HARRISVILLE CITY
363 W. Independence Blvd · Harrisville, Utah 84404 · 801-782-4100
www.cityofharrisville.com

MAYOR:
Michelle Tait

COUNCIL MEMBERS:
Grover Wilhelmsen
Steve Weiss
Blair Christensen
Max Jackson
Kenny Loveland

CITY COUNCIL
AGENDA
363 West Independence Blvd
February 8, 2022
Join Zoom Meeting
https://us02web.zoom.us/j/87121693579?pwd=ckQzZFFEVGdCZkxhZUx6UHlYYytQZz09
Meeting ID: 871 2169 3579
Passcode: 394578

"In accordance with the Americans with Disabilities Act, the City of Harrisville will make reasonable accommodations for participation in the meeting. Request for assistance can be made by contacting the City Recorder at 801-782-4100, providing at least three working days advance notice of the meeting."

7:00 P.M. CITY COUNCIL MEETING
Presiding: Mayor Michelle Tait
Mayor Pro Tem: Steve Weiss

1. **CALL TO ORDER**
2. **PLEDGE OF ALLEGIANCE** [Council Member Loveland]
3. **OPENING CEREMONY** [Rajan Zed, President, Universal Society of Hinduism]
4. **CONSENT ITEMS**
   - **a.** Approve the minutes of January 11, 2022 as presented.
   - **b.** Mayor's Appointment of City Treasurer
5. **OATHS OF OFFICE** [Jennie Knight]
6. **BUSINESS ITEMS**
   - **a.** Children's Justice Center Presentation [Patricia Alatrista]
   - **b.** Discussion/possible action to grant final approval for The Copperwoods subdivision; a 66-unit mixed-use development located at approximately 1956 North Highway 89. [Justin Shinsel]
   - **c.** Discussion/possible action to adopt Harrisville Ordinance 530; a zoning change application received by Ben Lomond Properties, LLC from Agricultural (A-1) zone to Commercial (CP-2) for Weber County Parcel #11-019-0007, located at approximately 1801 N. Highway 89. [Bill Morris]
   - **d.** **PUBLIC HEARING** – Harrisville City Council will take comments for or against Harrisville Resolution 22-03; a resolution adopting the Sanitary Sewer Impact Fee Facilities Plan.
   - **e.** Discussion/possible action to adopt Harrisville Resolution 22-03; a resolution adopting the Sanitary Sewer Impact Fee Facilities Plan. [Bill Morris]
   - **f.** Youth City Council Presentation/Report on attending Local Officials Day at the Legislature. [Tami Johnson]
   - **g.** Discussion/possible action to purchase utility trailers. [Justin Shinsel]
   - **h.** 2022 Goals [Mayor Tait]
7. **PUBLIC COMMENTS -** ***(3 minute maximum)***
8. **MAYOR/COUNCIL FOLLOW-UP**
9. **CLOSED EXECUTIVE SESSION:** Utah State Code §52-4-205(1)(a): The Council may consider a motion to enter into Closed Executive Session for the purpose of discussion of character, professional competence, or physical or mental health of individual(s).
10. **ADJOURN**

DATE POSTED: February 3, 2022 BY: Jennie Knight, City Recorder
I, Jennie Knight, certify that I am the City Recorder of Harrisville City, Utah, and that the foregoing City Council agenda was posted and can be viewed at City Hall, on the City's website www.cityofharrisville.com, and at the Utah Public Notice Website at http://pmn.utah.gov. Notice of this meeting has also been duly provided as required by law.

MINUTES OF HARRISVILLE CITY
CITY COUNCIL
January 11, 2022
363 West Independence Blvd
Harrisville, UT 84404

Present: Mayor Michelle Tait, Council Member Steve Weiss, Council Member Blair Christensen, Council Member Max Jackson, Council Member Kenny Loveland.

Staff: Bill Morris, City Administrator, Jennie Knight, City Recorder, Cynthia Benson, Deputy Recorder, Justin Shinsel, Public Works Director, Mark Wilson, Police Chief, Dennis Moore, Assistant Chief, Jessica Hardy, Finance Director, Rick Hill, Bailiff, John Millaway, Police Officer.

Visitors: Brad Elmer, Timothy Millaway, Jorden Millaway, John Millaway, Blaine Barrow, Scott Smoot, Brenda Nelson, Nathan Averill, Annette Loveland, John Macedone, Jake Thompson, Rod Thompson, Deanne Aguilar, Carlos Aguilar, Austin Moffit, Arnold Tait.

7:00 P.M. CITY COUNCIL MEETING

1. **Call to Order.**

Mayor Tait called the meeting to order and welcomed all visitors.

2. **Opening Ceremony.**

Council Member Jackson led the pledge of allegiance and conducted the opening ceremony.

3. **Oaths of Office.**

Jennie Knight administered the Oaths of Office to Mayor Michelle Tait, Council Member Steve Weiss, Council Member Max Jackson, Council Member Kenny Loveland and Officer John Millaway.

4. **Consent Items.**

a. Approve the minutes of December 14, 2021 as presented.

MOTION: Council Member Wilhelmsen motioned to approve the minutes of December 14, 2021 as presented. Council Member Weiss seconded the motion. All Council Members voted aye. Motion passed.

b. Mayor Pro-Tem

MOTION: Council Member Weiss motioned to approve the appointment of Blair Christensen as Mayor Pro Tem. Council Member Loveland seconded the motion. All Council Members voted aye. Motion passed.

c. Advice and consent to appoint Planning Commissioners.

MOTION: Council Member Loveland motioned to approve the appointment of Brenda Nelson, Nathan Averill, and Brad Elmer (alternate) as Planning Commissioners for 5-year terms. Council Member Christensen seconded the motion. All Council Members voted aye. Motion passed.

5. **Business Items.**
    a. **PUBLIC HEARING – Harrisville City Council will take comments for or against Harrisville Resolution 22-01; a resolution authorizing the surplus of certain real properties owned by the city.**

Bill Morris explained the city properties being considered for surplus. The parcels were reviewed and the plan to surplus the Public Works building on Washington Boulevard, which was originally intended to be a park. A developer of the south parcel will be taking over the entire project and rededicating approximately 11 acres back to the city in a conservation easement for a park.

MOTION: Council Member Weiss motioned to open the public hearing on Harrisville Resolution 22-01; a resolution authorizing the surplus of certain real properties owned by the city. Council Member Loveland seconded the motion. All Council Members voted aye.

No public comment was given.

MOTION: Council Member Weiss motioned to close the public hearing. Council Member Wilhelmsen seconded the motion. All Council Members voted aye. Motion passed.

    b. **Discussion/possible action to adopt Harrisville Resolution 22-01; a resolution authorizing the surplus of certain real properties owned by the city.**

Council Member Loveland requested additional information regarding the parcel description in the notice. Staff reported a typo was corrected in the original posting. The parcel is on the west side of Washington Boulevard. This resolution allows for the sale of this property. Council Member Christiansen asked if the developer was in agreement with this process. Mr. Morris explained there is a contract for the sale. Mayor Tait asked for Scott Smoot, the developer for the project, to answer any questions the Council may have. Mr. Smoot said they have reviewed the contract and have very few changes. Mr. Morris commented Mr. Smoot has been very easy to work with. Council Member Jackson asked if the family who originally deeded the property to the city has been contacted. Mr. Morris said an attempt was made but they were unable to be located. Mr. Morris said that the park could be named after the family that originally donated the parcel. Council Member Jackson asked if the plaque on the shop building will be removed. Mr. Morris said that is the intent. Council Member Wilhelmsen asked about the lining up of the roads for the UDOT requirements and how they line up within the property. Mr. Smoot said that the road will end at a parking lot at the park.

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Mr. Morris discussed the other property listed for surplus on 700 N. He said the parcel is only being surplused at this time. The city plans to make two lots paper ready as residential subdivision before they go on the market. The city will be the developer. He also explained a portion of the land will be repaired to help soften the traffic along this road. Mr. Shinsel said a portion of the road will be widened as well.

Council Member Jackson asked about the wetlands behind the city shops and how it will be developed. Mr. Morris said it would be developed as state code allows.

Council Member Loveland asked for clarification on the 700 N parcel. He asked why the city is moving to surplus. Mr. Morris reviewed UCA §10-3-8 which requires a public hearing be held before city owned property is surplused. Mr. Morris explained that when the city is ready to sell this land it will be paper ready. The intent is to help the residents along 700 North instead of allowing a developer to develop as they see fit.

MOTION: Council Member Weiss motioned to adopt Harrisville Resolution 22-01; a resolution authorizing the surplus of certain real properties owned by the city. Council Member Christensen seconded the motion. A Roll Call Vote was taken.

Council Member Wilhelmsen	**Yes**
Council Member Weiss	**Yes**
Council Member Christensen	**Yes**
Council Member Jackson	**Yes**
Council Member Loveland	**Yes**

Motion passed 5-0.

c. Discussion/possible action to adopt Harrisville Resolution 22-02; a resolution to adopt a purchase, lease and dedication agreement.

Mr. Morris explained that Ms. Knight coordinated with Mr. Smoot to make the changes in the contract. Mr. Morris read through the contract and explained how the fair market value was obtained. The Public Works property value was $875,000. Since the city is going to lease the buildings while the new city shops are being built and develop the road, a contribution needs to be kept. The rent and road costs to be developed are $225,000. The purpose of the agreement is to align the road and access to the future park. The agreement goes through what the city's responsibilities along with allowance for developer access for surveys. Council Member Loveland asked who would be responsible to the removal of the buildings. Mr. Morris asked Mr. Smoot if this could be clarified in the contract. He updated paragraph "8" to read "The Developer is responsible, at the Developer's sole expense, for any demolition on the Premises after the structures have been vacated by the City." Mr. Smoot said that was the intent to demolish once the city vacates the premises. Mr. Morris said the city can salvage what he wishes from the building as per the contract.

MOTION: Council Member Wilhelmsen motioned to adopt Harrisville Resolution 22-02; a resolution to adopt the purchase, lease and dedication agreement with

the amended changes. Council Member Loveland seconded the motion. A Roll Call Vote was taken.

Council Member Wilhelmsen	**Yes**
Council Member Weiss	**Yes**
Council Member Christensen	**Yes**
Council Member Jackson	**Yes**
Council Member Loveland	**Yes**

Motion passed 5-0.

d. Discussion/possible action to grant preliminary approval for The Copperwoods Subdivision a 65-unit mixed-use development located at approximately 1956 North Highway 89.

Mr. Shinsel explained this project has already been through Project Management and Preliminary Review by the Planning Commission. Staff is excited to see this development in the city. The developers have been great to work with. Council Member Jackson asked how this development will aesthetically blend with the developments to the south. Mr. Shinsel said that the renderings match with the south developments. Council Member Weiss asked about the traffic. Mr. Shinsel said this is being addressed with a light on HWY 89 and they have been in constant contact with UDOT to address this issue. There will be no left turn off 2000 North to help with this issue. Mr. Thompson, the developer, was asked to address a question about the commercial element that will be going in off 750 West by Council Member Christensen. Mr. Thompson said there is no interest yet and he will have more information when the development begins.

MOTION: Council Member Christensen motioned to grant preliminary approval for The Copperwoods Subdivision a 65-unit mixed-use development located at approximately 1956 North Highway 89. Council Member Jackson seconded the motion. All Council Members voted aye. Motion passed.

e. Discussion/possible action to approve 750 West Public Works Building Concept Plan.

Mr. Shinsel explained this project is referred to as the Municipal Center. It will house Public Works and the City Offices. Mr. Shinsel explained how the parcel will be accessed from HWY 89 and 750 West. The first leg will be the city shops along with the infrastructure for the entire project. The monies for this facility will come from the sale of surplus properties, impact fees, and from ARPA funds for infrastructure. Mr. Morris asked about how Bryan Fife feels about the project. Mr. Fife feels it is easier access for him to manage the parks by staying at the parks building. Council Member Loveland asked for more detail. Mr. Shinsel moved to the whiteboard to further clarify each building along with outlining the accesses. Council Member Jackson asked if this concept was strapping us and will not allow a future plan with North View fire District. Mr. Shinsel and Mayor Tait explained that discussions have occurred with the fire department on possibilities for them to be a part of the development. It will depend on what UDOT will allow for access for them on where the new possible station can be placed. Council Member Jackson asked

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about the light that will be on HWY 89. He wanted to know if it had been approved with UDOT and if it could have an automatic switch when an emergency vehicle is nearby. Mr. Shinsel said that the light itself has already been approved but the switch would need to be approved through UDOT. Mr. Shinsel will look more into this during engineering. Mayor Tait clarified that the only part the city is looking at developing at this time is the city shop area. Mr. Shinsel further explained that the concept is just that. It can be changed as the project needs grow. Jones and Associates are already working on an RFP for an architect and the engineering of the site plan. The goal is to be out of the old city shops within three (3) years. Mr. Morris explained that the next step is for site plan review by the Planning Commission. Tonight, the city staff needs to know if this plan is acceptable to continue with the project. Mr. Morris explained this land has more space to facilitate the needs of the city than the other properties. Council Member Loveland was concerned with the parking for all the recreation activities. Mr. Morris said another thing to consider was angled parking on the side roads. Mr. Shinsel said adjustments like parking and such can be finalized through the engineering. What he is looking for now is the concept being agreeable to the Council. Mr. Morris said if there are any concerns to send them to Mr. Shinsel ahead of time for him to address during the engineering process. He explained a little of the intended interior design of the main city building. Council Member Loveland asked how large the new city shops are compared to what the city currently has. Mr. Shinsel said it is nearly double. The intent was to include interior storage for future equipment the city will most likely need. Mr. Shinsel further explained the interior intent of the building. The growth of the city will go from a small city to a mid-size city with all the new developments. His intent is to plan for that future growth. Council Member Jackson asked if the building will have a lift system. Mr. Shinsel said yes there will be a full drive on lift system and a crane system installed.

MOTION: Council Member Weiss motioned to approve the 750 West Public Works Building Concept Plan. Council Member Loveland seconded the motion. All Council Members voted aye. Motion passed.

6. **Public Comments -** ***(3 minute maximum)***

John Macedone asked for the city to relook at the illegal trucking company on 750 West. He said it has increased in double since he last brought this matter before Council.

Blaine Barrow rose and spoke on the concept plan for the new municipal center. He asked how many streets will be available for access to the parcel. Mr. Shinsel explained that it will border the south and north property lines surrounding the parcel. He said he heard about this project by the residents around the new development. He and those that brought this to his attention are concerned that they do not have a voice in the project. Mr. Barrows asked why the public buildings were on the frontage of 750 West. He also asked if there will be a fire station, about access to the highway and if there will be any access points. [All questions and concerns were addressed by Mr. Shinsel after the meeting due to time allotment being used.]

Diane Aguilar addressed the Harrisville City Park. She asked if the Harrisville City Park was disappearing with the current developments. She asked about the fish being placed in the pond. Mayor Tait explained the city does not have any control of when the fish are placed. Ms. Aguilar further expressed how much she loves the park and the pond at Harrisville Park.

7. **Mayor/Council Follow-up**

Council Member Weiss asked about the white board and if something can be done so he and Council Member Wilhelmsen can have a better view of the packet material. Discussion about options occurred ending with city staff looking into the matter. He also addressed the Ben Lomond project and expressed his displeasure with what he was seeing being done. Mr. Shinsel explained work is being done behind the scenes with engineering, demolitions, etc outside of the cleaning of the lot that is currently visible. Council Member Weiss also addressed the meeting promised to the city by BLD Investments showing the full concept to the city residents. Mr. Shinsel said he would address this personally with the developer. He further explained that the project is moving forward on the smaller matters like the demolitions and utility disconnects. Mr. Shinsel said that they are working on the engineering now with the developer's engineer.

Council Member Jackson also asked about Ben Lomond project. It is a concern that nothing is being done. Mr. Shinsel stated again, what is being completed right now is the behind the scenes matters.

Mayor Tait thanked Mr. Shinsel for all his work on the snow these past weeks. She also presented a thank you note from Liesa-Mari Rodriguez for helping her pass her lobbying class with 100% because of being one of the few that completed their project.

Council Member Wilhelmsen said he wanted to thank the city staff for not ignoring the complaints about the missed trash pickup this past week along his street and for making certain it was completed in a timely manner.

Assistant Chief Moore addressed the encryption on the radios has been put on hold.

8. **Adjourn 8:12**

MOTION: Council Member Jackson motioned for the meeting to adjourn at 8:12 p.m. Council Member Weiss seconded the motion. All Council Members voted aye. Motion passed.

Meeting adjourned at 8:12 p.m.

ATTEST:

_____
MICHELLE TAIT
Mayor

_____
JENNIE KNIGHT
City Recorder
Approved this 8th day of February, 2022

M E M O R A N D U M

JONES & ASSOCIATES CONSULTING ENGINEERS

TO:	Harrisville City Council
FROM:	Matthew L. Robertson, P.E. City Engineer
RE:	**COPPERWOODS MIXED-USE SUBDIVISION** **Final Plan Review**
Date:	February 3, 2022

Our office has completed a review of the final plat and improvement plans for the Copperwoods at Harrisville mixed-use subdivision located on Highway 89 between 2000 North and 2150 North. The development will include private drives and parking areas and no new city streets or rights-of-way are being proposed. Previous comments have been adequately addressed and we recommend final approval at this time with the following comments:

1. The Weber County Surveyor's office has completed a review of the plat and had a few comments for the surveyor to address. Revisions were made and the final plat has been submitted to the County for final approval. Final approval should be obtained before any construction begins.

2. An engineer's estimate for the cost of the public improvements has been submitted and will be reviewed by our office. This estimate needs to be approved before the pre-construction meeting and will be the basis for the developer's agreement and the associated construction guarantee.

3. Prior to construction, the Developer and the Contractor must hold a pre-construction meeting with City staff to review construction requirements.

Please let me know if you have any questions.

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STAFF REPORT

To:	Harrisville Mayor and City Council
From:	Jennie Knight, City Recorder
Date:	February 2, 2022
RE:	Final Approval of The Copperwoods Mixed-use Subdivision
Zone:	Mixed-Use Commercial
Total Project Area:	6.192 Acres
Phases:	1

The Copperwoods Mixed-Use Commercial Subdivision is located at approximately 1956 North Highway 89. This subdivision received preliminary approval from this body on January 11, 2022 and final approval from Planning Commission on January 12, 2022.

The final subdivision plat for the 66-unit development complies with Harrisville Ordinance 522; which includes the Master Development Agreement with regard to design and site standards and is consistent with the master plan and overall land use.

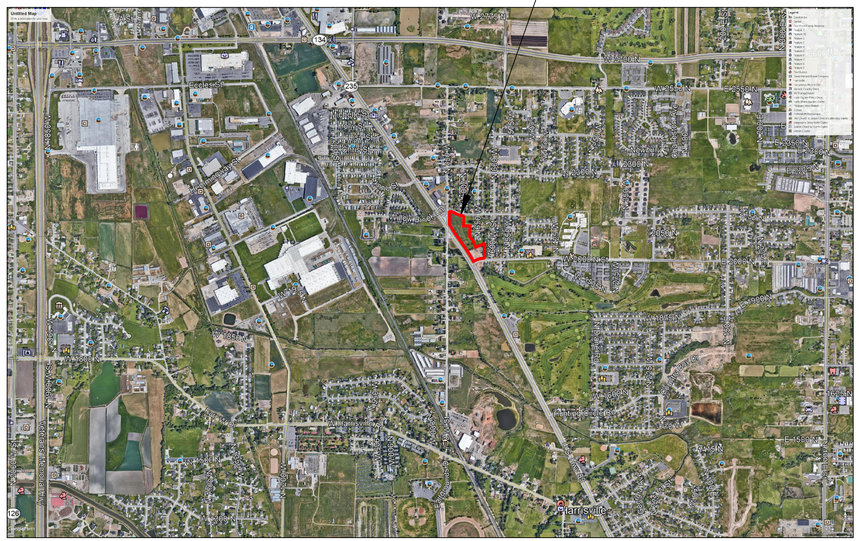
Recommendation: Staff recommends final approval subject to any comments from the City Engineer's Memo dated February 3, 2022 and all staff and agency comments.

THE COPPERWOODS AT HARRISVILLE

PART OF THE SE QUARTER OF SECTION 31
TOWNSHIP 7 NORTH RANGE 1 WEST
SALT LAKE BASE AND MERIDIAN
WEBER COUNTY
1956 NORTH HWY 89
HARRISVILLE, UTAH

INDEX SHEET

PROJECT


Harrisville
Pleasant View
Ogden
Riverdale
Roy
Washington Terrace
Farr West
Plain City
Uintah
Eastside
Harrisville Park
Harrisville Elementary School
Harrisville Junior High School
Harrisville Cemetery
Harrisville Fire Station
Harrisville Police Department
Harrisville Water Tank
Harrisville Water Tank
Harrisville Water Tank

THE COPPERWOODS AT HARRISVILLE

EXIST/ DEMO PLAN

0 20 40

SCALE: 1"= 40'

S02°30'00"W 294.28'

DRAIN ENTRY

SW CO

N58°33'57"E 198.00'

S21°26'03"E 152.00'

S38°34'27"E 94.91'

S02°30'00"W 213.03'

N15°58'29"E 124.73'

Existing stop sign/ comm boxes to be relocated

Existing well to be capped

Existing ditch to be piped

Existing 36" ADS stub with apron to be removed

Existing storm pond

Existing pond outlet box

Double inlet box w/ 36" RCP IE: 4306.70

S01°37'08"W 202.51' (202.48' B.R.)

S88°22'52"E 10.00'

Existing comm box to be removed

Existing storm line to be removed

N33°01'52"W 466.22'

N01°37'08"E 255.80' (225.27' B.R.)

C1

C5

C6

CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	422.38	5789.58	4°10'48"	N30°56'28"W	422.29
C2	130.75	221.84	33°46'14"	S71°29'35"E	128.87
C3	166.13	281.84	33°46'24"	S71°29'40"E	163.74
C4	192.76	379.97	29°03'59"	S77°14'21"W	190.70
C5	48.09	379.97	7°15'06"	S88°08'48"W	48.06
C6	144.67	379.97	21°48'53"	S73°36'49"W	143.80

LEGEND

- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING CABLE/PHONE
- EXISTING SEWER
- EXISTING WATER
- EXISTING STORM
- EXISTING IRRIGATION
- EXISTING MNR CONTOUR (1')
- EXISTING MJR CONTOUR (5')
- EXISTING ASPHALT
- EXISTING CONCRETE

REGISTERED PROFESSIONAL ENGINEER
NO. 368590
ADAM V. MACKELPRANG
1-21-2022
STATE OF UTAH

ALLIANCE CONSULTING ENGINEERS
150 EAST 200 NORTH SUITE P
LOGAN, UTAH 84321
(435)755-5121
allianceclogan@yahoo.com

No.	REVISIONS/ SUBMISSIONS	DATE

REVIEWED : DRAWN :
CAD FILE : PROJECT NO. :

PROJECT TITLE
THE COPPERWOODS AT HARRISVILLE
PART OF THE SE QUARTER OF SECTION 31
TOWNSHIP 7 NORTH, RANGE 1 WEST
SALT LAKE BASE AND MERIDIAN
WEBER COUNTY
1656 NORTH HWY 89
HARRISVILLE, UTAH

DRAWING TITLE
EXIST/DEMO PLAN

DATE : SEPT,2021

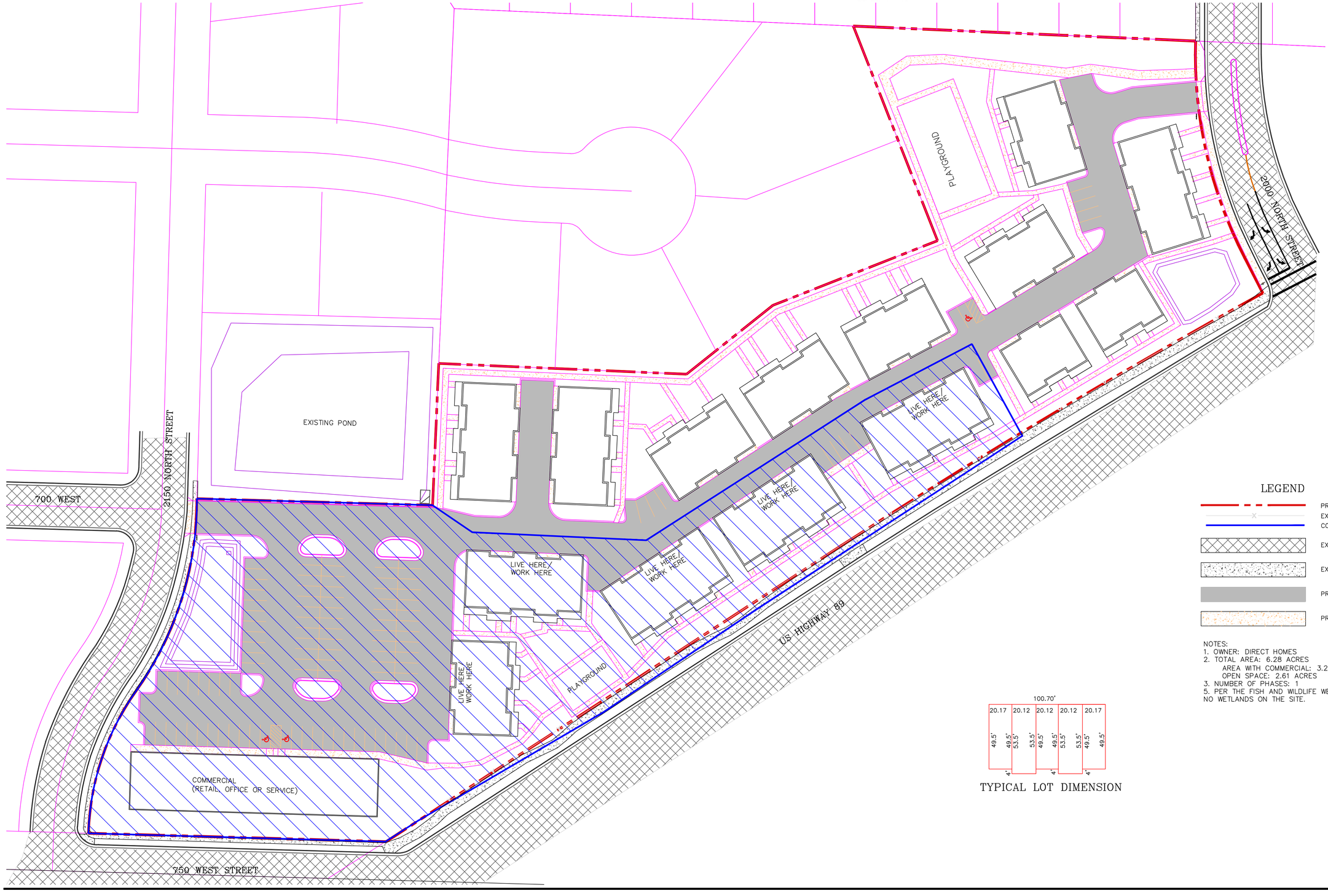
DRAWING No. 2

THE COPPERWOODS AT HARRISVILLE

SITE MASTERPLAN

0 20 40

SCALE: 1"=40'



LEGEND

- PROPERTY BOUNDARY
- EXISTING FENCE
- COMMERCIAL BOUNDARY
- EXISTING ASPHALT
- EXISTING CONCRETE
- PROPOSED ASPHALT
- PROPOSED CONCRETE

NOTES:
1. OWNER: DIRECT HOMES
2. TOTAL AREA: 6.28 ACRES
   AREA WITH COMMERCIAL: 3.22 ACRES (51.27%)
   OPEN SPACE: 2.61 ACRES
3. NUMBER OF PHASES: 1
5. PER THE FISH AND WILDLIFE WETLANDS MAPPER THERE ARE NO WETLANDS ON THE SITE.

