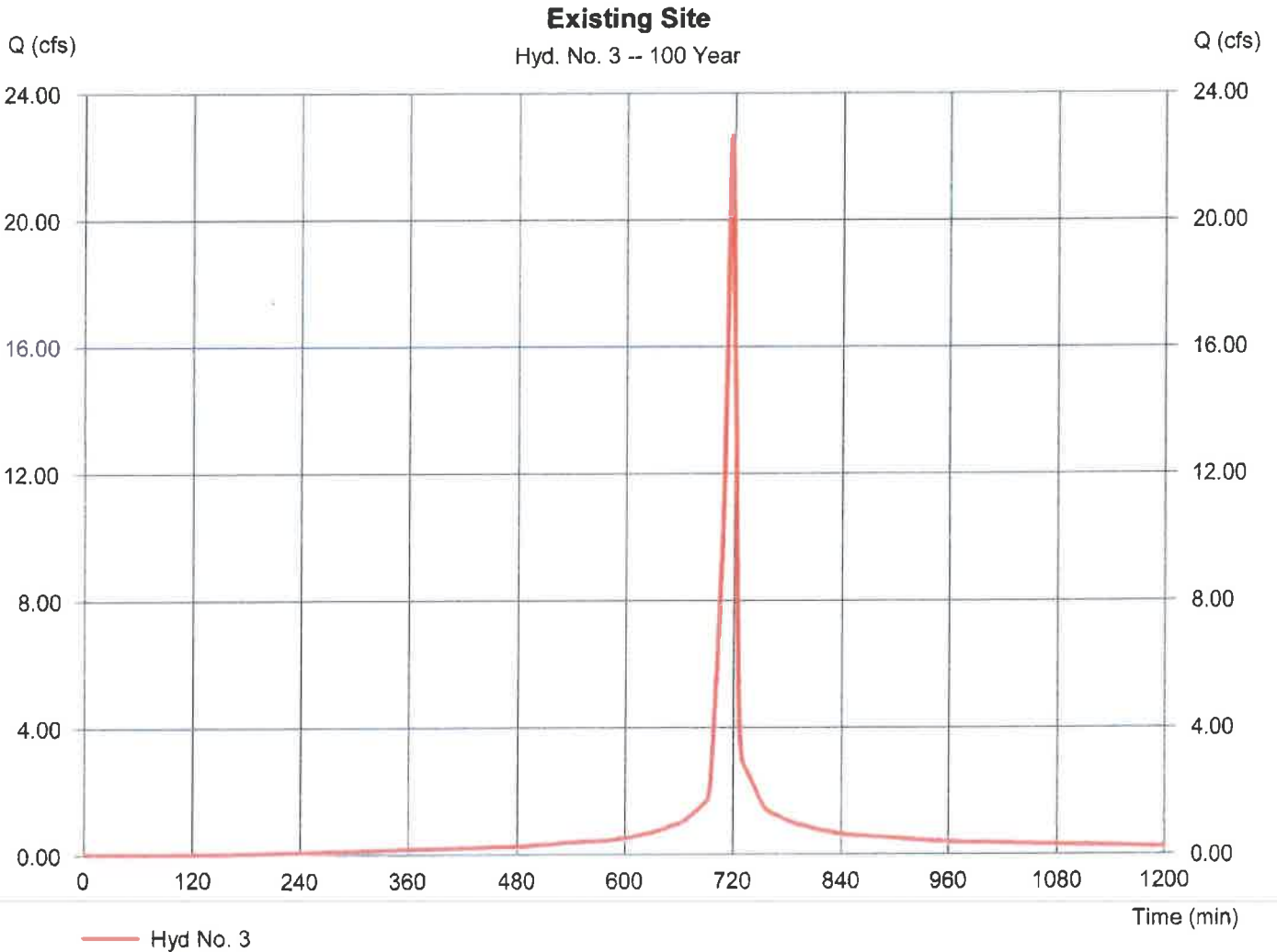
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc v2022

Friday, 06 / 25 / 2021

Hyd. No. 3

Existing Site

Hydrograph type	= SCS Runoff	Peak discharge	= 22.63 cfs
Storm frequency	= 100 yrs	Time to peak	= 717 min
Time interval	= 1 min	Hyd. volume	= 51,159 cuft
Drainage area	= 1.860 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 8.55 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