TYPICAL LOT DIMENSION

REGISTERED PROFESSIONAL ENGINEER
NO.368590
ADAM V. MACKELPRANG
1-21-2022
STATE OF UTAH

ALLIANCE CONSULTING ENGINEERS
150 EAST 200 NORTH SUITE P
LOGAN, UTAH 84321
(435)755-5121
alliancelogan@yahoo.com

No.	REVISIONS/ SUBMISSIONS	DATE

REVIEWED :
CAD FILE :
DRAWN :
PROJECT NO. :

PROJECT TITLE: THE COPPERWOODS AT HARRISVILLE

DRAWING TITLE: SITE MASTERPLAN

DATE : SEPT,2021

DRAWING NO. 3

THE COPPERWOODS AT HARRISVILLE

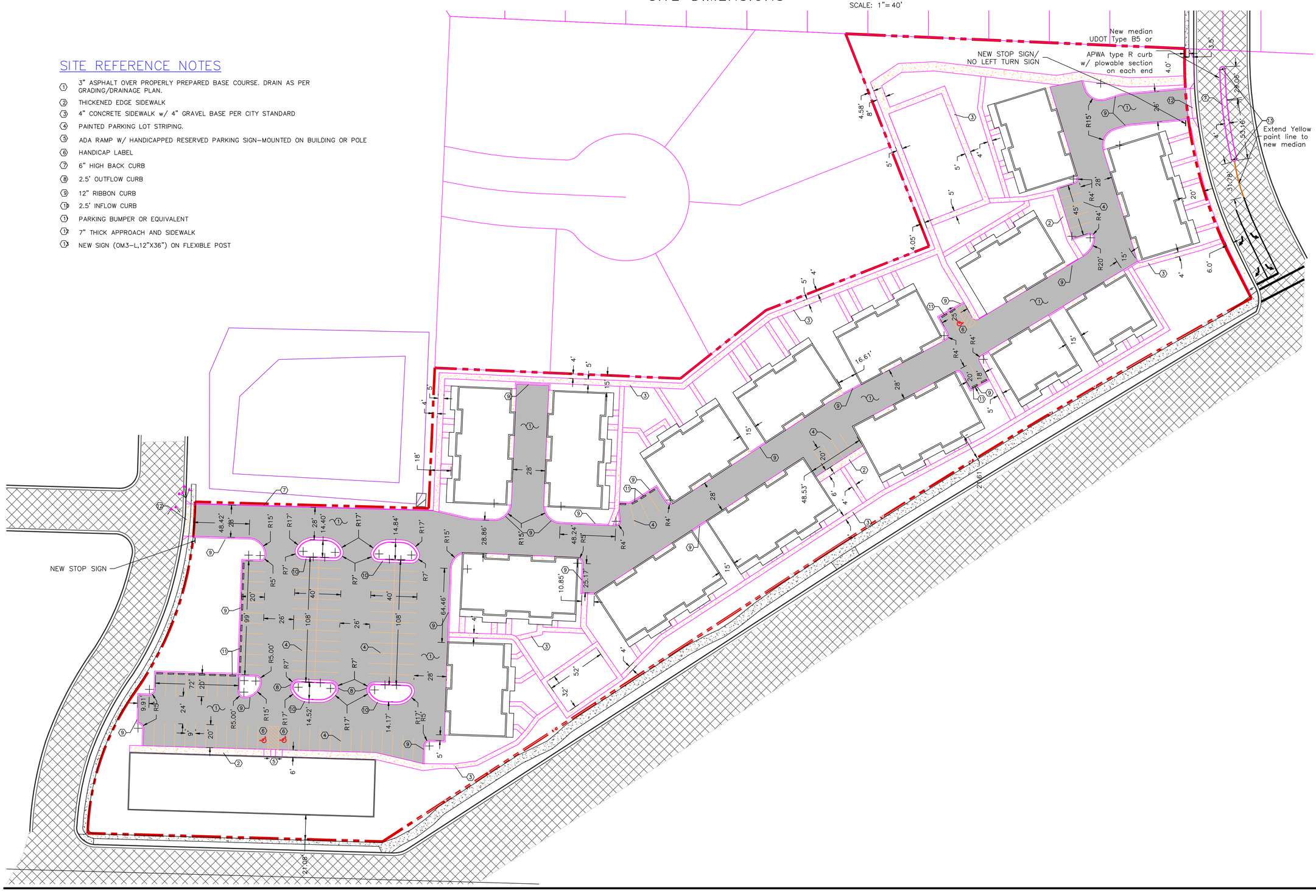
SITE DIMENSIONS

0 20 40

SCALE: 1"=40'

SITE REFERENCE NOTES

1. 3" ASPHALT OVER PROPERLY PREPARED BASE COURSE. DRAIN AS PER GRADING/DRAINAGE PLAN.
2. THICKENED EDGE SIDEWALK
3. 4" CONCRETE SIDEWALK w/ 4" GRAVEL BASE PER CITY STANDARD
4. PAINTED PARKING LOT STRIPING.
5. ADA RAMP W/ HANDICAPPED RESERVED PARKING SIGN-MOUNTED ON BUILDING OR POLE
6. HANDICAP LABEL
7. 6" HIGH BACK CURB
8. 2.5' OUTFLOW CURB
9. 12" RIBBON CURB
10. 2.5' INFLOW CURB
11. PARKING BUMPER OR EQUIVALENT
12. 7" THICK APPROACH AND SIDEWALK
13. NEW SIGN (OM3-L,12"X36") ON FLEXIBLE POST



REGISTERED PROFESSIONAL ENGINEER
NO.368590
ADAM V. MACKELPRANG
1-21-2022
STATE OF UTAH

ALLIANCE CONSULTING ENGINEERS
150 EAST 200 NORTH SUITE P
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(435)755-5121
alliancelogan@yahoo.com

No.	REVISIONS / SUBMISSIONS	DATE

REVIEWED :
DRAWN :
CAD FILE :
PROJECT NO. :

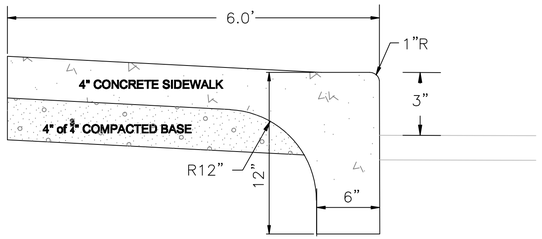
PROJECT TITLE
THE COPPERWOODS AT HARRISVILLE

DRAWING TITLE
SITE DIMENSIONS

DATE : SEPT,2021

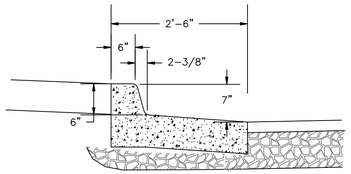
DRAWING NO
4

THE COPPERWOODS
AT HARRISVILLE
SITE DETAILS



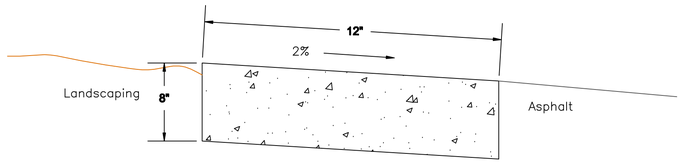
SIDEWALK WITH THICKENED EDGE

NOT TO SCALE



NOTES:
1. Contraction joints 10 feet on center to a depth of 1/4 the curb.
2. Expansion joints with premolded filler 150 feet on center.
3. Exposed concrete surface to have a light broom finish.

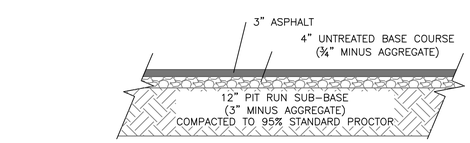
OUTFLOW CURB AND GUTTER DETAIL



12" RIBBON CURBING

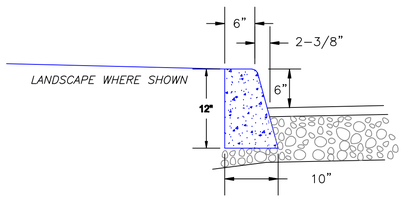
NOT TO SCALE

5' transition to standard TBC



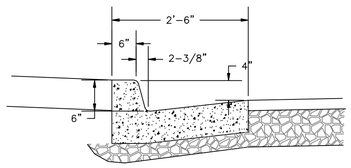
PARKING PAVEMENT SECTION

NOT TO SCALE



6" HIGH BACK CURB DETAIL

NOT TO SCALE



NOTES:
1. Contraction joints 10 feet on center to a depth of 1/4 the curb.
2. Expansion joints with premolded filler 150 feet on center.
3. Exposed concrete surface to have a light broom finish.

INFLOW CURB AND GUTTER DETAIL

REGISTERED PROFESSIONAL ENGINEER
NO.368990
ADAM V. MACKELPRANG
1-21-2022
STATE OF UTAH

ALLIANCE CONSULTING ENGINEERS
150 EAST 200 NORTH SUITE P
LOGAN, UTAH 84321
(435)755-5121
alliancelogan@yahoo.com

No.	REVISIONS/ SUBMISSIONS	DATE

REVIEWED :
CAD FILE :
DRAWN :
PROJECT NO. :

PROJECT TITLE
THE COPPERWOODS AT HARRISVILLE

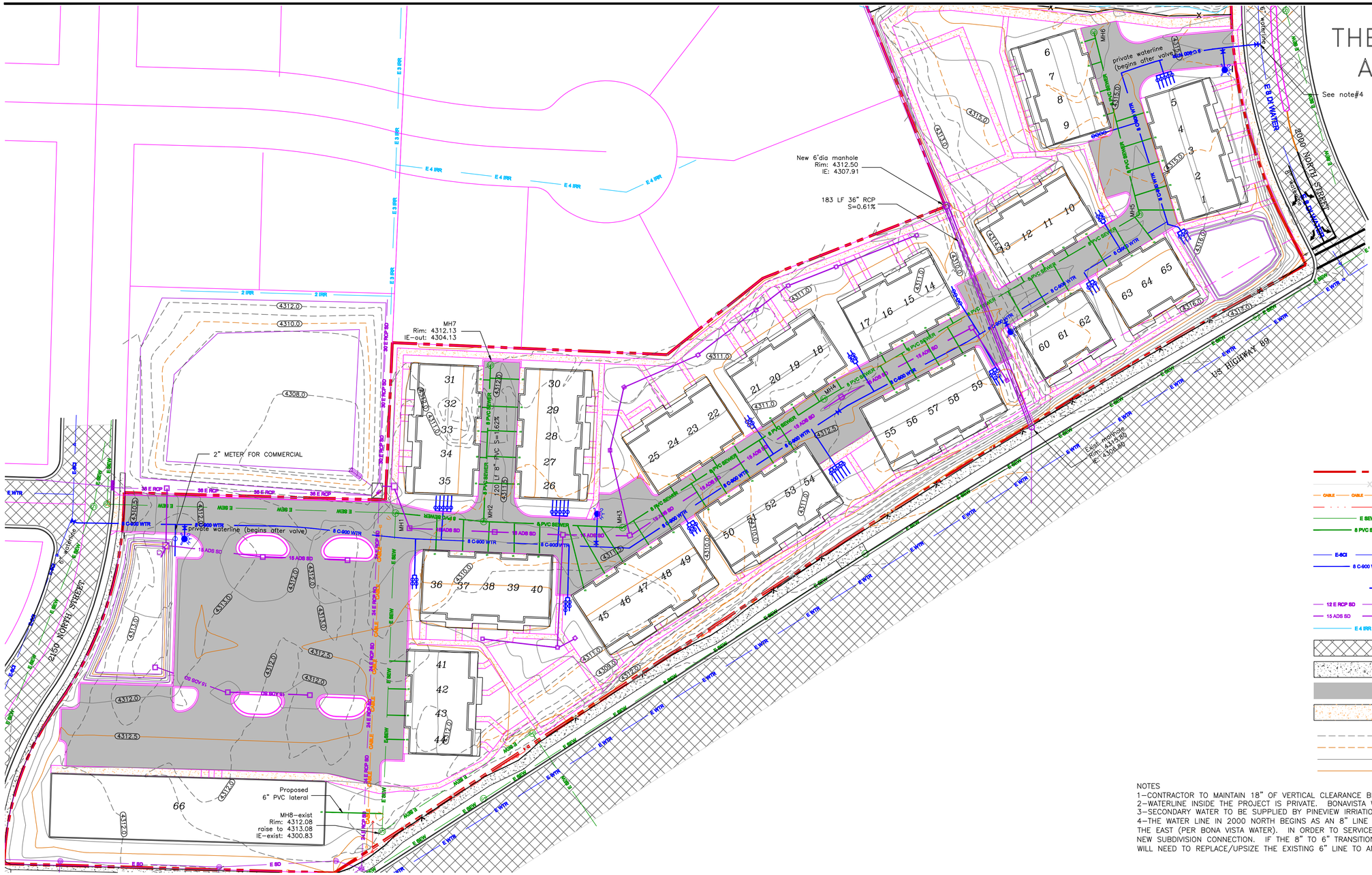
DRAWING TITLE
SITE DETAILS

DATE : SEPT,2021

DRAWING No. 5

THE COPPERWOODS AT HARRISVILLE

UTILITY PLAN

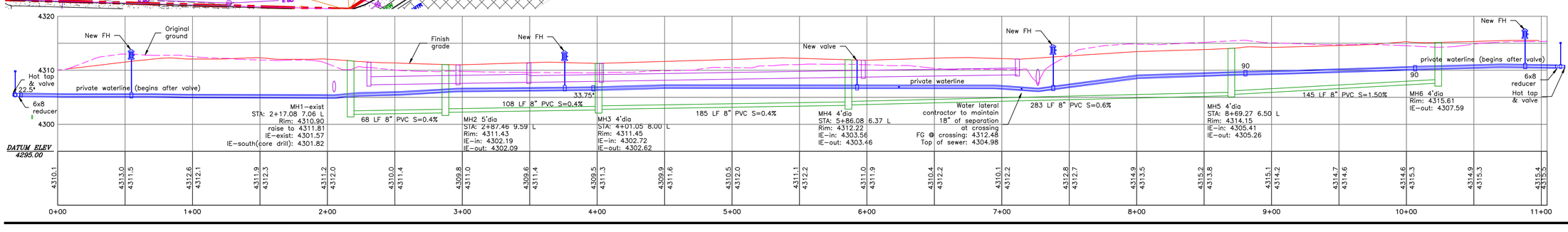


SCALE: 1"= 40'_HORIZONTAL
SCALE: 1"= 10'_VERTICAL

LEGEND

- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING CABLE/COMMUNICATION
- EXISTING POWER
- EXISTING SEWER LINE
- PROPOSED SEWER LINE
- PROPOSED 4" PVC SEWER SERVICE
- EXISTING WATER LINE
- PROPOSED WATER LINE
- PROPOSED 2" LATERAL WITH MANIFOLD TO INDIVIDUAL 3/4" METERS
- EXISTING STORM LINE
- PROPOSED STORM LINE
- EXISTING IRRIGATION AS NOTED
- EXISTING ASPHALT
- EXISTING CONCRETE
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- EXISTING MINOR CONTOUR (1.0')
- EXISTING MAJOR CONTOUR (5.0')
- PROPOSED MINOR CONTOUR (0.5')
- PROPOSED MAJOR CONTOUR (2.5')

NOTES
1-CONTRACTOR TO MAINTAIN 18" OF VERTICAL CLEARANCE BETWEEN SEWER AND WATER
2-WATERLINE INSIDE THE PROJECT IS PRIVATE. BONAVISTA WATER WILL ONLY MAINTAIN METERS.
3-SECONDARY WATER TO BE SUPPLIED BY PINEVIEW IRRIATION.
4-THE WATER LINE IN 2000 NORTH BEGINS AS AN 8" LINE IN HIGHWAY 89 AND TRANSITIONS TO A 6" SOMEWHERE TO THE EAST (PER BONA VISTA WATER). IN ORDER TO SERVICE THE SUBDIVISION THIS LINE MUST BE AN 8" UP TO THE NEW SUBDIVISION CONNECTION. IF THE 8" TO 6" TRANSITION IS BEFORE THE NEW CONNECTION, THE CONTRACTOR WILL NEED TO REPLACE/UPSIZE THE EXISTING 6" LINE TO AN 8" UP TO THE CONNECTION.



REGISTERED PROFESSIONAL ENGINEER
NO.368590
ADAM V. MACKELPRANG
1-21-2022
STATE OF UTAH

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No.	REVISIONS/ SUBMISSIONS	DATE

REVIEWED :
CAD FILE :
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PROJECT NO. :

PROJECT TITLE: THE COPPERWOODS AT HARRISVILLE

DRAWING TITLE: UTILITY PLAN

DATE : SEPT,2021

DRAWING No.

THE COPPERWOODS AT HARRISVILLE
DRAINAGE CALCULATIONS

SCALE: 1"=40'

COPPERWOODS AT HARRISVILLE										
AREA A										
Drainage Area to Pond:			1.36	acres						
Weighted 'C' value for Pond Drainage Area:			0.75							
Allowable Discharge Rate:			0.10	cfs/acre						
100-Year Return Period										
	Precip.*	Precip.				Accum.	Allowable	Accum.	Required	
Interval	Intensity	Depth	Area	C	CxAx3630	Inflow	Discharge	Discharge	Storage	
(min)	(in/hr)	(in)	(ac)	Value	(ft^3/in)	(ft3/min)	(ft^3/min)	(ft^3)	(ft^3)	(ac-ft)
5	6.86	0.57	1.36	0.75	3697.155	2114.7727	8.148	40.74	2074	0.05
10	5.23	0.87	1.36	0.75	3697.155	3220.222	8.148	81.48	3139	0.07
15	4.32	1.08	1.36	0.75	3697.155	3992.9274	8.148	122.22	3871	0.09
30	2.90	1.45	1.36	0.75	3697.155	5360.8748	8.148	244.44	5116	0.12
60	1.80	1.80	1.36	0.75	3697.155	6654.879	8.148	488.88	6166	0.14
120	1.00	2.00	1.36	0.75	3697.155	7394.31	8.148	977.76	6417	0.15
180	0.68	2.05	1.36	0.75	3697.155	7575.4706	8.148	1466.64	6109	0.14
360	0.38	2.27	1.36	0.75	3697.155	8385.1475	8.148	2933.28	5452	0.13
720	0.23	2.81	1.36	0.75	3697.155	10381.611	8.148	5866.56	4515	0.10
1440	0.13	3.12	1.36	0.75	3697.155	11535.124	8.148	11733.12	0	0.00

COPPERWOODS AT HARRISVILLE										
AREA B										
Drainage Area to Pond:			3.96	acres						
Weighted 'C' value for Pond Drainage Area:			0.57							
Allowable Discharge Rate:			0.10	cfs/acre						
100-Year Return Period										
	Precip.*	Precip.				Accum.	Allowable	Accum.	Required	
Interval	Intensity	Depth	Area	C	CxAx3630	Inflow	Discharge	Discharge	Storage	
(min)	(in/hr)	(in)	(ac)	Value	(ft^3/in)	(ft3/min)	(ft^3/min)	(ft^3)	(ft^3)	(ac-ft)
5	6.86	0.57	3.96	0.57	8193.636	4686.7598	23.76	118.8	4568	0.10
10	5.23	0.87	3.96	0.57	8193.636	7136.657	23.76	237.6	6899	0.16
15	4.32	1.08	3.96	0.57	8193.636	8849.1269	23.76	356.4	8493	0.19
30	2.90	1.45	3.96	0.57	8193.636	11880.772	23.76	712.8	11168	0.26
60	1.80	1.80	3.96	0.57	8193.636	14748.545	23.76	1425.6	13323	0.31
120	1.00	2.00	3.96	0.57	8193.636	16387.272	23.76	2851.2	13536	0.31
180	0.68	2.05	3.96	0.57	8193.636	16788.76	23.76	4276.8	12512	0.29
360	0.38	2.27	3.96	0.57	8193.636	18583.166	23.76	8553.6	10030	0.23
720	0.23	2.81	3.96	0.57	8193.636	23007.73	23.76	17107.2	5901	0.14
1440	0.13	3.12	3.96	0.57	8193.636	25564.144	23.76	34214.4	0	0.00

AREA C										
Drainage Area to Pond:			0.28	acres						
Weighted 'C' value for Pond Drainage Area:			0.38							
Allowable Discharge Rate:			0.00	cfs/acre						
100-Year Return Period										
	Precip.*	Precip.				Accum.	Allowable	Accum.	Required	
Interval	Intensity	Depth	Area	C	CxAx3630	Inflow	Discharge	Discharge	Storage	
(min)	(in/hr)	(in)	(ac)	Value	(ft^3/in)	(ft3/min)	(ft^3/min)	(ft^3)	(ft^3)	(ac-ft)
5	6.86	0.57	0.28	0.38	386.232	220.9247	0	0	221	0.01
10	5.23	0.87	0.28	0.38	386.232	336.40807	0	0	336	0.01
15	4.32	1.08	0.28	0.38	386.232	417.13056	0	0	417	0.01
30	2.90	1.45	0.28	0.38	386.232	560.0364	0	0	560	0.01
60	1.80	1.80	0.28	0.38	386.232	695.2176	0	0	695	0.02
120	1.00	2.00	0.28	0.38	386.232	772.464	0	0	772	0.02
180	0.68	2.05	0.28	0.38	386.232	791.38937	0	0	791	0.02
360	0.38	2.27	0.28	0.38	386.232	875.97418	0	0	876	0.02
720	0.23	2.81	0.28	0.38	386.232	1084.5395	0	0	1085	0.02
1440	0.13	3.12	0.28	0.38	386.232	1205.0438	0	0	1205	0.03

REGISTERED PROFESSIONAL ENGINEER
NO.366590
ADAM V. MACKELPRANG
1-21-2022
STATE OF UTAH

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No.	REVISIONS/ SUBMISSIONS	DATE

REVIEWED :
CAD FILE :
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PROJECT NO. :

PROJECT TITLE: THE COPPERWOODS AT HARRISVILLE

DRAWING TITLE: DRAINAGE CALCULATION

DATE : SEPT,2021

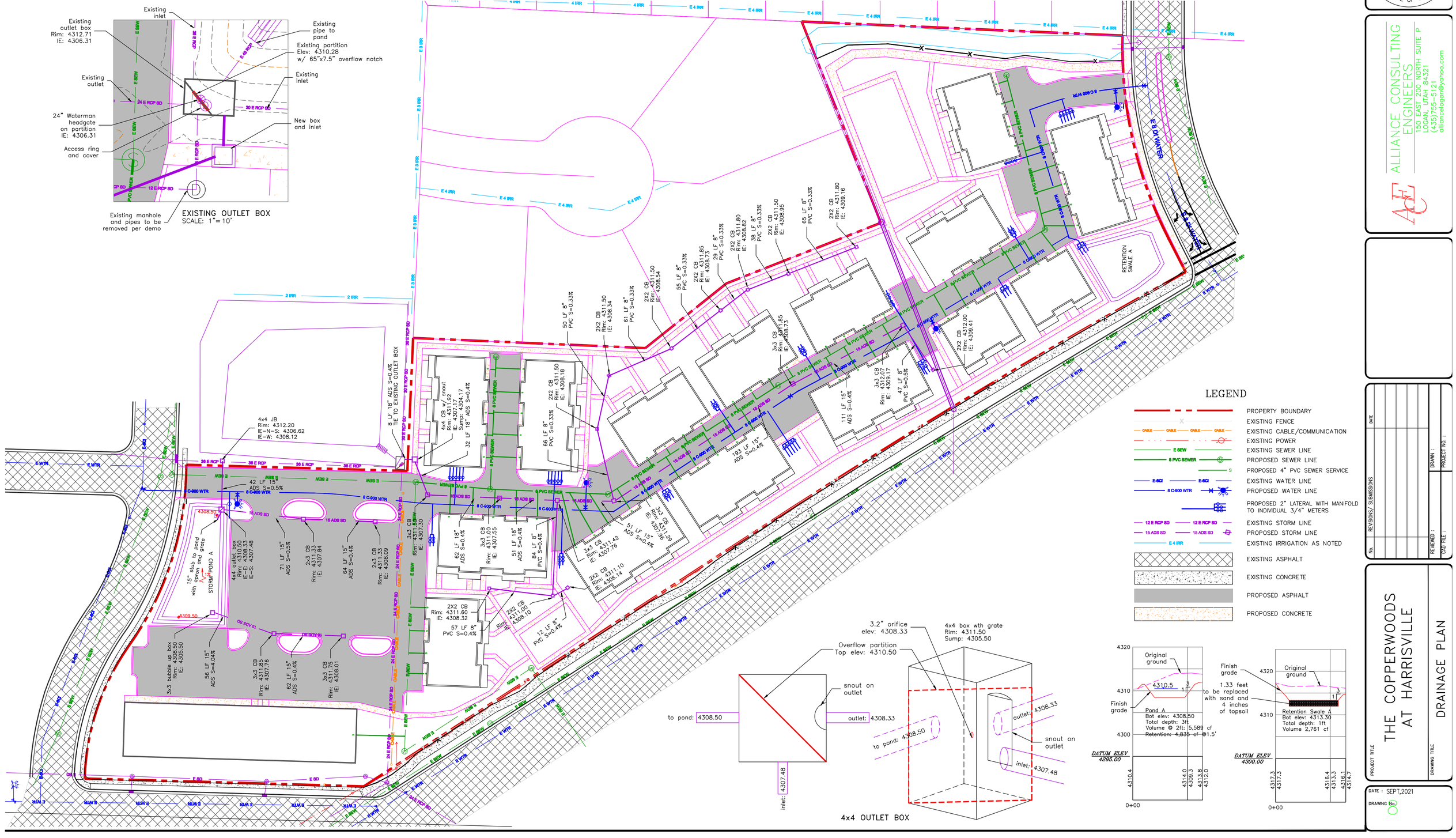
DRAWING No:

THE COPPERWOODS AT HARRISVILLE

DRAINAGE PLAN

SCALE: 1"=40'

EXISTING OUTLET BOX
SCALE: 1"=10'



4x4 OUTLET BOX

LEGEND

- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING CABLE/COMMUNICATION
- EXISTING POWER
- EXISTING SEWER LINE
- PROPOSED SEWER LINE
- PROPOSED 4" PVC SEWER SERVICE
- EXISTING WATER LINE
- PROPOSED WATER LINE
- PROPOSED 2" LATERAL WITH MANIFOLD TO INDIVIDUAL 3/4" METERS
- EXISTING STORM LINE
- PROPOSED STORM LINE
- EXISTING IRRIGATION AS NOTED
- EXISTING ASPHALT
- EXISTING CONCRETE
- PROPOSED ASPHALT
- PROPOSED CONCRETE

REGISTERED PROFESSIONAL ENGINEER
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ADAM V. MACKELPRANG
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No.	REVISIONS / SUBMISSIONS	DATE

DRAWN :
PROJECT NO. :
REVIEWED :
CAD FILE :

PROJECT TITLE: THE COPPERWOODS AT HARRISVILLE

DRAWING TITLE: DRAINAGE PLAN

DATE : SEPT,2021

DRAWING No. C

THE COPPERWOODS AT HARRISVILLE

GRADING PLAN

0 20 40

SCALE: 1"= 40'_HORIZONTAL

REGISTERED PROFESSIONAL ENGINEER
NO.366590
ADAM V. MACKELPRANG
1-21-2022
STATE OF UTAH

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No.	REVISIONS/ SUBMISSIONS	DATE

REVIEWED :
DRAWN :
CAD FILE :
PROJECT NO. :

PROJECT TITLE: THE COPPERWOODS AT HARRISVILLE

DRAWING TITLE: GRADING PLAN

DATE : SEPT,2021

DRAWING No. 3

THE COPPERWOODS AT HARRISVILLE

0 20 40
SCALE: 1"= 40'

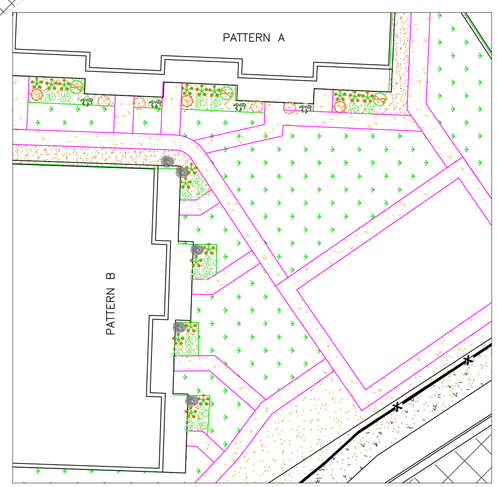
New 6' removable white vinyl privacy fence along ditch

8' wide 8" thick concrete

New 3.5' perforated fence along street

PATTERN A

PATTERN B



TYPICAL BUILDING SHRUBS
SCALE: 1"= 20'

LEGEND

- TRI COLOR BEECH TREE (8)
- MIMOSA TREE (12)
- NORTHERN RED OAK (5)
- JAPANESE MAPLE (8)
- TULIP TREE (5)
- CHITALPA (7)
- AMUR MAPLE (6)
- JAPANESE TREE LILAC (8)
- DIANA JAPANESE LARCH (5)
- JADE BUTTERFLY MAIDENHAIR TREE (15)
- FEATHER REED GRASS 'EL DORADO'
- LARGE BLUE FESCUE
- DAYLILY 'ADVANCED PARTY'
- DAYLILY 'GOING BANANAS'
- HOLLYHOCKS ALCEA ROSEA 'HALO BLUSH'
- BURNING BUSH
- HYDRANGEA 'OAK LEAF'
- COREOPSIS GRANDIFLORA 'YELLOW'
- BUTTERFLY WEED 'ORANGE'
- BALLOON FLOWER 'BLUE'
- NEW GRASS (64,446 sf)
- NEW BARK/GRAVEL W/ WEED BARRIER

REGISTERED PROFESSIONAL ENGINEER
NO.368590
ADAM V. MACKELPRANG
1-21-2022
STATE OF UTAH

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alliancelogan@yahoo.com

No.	REVISIONS/ SUBMISSIONS	DATE

DRAWN :
PROJECT NO. :
REVIEWED :
CAD FILE :

PROJECT TITLE: THE COPPERWOODS AT HARRISVILLE

DRAWING TITLE: LANDSCAPE PLAN

DATE : SEPT,2021

DRAWING No. 10

HARRISVILLE CITY
ORDINANCE 530

BEN LOMOND PROPERTIES ZONING MAP AMENDMENT

AN ORDINANCE OF HARRISVILLE CITY, UTAH, AMENDING THE OFFICIAL ZONING MAP FOR CERTAIN PARCELS LOCATED AT APPROXIMATELY 1801 NORTH HIGHWAY 89 BASED UPON AN APPLICATION FILED WITH THE CITY; SEVERABILITY; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, Harrisville City is a municipal corporation, duly organized and existing under the laws of the State of Utah;

WHEREAS, *Utah Code Annotated* §10-8-84 and §10-8-60 allow municipalities in the State of Utah to exercise certain police powers and nuisance abatement powers, including but not limited to providing for safety and preservation of health, promotion of prosperity, improve community well-being, peace and good order for the inhabitants of the City;

WHEREAS, Title 10, Chapter 9a of the *Utah Code Annotated* enables municipalities to regulate land use and development;

WHEREAS, the City has adopted an Official General Plan and Zoning Map to govern land use within the City;

WHEREAS, the City received an Application to amend the Official Zoning Map of Harrisville City filed by the putative property owner, Ben Lomond Properties, LLC, and desires to act upon the same;

WHEREAS, the attached Exhibit "A" contains the required Concept Plan for the area of the proposed amendment to the Zoning Map;

WHEREAS, after publication of the required notice the Planning Commission held its public hearing on January 12, 2022, to take public comment on this proposed Ordinance, and gave its recommendation to _____ this Ordinance;

WHEREAS, the City Council received the recommendation from the Planning Commission and held its public meeting on _____, to act upon this Ordinance;

NOW, THEREFORE, be it ordained by the City Council of Harrisville as follows:

Section 1: **Zoning Map Amendment.** That the Zoning Map for certain real property identified as Weber County Parcel Number 11-019-0007 as set forth in the attached Exhibit "A" which is hereby adopted and incorporated herein by this reference, is hereby changed from A-1 (Agriculture) Zone to the CP-2 (Commercial) Zone.

DRAFT

Section 2: **Concept Plan and Reversion.** The Concept Plan attached in Exhibit "A" which is hereby adopted and incorporated herein by this reference is adopted as the required Concept Plan for this Zoning Map Amendment. Any development must substantially conform to this Concept Plan. In the event that any development fails to substantially conform to the Concept Plan, or in the event that the final plat is not recorded with Weber County within eighteen (18) months of the effective date of this Ordinance, then the property is automatically reverted to its prior zoning of A-1 Agriculture.

Section 3: **Severability.** If a court of competent jurisdiction determines that any part of this ordinance is unconstitutional or invalid, then such portion of the ordinance, or specific application of the ordinance, shall be severed from the remainder, which shall continue in full force and effect.

Section 4: **Effective date.** This Ordinance shall be effective immediately upon posting after final passage, approval, and posting.

PASSED AND ADOPTED by the City Council on this _____ day of _____, 2022.

_____
MICHELLE TAIT, Mayor
Harrisville City

ATTEST:

_____
JENNIE KNIGHT, City Recorder

Roll Call Vote Tally:

Council Member Wilhelmsen	Yes	No
Council Member Weiss	Yes	No
Council Member Christensen	Yes	No
Council Member Jackson	Yes	No
Council Member Loveland	Yes	No

RECORDED this _____ day of _____, 2022.
PUBLISHED OR POSTED this _____ day of _____, 2022.

CERTIFICATE OF PASSAGE AND PUBLICATION OR POSTING

According to the provision of U.C.A. §10-3-713, 1953 as amended, I, the municipal recorder of Harrisville City, hereby certify that foregoing ordinance was duly passed and published, or posted at 1) City Hall 2) Harrisville Cabin and 3) 2150 North on the above referenced dates.

_____ DATE:_____
City Recorder

DRAFT

BEN LOMOND COMMERCIAL

JANUARY 1, 2022

M E M O R A N D U M

TO: Harrisville City Mayor and Council

FROM: Jennie Knight, City Recorder

RE: Ordinance 530; Ben Lomond Properties Zoning Map Amendment

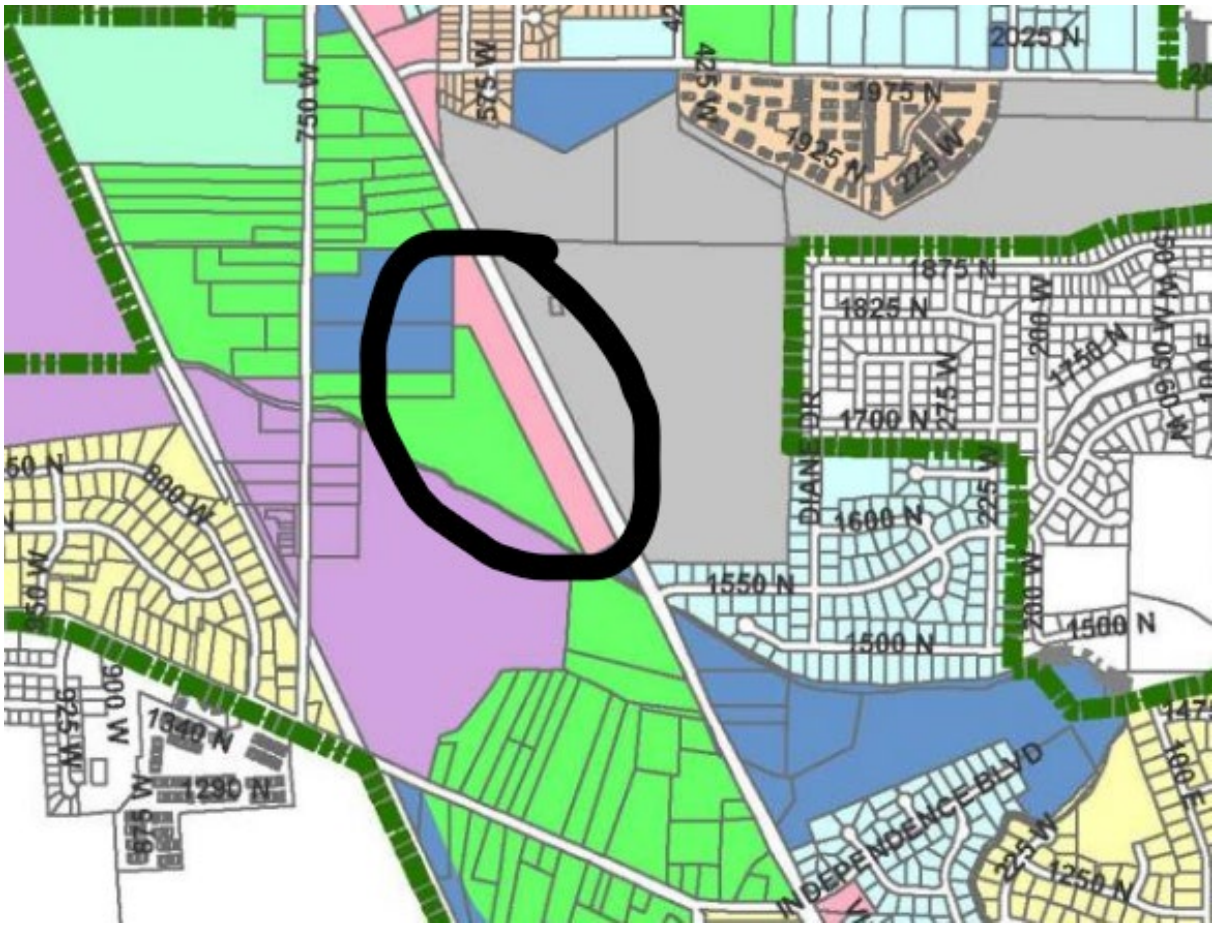
DATE: February 3, 2022

The proposed Ordinance with accompanying exhibits, comes with a positive recommendation from the Planning Commission at their January 12, 2022 meeting with no conditions.

Background: BLD Commercial Investments, LLC, submitted an application on December 23, 2021 to rezone approximately 8.67 acres located at approximately 1801 Noth Highway 89 (Parcel: 11-019-0007) from A-1 (Agricultural) to CP-2 (Commercial). A public hearing was held on January 12, 2022 to receive public comments.

Findings: The complete application, including the concept plan (Exhibit "A"), complies with:

- HCMC §11.06.040 Concept Development Plan which includes:
  1. *General land use types.*
  2. *Approximate locations and arrangements of:*
     a. *Buildings.*
     b. *Structures and facilities.*
     c. *Open space.*
     d. *Parking, access, and traffic patterns.*
     e. *Infrastructure.*
- HCMC §11.12.010 Purpose and Intent of the CP-2 zone which states: *"The location of the zone should be along selected locations adjacent to the arterial streets which run through Harrisville in order to provide good access with limited disturbance to the residential areas of the community."*
- The proposed concept plan is consistent with the 2019 Future Land Use Map



Staff Recommendation: Staff recommends adoption of Harrisville Ordinance 530; Ben Lomond Properties Zoning Map Amendment based on the following findings: the concept plan complies with Harrisville Municipal Code and the Purpose and Intent of the CP-2 zone and the zoning change is consistent with the Harrisville 2019 Future Land Use Map.

Applicant/Property Owner Information

Date / Time
12/23/2021
Applicant's Name
BLD Commercial Investment, LLC - Dpuglas E. Palermo, Manager
Applicant's Address
51 W. Center ST. #644, Orem, Utah 84057
Applicant's Phone Number
(917) 863-5161
Applicant's Email Address
depnorfolk@gmail.com
Property Owner's Name
Ben Lomond Properties, LLC
Property Owner's Mailing Address
c/o Don Scott, 3147 N. Hwy 89, Pleasant View, Utah 84404
Property Owner's Phone Number
(801) 510-3444
Type of Rezone
Changing the current zoning map
Have any Conditional Use Permits been granted for this property?
No

Zoning Information

Street address or location of property for which a change in zoning is requested
US 89 West of Ben Lomond Views development
Parcel # of property
11-019-0007
Current Zoning of Property
A-1
Proposed Zoning of Property
CP-2
Current Zoning on General Plan
CP-2
Proposed Zoning on General Plan
CP-2

Reason for Rezone

Give the reason for requesting a rezone.
According to the current Zoning Map, the property is in an A-1 Zone. The request to rezone to CP-2 is to accommodate the development of shops and other commercial buildings and is consistent with the City's Future Zoning plan.

Explain how the proposed amendment is in harmony with the City General Plan Land Use Map, including what conditions exist in the general area to warrant such a change. How is the change in the public interest as well as the applicant's desire?
The City's general plan land use map currently labels the subject property as "CP-2." It is applicant's understanding that the City plans to develop a new City governmental complex to the west of the subject parcel. Development of this area abutting US 89 for small shops and similar improvements will complement the City's plans for the area.

As part of the rezone application process, you'll need to upload a concept site plan that is consistent with the zone you are applying for. Please upload a .pdf version of your concept plan below:
See attached: CONCEPT PLAN 021021.pdf

Signature

This petition must be signed by the property owner of record or the petitioner must furnish an affidavit from the owner giving authorization to appear before any city administrative or legislative body to act on behalf of the owner in matters pertaining to this petition.

M E M O R A N D U M

TO: Harrisville City Mayor and Council

FROM: Jennie Knight, City Recorder

RE: Resolution 22-03; Sanitary Sewer Capital Facilities Plan

DATE: February 3, 2022

Staff is proposing to adopt the January 2022 Sanitary Sewer Capital Facilities Plan to mitigate the costs of sanitary sewer services throughout the city. The proposed Resolution with accompanying exhibit complies with Title 11, Chapter 36a of the Utah Code Annotated which authorizes cities to prepare an Impact Fee Facilities Plan.

- On October 14, 2020, public notice was given of the intent to prepare an impact fee facilities plan.
- Jones & Associates was retained to prepare the Sanitary Sewer Capital Facilities Plan (Exhibit "A").
- On January 26, 2022, public notice was given that a public hearing will be held on February 8, 2022 at 7:00 pm to receive public comments.

HARRISVILLE CITY
RESOLUTION 22-03

SANITARY SEWER CAPITAL FACILITIES PLAN

A RESOLUTION OF HARRISVILLE CITY, UTAH, ADOPTING THE SEWER CAPTIAL FACILITIES PLAN.

WHEREAS, Harrisville City (hereafter "City") is a municipal corporation duly organized and existing under the laws of the State of Utah;

WHEREAS, the City Council is the legislative body of the City;

WHEREAS, Title 11, Chapter 36a of the Utah Code Annotated authorized municipalities in the State of Utah to prepare an Impact Fee Facilities Plan;

WHEREAS, the City has retained Jones & Associates prepare the Sanitary Sewer Capital Facilities Plan;

NOW, THEREFORE, BE IT RESOLVED by the City Council of Harrisville City, Utah, as follows:

Section 1. Review and Adoption.
The City Council has reviewed and hereby adopts the Harrisville City Sanitary Sewer Capital Facilities Plan dated January 2022, attached hereto as Exhibit "A" and incorporated herein by this reference.

Section 2. Effective Date
This Resolution is effective immediately upon passage and approval.

PASSED AND APPROVED by the Harrisville City Council this 8th day of February, 2022.

_____
MICHELLE TAIT, Mayor
Harrisville City

ATTEST:

_____
JENNIE KNIGHT, City Recorder

Municipal Council
Roll Call Vote Tally:

	Yes	No
Mr. Wilhelmsen	___	___
Mr. Weiss	___	___
Mr. Christensen	___	___
Mr. Jackson	___	___
Mr. Loveland	___	___

DRAFT

Harrisville City Corporation

Sanitary Sewer Capital Facilities Plan and Impact Fee Facilities Plan

January 2022

Prepared by
JONES & ASSOCIATES
Consulting Engineers

SANITARY SEWER
CAPITAL FACILITIES PLAN
AND
IMPACT FEE FACILITIES PLAN

for

HARRISVILLE CITY

January 2022

Prepared by

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LIST OF ACRONYMS

CFP	Capital Facilities Plan
CWSID	Central Weber Sewer Improvement District
DWQ	Division of Water Quality
d/D	(flow) depth to (pipe) Diameter ratio
ERU	Equivalent Residential Unit
GIS	Geographic Information System
gpcpd	gallons per capita per day
gpd	gallons per day
gpm	gallons per minute
IFA	Impact Fee Analysis
IFFP	Impact Fee Facilities Plan
lf	linear foot or linear feet
SSA	(Autodesk®) Storm and Sanitary Analysis
UAC	Utah Administrative Code
UDEQ	Utah Department of Environmental Quality

1.0 EXECUTIVE SUMMARY

A sewer capital facilities plan begins with an analysis that identifies projects needed for adequate service under current conditions. The plan also considers future growth and identifies projects needed to allow the system to expand properly. This report only considers projects related to sewer collection which is provided by Harrisville City. Sewer treatment and outfall is provided by Central Weber and is not part of this report.

The general design standards used for the analysis of Harrisville City's sewer collection system can be found under Title 317 (Water Quality) of the State of Utah Office of Administrative Rules. Harrisville City's sanitary sewer collection system was analyzed to check for compliance with these State sizing regulations. For the assessment we have checked the existing system for deficiencies and identified projects needed to accommodate future growth.

Current Conditions Analysis: The analysis of the existing system shows several areas of undersized collection piping per the State's design standards. This does not mean that the system frequently backs up or experiences severe problems. The State's sizing standards usually include safety factors and allowances for higher-than-normal flows. The existing collection piping appears to be adequate based on actual field operating conditions. However, for the purposes of meeting current design standards these lines have been identified as deficiencies in this plan.

Excess Capacity Analysis: Some of the existing collection main lines are already large enough to handle much of the expected growth on the system. These oversized lines were analyzed to determine how much growth they can handle without the need to be replaced with larger pipes. The city currently has many oversized sewer main lines.

System Growth and Expansion Analysis: The analysis of the city's sewer collection system with expected growth reveals areas where sewer collection main lines will need to be larger than existing or minimum standards in order to function properly. The analysis indicates where larger sewer collection lines will be needed for growth to continue as expected.

Recommended sewer construction projects have been identified based on the results of the foregoing assessments. Cost estimates for each project can be found in Appendix A. Table 1.1 below contains a summary of the project costs.

Table 1.1 – Projects Cost Summary

	Cost Breakdown		
Estimated Total Cost	Existing Deficiency	Future Development	Other
$7,386,890	$282,343	$2,296,227	$4,808,320

There is a high groundwater table in Harrisville City. Many sewer collection lines and manholes are below the water table. When this occurs groundwater can find its way into the sewer collection system.

Storm water runoff can also find its way into the sanitary sewer collections system. While some of this is expected to happen, these additional flows are not desirable. They are often referred to as Inflow and Infiltration or I & I. A study of storm water runoff and groundwater impacts on the sewer system has not been performed and is not a part of this study. However, it would be wise to complete an Inflow and Infiltration study. For this report it seems reasonable to rely upon the safety factors built into the State's Administrative Rules for sewer collection design.

Sections 1-8 of this report contain the sewer Capital Facilities Plan (CFP). These sections identify project needed for long term growth. Section 9 of this report contains the sewer Impact Fee Facilities Plan (IFFP). It focuses only on those projects that may be needed in the short term - six to ten years. The impact fee facilities plan will also break down and analyze the cost attributable to growth so that a fair and reasonable impact fee can be calculated by a financial consultant as explained under Title 11 Chapter 36a of the Utah Code.

2.0 INTRODUCTION

2.1 Background

A Capital Facilities Plan (CFP) identifies infrastructure projects needed for long term service – 40 years or even more – and may include system enhancements, replacement facilities, and maintenance projects. An Impact Fee Facilities Plan (IFFP) will only focus on projects needed in the short term – 6 to10 years – that are directly attributable to the impact caused by impending growth. The Utah Code 11-36a, Impact Fees Act, requires jurisdictions, which desire to charge impact fees, to adopt an IFFP. The IFFP must serve as a basis for justification of any impact fees currently in place or to be imposed in the future. Therefore, Harrisville City requested that Jones and Associates Consulting Engineers develop a CFP and IFFP for the City's sanitary sewer collection system. The project costs included in the IFFP along with other qualifying expenses will be used to perform an Impact Fee Analysis (IFA). The IFFP will be completed jointly by Jones and Associates and the public works department. Following the identification of qualified projects an Impact Fee Analysis will be completed by a certified financial consultant. The IFFP and IFA will be completed as a separate document.

2.2 System Overview

Harrisville City is in northern Weber County in the valley below the Wasatch Mountain Range. To the east is North Ogden City. To the west is Farr West City. Ogden City is located on the South. And Pleasant View is located to the north. Harrisville City is generally a residential area with some commercial and retail uses along Highway 89 and along Washington Boulevard. Harrisville City has an estimated population of 6,510.

The sanitary sewer system generally flows from the northeast to the southwest via collection lines and larger interceptor or trunk lines. All the City's wastewater eventually flows into Central Weber Sewer Improvement District's (CWSID) trunk lines. There are four CWSID trunk lines. One on the north side of the city that is in 2550 North along the border with Pleasant View City. Another is located centrally which runs down Independence Boulevard and then down North Harrisville Road and Chugg Lane. Another runs along the southwest city boundary line at North Street along the border with Ogden City. The last one runs along the western line of the city at 1200 West and the border with Farr West City. There are no sewer lift stations on the system. A schematic of the sewer system can be found in Exhibit 2.1.