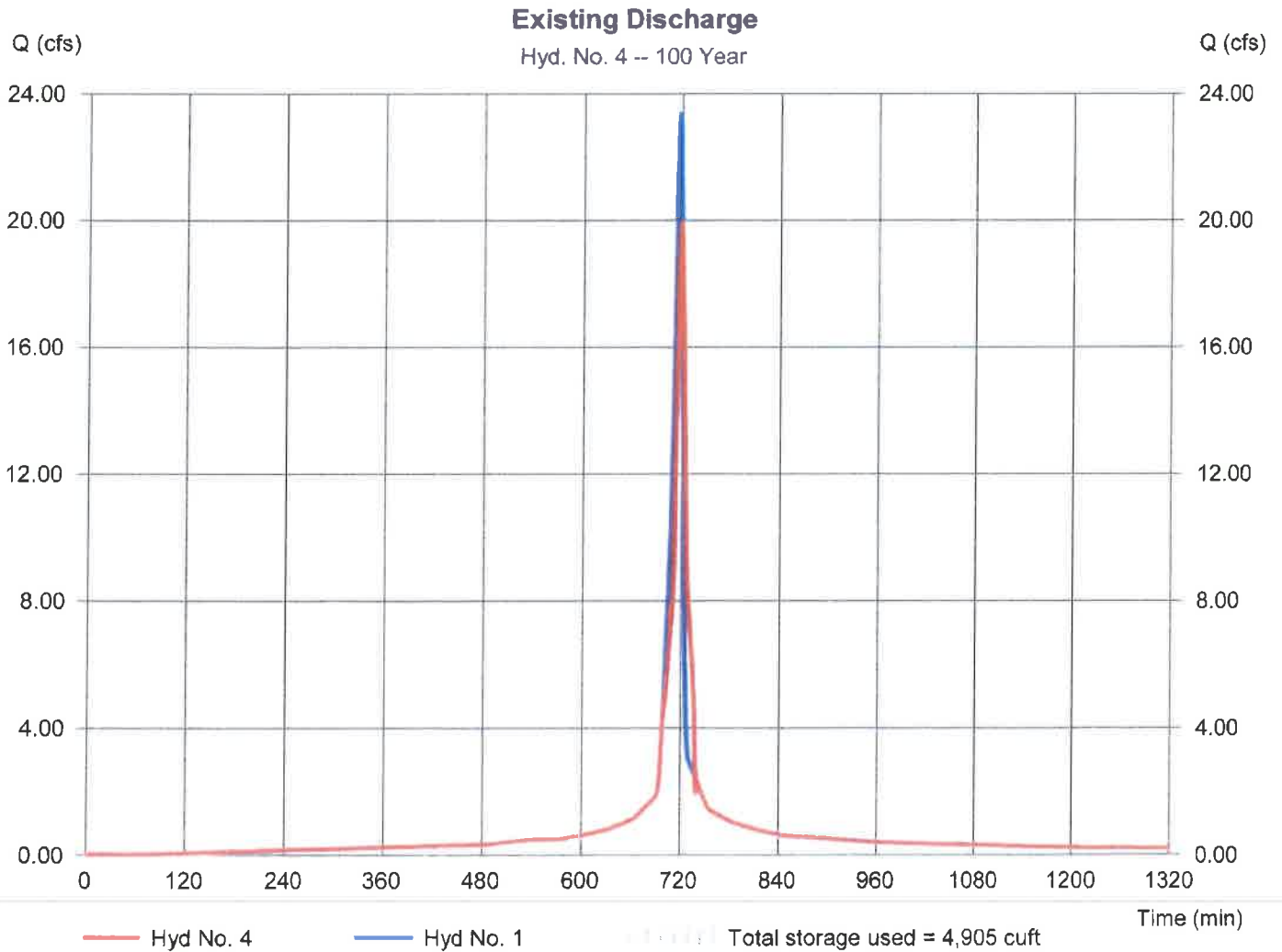
Friday, 06 / 25 / 2021

Hyd. No. 4

Existing Discharge

Hydrograph type	= Reservoir	Peak discharge	= 19.91 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 1 min	Hyd. volume	= 55,349 cuft
Inflow hyd. No.	= 1 - South Detained	Max. Elevation	= 931.85 ft
Reservoir name	= Self Storage 2	Max. Storage	= 4,905 cuft

Storage Indication method used



Appendix E – BMP Worksheets

BMP WORKSHEET: REQUIRED LEVEL OF SERVICE - DEVELOPED SITE

Project: Storage One KC
Location: Gladstone
Option: LS for Developed Site
Date: 17-Jun-21
By: RTD

I. Required Treatment Area

A. Total Area Disturbed by Redevelopment Activity

Disturbed Area Description	Area, acres
Total Disturbed Area	1.86

Total 1A 1.86

B. Existing Impervious Area Inside Disturbed Area

Existing Impervious Area Description	Area, acres
Existing Buildings and Pavement	1.08

Total 1B 1.08

C. Required Treatment Area

Area, acres
Total 1C 0.78 (1A-1B)

2. Percent Impervious in Post Development Condition and Level of Service

A. Total Post Development Impervious Area Inside Disturbed Area

Post Development Impervious Area Description	Area, acres
Building and Pavement	1.58

Total 2A 1.58

B. Existing Impervious Area Inside Disturbed Area	Area, acres
	1.08 (1B Total)

C. Net Increase in Impervious Area

Area, acres
Total 2C 0.50 (2A-1B)

D. Percent Impervious	Round to Integer	64 (2C-1C)x100
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E. Level of Service	LS=	5.9 (See Table 4.3)
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3. Minimum Required Total Value Rating of BMP Package

VR= 4.60 (LS*1C)

BMP WORKSHEET: DEVELOP MITIGATION PACKAGE(S) THAT MEET THE REQUIRED LS OR VR

Project: Storage One KC
 Location: Gladstone
 Option: Mitigation Package
 Date: 17-Jun-21
 By: RTD

I. Required LS OR VR

Note: Various BMP's May Alter CN of Proposed Development and LS; Recalculate Both if Applicable

II. Proposed BMP Option Package No. 1

Cover/BMP Description	Treatment Area	VR from Table 4.4 or Table 4.6	Product of VR x Area
Infiltration Basin	0.78	9.00	7.02
Not Treated	0.00		0.00
Total	0.78	Total	7.02 =Total Product/Total Area
		*Weighted VR:	9.00

1. Refer to Mitigation Instructions and Tables 2 and 4 as Appropriate When Determining VR.

2. Total Treatment Area Cannot Exceed 100 Percent of the Actual Site Area

Area of Site, acres

* Blank in Redevelopment

Meets Required Total LS or VR (Yes/No)?

(If No, or if Additional Options are Being Tested, Proceed Below.)