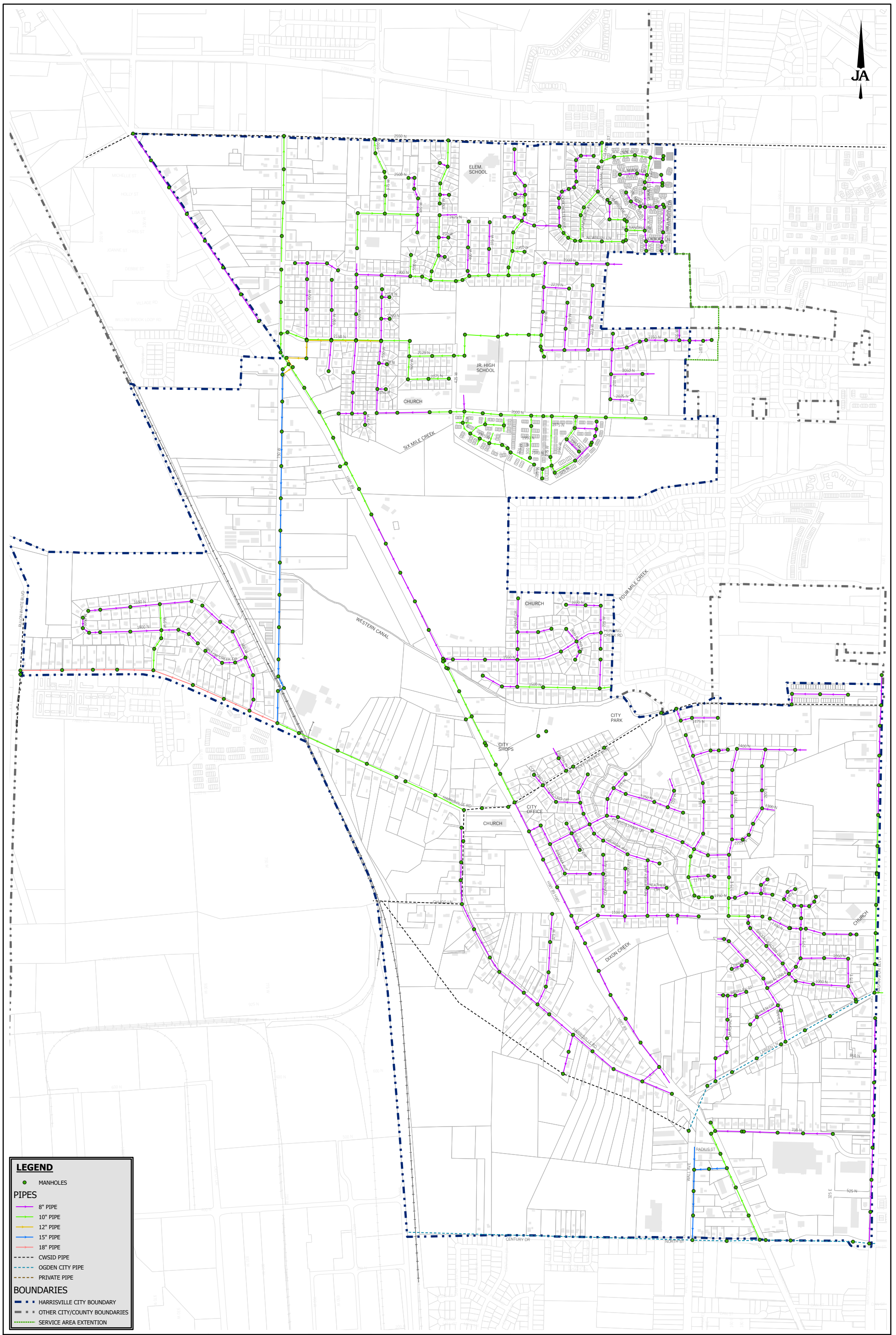
The following table is a summary of the sewer system's components and ownership:

Table 2.1 – Sanitary Sewer Collection System Summary

Component	Size	Quantity (miles)[1]
Pipe	8-inch	16.4
Pipe	10-inch	7.4
Pipe	12-inch	0.3
Pipe	15-inch	1.1
Pipe	18-inch	0.6
Manhole	4-ft & 5-ft diameter	497

[1]Includes Golf Crest which was previously privately owned

The City's wastewater is treated at the Central Weber Sewer Improvement District wastewater treatment plant. CWSID charges a monthly fee to the communities whose wastewater is treated at their facility. CWSID also charges a sanitary sewer impact fee which is separate from the impact fee charged by the City. **Information regarding CWSID's impact fee is not included in this report.**



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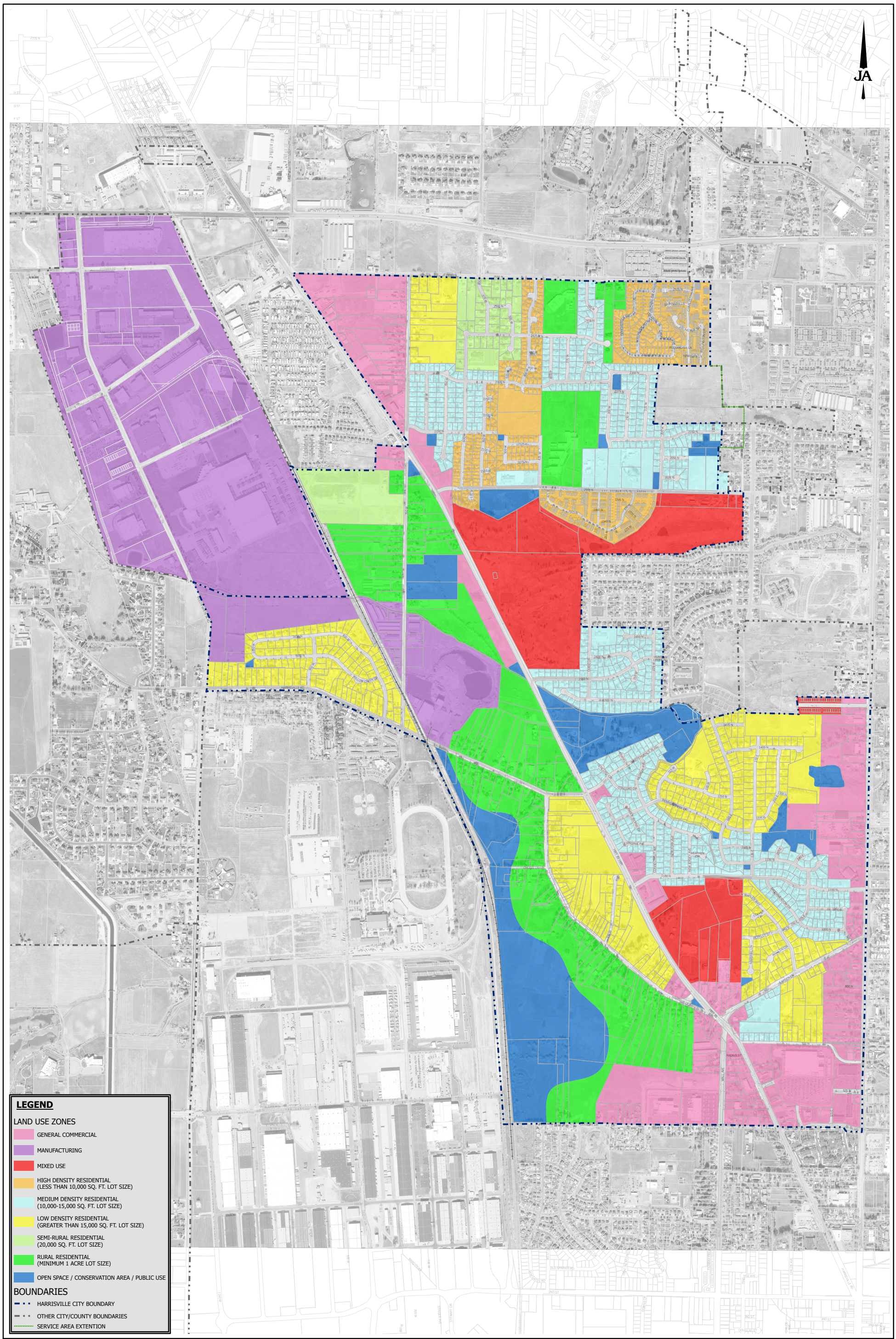
Harrisville City Corporation
Sanitary Sewer Capital Facilities Plan
Sewer System

EXHIBIT: 2.1

2.3 Service Area and Land Use

The City provides sanitary sewer collection service within the current city boundaries and will eventually serve the areas identified for future annexation. Harrisville City also serves a small area of North Ogden City on 2150 North just below 150 East. Future needs have been estimated based on the current land use definitions. It should be understood that land use boundaries can change with planning and development. Changes in land use and annexation areas may require periodic adjustments to this plan and the recommended sanitary sewer capital facilities projects. Exhibit 2.2 shows the proposed service area for the sewer system along with the expected land uses.



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Harrisville City Corporation
Sanitary Sewer Capital Facilities Plan

Land Use

EXHIBIT: **2.2**

3.0 POPULATION ESTIMATES AND ERUs

3.1 Population and Growth Estimates

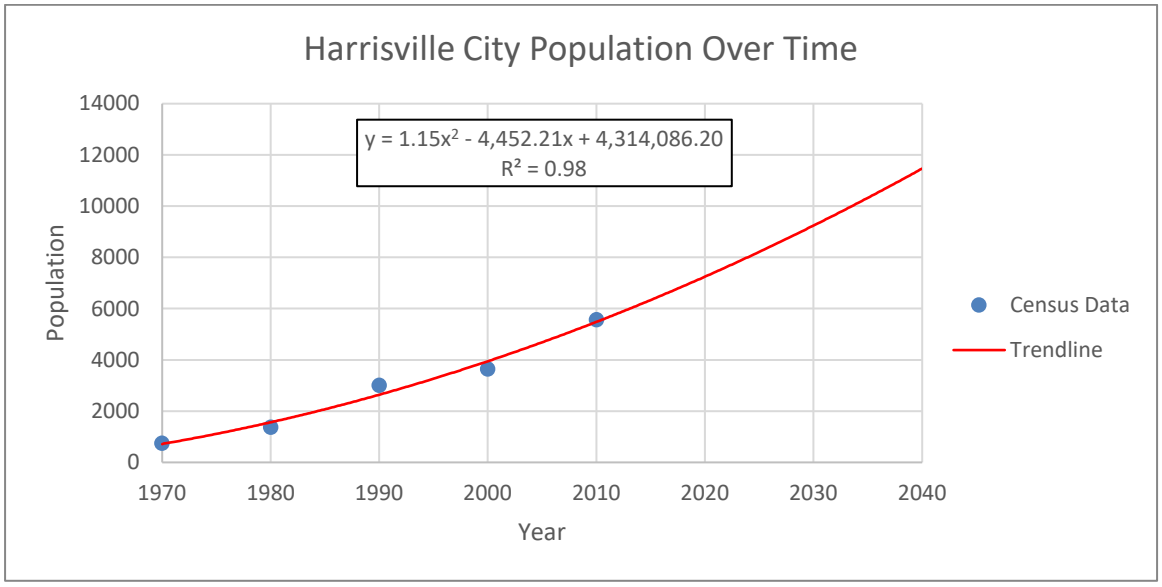
Historical population data was gathered for Harrisville City from official US Census Bureau data and the Governor's Office of Management and Budget (GOMB). The last 50 years of census data and the average yearly growth rate are shown below in Table 3.1. The 2020 census was being performed at the time of this study.

Table 3.1 – Historic Population Data and Growth Rate

Year	Census	Average Growth Rate per Year
1970	749	---
1980	1,371	6.23%
1990	3,004	8.16%
2000	3,645	1.95%
2010	5,567	4.33%

One way to project expected population growth is to use the historic population data and mathematically estimate a curve to best fit the data. This line can then be projected forward in time to estimate the City's population in the future. The following figure displays the findings of this method:

Figure 3.1 – Historic and Projected Population



The regression equation for the trendline used to project growth is shown in the figure. The R^2 value, also shown in the figure, is a representation of how well the trendline fits the historic data, with an R^2 value of 1.0 being a perfect fit. The trendline was found to be fairly accurate with an R^2 value of 0.9817. Therefore, it is reasonable to use the regression equation to approximate the population at future dates.

The projected populations from the regression equation were compared to the populations provided by the Governor's Office of Management and Budget (GOMB) and a constant growth rate of two percent per year of the trendline.

Table 3.2 – Population Projections

Year	GOMB	Regression Equation	Constant Growth Rate
2020	6,314	7,244	6,786
2030	7,741	9,239	8,272
2040	7,146	11,464	10,084
2050	8,428	13,918	12,292

The data contained in the table above shows that the population estimates produced by the GOMB contain the least aggressive growth estimates, and the regression equation providing the most aggressive. To ensure conservative estimates, the regression equation was selected for estimating future populations in this report.

3.2 Introduction to ERUs

The most common connections to the sewer system are from single family residential homes. For reference purposes all other types of connections can be equated to the impact of a typical single family residential home. The term used to describe this is the Equivalent Residential Unit or ERU. An ERU is the discharge into the system that is equivalent to one (1) single family residential home. All master planning requires actual counts for current connections in ERUs and estimates for future population and ERUs.

There are other types of sewer connections in the system such as multi-family, office, commercial, industrial, schools, churches, restaurants, etc. These other types of sewer connections were counted and reviewed. A multiplier was assigned to each connection to convert it to an ERU value. A flow rate could then be generated from the ERU values to determine a design flow rate required by the State of Utah Administrative Rules. Based on the analysis there are **2,861 existing ERU's** within the City. The flow rate values established by the State Administrative Rules were used to determine the current status of the sewer system infrastructure. [1]

3.3 ERU Projections and "Built-Out"

The concept of ERUs can be applied to undeveloped land to estimate future sewer flow rates as development takes place. ERU values have been applied to the undeveloped areas on the City's Future Land Use Map within the existing and future sewer collection service area. Using the Future Land Use Map 1,613 ERUs have been assigned to the developable land in the City. All the expected future ERUs are shown in Exhibit 3.1. The sewer system in the industrial park area located in the northwest corner of the city operates independently and has not been included in the ERU analysis.

[1] See Sewer analysis report in Appendix B.

Using population growth projections, the projected total ERUs are shown over time in Table 3.3. Since a portion of Harrisville City is expected to develop into commercial properties, the population growth does not directly correlate with the total projected ERUs; however, the growth rate can be applied to the current number of ERUs to project the future ERUs contributing to the sewer collection system. Following the same growth trend as the population, the projected growth of ERUs was determined.

Harrisville City's sewer collection system served **2,861 ERUs in 2020**. Based upon plans for land zoning and current undeveloped areas, approximately 1,613 additional ERUs could be added in the future. Approximately 967 of these additional ERUs will be residential. The remaining 646 will be commercial/industrial. At that point, the City will be at "built-out conditions," which means that there will be no more land available for new development.

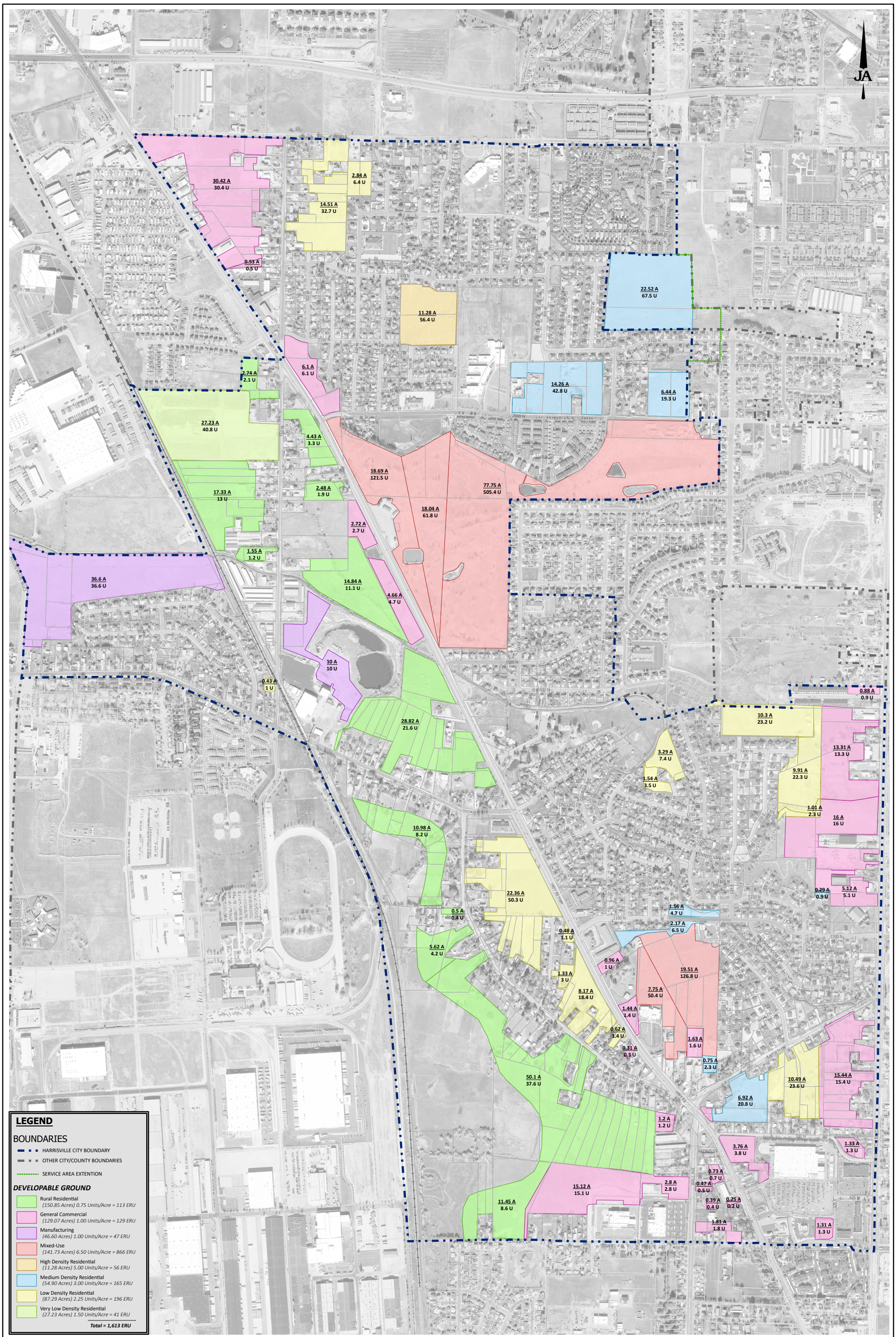
While residential development is expected to closely follow the growth rate of the population, non-residential development can occur much differently. Because a large percentage of future ERUs belong to non-residential development, projections to buildout will likely not represent actual growth trends accurately. Because of this, it is highly recommended that this report be reviewed and updated approximately every five years with more accurate data and projections.

Table 3.3 – Population and ERU Projections

Year	Population	Average Residential Growth Rate[1]	Projected Residential ERUs	Projected Other ERUs[2]	Projected Total ERUs	Additional ERUs from 2020
2020	7,244	2.67%	1,715[3]	1,146[3]	2,861[3]	0
2025	8,213	2.54%	1,947	1,206	3,153	292
2030	9,239	2.38%	2,194	1,269	3,462	601
2035	10,323	2.24%	2,454	1,335	3,789	928
2039[4] (Res. Build-out)	11,271	2.13%	2,682	1,392	4,074	1,213
2045	11,271	0%	2,682	1,477	4,159	1,298
2064[4] (Full Build-out)	11,271	0%	2,682	1,792	4,474	1,613

[1]Yearly average growth rate from the regression equation for the specified time period
[2]Yearly growth rate of 1.016% to match full build-out time frame specified in the Storm Water Capital Facilities Plan
[3]Actual
[4]Once residential build-out occurs, the population will not increase unless zoning changes and redevelopment occur.

Based on sewer system parameters, Harrisville City is expected to reach a build-out population of about 11,271 around the year 2039. Other development may continue after the population peaks out. These other developments may also place demand on the sewer system. This means that the ERUs will continue to increase even though the population has leveled out. The Equivalent Residential Unit (ERU) growth was extended to match the growth estimates found in the storm drain capital facilities plan. Approximately 4,474 ERUs could be expected at the built-out condition.



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Harrisville City Corporation
Sanitary Sewer Capital Facilities Plan

Undeveloped Ground

EXHIBIT: 3.1

4.0 ANALYSIS INFORMATION

4.1 Analysis Background and Data

Due to an insufficient amount of actual flow measurements taken on the sewer system, it was necessary to conduct an analysis to estimate sewer flow rates. A review of the sewer system map and connections were the basis of the analysis. Flow rates were estimated based on connection type and design guidelines established by the State Administrative Rules for Sewer Systems. Mapping was provided by Jones & Associates who keeps and maintains a Geographic Information System (GIS) database for the sewer system.

Autodesk® Storm and Sanitary Analysis 2020 was used to model the existing sewer system. Data for the model came from the recently completed GIS database which contains manhole locations, rim elevations, pipe sizes, and pipe flowline elevations.

The sewer modeling software was used to assess the system under three separation conditions. The results of the modeling identified the performance of the system under current conditions as well as expected future conditions. The conditions under which the system was assessed are as follows:

1. **Current Conditions Analysis** – This analysis was used to calculate the existing peak flow rates in the sewer system based on current conditions. Section 5.1 contains information regarding the existing flow rate analysis. Flow rates were then compared to actual pipe capacities. Deficiencies were identified and noted as projects needed under the current conditions. Section 5.2 identifies the areas in the existing system where capacity is a concern.
2. **Excess Capacity Analysis** – The existing system was analyzed to check for excess capacity in the collection system under current conditions. Pipes with excess capacity were identified. Those collection pipes with excess capacity may serve additional connections and will be a benefit to future growth. A discussion of excess capacity is found in Section 6 of this report.
3. **System Growth and Expansion Analysis** – This analysis determined the amount of flow that is expected to be added to the system by future connections. The exact point where the future connections enter the system is not known. However, we have attempted to add the future flows at logical points of connection. Section 7.1 contains information regarding the contribution of future connections on the sewer system. Adding the future flows to the existing flow analysis identified where capacity problems may occur based on future development. Section 7.2 identifies areas of concern where future flow rates may exceed pipe capacity.

4.2 Sewer Collection Lines

Sewer main lines that serve local neighborhoods are referred to as collectors. The flow rates in collector lines may peak and subside due to localized activity and schedules. As collectors combine the peaks in the flow rates become less pronounced due to broader activity levels and differing land uses. The sewer lines that carry flows from multiple collectors are referred to as interceptor lines.

4.3 Flows Used in Analysis

Item 1 of the Utah Administrative Rule R317-3-2 Sewers states:

> *Per Capita Flow: New sewer systems shall be designed on the basis of an annual average daily rate of flow of 100 gallons per capita per day [gpcpd] (0.38 cubic meter per capita per day) unless there are data to indicate otherwise. The per capita rate of flow includes an allowance for infiltration/inflow. The per capita rate of flow may be higher than 100 gallons per day (0.38 cubic meter per day) if there is a probability of large amounts of infiltration/inflow entering the system.*

The average household size is 3.31 persons as published by the US Census Bureau. In this study we will use 3.31 persons per ERU to calculate the average flow from a typical single-family residence. From the rule quoted above, the annual average daily flowrate is **331 gallons per ERU per day** (3.31 persons x 100 gpcpd). This is the primary factor used in the design and sizing of sewer lines.

In addition to wastewater, sewer pipes unavoidably carry flows from other sources such as ground water or storm water. These other sources are detrimental to the efficiency of the sewer system and must be minimized as much as possible. Water entering the sewer system from ground water sources is referred to as infiltration. Infiltration occurs through joints or cracks in pipes and manholes. Occasionally builders or homeowners connect land drain lines to the sewer. Pipes that carry groundwater flows are not allowed to connect to the sewer system. When water enters the sewer system from storm water or irrigation water it is referred to as inflow. Banned connections such as roof downspouts and basement stairwell drains are sources of inflow. Problematic water may also enter the sewer system through manhole covers at the ground surface. Inflow typically results directly from rainfall or irrigation runoff.

The potential for infiltration increases when groundwater is present at the level of the sewer system. The desire to construct below grade living spaces (basements) at the level of the water table also adds to the potential for illegal discharges to the sewer system. While we know that these conditions exist and that other water sources are entering the sewer system, we do not know the extent of the problem. As a conservative measure the sewer capacity analysis has included a provision for infiltration and inflow by limiting the recommended pipe flow depth at 70%. This will keep the actual flow rate at 85% of its full capacity and reserve 15% of pipe capacity as a buffer.

Infiltration and inflow is not only detrimental to the conveyance of sewer flow it is also detrimental to the treatment and removal of contaminants. Even though the City does not treat sewage water there should be a cooperative effort to limit infiltration so that the treatment plant (Central Weber Sewer Improvement District) can effectively remove contaminants without the need to work around unreasonable flow variations. Consequently, we would recommend that the City continue with maintenance and inspection efforts that focus on identifying and preventing infiltration and inflow. In areas of high groundwater, it may be wise to video inspect and monitor sewer flows to identify infiltration and inflow problems. Education and outreach programs may even help homeowners to voluntarily correct illegal connections to the sewer system. Ordinance changes may also be a good way to limit the potential for other sources of water from entering the sewer system. For example, if all living spaces were required to be raised above the ground water level then the sewer could be raised above the groundwater level too, thus preventing both infiltration and inflow from illegal connections.

4.4 Peaking Factors and Time Patterns

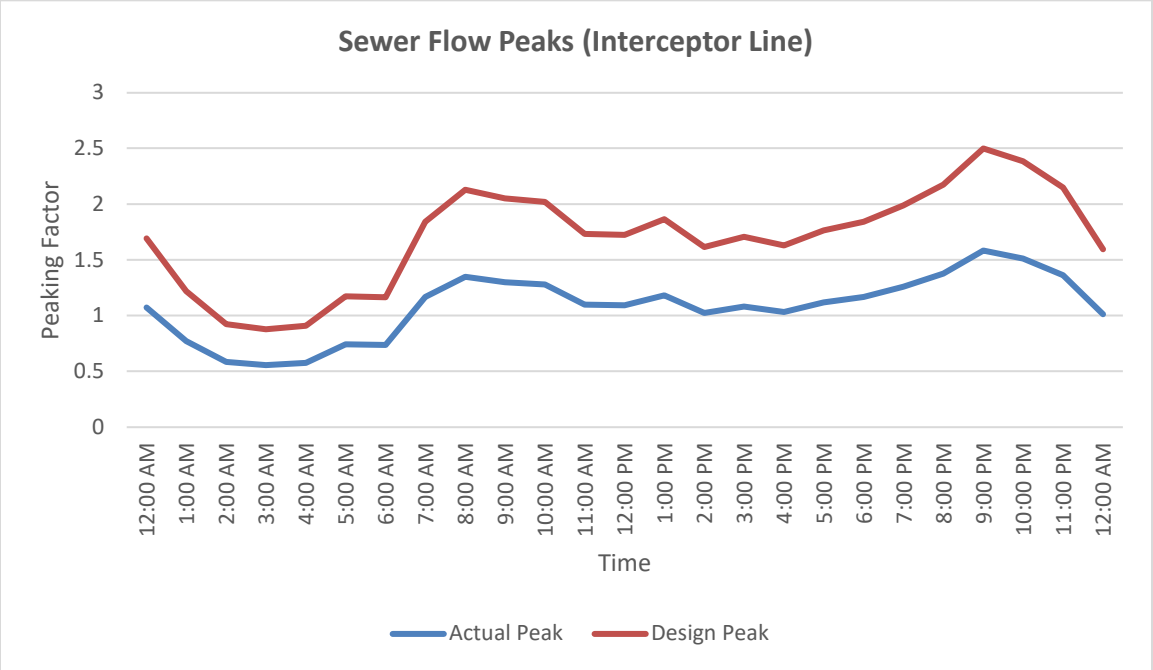
Sewer Flow rates are not constant. Rather they will rise and decline throughout the day. A peak usually occurs in the morning when the day's activities begin. After a decline during the middle of the day another peak will usually occur in the evening. The sewer collection system must be able to handle these peak flows. Conservative standards have been set by the State of Utah to govern the design of sewer collection systems. Administrative Rule R317-3-2, item 2 states:

Design Flow

a. *Laterals and collector sewers shall be designed for 400 gallons per capita per day (1.51 cubic meters per capita per day).*
b. *Interceptors and outfall sewers shall be designed for 250 gallons per capita per day (0.95 cubic meter per capita per day), or rates of flow established from an approved infiltration/inflow study.*

Based on an average flow of 100 gallons per capita per day, this rule implies a peaking factor of 2.5 for interceptor lines and 4.0 for collector lines. That is what will be used in this analysis. However, these peaking factors appear to be high for this community. A flow measuring device was placed on the City's 18" interceptor on West Harrisville Road just upstream of the connection to the Central Weber Sewer in 1200 West. It was monitored from April 8 to April 28, 2021. The maximum daily peaking factor recorded for this period was 1.58. Figure 4.1 shows the measured flow peaks (blue line) and the same flow peaks with a multiplier to match the 2.5 peaking factor set by State rules (red line).

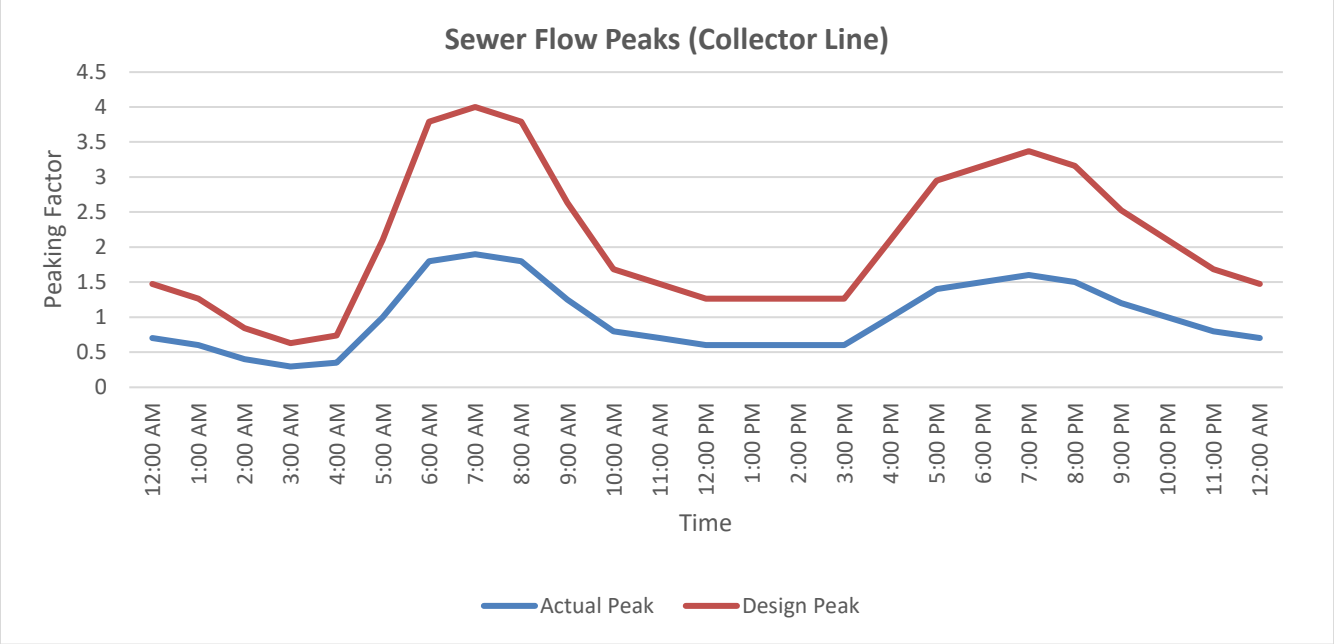
Figure 4.1 – Interceptor Time Pattern



Also, recent monitoring of residential sewer flows on a collector line in the adjacent city of Pleasant View shows that the peaking factor there is not as high as the state design peaking factor either. The graph shown in Figure 4.2 clearly identifies the actual morning and evening peaks in flow rate. The actual flow is shown by the blue line. The blue line has a morning peaking factor of 1.9. The graph indicates that the actual peak is about half the design peak found in the State Administrative Rules. To match the State's peak of 4.0 for collection lines a multiplier has been applied to create the red line which was used in the SSA analysis.

Based on the flow data that has been collected we feel that the peaking factors given by the state will adequately cover Harrisville City's needs.

Figure 4.2 – Collector Time Pattern



Both communities are primarily residential. It is expected that commercial time patterns will differ. However, since the community is primarily residential, the influence of commercial sewer flow variations has not been accounted for in this study.

It is interesting to note that the peak sewer flow rates are more pronounced for collector lines than for interceptor lines. Because collector lines are more localized, flow variation is naturally more apparent. This is a result of fewer contributing data points. Variations will show up more readily with a smaller population base. Interceptor lines are influenced by a broader population base. Variations become more muted with a broader data sampling.

4.4 Accuracy of the Sewer Flow Rate Analysis

It should be noted that the flows used in this analysis may not accurately represent what the system actually conveys. Reasons are as follows:

1. Wastewater discharge is closely related to culinary water usage. With that in mind, we checked the water usage reports for the local water supplier, Bona Vista Water Improvement District, and found that a typical residential connection uses an average of 367 gallons of water a day. This data covers a service district that includes surrounding communities and, in some cases, does include outdoor water use (irrigation). Outdoor water use does not contribute to wastewater collection system flow rates. Consequently, we believe that the Bona Vista Water Improvement District's data may serve as a ballpark comparison number but may not be entirely accurate if outdoor water use and neighboring communities are included.
2. The actual peaking factors calculated in similar communities are much lower than those required by the State Administrative Rules as can be seen in Figure 4.1. For example, the sewer main on West Harrisville Road was fitted with a flow meter and monitored between April 8 and April 28, 2021. The data from the monitoring indicated a daily peaking factor that ranged from 1.32 to 1.58 as opposed to the State's design peaking factor of 2.5 for interceptor lines.

The two preceding points suggest that the sewer flow rates in this study may be higher than actual conditions. However, we also know that infiltration and inflow are occurring in the sewer system. The actual contribution of inflow and infiltration are not known but expected to be high due to the presence of an elevated groundwater table. With these uncertainties we feel that the minimum design sewer flow rates established by the State Administrative Rules are reasonable for use in this study.

5.0 EXISTING COLLECTION SYSTEM

5.1 Existing System Pipe Capacity Analysis

A pipe capacity analysis compares the highest expected flow rate to the actual carrying capacity of a pipe. Flow rates were estimated by counting the number of connections on a sewer main. An appropriate multiplier was applied to each connection depending on the connection type. Schools for example may have the effect of several typical homes. Alternatively, certain businesses such as a small office may only have a fraction of the flow that a typical home would produce. The flow from these connections was collectively added together to analyze the existing sewer system. A peaking factor was then applied to account for daily fluctuations as previously discussed in Section 4.4 of this report. The sanitary sewer model generated flow rates for every sewer main line on the system. Critical areas where flow rates accumulate were identified. Some of those critical areas are shown in Exhibit 5.1.

The existing pipes were then checked to see if they were large enough to handle the expected peak flow rates. Sewer mainline capacity is dependent upon size and slope. Larger pipes and pipes with more slope have higher capacities. A ground survey was performed to obtain accurate pipe size and slope. This information was then entered into the model so that the actual carrying capacity of each pipe could be checked against the expected peak flow rate. This capacity analysis identified several areas where existing pipe sizes are too small to handle the expected flows as discussed in the following section.

EXIST. 437.06 GPM

EXIST. 204.5 GPM

EXIST. 863.4 GPM

Exist. 715.97 gpm

EXIST. 123.9 GPM

EXIST. 208.02 GPM

EXIST. 116.53 GPM

LEGEND

- MANHOLES

PIPES

- 8" PIPE
- 10" PIPE
- 12" PIPE
- 15" PIPE
- 18" PIPE
- CWSID PIPE
- OGDEN CITY PIPE
- PRIVATE PIPE

BOUNDARIES

- HARRISVILLE CITY BOUNDARY
- OTHER BOUNDARIES
- SERVICE AREA EXTENTION

NOTES:

FEET
0 250 500 1,000

DATE: 10/25/2021

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DRAWN KCT
CHECKED MLR

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Harrisville City Corporation
Sanitary Sewer Capital Facilities Plan
Existing Sewer Flows

EXHIBIT: **5.1**

5.2 Existing System Deficiencies and Recommendations

The analysis identified several sewer main lines that flow at more than the recommended 70% depth under the analysis parameters. Even though the analysis indicates that the flow rate exceeds the pipe's recommended flow we feel that the existing system capacity is sufficient under current conditions. These lines should be monitored to ensure that they do not fail.

The analysis also identified several sections of existing pipe where the design flow is over the pipe's actual capacity. That does not mean that the system is experiencing sewer back-ups. It simply means that these pipes do not meet the State's design standards for sizing. We suspect that the calculated flow rates are higher than the actual flow rates. If it were not so we would expect to have been notified of sewer back-ups. However, to keep up with current design standards, pipes that appear to be undersized should be replaced with larger lines since they are considered deficient by the applicable rules and standards set by the State. These lines should also be monitored to ensure that they do not fail.

Actual survey of the sewer system also identified some pipes that appear to have been constructed without sufficient grade or even reverse grade. These pipes should be removed and replaced with sufficient grade to provide a proper flow velocity necessary to scour the system.

Some operational recommendations are recommended based on the sewer capacity analysis. They are discussed below.

Operation and Maintenance Activity #1

Monitor the flow rate of the existing pipes that appear to be above the recommended flow rate or the design flow rate - even though these flow rates seem to be based on conservative peaking factors established by the State.

Operation and Maintenance Activity #2

Establish a sewer infiltration and inflow monitoring/prevention program. Because groundwater could be a real problem, we recommend that infiltration and inflow be studied. An effort should be made to work cooperatively with the Central Weber Sewer Improvement District on a regional study that includes several cities and jurisdictions. This may help lower the overall cost of the study and provide additional resources from other interested parties. The potential for groundwater problems is high and that is another reason to use the design standards set by the State.

Sewer pipes that are deficient because they are too small will need to be replaced with larger ones. These deficiencies have been assigned project numbers and are discussed below. They are also shown in Exhibit 5.2.

Project #1

2300 N from 350 W to 375 W: This pipe has insufficient slope for scour velocity. The analysis also indicates that this pipe is flowing more than the recommended flow depth of 70%.

Recommendation – increase pipe size from 10" to 12". This may not solve the insufficient velocity problem, but it will improve capacity. *(MH 358 to MH 359)*

Project #2

2300 N from 500 W to 550 W: The flow in this pipe exceeds the recommended flow depth of 70%. Recommendation – increase pipe size from 8" to 10". This will improve capacity. *(MH 32 to MH 33)*

Project #3

2150 N from 600 W to 700 W: This stretch of pipe (north side of road) exceeds the recommended flow depth of 70%. Recommendation – increase pipe size from 10" to 12". This will improve capacity. *(MH 18 to MH 28)*

Project #4

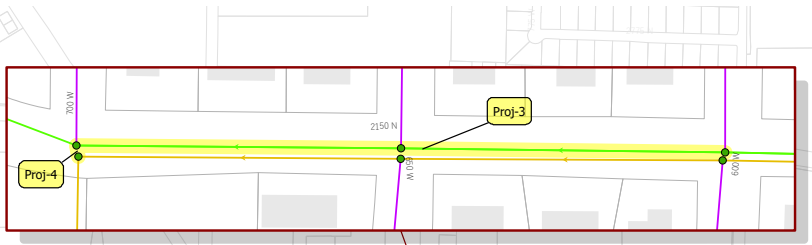
750 W from 2075 N to 2125 N: This stretch of pipe exceeds capacity based on the State's design criteria. Rather than replacing this section of pipe the sewer could be rerouted to a pipe with excess capacity at 2150 N and 700 W: There are two sewer lines on 2150 N at 700 W. The sewer line on the north flows east to west and the sewer line on the south comes from the east and then turns to the south. The line to the south has more capacity than the line that continues to the west. This project would divert the flow in the north manhole and send it to the south manhole rather than continue west. Excess flows in the north manhole should still be allowed to continue west but the majority should be sent to the south. Recommendation – divert the flow in the line to the manhole on the south with a 12" main. *(MH 18 to MH 397)*

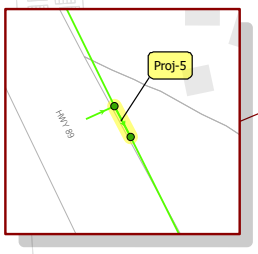
Project #5

Highway 89 at approximately 1350 N (in front of the parking lot to Harrisville City Park): This small stretch of pipe appears to be laid at reverse grade. Recommendation – remove and replace the pipe so that it has positive flow between manholes. *(MH 147 to MH 147A)*

Project #6

Highway 89 from 1203 N to Independence Boulevard: This stretch of pipe exceeds the recommended flow depth of 70%. Recommendation – increase pipe size from 8" to 12". *(MH 149 to MH 179)*





Proj-1
Proj-2
Proj-3
Proj-4
Proj-5
Proj-6

LEGEND

- EXISTING DEFICIENCIES
- MANHOLES

PIPES

- 8" PIPE
- 10" PIPE
- 12" PIPE
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Harrisville City Corporation
Sanitary Sewer Capital Facilities Plan

Existing Deficiencies

EXHIBIT: **5.2**

6.0 EXCESS CAPACITY

6.1 Existing System Excess Capacity Analysis

Just as it is important to identify deficiencies in a utility system, it is also important to identify excess capacity. Sometimes a utility system has more capacity than it needs to serve existing customers. Because of this, no modifications need to be made to the utility system to accommodate new growth. If the system has been oversized, it will allow for expansion without modification or cost to those wishing to connect. This is a benefit which has been provided by others. Consequently, it is reasonable to require new connections to pay back the cost of infrastructure that was provided by others. This section of the capital facility plan will identify areas of the system that have excess capacity. This information will be used later on to help recover costs identified in the Impact Fee Facilities Plan found in section 9 of this report.

6.2 Excess Capacity Lines

A review of sewer pipe capacity has identified a few areas of the system that will clearly support the expected future connections. One area is located on 2150 North Street from 550 West to Highway 89. This twelve-inch diameter sewer main was installed in 2002. Another is a ten-inch sewer main located behind Orion Junior High and runs down to 550 West. This line was also installed in 2002. A review of the files from these two projects indicate that they were constructed by the city for the purpose of providing sewer service to future development.

There are several other sewer lines with excess capacity that we have not included above. Two examples are the eighteen-inch line on West Harrisville Road and the fifteen-inch line on 750 West. These two lines have a lot of excess capacity that will be utilized by growth; however, we cannot document when or how these lines were completed and paid for. Consequently, the historical cost of these projects cannot be established. These and other oversized sewer main lines must be left out because an assumed value cannot be used under the legislation that regulates the calculation of impact fees. Future connections can use the excess capacity without reimbursement to previous system users.

The excess capacity of the two existing lines previously identified can be shown as a percentage. The modeling software provides the existing flow rate and the future flow rate based on the growth assumptions. The table below lists these flow rates and the percentage of the capacity that is attributable to future growth.

Table 6.1 – Excess Capacity

Description and Location	Existing gpm	Future gpm	Amount Attributable to Growth
12” Sewer on 2150 North (Hwy 89 to 550 West)	204.50	836.38	76%
10” Sewer behind Orion Junior High to (down to 550 West)	148.24	324.44	54%

7.0 FUTURE COLLECTION SYSTEM

7.1 Future System Model and Analysis

The future system analysis started with the existing system analysis. Deficiencies in the existing model were first corrected prior to adding additional flows from expected growth. The system was then reevaluated with the added flows for growth using computer software - Autodesk® Storm and Sanitary Analysis. The additional flows can only be estimated based on the perceived future developments within the city.

Using the ERU values from Exhibit 3.1, peak flows associated with the undeveloped ground were added to the sewer main lines. The resulting flow analysis identified where future development would cause the sewer mains (which had been corrected for existing deficiencies) to exceed their capacity. This analysis identified sewer main lines that would need to be increased in size because of the expected growth.

7.2 Future System Capacity Needs and Recommendations

Exhibit 7.1 contains an illustration that shows the resulting future flow rates for the main sewer interceptor lines. The system was then analyzed to see if it could handle the expected flow rates. In most cases the existing pipes (or those corrected for existing deficiencies) could handle the expected future flow rates. However, there were a few areas where the future flow rates exceeded the sewer pipe capacities. As a result, projects have been identified to replace city sewer main lines with larger main lines that will handle the expected additional flows.

There are two areas of the sewer system that will require upsizing for growth. They are described below and they can also be seen in Exhibit 8.1 in the following section of this report.

Project #7

2150 N from 600 W to 500 W and 500 W from 2150 N to 2125 N: This section of pipe (north side of road) has insufficient capacity under future conditions. It would be an extension of deficiency project #3 (600 W to 700 W) but would serve future growth. Recommendation – increase pipe size from 10” to 12”. *(MH 28 to MH 380)*

Project #8

North Harrisville Road from 797 W to 871 W: This existing 8” diameter sewer line has insufficient capacity under future conditions. Recommendation – increase pipe size from 8” to 10” on North Harrisville road and down to the Central Weber interceptor line behind the home at 871 West. *(MH 174 to MH 177)*

There are also sewer mains owned by the Central Weber Sewer Improvement District that may need to be upsized to allow for future growth within the city. The results of this analysis have been discussed with Central Weber Sewer District so that they can begin planning for these future conditions.

Public Works Facility

The City plans to construct a new shop and office building for the public works department. This facility will serve multiple service needs including the sewer department. The facility will provide space for equipment, materials, and personnel needed to run the sewer department.

Because the proposed facility will serve many different utility departments and activities the cost of the new facility should be distributed proportionately. Funding for the new facility will be a shared burden. This report will follow the same funding logic that is included in the Storm Drain Capital Facilities Plan and Impact Fee Facilities Plan (July 2021).

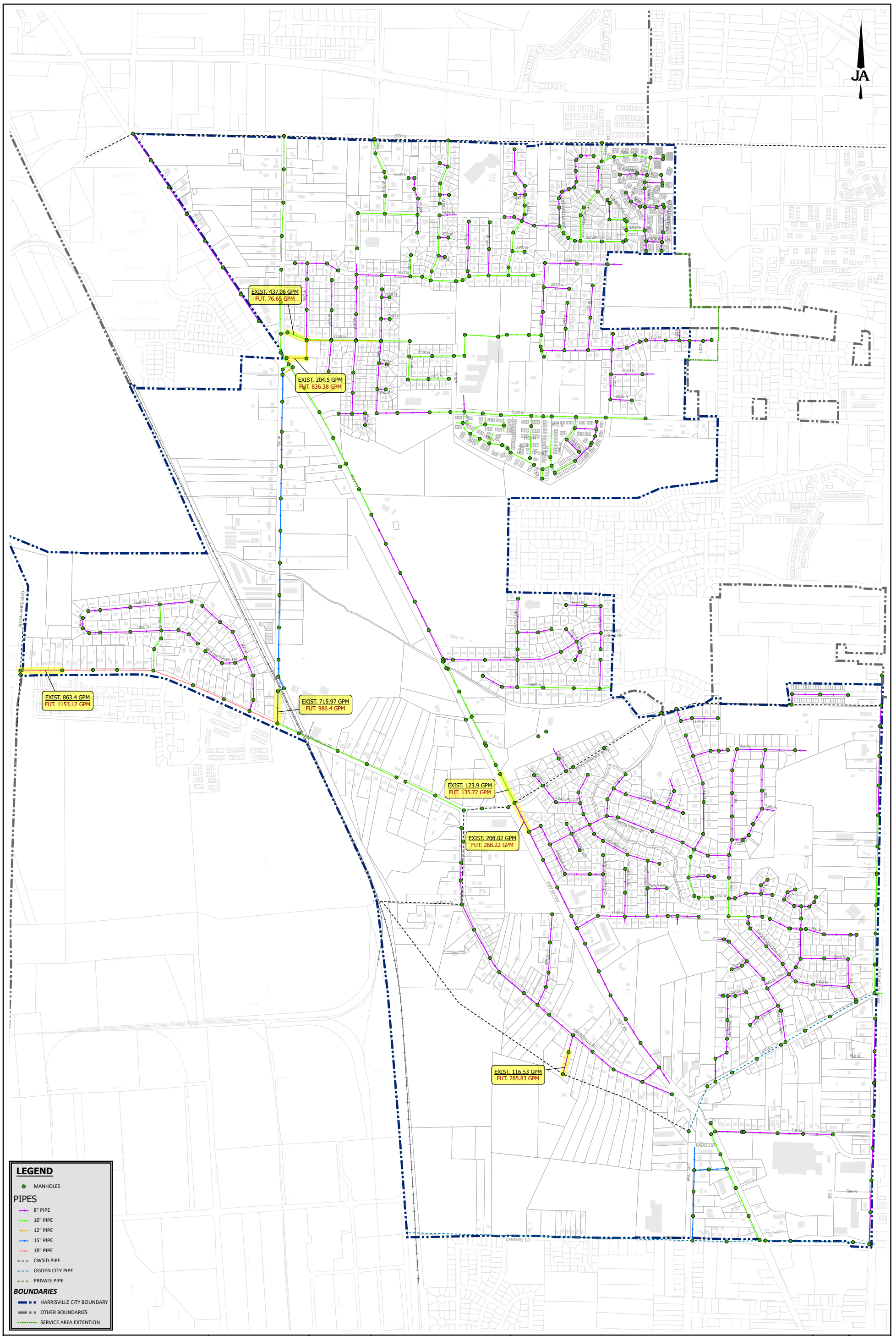
While the existing facility is adequate under current circumstances the need for the new facility is due to growth. Therefore, the cost of constructing the new facility should be paid, in part, by new growth. The proportionate share of the cost will be addressed in the Impact Fee Analysis submitted by the city's financial consultant.

Project #9

The city needs to construct a new public works facility to accommodate the personnel, equipment, and materials needed to run the utility departments including the sewer.

Growth at the Ben Lomond Golf Course

The Ben Lomond Golf Course has recently been rezoned for a mixed-use development. The city has coordinated with the developer regarding the expansion of city utilities that will serve the project. After some consideration the developer has chosen to not connect their sewer lines to any existing city lines. Instead, they will run their own sewer collection system along Highway 89 all the way to the Central Weber Sewer interceptor line at Independence Boulevard. The future sewer model does not include flows from the Ben Lomond Golf Course redevelopment project since it will be independent of any existing sewer collection lines.



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Harrisville City Corporation
Sanitary Sewer Capital Facilities Plan

Existing and Future Sewer Flows

EXHIBIT: **7.1**

8.0 CAPITAL FACILITIES PLAN AND COST ESTIMATES

8.1 Summary and Recommendations

This report contains an evaluation of Harrisville City's sanitary sewer system. The Capital Facilities Plan outlines the planned improvement projects needed for the City's immediate replacement needs and for future growth through build-out. It does not attempt to identify the sewer lines that will be in need of replacement in the future due to the life expectancy of the pipe. It is expected that depreciation costs, which should be budgeted and set aside, will be sufficient for these problems. It also does not identify any of the infill (collector) sewer lines. It is assumed that the minimum size sewer mains constructed by development will have sufficient capacity to handle project needs. The model of future flows anticipates connections at logical locations.

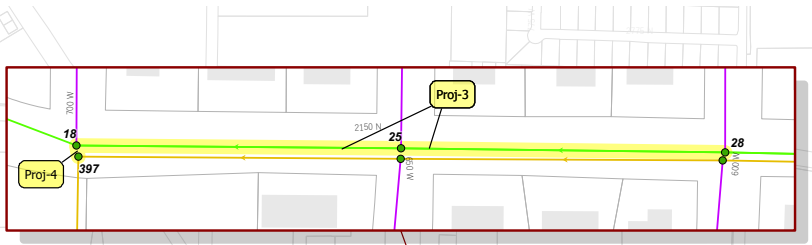
It is recommended that the City continue to clean and maintain the sewer system on a frequent basis and pay special attention to areas where deficiencies have been noted in this study.

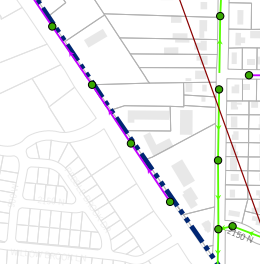
The recommended capital facilities projects are schematic in nature meaning that the location may change to accomplish the same purpose. The exact location and perhaps the scope of the projects may change according to development layouts. The recommended projects should be constructed as needed or as development dictates. Consequently, this Capital Facilities Plan should be updated regularly in response to growth changes. Our recommendation is that this should be done every five years.

This Capital Facilities Plan is a valuable planning tool and contains information needed for the development of an Impact Fee Facilities Plan (IFFP) and Impact Fee Analysis (IFA). The Impact Fee Facilities Plan creates a short-term list of projects from the Capital Facilities Plan based on priority. The IFFP is found in Section 9 of this report. The information in the IFFP will be used to create the IFA. The IFA will be bound as a separate document.

8.2 Projects

Exhibit 8.1 (Projects Map) identifies the projects associated with the overall Capital Facilities Plan. Brief descriptions explaining the needs of these projects are found in Sections 5.2 and 7.2. Some of the projects can be broken into small phases, with proper planning. Design of the entire sewer line may be required to assure that the segment being installed is done so at the correct elevations needed for the long-term working of the sewer line. It should be noted, however, that due to sanitary sewer being gravity flow, all improvements should be constructed from downstream to upstream in order to avoid any elevation conflicts.





JA

Proj-9
New Public Works Facility

Proj-1
Proj-2
Proj-3
Proj-4
Proj-5
Proj-6
Proj-7
Proj-8

32
33
358
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28
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380
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LEGEND

- PROJECTS
- MANHOLES

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Harrisville City Corporation
Sanitary Sewer Capital Facilities Plan

Projects Map

EXHIBIT: 8.1

For planning purposes, it is important to decide which improvements should be constructed first. However, this has proved very difficult because we do not know which areas within the city will develop first. We suggest that the public works department make these decisions based on what they are observing out in the field. For example, a sewer project may be moved to the top of the list if there are frequent breaks or blockages already occurring in that area.

A summarized list of the projects with their estimated costs is shown in Table 8.1. Itemized cost estimates and descriptions for each of the projects are included in Appendix A. Project costs are shown as being attributed to an existing deficiency and/or needed for future development. All costs in the following table are current values and will need to be inflated for the year in which they will be constructed.

Table 8.1 – Summary of Capital Improvement Projects

Project ID.	Project Description	Existing Deficiency	Future Development	Total
PROJ-1	2300 N: 350 W-375 W upsize from 10” to 12”	$87,900	-	$87,900
PROJ-2	2300 N: 500 W-550 W upsize from 8” to10”	$118,512	-	$118,512
PROJ-3	2150 N: 600 W-700 W upsize from 10” to 12”	$16,380	$188,364	$204,744
PROJ-4	2150 N: 700 W connect manholes (N to S)	$2,654	$23,884	$26,538
PROJ-5	Hwy 89: 1350 N correct slope issue	$48,732	-	$48,732
PROJ-6	Hwy 89: 1203 N to Ind Blvd upsize 8” to 12”	$8,165	$127,915	$136,080
PROJ-7	2150 N: 600 W to 500 W to 2125 N upsize 10” to 12”	-	$282,432	$282,432
PROJ-8	N Harrisville Rd: 797 W to 871 W upsize 8” to 10”	-	$471,552	$471,552
PROJ-9	New public works facility[1]	-	$1,202,080	$6,010,400
	Totals	**$282,343**	**$2,296,227**	**$7,386,890**

[1]The estimated total cost of the new public works facility is $6,010,400. The portion of the new facility which can be attributed to future growth will is 20%. Therefore, only $1,202,080 is expected to come from the sanitary sewer department funding options. A credit for the existing facility, which will be sold off, should also be considered when calculating an impact fee.

9.0 IMPACT FEE FACILITIES PLAN

9.1 Introduction

The Sanitary Sewer Impact Fee will be enacted as a means for new development to pay for their impact on the existing sanitary sewer system. Utah state law requires that an Impact Fee Facilities Plan (IFFP) be prepared before an Impact Fee can be implemented. The law requires that the IFFP only contain the costs for short term growth (6-10 years) and must not include improvements which would raise the existing level of service. This section will summarize information from the previous sections of this report as it pertains to the enactment of the impact fee.

Title 11-36a, Section 300, of the Utah State Code outlines the requirements of the Impact Fee Analysis (IFA), which is also required to be prepared before an Impact Fee can be implemented. The City's financial consultant will prepare the IFA.

9.2 Growth Projections

Long term growth projections for Harrisville City are discussed in Section 3.2. This section will focus on the growth during the next decade.

As stated in Section 3.2, Harrisville City is expected to reach a build-out population of about 11,271 around 2039. Other development may continue after the population peaks out. These other developments may place demand on the sewer system. This means that the ERUs will continue to increase even though the population has leveled out. The Equivalent Residential Unit (ERU) growth was extended to match the growth estimates found in the storm drain capital facilities plan. Approximately 4,474 ERUs could be expected at the build-out condition. The following table contains the projected population and ERUs for the next 10 years as applicable to the IFFP:

Table 9.1 – Population and ERU Projections (IFFP)

Year	Population	ERUs	Increase from 2020
2021	7,433	2,918	57
2022	7,625	2,976	115
2023	7,819	3,034	173
2024	8,015	3,093	232
2025	8,213	3,153	292
2026	8,414	3214	353
2027	8,617	3,275	414
2028	8,822	3,337	476
2029	9,029	3,399	538
2030	9,239	3,462	601
2031	9,451	3,526	665

The table indicates that the city may see 665 additional sewer ERUs by the year 2031. Projects selected for the Impact Fee Facilities Plan should accommodate the expected growth.

9.3 Service Area

The existing sanitary sewer collection system serves all the residents in the city boundary with one, interconnected system. In the future, it is expected that all the proposed annexation areas will also be included in the service area.

9.4 Level of Service

For a sanitary sewer collection system, the reasonable expectation of the residents is that they can use the sewer system under normal operating conditions, including peak use times, without the connection backing up. Unusual circumstances are not considered in the analysis.

The existing collection system was analyzed using the parameters outlined in Sections 4.3 and 4.4. The expectation is that all pipes will serve the City during peak hours. Any trunk line flowing over 70% full (by depth) during those times was considered to be deficient. The same parameters were applied to the future system model.

9.5 Excess Capacity

Future growth often requires new facilities to be constructed. However, existing sewer facilities may be able to handle some growth without any modification. This benefit to future customers can often be attributed to existing users. If the actual cost of these benefits can be determined, then they can be distributed among new customers so that they pay their fair share. In an effort to do this sewer projects constructed using City funds were identified and analyzed to determine excess capacity. The state code governing impact fees allows for this with the following conditions which are found in Utah Code 11-36a-202 Prohibitions:

*(1) A local political subdivision or private entity may **not**:*

(a) impose an impact fee to:

(i) cure deficiencies in a public facility serving existing development;

(ii) raise the established level of service of a public facility serving existing development;

(iii) recoup more than the local political subdivision's or private entity's costs actually incurred for excess capacity in an existing system improvement; or

(iv) include an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with:

(A) generally accepted cost accounting practices; and

(B) the methodological standards set forth by the federal Office of Management and Budget for federal grant reimbursement.

The following table lists the projects previously discussed in section 6.2 of this report that will serve future growth. The historical cost (i.e., the cost actually incurred) has been listed in the table. Only the percentage of the total cost attributable to future growth is used in the impact fee analysis.

Table 9.2 – Excess Capacity

Description and Location	Historical Cost	Amount Attributable to Growth	Allowable Cost
12" Sewer on 2150 North (Hwy 89 to 550 West)	$108,433	76%	$82,409
10" Sewer behind Orion Junior High to (down to 550 West)	$29,600	54%	$15,984
Total			**$98,393**

9.6 Future Development Needs

Even though we have no way of knowing for certain where to plan for immediate growth we have attempted to identify the project that will likely be needed soon. Table 9.3 below shows the projects that seem logical to construct in the next 6 to 10 years. Should development occur sooner in other areas of the city, this list of projects should be re-evaluated and re-prioritized to accommodate growth as it actually occurs. The ERUs that will be added to the system in the area of the construction project are also listed.

Table 9.3 – IFFP Projects

Project ID	Project Description	Future Development	ERUs Served	Estimated Construction Year
PROJ-3	2150 N: 600 W-700 W upsize from 10" to 12"	$188,364	295	2023
PROJ-4	2150 N: 700 W connect manholes (N to S)	$23,884	295[2]	2025
PROJ-6	Hwy 89: 1203 N to Ind Blvd upsize 8" to 12"	$127,915	65	2027
PROJ-9	New public works facility[1]	$1,202,080	1,613	2023
	Total	**$1,542,243**		

[1]A credit for the existing public works facility is expected to be considered in the Impact Fee Analysis (IFA).

[2]The ERUs listed for Proj-3 are the same ERUs listed in Proj-4. In other words, they are not additional but rather serve a total of 295 ERUs together.

The other long-term projects are listed in the following table. All costs are current values and will need to be inflated for the year in which they will be constructed.

Table 9.4 – Long-term Projects

Project ID	Project Description	Future Development	Additional ERUs Served	Estimated Construction Year
PROJ-1	2300 N: 350 W-375 W upsize from 10" to 12"	Deficiency	0	2022
PROJ-2	2300 N: 500 W-550 W upsize from 8" to10"	Deficiency	0	2024
PROJ-5	Hwy 89: 1350 N correct slope issue	Deficiency	0	2026
PROJ-7	2150 N: 600 W to 500 W to 2125 N upsize 10" to 12"	$282,432	295	2023
PROJ-8	N Harrisville Rd: 797 W to 871 W upsize 8" to 10"	$471,552	184	2030
	Total	**$753,984**		

The order of the projects may change depending on where development occurs first. A long-term project may need to be moved up to accommodate growth. Likewise, a project on the short-term list (IFFP) may not need to be constructed as soon as anticipated. Consequently, projects may need to be swapped around to follow the natural progression of development.

It is assumed that only the IFFP projects listed in Table 9.3 will be completed in the next 10 years. Each of these projects has an associated number of ERUs that they will serve. Projects 3 and 4 will serve 295 ERUs. Project 6 will serve an additional 65 ERUs. We are assuming that all these specific ERUs will be added to the system during the next 10-year time period. However, not all of the ERUs listed for the new public works facility, Project 9 (1,613), will be added to the system during the 10-year period. Table 9.1 indicates that only 665 ERUs will be added during that time frame. When calculating an impact fee only that portion of the expected 10-year growth should be considered. In this case 665 ERUs will be added. Consequently, 41% of the eligible cost of the public works facility may be considered in the impact fee calculation since 665 is 41% of 1,613. Table 9.5 lists the amount of the eligible project costs that may be considered in the impact fee calculation.

All costs in the following table are current values and will need to be inflated for the year in which they will be constructed.

Table 9.5 –Projects Cost Summary

Project ID	Project Description	Total Estimated Cost	Cost Breakdown			Impact Fees Considered[1]	Proposed Budget Year
			Replacement/ Deficiency	Total Impact Fee Eligible	Developer Participation		
Proj-3	2150 N: 600 W-700 W, 12”	$204,744	$16,380	$188,364	-	$188,364	2023
Proj-4	2150 N: 700 W, bypass	$26,538	$2,654	$23,884	-	$23,884	2025
Proj-6	Hwy 89: 1203 N-Ind Blvd, 12”	$136,080	$8,165	$127,915	-	$127,915	2027
Proj-9	New public works facility	$6,010,400	-	$1,202,080	-	$495,588	2023
	TOTAL	**$ 6,377,762**	**$27,199**	**$1,542,243**	**-**	**$835,751**	

[1] The costs listed in the “Impact Fees Considered” column are those associated with short-term growth (10 years – the timeline of this study) which may be used in consideration for calculation of the new impact fee.

9.6 Certification

"I certify that the attached impact fee facilities plan:

1. includes only the costs of public facilities that are:
    a. allowed under the Impact Fees Act; and
    b. actually incurred; or
    c. projected to be incurred or encumbered within six years after the day on which each impact fee is paid;
2. does not include:
    a. costs of operation and maintenance of public facilities;
    b. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents; or
    c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and the methodological standards set forth by the federal Office of Management and Budget for federal grant reimbursement; and
3. complies in each and every relevant respect with the Impact Fees Act."

_____

Matthew Hartvigsen, P.E. – Consulting City Engineer

_____

Bill Morris, City Administrator/Attorney

Works Cited

Utah Administrative Rules (R317-3-2)
Jones & Associates (2021). *Storm Drain Capital Facilities Plan and Impact Fee Facilities Plan*
Utah Code 11-36a (2021).

APPENDIX A

PROJECTS COST ESTIMATES

Deficiency Project 1

Increase pipe size from 10" to 12".

Manhole 358-Manhole 359

Date: October 2021

Concept Cost Estimate

Location:
2300 North from
350 West to 375 West

Item	Description	Qty	Unit	Unit Price	Total
1	Mobilization	1	ls	$8,500.00	$8,500.00
2	SWPPP	1	ls	$4,500.00	$4,500.00
3	Traffic Control	1	ls	$7,000.00	$7,000.00
4	Bypass pumping	1	ls	$6,000.00	$6,000.00
5	Remove existing 10" pipe	250	lf	$30.00	$7,500.00
6	Furnish and install new 12" pipe	250	lf	$65.00	$16,250.00
7	Connect to existing mahole	2	ea	$2,500.00	$5,000.00
8	Connect existing sewer lateral to new line	3	ea	$1,500.00	$4,500.00
9	Asphalt patching	2,500	sf	$5.00	$12,500.00
10	Clean and camera	250	lf	$6.00	$1,500.00
				Subtotal	**$73,250.00**
				20%± Engineering & Contingency	**$14,650.00**
				TOTAL =	**$87,900.00**

Note: 2300 North from 350 West to 375 West: This section of pipe has insufficent slope for scour velocity. The analysis also indicates that this pipe is flowing more than the recommended flow depth of 70%. Recommendation: Increase pipe size from 10" to 12". This may not solve the insufficient velocity problem, but it will improve capacity.

	Total	**$87,900.00**
100%	**Existing Deficiency**	**$87,900.00**
	IMPACT FEE ELIGIBLE COST =	**$0.00**

Deficiency Project 2

Increase pipe size from 8" to 10".

Manhole 33-Manhole 32

Date: October 2021

Concept Cost Estimate

Location:
2300 North from
500 West to 550 West

Item	Description	Qty	Unit	Unit Price	Total
1	Mobilization	1	ls	$11,500.00	$11,500.00
2	SWPPP	1	ls	$6,000.00	$6,000.00
3	Traffic Control	1	ls	$9,000.00	$9,000.00
4	Bypass pumping	1	ls	$6,000.00	$6,000.00
5	Remove existing 8" pipe	360	lf	$25.00	$9,000.00
6	Furnish and install new 10" pipe	360	lf	$60.00	$21,600.00
7	Connect to existing mahole	2	ea	$2,500.00	$5,000.00
8	Connect existing sewer lateral to new line	7	ea	$1,500.00	$10,500.00
9	Asphalt patching	3,600	sf	$5.00	$18,000.00
10	Clean and camera	360	lf	$6.00	$2,160.00
				Subtotal	**$98,760.00**
				20%± Engineering & Contingency	**$19,752.00**
				TOTAL =	**$118,512.00**

Note: 2300 North from 500 West to 550 West: The flow in this section of pipe exceeds the recommended flow depth of 70%. Recommendation-Increase pipe size from 8" to 10". This will improve capacity.

	Total	**$118,512.00**
100%	**Existing Deficiency**	**$118,512.00**
	IMPACT FEE ELIGIBLE COST =	**$0.00**

Deficiency and Growth Project 3

Increase pipe size from 10" to 12".

Manhole 18-Manhole 28

Date: October 2021

Concept Cost Estimate

Location:
2150 North from
600 West to 700 West

Item	Description	Qty	Unit	Unit Price	Total
1	Mobilization	1	ls	$19,500.00	$19,500.00
2	SWPPP	1	ls	$10,000.00	$10,000.00
3	Traffic Control	1	ls	$15,500.00	$15,500.00
4	Bypass pumping	1	ls	$7,000.00	$7,000.00
5	Remove existing 10" pipe	620	lf	$30.00	$18,600.00
6	Furnish and install new 12" pipe	620	lf	$65.00	$40,300.00
7	Connect to existing mahole	4	ea	$2,500.00	$10,000.00
8	Connect existing sewer lateral to new line	10	ea	$1,500.00	$15,000.00
9	Asphalt patching	6,200	sf	$5.00	$31,000.00
10	Clean and camera	620	lf	$6.00	$3,720.00
				Subtotal	**$170,620.00**
				20%± Engineering & Contingency	**$34,124.00**
				TOTAL =	**$204,744.00**

Note: This stretch of pipe (north side of the road) exceeds the recommended flow depth of 70% . Recommendation- Increase pipe size from 10" to 12". This will improve capacity. The model shows a 8% deficiency for current conditions. Consequently, 8% of the project cost will be considered a deficiency and 92% will be considered for future growth.

	Total	**$204,744.00**
8%	**Existing Deficiency**	**$16,379.52**
	IMPACT FEE ELIGIBLE COST =	**$188,364.48**

Deficiency and Growth Project 4

Re-route from from Manhole 18 to Manhole 397

Date: October 2021

Concept Cost Estimate

Location:
2150 North and 700 West

Item	Description	Qty	Unit	Unit Price	Total
1	Mobilization	1	ls	$2,700.00	$2,700.00
2	SWPPP	1	ls	$1,400.00	$1,400.00
3	Traffic Control	1	ls	$2,200.00	$2,200.00
4	Bypass pumping	1	ls	$5,000.00	$5,000.00
5	Furnish and install new 12" pipe	15	lf	$65.00	$975.00
6	Connect to existing mahole	2	ea	$2,500.00	$5,000.00
7	Reconfigure existing manhole to divert flows	1	ea	$2,500.00	$2,500.00
8	Asphalt patching	150	sf	$15.00	$2,250.00
9	Clean and camera	15	lf	$6.00	$90.00
				Subtotal	**$22,115.00**
				20%± Engineering & Contingency	**$4,423.00**
				TOTAL =	**$26,538.00**

Note: There are two sewer lines in 2150 North at 700 West. The sewer line on the north flows east to west and the sewer line on the south comes from the east and then turns to the south. The line to the south has more capacity than the line that continues to the west. This project would divert the flow in the north manhole and send it to the south manhole rather than continue west. Excess flows in the north manhole should still be allowed to continue west cut the majority should be sent to the south. Recommendation-Divert the flow in the line on the north to the manhole on the south with 12" main. The model shows a 10% deficiency in the downsream piping that goes under Highway 89. Consequently, 10% of the project cost will be considered a deficiency and 90% will be considered for future growth.

	Total	**$26,538.00**
10%	**Existing Deficiency**	**$2,653.80**
	IMPACT FEE ELIGIBLE COST =	**$23,884.20**

Deficiency Project 5

Repair reverse grade pipe.

Manhole 147-Manhole 147A

Date: October 2021

Concept Cost Estimate

Location:
Highway 89 and 1350 North

Item	Description	Qty	Unit	Unit Price	Total
1	Mobilization	1	ls	$2,600.00	$2,600.00
2	SWPPP	1	ls	$1,300.00	$1,300.00
3	Traffic Control	1	ls	$2,100.00	$2,100.00
4	Bypass pumping	1	ls	$3,000.00	$3,000.00
5	Remove existing 10" pipe	35	lf	$30.00	$1,050.00
6	Furnish and install new 10" pipe	35	lf	$60.00	$2,100.00
7	Connect to existing mahole	2	ea	$2,500.00	$5,000.00
8	Connect existing sewer lateral to new line	1	ea	$1,500.00	$1,500.00
9	Asphalt patching	350	sf	$5.00	$1,750.00
10	Clean and camera	35	lf	$6.00	$210.00
11	UDOT permit, flowable fill, and additional pavement	1	ls	$20,000.00	$20,000.00
				Subtotal	**$40,610.00**
				20%± Engineering & Contingency	**$8,122.00**
				TOTAL =	**$48,732.00**

Note: In front of the parking lot to the Harrisville City park, there is a small stretch of pipe that appears to be laid at reverse grade, Recommendation-remove and replace the pipe so that it has positve flow between manholes.

	Total	**$48,732.00**
100%	**Existing Deficiency**	**$48,732.00**
	IMPACT FEE ELIGIBLE COST =	**$0.00**

Deficiency and Growth Project 6

Increase pipe size from 8" to 12".

Manhole 149 to Manhole 179

Date: October 2021

Concept Cost Estimate

Location:
Highway 89 from
1203 N to Independence Blvd

Item	Description	Qty	Unit	Unit Price	Total
1	Mobilization	1	ls	$12,500.00	$12,500.00
2	SWPPP	1	ls	$6,500.00	$6,500.00
3	Traffic Control	1	ls	$10,000.00	$10,000.00
4	Bypass pumping	1	ls	$6,000.00	$6,000.00
5	Remove existing 8" pipe	400	lf	$25.00	$10,000.00
6	Furnish and install new 12" pipe	400	lf	$65.00	$26,000.00
7	Connect to existing mahole	2	ea	$2,500.00	$5,000.00
8	Connect existing sewer lateral to new line	2	ea	$2,500.00	$5,000.00
9	Asphalt patching	4,000	sf	$7.50	$30,000.00
10	Clean and camera	400	lf	$6.00	$2,400.00
				Subtotal	**$113,400.00**
				20%± Engineering & Contingency	**$22,680.00**
				TOTAL =	**$136,080.00**

Note: This stretch of pipe exceeds the recommended flow depth of 70% . Recommendation-Increase pipe size from 8" to 12" to meet existing and future needs. The model shows a 6% deficiency for current conditions. Consequently, 6% of the project cost will be considered a deficiency and 94% will be considered for future growth.

	Total	**$136,080.00**
6%	**Existing Deficiency**	**$8,164.80**
	IMPACT FEE ELIGIBLE COST =	**$127,915.20**

Growth Project 7

Increase pipe size from 10" to 12".

Manhole 28-Manhole 380

Date: October 2021

Concept Cost Estimate

Location:
2150 N/500 W from
600 W to 2125 N

Item	Description	Qty	Unit	Unit Price	Total
1	Mobilization	1	ls	$27,000.00	$27,000.00
2	SWPPP	1	ls	$13,500.00	$13,500.00
3	Traffic Control	1	ls	$21,500.00	$21,500.00
4	Bypass pumping	1	ls	$8,000.00	$8,000.00
5	Remove existing 10" pipe	860	lf	$30.00	$25,800.00
6	Furnish and install new 12" pipe	860	lf	$65.00	$55,900.00
7	Connect to existing mahole	7	ea	$2,500.00	$17,500.00
8	Connect existing sewer lateral to new line	12	ea	$1,500.00	$18,000.00
9	Asphalt patching	8,600	sf	$5.00	$43,000.00
10	Clean and camera	860	lf	$6.00	$5,160.00
				Subtotal	**$235,360.00**
				20%± Engineering & Contingency	**$47,072.00**
				TOTAL =	**$282,432.00**

Note: This section of pipe (north side of road) has insufficient capacity under future conditions. It would be an extension of deficiency project #3, but would serve future growth. Recommendation-Increase pipe size from 10" to 12"

	Total	**$282,432.00**
0%	**Existing Deficiency**	**$0.00**
	IMPACT FEE ELIGIBLE COST =	**$282,432.00**

Growth Project 8

Increase pipe size from 8" to 10".

Manhole 174-Manhole 177

Date: October 2021

Concept Cost Estimate

Location:
North Harrisville Road
797 West to 871 West

Item	Description	Qty	Unit	Unit Price	Total
1	Mobilization	1	ls	$42,000.00	$42,000.00
2	SWPPP	1	ls	$21,000.00	$21,000.00
3	Traffic Control	1	ls	$34,000.00	$34,000.00
4	Bypass pumping	1	ls	$10,000.00	$10,000.00
5	Remove existing 8" pipe	1,560	lf	$25.00	$39,000.00
6	Remove existing sewer manhole	5	ea	$3,000.00	$15,000.00
7	Furnish and install new 10" pipe	1,560	lf	$60.00	$93,600.00
8	Connect to existing mahole	2	ea	$2,500.00	$5,000.00
9	Furnish and install new 4' manhole	4		$4,500.00	$18,000.00
10	Furnish and install new 5' manhole	1		$5,500.00	$5,500.00
11	Connect existing sewer lateral to new line	15	ea	$1,500.00	$22,500.00
12	Asphalt patching	15,600	sf	$5.00	$78,000.00
13	Clean and camera	1,560	lf	$6.00	$9,360.00
				Subtotal	**$392,960.00**
				20%± Engineering & Contingency	**$78,592.00**
				TOTAL =	**$471,552.00**

Note: This existing 8" diameter sewer line has insufficient capacity under future conditions. Recommendation-Increase pipe size from 8" to 10" to Central Weber interceptor line.

	Total	**$471,552.00**
0%	**Existing Deficiency**	**$0.00**
	IMPACT FEE ELIGIBLE COST =	**$471,552.00**

Growth Project 9

New Public Works Facility

Date: October 2021

Concept Cost Estimate

Location:
1776 North 750 West

Item	Description	Qty	Unit	Unit Price	Total
1	Reports and studies	1	ls	$15,000.00	$15,000.00
2	Site utilities and site work	1	ls	$967,800.00	$967,800.00
3	Salt shed	1,600	sf	$120.00	$192,000.00
4	Soil bins	3,200	sf	$98.00	$313,600.00
5	Vehicle/equipment storage	4,000	sf	$150.00	$600,000.00
6	Shop building	9,600	sf	$200.00	$1,920,000.00
7	Office building	3,200	sf	$250.00	$800,000.00
				Subtotal	**$4,808,400.00**
				10%± Professional Services	**$481,000.00**
				15%± Contingency	**$721,000.00**
				TOTAL =	**$6,010,400.00**

Note: Because the proposed facility will serve many different utility departments and activities the cost of the new facility should be distributed proportionately. Funding for the new facility will be a shared burden. This estimate will follow the same funding logic that is included in the storm water capital facilities plan.

While the existing facility is adequate under current circumstances the need for the new facility is due to growth. Therefore, the cost of constructing the new facility should be paid, in part, by new growth. The proportionate share of the cost will be addressed in the Impact Fee Analysis submitted by the city's financial consultant. A credit for the existing public works facility is expected to be considered in the Impact Fee Analysis (IFA).

	Total	**$6,010,400.00**
20%	**Shared Utility Cost**	**$1,202,080.00**
	SEWER DEPARTMENT COST	**$1,202,080.00**

APPENDIX B

SEWER ANALYSIS MODEL REPORT

Element ID	Description	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Peak Flow (gpm)	Max Flow Velocity (ft/sec)	Design Flow Capacity (gpm)	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)	Reported Condition
Link-1000		4236.69	4223.29	6.6200	9.960	25.26	3.13	2192.22	0.08	0.06	Calculated
Link-1001		4222.51	4219.67	0.3700	9.960	24.45	1.15	516.17	0.15	0.12	Calculated
Link-1002		4219.57	4218.48	0.3500	9.960	24.21	1.08	506.47	0.15	0.12	Calculated
Link-1003		4218.18	4215.34	0.5900	9.960	24.04	1.29	653.28	0.13	0.11	Calculated
Link-1004		4215.79	4212.49	0.7700	9.960	23.95	1.42	750.14	0.12	0.10	Calculated
Link-1005		4217.78	4215.66	0.6400	9.960	0.00	0.00	560.59	0.00	0.00	Calculated
Link-1006		4216.35	4215.31	0.2700	9.960	0.00	0.00	444.47	0.00	0.00	Calculated
Link-1007		4215.11	4214.33	0.2900	9.960	0.00	0.00	351.55	0.00	0.00	Calculated
Link-1008		4214.66	4214.29	0.1700	15.000	79.55	1.21	1012.24	0.19	0.23	Calculated
Link-1009		4214.30	4214.05	0.1400	15.000	76.91	1.06	924.21	0.19	0.24	Calculated
Link-1010	inlet_calculated	4215.68	4214.26	0.5000	15.000	0.00	0.00	1774.24	0.00	0.00	Calculated
Link-1011		4213.86	4213.66	0.0800	15.000	76.48	0.87	690.59	0.22	0.28	Calculated
Link-1012		4213.51	4213.10	0.1400	15.000	81.92	1.07	924.95	0.20	0.25	Calculated
Link-1013		4212.97	4212.49	0.1600	15.000	81.59	1.12	995.83	0.19	0.24	Calculated
Link-1014	Assumed_30"CWSID_PipeInverts	4226.51	4215.46	1.8300	15.000	176.96	3.28	3397.10	0.15	0.19	Calculated
Link-1015		4246.49	4245.92	0.2300	9.960	436.62	1.97	404.39	0.92	0.77	> CAPACITY
Link-1016		4253.48	4252.64	0.3100	9.960	120.44	1.62	475.46	0.34	0.29	Calculated
Link-1017	inlet_calculated	4276.43	4276.24	0.4900	8.040	0.00	0.00	200.69	0.00	0.00	Calculated
Link-1018		4265.07	4264.42	0.4800	9.960	0.00	0.00	579.85	0.00	0.00	Calculated
Link-1019		4264.44	4263.78	0.6100	9.960	0.00	0.00	643.10	0.00	0.00	Calculated
Link-1020		4260.82	4260.25	0.5400	9.960	69.40	1.70	615.28	0.22	0.19	Calculated
Link-1021		4230.03	4229.84	0.1400	8.040	0.00	0.00	175.37	0.00	0.00	Calculated
Link-1022		4232.89	4232.06	0.5100	8.040	0.00	0.00	336.08	0.00	0.00	Calculated
Link-1023		4227.60	4227.14	0.2000	30.000	323.04	1.70	7210.99	0.14	0.36	Calculated
Link-1024		4224.30	4222.79	0.4400	8.040	77.67	1.66	312.22	0.34	0.23	Calculated
Link-1025		4236.35	4233.76	2.0500	9.960	121.70	2.19	719.96	0.28	0.23	Calculated
Link-1026	slope_was_negative_made_zero	4237.62	4237.25	1.1200	9.960	121.71	2.57	902.99	0.25	0.21	Calculated
Link-1028		4246.97	4245.55	1.1600	8.040	45.46	2.01	507.21	0.20	0.13	Calculated
Link-1029		4257.60	4257.20	0.5300	8.040	0.00	0.00	342.94	0.00	0.00	Calculated
Link-1032		4247.01	4245.82	0.4500	8.040	0.00	0.00	315.89	0.00	0.00	Calculated
Link-1033		4245.47	4245.15	0.2600	8.040	0.00	0.00	240.70	0.00	0.00	Calculated
Link-1034	inlet_calculated	4246.55	4246.00	0.5000	8.040	0.00	0.00	331.91	0.00	0.00	Calculated
Link-1035		4259.73	4258.91	0.2500	9.960	0.00	0.00	422.17	0.00	0.00	Calculated
Link-1036		4258.71	4258.67	0.2800	9.960	0.00	0.00	449.03	0.00	0.00	Calculated
Link-1038	changed_invert_elev_from_4217.12_to_4218.55_to_elim_reverse	4218.55	4218.18	1.4600	8.040	0.00	0.00	520.22	0.00	0.00	Calculated
Link-1039		4246.35	4241.12	1.3000	8.040	108.96	1.95	333.21	0.39	0.26	Calculated
Link-1040		4261.57	4258.32	1.9100	8.040	0.00	0.00	649.84	0.00	0.00	Calculated
Link-1041		4255.63	4254.96	0.5000	8.040	0.00	0.00	332.80	0.00	0.00	Calculated
Link-1042		4256.55	4255.83	0.6300	8.040	0.00	0.00	372.24	0.00	0.00	Calculated
Link-1043		4259.42	4258.64	0.9200	9.960	0.00	0.00	817.05	0.00	0.00	Calculated
Link-1044		4250.14	4250.11	0.2900	8.040	0.00	0.00	253.44	0.00	0.00	Calculated
Link-1045		4262.03	4261.38	0.6600	9.960	167.36	2.32	688.70	0.34	0.28	Calculated
Link-1046	inlet_calculated	4253.48	4252.79	0.5000	8.040	0.00	0.00	332.40	0.00	0.00	Calculated
Link-1047	invert_elevations_assumed	4252.99	4251.37	0.5000	9.960	0.00	0.00	603.28	0.00	0.00	Calculated
Link-1048	inlet_Calculated	4257.09	4256.05	0.5000	8.040	0.00	0.00	65.24	0.00	0.00	Calculated
Link-1049	inlet_calculated	4238.20	4238.05	0.5100	9.960	0.00	0.00	607.01	0.00	0.00	Calculated
Link-1050	inlet_calculated	4237.78	4237.05	0.5000	8.040	0.00	0.00	333.36	0.00	0.00	Calculated
Link-1051	inlet_calculated	4238.62	4238.24	0.5100	8.040	0.00	0.00	93.86	0.00	0.00	Calculated
Link-1052		4242.12	4240.26	0.5400	8.040	0.00	0.00	342.25	0.00	0.00	Calculated
Link-1053	elevations_assumed	4244.19	4243.85	0.5000	8.040	0.00	0.00	332.16	0.00	0.00	Calculated
Link-1055		4230.94	4230.54	0.2500	15.000	290.95	1.85	1253.92	0.33	0.41	Calculated
Link-1056		4230.30	4230.00	0.3600	15.000	290.94	2.12	1507.88	0.30	0.37	Calculated
Link-1057		4229.86	4228.76	0.2800	15.000	290.94	1.93	1321.05	0.32	0.40	Calculated
Link-1058	inlet_calculated	4268.81	4267.90	0.5000	8.040	0.00	0.00	331.79	0.00	0.00	Calculated
Link-1059	inlet_calculated	4263.77	4263.06	0.5000	8.040	0.00	0.00	240.36	0.00	0.00	Calculated
Link-1060		4255.39	4254.63	0.3400	9.960	1.76	0.44	446.35	0.05	0.04	Calculated
Link-1061		4258.00	4256.46	0.3800	9.960	0.00	0.00	525.05	0.00	0.00	Calculated
Link-1062		4249.31	4247.78	0.7900	30.000	38.34	1.45	14169.19	0.04	0.10	Calculated
Link-1063		4247.58	4236.67	0.7900	30.000	38.33	1.46	14180.22	0.04	0.10	Calculated
Link-1066		4222.19	4219.72	0.6400	30.000	349.06	2.56	12784.45	0.11	0.28	Calculated
Link-1067	inverts_pulled_from_manhole_in	4261.50	4258.31	1.1300	8.040	81.01	2.36	499.30	0.27	0.18	Calculated
Link-1068		4256.14	4255.21	0.6000	8.040	21.22	1.30	363.83	0.16	0.11	Calculated
Link-1069		4252.45	4246.35	4.6300	8.040	27.18	2.81	1011.98	0.11	0.08	Calculated

Element ID	Description	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Peak Flow (gpm)	Max Flow Velocity (ft/sec)	Design Flow Capacity (gpm)	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)	Reported Condition
Link-1070	Assumed_30"CWSID_PipeInverts	4215.26	4213.54	0.1000	30.000	176.90	1.14	5051.63	0.13	0.32	Calculated
Link-1071	Assumed_30"CWSID_PipeInverts	4213.34	4211.78	0.1000	30.000	287.02	1.26	5041.19	0.16	0.40	Calculated
Link-1072	Assumed_30"CWSID_PipeInverts	4211.57	4209.99	0.1000	30.000	285.73	1.25	5044.51	0.16	0.40	Calculated
Link-1073		4251.39	4249.51	0.7900	30.000	31.79	1.42	14193.00	0.03	0.09	Calculated
Link-1074	Flowline_Calculated	4272.16	4270.29	0.5000	8.040	0.00	0.00	332.35	0.00	0.00	Calculated
Link-1075		4265.43	4264.63	0.2300	8.040	0.00	0.00	169.39	0.00	0.00	Calculated
Link-1076		4264.59	4262.67	0.5500	8.040	0.00	0.00	487.69	0.00	0.00	Calculated
Link-1077		4262.63	0.00	3306.9300	8.040	0.00	0.00	507.07	0.00	0.00	Calculated
Link-1078	elevations_assumed	4291.15	4273.08	0.5000	30.000	0.00	0.00	11280.61	0.00	0.00	Calculated
Link-1079		0.00	0.00	0.0000	30.000	66.03	1.86	13404.26	0.05	0.12	Calculated
Link-1080		0.00	0.00	0.0000	30.000	85.77	1.70	12971.68	0.06	0.15	Calculated
Link-1081		0.00	0.00	0.0000	30.000	124.22	2.00	13296.83	0.07	0.17	Calculated
Link-1082	calculated	4245.57	4238.77	0.3500	30.000	145.54	1.61	9468.12	0.09	0.22	Calculated
Link-1123		4224.23	4222.92	0.3300	30.000	350.58	2.05	9173.03	0.13	0.33	Calculated
Link-1124		0.00	0.00	0.0000	18.000	129.86	43.91	276693.88	0.02	0.03	Calculated
Link-1125		4222.34	4222.00	0.2600	18.000	438.93	2.09	2087.23	0.31	0.47	Calculated
Link-1127		4261.13	4251.59	0.7900	30.000	34.23	1.60	14184.14	0.03	0.09	Calculated
Link-1128		4219.72	4210.00	1.0000	30.000	367.57	3.00	15944.31	0.11	0.27	Calculated
Link-1130		4209.79	4209.78	0.0100	30.000	640.17	0.62	1393.74	0.48	1.19	Calculated
Link-1133		4238.57	0.00	3658.3500	30.000	153.28	0.19	468.74	0.39	0.98	Calculated
Link-487		4249.10	4248.21	0.3900	8.040	0.00	0.00	292.93	0.00	0.00	Calculated
Link-488		4248.89	4247.91	0.5900	8.040	7.46	0.95	362.17	0.10	0.07	Calculated
Link-489		4247.79	4247.43	0.2300	8.040	22.35	1.02	226.35	0.21	0.14	Calculated
Link-490		4270.70	4269.73	0.6200	8.040	0.00	0.00	368.64	0.00	0.00	Calculated
Link-491		4269.72	4269.16	0.6900	8.040	0.00	0.00	333.66	0.00	0.00	Calculated
Link-492		4269.31	4268.75	0.4200	8.040	0.00	0.00	282.89	0.00	0.00	Calculated
Link-493		4268.83	4268.48	0.2600	8.040	0.00	0.00	240.05	0.00	0.00	Calculated
Link-494		4268.40	4267.91	0.6300	8.040	0.00	0.00	339.99	0.00	0.00	Calculated
Link-495		4267.99	4267.82	0.2500	8.040	0.00	0.00	234.34	0.00	0.00	Calculated
Link-496		4267.69	4267.26	0.4700	8.040	0.00	0.00	323.67	0.00	0.00	Calculated
Link-497		4267.24	4267.00	0.2700	8.040	0.00	0.00	243.41	0.00	0.00	Calculated
Link-498		4266.87	4266.46	0.3500	8.040	0.00	0.00	279.10	0.00	0.00	Calculated
Link-499		4266.42	4265.23	0.5200	8.040	0.00	0.00	302.34	0.00	0.00	Calculated
Link-500		4269.87	4268.97	0.3000	8.040	0.00	0.00	257.36	0.00	0.00	Calculated
Link-501		4277.11	4276.76	0.1600	8.040	0.00	0.00	179.01	0.00	0.00	Calculated
Link-502		4276.80	4276.21	0.4800	8.040	0.00	0.00	309.30	0.00	0.00	Calculated
Link-503		4276.35	4276.00	0.8900	8.040	0.00	0.00	444.45	0.00	0.00	Calculated
Link-504		4275.90	4275.22	0.4400	8.040	0.00	0.00	310.20	0.00	0.00	Calculated
Link-505		4278.09	4277.48	0.6000	8.040	0.00	0.00	365.00	0.00	0.00	Calculated
Link-506		4277.85	4277.53	0.9600	8.040	0.00	0.00	460.44	0.00	0.00	Calculated
Link-507		4277.40	4276.38	0.4700	8.040	0.00	0.00	321.14	0.00	0.00	Calculated
Link-508		4272.84	4271.80	0.4500	8.040	0.00	0.00	313.71	0.00	0.00	Calculated
Link-509		4272.21	4271.65	0.4400	8.040	0.00	0.00	313.53	0.00	0.00	Calculated
Link-510		4271.63	4271.04	0.4500	8.040	0.00	0.00	316.64	0.00	0.00	Calculated
Link-511		4270.96	4270.58	0.6100	8.040	0.00	0.00	315.10	0.00	0.00	Calculated
Link-512		4276.08	4274.85	1.4000	8.040	0.00	0.00	556.04	0.00	0.00	Calculated
Link-513		4274.85	4270.68	2.9500	8.040	0.00	0.00	806.85	0.00	0.00	Calculated
Link-514		4277.06	4275.56	0.4800	8.040	0.00	0.00	325.52	0.00	0.00	Calculated
Link-515		4275.50	4273.73	1.4700	8.040	0.00	0.00	526.24	0.00	0.00	Calculated
Link-516		4274.43	4274.07	0.3200	8.040	0.00	0.00	267.37	0.00	0.00	Calculated
Link-517		4270.62	4269.43	0.4100	8.040	0.00	0.00	287.31	0.00	0.00	Calculated
Link-518		4273.99	4272.57	0.7200	8.040	0.00	0.00	399.58	0.00	0.00	Calculated
Link-519	inlet_calculated	4273.24	4272.77	0.4000	8.040	0.00	0.00	296.90	0.00	0.00	Calculated
Link-520		4272.45	4269.63	2.1200	8.040	0.00	0.00	683.84	0.00	0.00	Calculated
Link-521		4271.41	4271.23	0.3800	8.040	0.00	0.00	289.00	0.00	0.00	Calculated
Link-522		4270.93	4269.90	0.5000	8.040	0.00	0.00	333.47	0.00	0.00	Calculated
Link-523		4276.36	4276.17	0.2100	9.960	0.00	0.00	265.70	0.00	0.00	Calculated
Link-524		4276.27	4275.26	0.4600	9.960	0.00	0.00	575.65	0.00	0.00	Calculated
Link-525		4275.11	4274.63	0.2500	9.960	0.00	0.00	390.08	0.00	0.00	Calculated
Link-526		4274.70	4273.95	0.2900	9.960	0.00	0.00	440.16	0.00	0.00	Calculated
Link-527		4274.01	4273.53	0.2900	9.960	0.00	0.00	460.10	0.00	0.00	Calculated
Link-528		4273.48	4272.88	0.2600	9.960	0.00	0.00	433.97	0.00	0.00	Calculated
Link-529		4269.68	4269.47	0.1100	9.960	0.00	0.00	285.16	0.00	0.00	Calculated
Link-530		4269.32	4269.26	0.1800	9.960	0.00	0.00	253.68	0.00	0.00	Calculated

Element ID	Description	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Peak Flow (gpm)	Max Flow Velocity (ft/sec)	Design Flow Capacity (gpm)	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)	Reported Condition
Link-531		4269.35	4268.99	0.3400	9.960	0.00	0.00	480.36	0.00	0.00	Calculated
Link-532		4269.59	4268.91	0.3000	9.960	67.22	1.50	429.73	0.26	0.22	Calculated
Link-533		4269.01	4268.62	0.3100	9.960	64.02	1.41	475.44	0.25	0.21	Calculated
Link-534		4268.50	4268.25	0.6400	9.960	63.70	1.59	594.18	0.22	0.18	Calculated
Link-535		4268.31	4267.67	0.2400	9.960	63.94	1.30	419.45	0.26	0.22	Calculated
Link-536		4267.65	4266.88	0.2900	9.960	63.92	1.36	458.30	0.25	0.21	Calculated
Link-537		4268.90	4268.22	0.2600	9.960	0.00	0.00	433.33	0.00	0.00	Calculated
Link-538		4267.94	4267.88	0.0600	9.960	0.00	0.00	203.71	0.00	0.00	Calculated
Link-539		4267.70	4267.00	0.2200	9.960	0.00	0.00	400.73	0.00	0.00	Calculated
Link-540		4266.78	4266.63	0.2200	9.960	63.81	1.20	402.84	0.27	0.22	Calculated
Link-541		4266.57	4266.26	0.3400	9.960	63.71	1.40	496.84	0.24	0.20	Calculated
Link-542		4266.22	4265.88	0.4100	9.960	63.68	1.26	428.00	0.26	0.22	Calculated
Link-543		4266.01	4265.51	0.5100	9.960	63.64	1.61	606.72	0.22	0.18	Calculated
Link-544		4260.14	4259.67	0.6300	8.040	0.00	0.00	372.31	0.00	0.00	Calculated
Link-545		4259.65	4259.38	0.2000	8.040	0.00	0.00	210.36	0.00	0.00	Calculated
Link-546		4259.30	4259.30	0.0000	8.040	0.00	0.00	13.06	0.00	0.00	Calculated
Link-547		4258.72	4257.78	0.4600	8.040	0.00	0.00	280.16	0.00	0.00	Calculated
Link-548		4258.58	4258.00	0.2600	8.040	0.00	0.00	241.46	0.00	0.00	Calculated
Link-549		4262.08	4260.99	0.5000	8.040	0.00	0.00	332.56	0.00	0.00	Calculated
Link-550		4267.65	4266.51	0.3800	8.040	0.00	0.00	290.10	0.00	0.00	Calculated
Link-551		4260.95	4260.49	0.4400	8.040	0.00	0.00	310.12	0.00	0.00	Calculated
Link-552		4261.81	4261.13	0.6200	8.040	0.00	0.00	369.51	0.00	0.00	Calculated
Link-553		4266.55	4265.72	0.4200	8.040	0.00	0.00	304.32	0.00	0.00	Calculated
Link-554		4265.68	4264.98	0.6400	8.040	0.00	0.00	350.25	0.00	0.00	Calculated
Link-555		4265.62	4264.82	0.6500	8.040	0.00	0.00	315.18	0.00	0.00	Calculated
Link-556		4265.47	4264.16	0.4200	8.040	141.99	2.05	299.77	0.48	0.32	Calculated
Link-557		4264.19	4263.51	0.4200	8.040	141.48	1.94	303.04	0.48	0.32	Calculated
Link-558		4263.82	4263.38	0.5000	8.040	0.00	0.00	293.00	0.00	0.00	Calculated
Link-559		4264.48	4264.06	0.3500	8.040	0.00	0.00	277.92	0.00	0.00	Calculated
Link-560		4264.02	4263.48	0.5100	8.040	0.00	0.00	335.33	0.00	0.00	Calculated
Link-561		4263.84	4262.70	0.3400	8.040	0.00	0.00	275.88	0.00	0.00	Calculated
Link-562		4262.52	4260.68	0.5600	8.040	0.00	0.00	346.57	0.00	0.00	Calculated
Link-563		4263.33	4262.09	0.3900	8.040	0.00	0.00	291.79	0.00	0.00	Calculated
Link-564		4261.83	4260.82	0.3500	8.040	0.00	0.00	276.63	0.00	0.00	Calculated
Link-565		4260.60	4260.03	0.8800	8.040	0.00	0.00	416.69	0.00	0.00	Calculated
Link-566		4260.65	4259.94	0.6000	8.040	0.00	0.00	365.41	0.00	0.00	Calculated
Link-567		4259.49	4259.37	0.1500	8.040	0.00	0.00	184.29	0.00	0.00	Calculated
Link-568		4257.06	4256.12	0.2600	8.040	251.43	1.74	232.48	0.95	0.63	> CAPACITY
Link-569		4256.19	4252.78	1.0900	8.040	247.59	3.18	491.39	0.50	0.33	Calculated
Link-570		4258.60	4257.61	0.2300	9.960	1.86	0.05	12.91	0.24	0.20	Calculated
Link-571		4257.55	4256.36	0.3600	9.960	1.78	0.75	696.88	0.04	0.03	Calculated
Link-572		4256.29	4255.59	0.3100	9.960	1.77	0.48	476.37	0.04	0.04	Calculated
Link-573		4254.77	4254.57	0.2900	9.960	1.76	0.44	455.52	0.05	0.04	Calculated
Link-574		4254.57	4253.98	0.2300	9.960	1.75	0.41	409.93	0.05	0.04	Calculated
Link-575		4253.93	4253.37	0.3100	9.960	1.75	0.46	477.75	0.04	0.04	Calculated
Link-576		4260.01	4259.42	0.1800	9.960	0.00	0.00	363.33	0.00	0.00	Calculated
Link-577		4260.72	4260.20	0.2300	9.960	0.00	0.00	406.83	0.00	0.00	Calculated
Link-578		4261.01	4260.82	0.1400	9.960	0.00	0.00	313.70	0.00	0.00	Calculated
Link-579		4261.48	4261.10	0.3500	9.960	0.00	0.00	503.96	0.00	0.00	Calculated
Link-580		4260.83	4259.99	0.3000	9.960	0.00	0.00	470.52	0.00	0.00	Calculated
Link-581		4259.81	4259.39	0.1900	9.960	0.00	0.00	368.80	0.00	0.00	Calculated
Link-582		4259.07	4258.62	0.2100	9.960	0.00	0.00	358.23	0.00	0.00	Calculated
Link-583		4258.69	4258.42	0.2400	9.960	0.00	0.00	420.66	0.00	0.00	Calculated
Link-584		4263.48	4263.10	0.2100	9.960	167.71	1.32	311.03	0.52	0.44	Calculated
Link-585		4263.24	4262.58	0.2900	9.960	167.64	1.72	455.87	0.42	0.35	Calculated
Link-586		4263.28	4262.54	0.5000	9.960	0.00	0.00	600.06	0.00	0.00	Calculated
Link-587		4262.31	4262.10	0.1000	9.960	167.46	1.17	270.10	0.57	0.47	Calculated
Link-588		4262.89	4262.39	0.5000	9.960	0.00	0.00	553.61	0.00	0.00	Calculated
Link-589		4262.47	4261.50	0.3200	9.960	0.00	0.00	479.84	0.00	0.00	Calculated
Link-590		4261.39	4261.28	0.0400	9.960	194.57	0.87	180.09	0.92	0.76	> CAPACITY
Link-591		4260.74	4260.15	0.2500	9.960	204.69	1.77	422.47	0.49	0.41	Calculated
Link-592		4260.09	4259.89	0.2100	9.960	219.12	1.64	386.14	0.54	0.45	Calculated
Link-593		4259.71	4259.44	0.3200	9.960	218.82	1.88	467.04	0.48	0.40	Calculated
Link-594		4259.46	4258.40	0.3400	9.960	217.57	1.97	497.07	0.46	0.38	Calculated

Element ID	Description	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Peak Flow (gpm)	Max Flow Velocity (ft/sec)	Design Flow Capacity (gpm)	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)	Reported Condition
Link-595		4258.24	4257.93	0.2700	9.960	248.45	1.85	439.30	0.54	0.45	Calculated
Link-596		4257.87	4257.27	0.4100	9.960	248.20	2.17	543.85	0.47	0.39	Calculated
Link-597		4257.93	4256.94	0.3700	9.960	0.00	0.00	488.55	0.00	0.00	Calculated
Link-598		4251.82	4251.64	0.0900	9.960	148.29	1.12	259.71	0.54	0.45	Calculated
Link-599		4251.30	4249.29	0.5800	9.960	148.24	2.15	648.09	0.33	0.27	Calculated
Link-600		4249.27	4248.54	0.2300	9.960	166.73	1.61	413.09	0.44	0.37	Calculated
Link-601		4248.40	4247.63	0.2500	9.960	456.91	2.04	426.86	0.92	0.77	> CAPACITY
Link-602		4247.50	4246.94	0.1800	9.960	393.49	1.77	363.75	1.00	0.83	SURCHARGED
Link-603		4245.86	4245.51	0.4200	9.960	432.75	2.53	555.02	0.66	0.55	Calculated
Link-604		4249.33	4247.95	0.4400	12.000	162.68	1.97	902.97	0.29	0.29	Calculated
Link-605		4248.00	4247.10	0.3000	12.000	193.79	1.81	752.93	0.35	0.35	Calculated
Link-606		4246.78	4245.68	0.3600	12.000	203.60	1.79	735.68	0.36	0.36	Calculated
Link-607		4245.92	4244.95	0.4300	12.000	204.49	2.05	889.07	0.33	0.33	Calculated
Link-608		4245.00	4244.21	0.3200	12.000	204.50	1.87	784.70	0.35	0.35	Calculated
Link-609		4244.07	4238.61	3.9300	12.000	204.50	1.99	856.45	0.33	0.33	Calculated
Link-610		4243.54	4242.55	0.6200	12.000	204.49	2.37	1093.16	0.29	0.29	Calculated
Link-611		4244.85	4243.53	0.5600	9.960	437.17	2.85	640.29	0.61	0.50	Calculated
Link-612		4242.44	4242.29	0.0900	9.960	269.03	1.20	248.63	1.00	0.83	SURCHARGED
Link-613		4242.15	4242.14	0.0100	9.960	93.50	0.42	86.41	1.00	0.83	SURCHARGED
Link-614		4242.06	4241.89	0.2600	15.000	93.30	1.32	1193.50	0.19	0.23	Calculated
Link-615		4246.54	4245.57	0.2300	9.960	0.00	0.00	412.91	0.00	0.00	Calculated
Link-616		4249.01	4247.76	0.3000	9.960	0.00	0.00	468.48	0.00	0.00	Calculated
Link-617		4251.17	4248.69	0.6000	9.960	0.00	0.00	615.38	0.00	0.00	Calculated
Link-618		4249.77	4247.47	0.5700	9.960	0.00	0.00	643.72	0.00	0.00	Calculated
Link-619		4247.44	4245.48	0.5000	9.960	0.00	0.00	603.22	0.00	0.00	Calculated
Link-620		4258.11	4258.01	0.2100	9.960	80.94	1.26	390.27	0.31	0.26	Calculated
Link-621		4258.01	4257.66	0.2500	9.960	80.95	1.18	357.78	0.32	0.27	Calculated
Link-622		4257.76	4257.02	0.4700	9.960	115.89	1.87	586.18	0.30	0.25	Calculated
Link-623		4256.79	4256.08	0.2600	9.960	116.00	1.51	436.47	0.35	0.29	Calculated
Link-624		4256.00	4255.77	0.2000	9.960	115.91	1.38	384.95	0.38	0.31	Calculated
Link-625	inlet_invert_calculated	4255.57	4254.19	0.3400	9.960	115.90	1.65	493.45	0.33	0.27	Calculated
Link-626		4254.48	4253.64	0.3200	9.960	115.86	0.80	182.47	0.58	0.48	Calculated
Link-627		4254.36	4253.54	0.6300	9.960	120.39	2.08	674.94	0.29	0.24	Calculated
Link-628		4252.50	4251.64	0.3000	9.960	120.43	1.48	416.87	0.37	0.31	Calculated
Link-629		4258.87	4257.99	0.3500	9.960	0.00	0.00	503.25	0.00	0.00	Calculated
Link-630		4257.97	4256.91	0.4200	9.960	0.00	0.00	550.18	0.00	0.00	Calculated
Link-631		4256.77	4251.66	1.7900	9.960	0.00	0.00	1121.53	0.00	0.00	Calculated
Link-632		4266.29	4262.81	0.7100	9.960	0.00	0.00	715.73	0.00	0.00	Calculated
Link-633		4262.77	4261.68	0.2900	9.960	0.00	0.00	462.66	0.00	0.00	Calculated
Link-634		4261.24	4260.70	0.1800	9.960	72.55	1.25	318.79	0.31	0.26	Calculated
Link-635		4260.27	4259.72	0.3700	9.960	67.12	1.35	445.38	0.26	0.22	Calculated
Link-636		4259.86	4258.61	0.3300	9.960	134.34	1.85	491.20	0.36	0.30	Calculated
Link-637		4258.53	4257.79	0.3300	9.960	133.86	1.51	400.94	0.40	0.33	Calculated
Link-638		4258.03	4257.13	0.3900	9.960	133.63	1.83	535.10	0.34	0.28	Calculated
Link-639		4257.05	4256.38	0.3900	9.960	133.41	1.62	456.86	0.37	0.31	Calculated
Link-640		4256.55	4255.92	0.2400	9.960	133.34	1.52	418.48	0.39	0.32	Calculated
Link-641		4267.78	4266.11	0.4400	8.040	0.00	0.00	310.62	0.00	0.00	Calculated
Link-642		4266.05	4264.38	0.4200	8.040	0.00	0.00	306.22	0.00	0.00	Calculated
Link-643		4264.24	4262.60	0.5400	8.040	0.00	0.00	346.93	0.00	0.00	Calculated
Link-644		4264.07	4262.42	0.5200	8.040	0.00	0.00	325.47	0.00	0.00	Calculated
Link-645		4262.56	4258.88	1.2000	8.040	20.73	1.72	447.84	0.14	0.09	Calculated
Link-646		4259.78	4257.64	0.7400	8.040	19.44	1.40	392.75	0.15	0.10	Calculated
Link-647		4266.77	4264.24	0.7800	8.040	0.00	0.00	330.41	0.00	0.00	Calculated
Link-648		4265.17	4261.70	1.3100	8.040	0.00	0.00	537.59	0.00	0.00	Calculated
Link-649		4268.70	4266.75	0.4900	8.040	0.00	0.00	327.77	0.00	0.00	Calculated
Link-650		4266.71	4263.09	0.9000	8.040	0.00	0.00	446.31	0.00	0.00	Calculated
Link-652		0.00	4271.52	-3021.5200	8.040	0.00	0.00	377.13	0.00	0.00	Calculated
Link-653		4272.80	4271.76	0.8200	8.040	10.37	1.32	426.87	0.11	0.07	Calculated
Link-654		4271.72	4270.97	0.4400	8.040	10.32	0.98	313.56	0.12	0.08	Calculated
Link-655		4270.97	4270.01	0.3900	8.040	10.22	0.94	294.66	0.13	0.08	Calculated
Link-656		4269.95	4269.59	0.4500	8.040	10.20	0.95	315.78	0.12	0.08	Calculated
Link-657		4269.41	4268.80	0.3400	8.040	10.18	0.87	275.37	0.13	0.09	Calculated
Link-658		4268.54	4264.83	2.0100	8.040	10.18	1.57	666.94	0.09	0.06	Calculated
Link-659		4264.36	4263.31	0.3500	8.040	48.86	1.42	279.78	0.28	0.19	Calculated

Element ID	Description	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Peak Flow (gpm)	Max Flow Velocity (ft/sec)	Design Flow Capacity (gpm)	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)	Reported Condition
Link-660		4263.07	4262.02	0.3600	8.040	65.54	1.49	280.90	0.33	0.22	Calculated
Link-661		4269.56	4267.28	0.8500	8.040	0.00	0.00	433.33	0.00	0.00	Calculated
Link-662		4267.20	4265.96	0.4000	8.040	8.48	1.00	296.99	0.11	0.07	Calculated
Link-663		4265.78	4262.58	1.0400	8.040	17.60	1.15	318.84	0.16	0.11	Calculated
Link-671		4267.71	4265.86	0.4800	8.040	0.00	0.00	324.09	0.00	0.00	Calculated
Link-672		4252.58	4251.77	0.5000	8.040	247.58	2.33	332.45	0.64	0.43	Calculated
Link-673		4251.61	4250.22	0.4200	8.040	247.60	2.28	322.45	0.66	0.44	Calculated
Link-674		4250.05	4248.56	0.4600	8.040	247.61	2.27	319.89	0.66	0.44	Calculated
Link-675		4254.42	4253.94	0.5000	8.040	0.00	0.00	296.12	0.00	0.00	Calculated
Link-676		4254.54	4254.22	0.3300	8.040	0.00	0.00	268.77	0.00	0.00	Calculated
Link-677		4253.68	4253.09	0.5700	8.040	0.00	0.00	329.90	0.00	0.00	Calculated
Link-678		4254.04	4253.14	0.3400	8.040	0.00	0.00	267.99	0.00	0.00	Calculated
Link-679		4253.17	4249.47	1.3700	8.040	0.00	0.00	549.19	0.00	0.00	Calculated
Link-680		4251.14	4250.66	0.4900	8.040	0.00	0.00	327.52	0.00	0.00	Calculated
Link-681		4250.66	4249.53	0.4100	8.040	133.09	1.87	301.50	0.47	0.31	Calculated
Link-682		4250.46	4247.97	0.6300	8.040	0.00	0.00	370.73	0.00	0.00	Calculated
Link-683		4249.28	4247.38	0.5000	8.040	0.00	0.00	331.81	0.00	0.00	Calculated
Link-684		4252.91	4252.00	0.5600	8.040	0.00	0.00	325.97	0.00	0.00	Calculated
Link-685		4252.13	4250.74	0.5700	8.040	0.00	0.00	354.51	0.00	0.00	Calculated
Link-686		4251.32	4250.83	0.3200	8.040	0.00	0.00	266.16	0.00	0.00	Calculated
Link-687		4250.60	4249.74	0.4300	8.040	14.57	1.18	308.27	0.14	0.10	Calculated
Link-688		4249.55	4248.55	0.2700	8.040	14.14	0.93	242.28	0.16	0.11	Calculated
Link-689		4248.35	4246.87	0.4000	8.040	13.92	1.02	296.78	0.15	0.10	Calculated
Link-690		4251.43	4249.99	0.3900	8.040	0.00	0.00	277.37	0.00	0.00	Calculated
Link-691		4250.13	4247.65	0.6700	8.040	0.00	0.00	385.57	0.00	0.00	Calculated
Link-692		4255.93	4253.99	0.4800	8.040	133.24	1.99	327.11	0.44	0.30	Calculated
Link-693		4253.86	4252.90	0.3700	8.040	133.18	1.77	280.06	0.49	0.32	Calculated
Link-694		4252.95	4251.64	0.4400	8.040	133.14	1.91	311.66	0.46	0.30	Calculated
Link-695		4251.40	4250.56	0.2600	8.040	133.11	1.50	225.66	0.55	0.37	Calculated
Link-696		4252.32	4251.40	0.8800	8.040	0.00	0.00	440.92	0.00	0.00	Calculated
Link-697		4253.29	4252.85	0.3000	8.040	0.00	0.00	258.35	0.00	0.00	Calculated
Link-698		4252.71	4252.26	0.2800	8.040	0.00	0.00	248.46	0.00	0.00	Calculated
Link-699		4252.97	4252.13	0.5000	8.040	0.00	0.00	333.93	0.00	0.00	Calculated
Link-700		4252.12	4251.35	0.3000	8.040	0.00	0.00	256.19	0.00	0.00	Calculated
Link-701		4251.28	4250.61	0.2700	8.040	0.00	0.00	243.12	0.00	0.00	Calculated
Link-702		4241.91	4241.41	0.1500	15.000	290.95	1.54	973.55	0.37	0.47	Calculated
Link-703		4241.34	4240.61	0.2000	15.000	290.97	1.70	1112.75	0.35	0.44	Calculated
Link-704		4240.48	4238.96	0.3500	15.000	290.99	1.66	1072.40	0.36	0.44	Calculated
Link-705		4239.70	4239.08	0.1600	15.000	291.00	1.56	990.61	0.37	0.46	Calculated
Link-706		4238.97	4237.73	0.3100	15.000	290.99	2.00	1397.78	0.31	0.39	Calculated
Link-707		4237.72	4236.77	0.2400	15.000	290.98	1.83	1228.82	0.33	0.41	Calculated
Link-708		4236.57	4235.23	0.3400	15.000	290.97	2.06	1454.66	0.30	0.38	Calculated
Link-709		4235.13	4233.54	0.3900	15.000	290.96	2.19	1579.10	0.29	0.36	Calculated
Link-710		4233.34	4232.21	0.2800	15.000	290.96	1.94	1337.73	0.32	0.40	Calculated
Link-711		4232.08	4231.48	0.2800	15.000	290.95	1.94	1340.20	0.32	0.40	Calculated
Link-712		4233.93	4232.59	0.3300	9.960	0.00	0.00	491.33	0.00	0.00	Calculated
Link-713		4232.48	4231.27	0.3000	9.960	0.00	0.00	470.57	0.00	0.00	Calculated
Link-714		4231.10	4229.03	0.3900	9.960	0.00	0.00	530.05	0.00	0.00	Calculated
Link-715		4228.89	4228.68	0.0700	9.960	18.27	0.65	230.48	0.18	0.15	Calculated
Link-716		4234.72	4231.80	0.7200	9.960	0.00	0.00	660.14	0.00	0.00	Calculated
Link-717		4232.27	4227.14	1.2800	9.960	0.00	0.00	964.74	0.00	0.00	Calculated
Link-719		4247.71	4246.75	0.2700	9.960	0.00	0.00	428.90	0.00	0.00	Calculated
Link-720		4246.81	4245.79	0.2900	9.960	0.00	0.00	446.72	0.00	0.00	Calculated
Link-721		4247.53	4247.10	0.5200	9.960	0.00	0.00	614.00	0.00	0.00	Calculated
Link-722		4245.83	4244.61	0.3400	9.960	0.00	0.00	494.63	0.00	0.00	Calculated
Link-723		4244.55	4243.50	0.3000	9.960	0.00	0.00	448.25	0.00	0.00	Calculated
Link-724		4243.57	4242.37	0.3400	9.960	0.00	0.00	498.01	0.00	0.00	Calculated
Link-726		4247.72	4246.01	0.4200	8.040	0.00	0.00	302.60	0.00	0.00	Calculated
Link-727		4246.05	4244.35	0.4300	8.040	0.00	0.00	305.06	0.00	0.00	Calculated
Link-728		4244.37	4242.86	0.3800	8.040	0.00	0.00	279.27	0.00	0.00	Calculated
Link-729		4242.98	4242.96	0.0100	8.040	0.00	0.00	33.31	0.00	0.00	Calculated
Link-730		4242.32	4241.15	0.9500	8.040	108.95	2.40	458.06	0.33	0.22	Calculated
Link-731		4242.98	4240.88	7.4000	9.960	121.62	4.90	2250.75	0.16	0.13	Calculated
Link-732		4241.00	4240.91	0.4700	9.960	121.62	1.89	586.26	0.31	0.26	Calculated

Element ID	Description	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Peak Flow (gpm)	Max Flow Velocity (ft/sec)	Design Flow Capacity (gpm)	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)	Reported Condition
Link-733		4240.75	4240.38	0.4100	9.960	121.62	1.75	525.50	0.33	0.27	Calculated
Link-734		4240.41	4240.38	0.1400	9.960	121.62	1.20	314.08	0.43	0.36	Calculated
Link-735		4240.38	4239.56	0.2600	9.960	121.76	1.39	381.55	0.39	0.32	Calculated
Link-736		4239.75	4238.40	0.3900	9.960	121.75	1.76	530.27	0.33	0.27	Calculated
Link-737		4238.90	4238.90	0.0000	9.960	0.00	0.00	29.75	0.00	0.00	Calculated
Link-738		4239.97	4237.62	0.6400	9.960	121.72	2.10	681.25	0.29	0.24	Calculated
Link-739		4237.25	4236.65	0.2200	9.960	121.71	1.44	402.91	0.38	0.31	Calculated
Link-740		4235.45	4232.31	0.7900	9.960	123.90	2.28	758.77	0.27	0.23	Calculated
Link-741		4233.58	4230.17	0.8300	30.000	78.46	1.85	14293.83	0.05	0.13	Calculated
Link-742		4230.29	4229.68	0.6400	30.000	314.54	2.35	12759.59	0.11	0.28	Calculated
Link-743		4229.48	4227.64	0.5600	30.000	324.00	2.40	11969.48	0.11	0.28	Calculated
Link-744		4251.37	4250.66	0.5000	9.960	0.00	0.00	603.54	0.00	0.00	Calculated
Link-745		4250.53	4249.94	0.1800	9.960	6.96	0.64	322.77	0.10	0.08	Calculated
Link-746		4250.07	4249.07	0.2600	9.960	6.33	0.74	436.55	0.08	0.07	Calculated
Link-747		4249.14	4248.40	0.2700	8.040	0.00	0.00	229.41	0.00	0.00	Calculated
Link-748		4248.49	4247.76	0.3800	8.040	0.00	0.00	291.16	0.00	0.00	Calculated
Link-749		4248.88	4247.97	0.2800	9.960	6.27	0.70	454.08	0.08	0.07	Calculated
Link-750		4258.85	4253.24	1.3400	8.040	0.00	0.00	526.40	0.00	0.00	Calculated
Link-751		4253.61	4252.45	0.5500	8.040	28.06	1.56	348.05	0.19	0.13	Calculated
Link-752		4247.52	4246.40	0.3300	8.040	33.75	1.34	271.36	0.23	0.15	Calculated
Link-753		4244.33	4242.33	0.5000	8.040	108.99	1.93	333.22	0.39	0.26	Calculated
Link-754		4257.96	4253.64	1.6900	8.040	0.00	0.00	611.42	0.00	0.00	Calculated
Link-755		4259.66	4258.56	0.4500	8.040	0.00	0.00	316.64	0.00	0.00	Calculated
Link-756		4258.77	4257.89	0.4700	8.040	0.00	0.00	321.20	0.00	0.00	Calculated
Link-757		4257.81	4256.44	0.4100	8.040	13.19	1.14	300.87	0.14	0.09	Calculated
Link-758		4252.40	4250.86	0.4300	8.040	0.00	0.00	308.18	0.00	0.00	Calculated
Link-759		4257.77	4256.50	0.6300	8.040	0.00	0.00	374.18	0.00	0.00	Calculated
Link-760		4256.14	4255.21	0.5300	8.040	21.20	1.24	342.55	0.17	0.11	Calculated
Link-761		4258.38	4255.22	1.5700	8.040	0.00	0.00	589.50	0.00	0.00	Calculated
Link-762		4254.76	4254.53	0.1000	8.040	33.30	0.81	148.67	0.32	0.21	Calculated
Link-763		4254.39	4246.35	1.4400	8.040	33.20	1.99	564.35	0.16	0.11	Calculated
Link-764		4228.61	4228.07	0.1400	18.000	339.46	1.60	1543.10	0.32	0.48	Calculated
Link-765		4228.02	4227.68	0.1000	18.000	367.54	1.40	1272.84	0.37	0.55	Calculated
Link-766		4227.52	4227.06	0.1100	18.000	367.51	1.46	1351.56	0.36	0.53	Calculated
Link-767		4226.87	4226.22	0.1200	18.000	367.52	1.52	1440.49	0.34	0.52	Calculated
Link-768		4225.86	4225.66	0.0400	18.000	426.25	1.09	861.84	0.50	0.75	Calculated
Link-769		4225.29	4224.37	0.3100	18.000	426.24	2.19	2262.22	0.29	0.44	Calculated
Link-770		4224.19	4222.77	0.3700	18.000	426.23	2.34	2489.68	0.28	0.42	Calculated
Link-772		4227.19	4227.04	0.1500	9.960	47.97	0.98	330.36	0.26	0.21	Calculated
Link-773		4227.04	4226.61	0.2700	9.960	48.05	1.20	445.42	0.22	0.18	Calculated
Link-774		4226.61	4225.86	0.2800	9.960	48.00	1.23	451.94	0.22	0.18	Calculated
Link-775		4230.52	4228.24	0.5800	8.040	0.00	0.00	356.83	0.00	0.00	Calculated
Link-776		4229.11	4228.49	0.1700	8.040	0.00	0.00	193.11	0.00	0.00	Calculated
Link-777		4228.23	4227.81	0.1300	9.960	26.52	0.91	307.00	0.19	0.16	Calculated
Link-778		4229.75	4229.15	0.1600	8.040	0.00	0.00	188.12	0.00	0.00	Calculated
Link-779		4230.19	4230.13	0.0400	8.040	0.00	0.00	94.11	0.00	0.00	Calculated
Link-780		4230.93	4230.65	0.2200	8.040	0.00	0.00	219.00	0.00	0.00	Calculated
Link-781		4230.59	4230.28	0.3200	8.040	0.00	0.00	266.57	0.00	0.00	Calculated
Link-782		4229.64	4228.77	0.2300	8.040	0.00	0.00	226.53	0.00	0.00	Calculated
Link-783		4228.51	4227.65	0.2200	8.040	0.00	0.00	221.94	0.00	0.00	Calculated
Link-784		4233.00	4231.98	0.6400	8.040	0.00	0.00	355.98	0.00	0.00	Calculated
Link-785		4232.08	4230.55	1.0900	8.040	0.00	0.00	485.24	0.00	0.00	Calculated
Link-786		4230.59	4227.65	1.3900	8.040	0.00	0.00	554.20	0.00	0.00	Calculated
Link-787		4238.10	4234.70	1.1300	8.040	0.00	0.00	500.56	0.00	0.00	Calculated
Link-788		4234.56	4233.50	0.5400	8.040	0.00	0.00	345.55	0.00	0.00	Calculated
Link-789		4233.23	4231.54	0.4700	8.040	0.00	0.00	322.37	0.00	0.00	Calculated
Link-790		4231.13	4230.37	0.3200	8.040	25.66	1.26	265.37	0.20	0.14	Calculated
Link-791		4230.28	4229.14	0.3800	8.040	24.21	1.20	288.50	0.20	0.13	Calculated
Link-792		4228.96	4228.56	0.2700	8.040	24.12	1.02	246.03	0.21	0.14	Calculated
Link-793		4233.93	4232.69	0.4900	8.040	0.00	0.00	300.47	0.00	0.00	Calculated
Link-794		4231.96	4231.37	0.4200	8.040	0.00	0.00	302.95	0.00	0.00	Calculated
Link-795		4229.00	4227.81	0.5000	8.040	8.44	1.03	332.00	0.10	0.07	Calculated
Link-796		4229.07	4227.65	0.3700	8.040	64.00	1.50	287.14	0.32	0.21	Calculated
Link-797		4230.52	4229.20	0.3800	8.040	64.10	1.51	289.13	0.32	0.21	Calculated

Element ID	Description	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Peak Flow (gpm)	Max Flow Velocity (ft/sec)	Design Flow Capacity (gpm)	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)	Reported Condition
Link-798		4227.60	4226.46	0.4100	8.040	77.43	1.63	302.50	0.34	0.23	Calculated
Link-799		4227.34	4225.34	0.5000	8.040	0.00	0.00	332.39	0.00	0.00	Calculated
Link-801		4235.80	4234.70	0.2800	8.040	0.00	0.00	249.04	0.00	0.00	Calculated
Link-802		4234.01	4233.78	0.0600	8.040	121.76	0.88	112.56	1.00	0.67	SURCHARGED
Link-803		4235.15	4234.15	0.6100	8.040	205.95	2.42	368.24	0.53	0.36	Calculated
Link-805		4236.21	4235.65	0.3400	8.040	39.45	1.40	272.93	0.25	0.17	Calculated
Link-806		4235.61	4234.86	0.3500	8.040	64.50	1.48	277.17	0.33	0.22	Calculated
Link-807		4234.84	4233.37	0.3800	8.040	62.71	1.53	291.61	0.31	0.21	Calculated
Link-808		4233.26	4232.01	0.3800	8.040	61.68	1.50	288.17	0.31	0.21	Calculated
Link-809		4231.97	4230.67	0.3700	8.040	61.47	1.48	286.78	0.31	0.21	Calculated
Link-810		4233.12	4229.48	1.0400	8.040	0.00	0.00	479.44	0.00	0.00	Calculated
Link-811		4229.40	4227.58	0.4800	8.040	0.00	0.00	327.14	0.00	0.00	Calculated
Link-812		4227.45	4226.47	0.5400	8.040	0.00	0.00	345.73	0.00	0.00	Calculated
Link-813		4226.37	4222.30	1.6700	8.040	0.00	0.00	608.17	0.00	0.00	Calculated
Link-814		4217.82	4215.75	0.7300	8.040	116.53	2.24	402.81	0.37	0.25	Calculated
Link-815		4219.08	4218.02	0.4900	8.040	116.60	1.94	327.60	0.41	0.27	Calculated
Link-816		4225.35	4224.77	0.1500	8.040	77.57	1.13	181.77	0.46	0.30	Calculated
Link-817		4221.99	4221.38	0.1900	8.040	92.69	1.30	206.30	0.47	0.31	Calculated
Link-818		4219.97	4219.32	0.1700	8.040	0.00	0.00	192.11	0.00	0.00	Calculated
Link-819		4222.04	4221.24	0.4200	8.040	0.00	0.00	304.92	0.00	0.00	Calculated
Link-820		4222.25	4221.85	0.1800	8.040	0.00	0.00	144.12	0.00	0.00	Calculated
Link-821		4224.30	4222.69	0.4000	8.040	0.00	0.00	298.55	0.00	0.00	Calculated
Link-824		4222.88	4221.49	0.4000	8.040	0.00	0.00	297.80	0.00	0.00	Calculated
Link-825		4227.14	4224.43	0.7000	30.000	363.60	2.69	13386.99	0.11	0.28	Calculated
Link-826		4229.56	4227.35	0.5200	8.040	0.00	0.00	321.82	0.00	0.00	Calculated
Link-827		4227.55	0.00	1900.9600	8.040	0.00	0.00	402.43	0.00	0.00	Calculated
Link-828		0.00	4223.98	-1424.5700	8.040	0.00	0.00	380.22	0.00	0.00	Calculated
Link-830		4237.02	4236.29	0.4000	8.040	0.00	0.00	259.42	0.00	0.00	Calculated
Link-831		4239.14	4237.80	0.5400	8.040	0.00	0.00	345.24	0.00	0.00	Calculated
Link-832		4237.67	4237.14	0.4000	8.040	0.00	0.00	295.43	0.00	0.00	Calculated
Link-833		4237.04	4235.83	0.4000	8.040	0.00	0.00	297.44	0.00	0.00	Calculated
Link-834		4235.82	4235.01	0.3100	8.040	0.00	0.00	260.66	0.00	0.00	Calculated
Link-835		4234.28	4233.46	0.4800	8.040	0.00	0.00	302.19	0.00	0.00	Calculated
Link-836		4236.47	4233.78	0.7900	30.000	38.28	1.39	14189.28	0.04	0.10	Calculated
Link-837		4250.68	4250.24	0.4400	9.960	14.36	1.04	565.28	0.11	0.09	Calculated
Link-838		4249.94	4249.75	0.1100	8.040	93.22	1.08	158.10	0.55	0.37	Calculated
Link-839		4249.52	4248.58	0.2300	8.040	93.07	1.39	227.77	0.44	0.30	Calculated
Link-840		4248.43	4246.91	0.3300	8.040	92.98	1.58	270.40	0.40	0.27	Calculated
Link-841		4246.85	4246.34	0.3700	8.040	92.96	1.63	286.59	0.39	0.26	Calculated
Link-842		4247.39	4246.46	0.4500	8.040	22.15	1.21	314.97	0.18	0.12	Calculated
Link-843		4246.14	4238.95	3.0000	8.040	135.06	3.85	813.78	0.28	0.18	Calculated
Link-844		4238.61	4237.85	0.3000	8.040	154.66	1.75	259.14	0.56	0.37	Calculated
Link-845		4237.65	4236.52	0.3800	8.040	168.27	1.86	276.21	0.56	0.38	Calculated
Link-846		4236.62	4234.24	0.9200	8.040	206.01	2.35	354.36	0.55	0.36	Calculated
Link-847		4238.94	4237.86	0.4700	8.040	0.00	0.00	322.72	0.00	0.00	Calculated
Link-848		4239.65	4236.91	2.0000	8.040	0.00	0.00	567.36	0.00	0.00	Calculated
Link-849		4241.11	4240.22	0.3700	8.040	0.00	0.00	287.71	0.00	0.00	Calculated
Link-850		4240.01	4239.45	0.3400	8.040	15.54	1.00	235.26	0.17	0.11	Calculated
Link-851		4239.60	4238.21	0.4500	8.040	14.85	1.11	313.86	0.15	0.10	Calculated
Link-852		4238.01	4237.36	0.1600	8.040	14.84	0.76	187.45	0.19	0.13	Calculated
Link-853		4241.64	4240.23	0.3500	8.040	0.00	0.00	278.94	0.00	0.00	Calculated
Link-854		4246.60	4241.24	2.1400	8.040	0.00	0.00	584.73	0.00	0.00	Calculated
Link-855		4242.73	4238.42	1.5400	8.040	16.25	1.89	570.98	0.11	0.07	Calculated
Link-856		4238.59	4237.03	0.4700	8.040	29.02	1.35	320.15	0.20	0.13	Calculated
Link-857		4237.04	4235.52	0.5100	8.040	31.47	1.36	324.24	0.21	0.14	Calculated
Link-858		4242.98	4240.82	0.7300	8.040	0.00	0.00	401.52	0.00	0.00	Calculated
Link-859		4240.83	4238.56	0.7700	8.040	0.00	0.00	408.85	0.00	0.00	Calculated
Link-860		4245.14	4244.03	0.4700	8.040	0.00	0.00	320.36	0.00	0.00	Calculated
Link-861		4244.05	4242.82	0.3500	8.040	0.00	0.00	279.32	0.00	0.00	Calculated
Link-862	inlet_calculated	4244.65	4243.12	0.5000	8.040	0.00	0.00	332.12	0.00	0.00	Calculated
Link-863		4243.32	4242.93	0.2600	8.040	0.00	0.00	239.44	0.00	0.00	Calculated
Link-864		4242.70	4241.99	0.2700	8.040	0.00	0.00	221.79	0.00	0.00	Calculated
Link-865		4240.28	4239.55	0.5100	8.040	0.00	0.00	336.48	0.00	0.00	Calculated
Link-866		4239.45	4238.76	0.5400	8.040	0.00	0.00	345.82	0.00	0.00	Calculated

Element ID	Description	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Peak Flow (gpm)	Max Flow Velocity (ft/sec)	Design Flow Capacity (gpm)	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)	Reported Condition
Link-867	inlet_calculated	4253.37	4252.56	0.5000	8.040	0.00	0.00	310.88	0.00	0.00	Calculated
Link-868		4252.66	4251.60	0.4800	8.040	0.00	0.00	327.24	0.00	0.00	Calculated
Link-869		4252.06	4251.71	0.1700	8.040	0.00	0.00	195.61	0.00	0.00	Calculated
Link-870		4251.53	4250.56	0.5400	8.040	8.05	1.08	345.81	0.10	0.07	Calculated
Link-871		4250.49	4248.90	0.4300	8.040	7.57	0.91	308.80	0.11	0.07	Calculated
Link-872		4254.02	4250.31	1.1600	8.040	0.00	0.00	505.46	0.00	0.00	Calculated
Link-873		4250.02	4249.01	0.7100	8.040	0.00	0.00	395.18	0.00	0.00	Calculated
Link-874		4248.47	4247.73	0.4700	8.040	0.00	0.00	322.57	0.00	0.00	Calculated
Link-875		4256.15	4254.94	0.4500	8.040	0.00	0.00	313.94	0.00	0.00	Calculated
Link-876		4257.91	4257.58	0.2900	8.040	0.00	0.00	255.13	0.00	0.00	Calculated
Link-877		4257.27	4256.14	1.1200	8.040	0.00	0.00	496.78	0.00	0.00	Calculated
Link-878		4256.08	4254.72	0.6000	8.040	0.00	0.00	363.19	0.00	0.00	Calculated
Link-879		4254.59	4253.75	0.2300	8.040	11.28	0.90	227.12	0.14	0.10	Calculated
Link-880		4253.53	4252.91	0.2700	8.040	10.28	0.94	243.54	0.14	0.09	Calculated
Link-881		4252.76	4251.34	0.3600	8.040	10.20	0.88	273.53	0.13	0.09	Calculated
Link-882		4251.42	4250.26	0.5200	8.040	10.18	0.98	338.43	0.12	0.08	Calculated
Link-883		4252.20	4251.84	0.2200	9.960	0.00	0.00	399.93	0.00	0.00	Calculated
Link-884		4251.61	4251.20	0.7000	9.960	0.00	0.00	511.38	0.00	0.00	Calculated
Link-885		4251.40	4251.26	0.0600	9.960	0.00	0.00	205.71	0.00	0.00	Calculated
Link-886		4250.75	4250.60	0.0600	9.960	15.43	0.45	140.35	0.21	0.18	Calculated
Link-887		4252.88	4251.84	0.4000	9.960	0.00	0.00	541.56	0.00	0.00	Calculated
Link-888		4251.95	4251.06	0.4000	9.960	14.83	0.97	540.01	0.11	0.09	Calculated
Link-889		4255.14	4254.38	0.7400	8.040	0.00	0.00	403.58	0.00	0.00	Calculated
Link-890		4254.36	4253.96	0.3700	8.040	0.00	0.00	287.51	0.00	0.00	Calculated
Link-891		4254.53	4253.93	0.4200	8.040	0.00	0.00	305.58	0.00	0.00	Calculated
Link-892		4253.84	4253.12	0.3900	8.040	8.65	0.96	293.63	0.11	0.08	Calculated
Link-893		4253.07	4252.49	0.3800	8.040	8.36	0.83	291.33	0.12	0.08	Calculated
Link-894		4252.43	4252.24	0.2500	8.040	8.33	0.71	234.58	0.13	0.09	Calculated
Link-895		4250.93	4250.44	0.2600	8.040	47.01	1.22	240.22	0.30	0.20	Calculated
Link-896		4252.80	4252.32	0.6300	8.040	0.00	0.00	372.05	0.00	0.00	Calculated
Link-897		4250.92	4250.85	0.0300	8.040	0.00	0.00	79.40	0.00	0.00	Calculated
Link-898		4252.19	4251.29	0.3500	8.040	46.98	1.68	358.17	0.24	0.16	Calculated
Link-900		4263.40	4259.49	1.0600	8.040	0.00	0.00	420.24	0.00	0.00	Calculated
Link-901		4260.44	4258.96	0.4200	8.040	6.25	0.93	304.74	0.09	0.06	Calculated
Link-902		4258.76	4257.34	0.5300	8.040	5.81	0.91	341.61	0.09	0.06	Calculated
Link-903		4257.10	4256.16	0.3300	8.040	5.62	0.74	271.69	0.10	0.07	Calculated
Link-904		4255.93	4254.90	0.3600	8.040	5.56	0.73	280.12	0.10	0.07	Calculated
Link-905		4254.64	4253.70	0.3200	8.040	5.56	0.71	267.97	0.10	0.07	Calculated
Link-906		4253.44	4252.43	0.5200	8.040	46.35	1.47	269.81	0.28	0.18	Calculated
Link-908		4258.39	4257.46	0.3100	8.040	0.00	0.00	261.68	0.00	0.00	Calculated
Link-909		4257.20	4256.31	0.4000	8.040	0.00	0.00	297.28	0.00	0.00	Calculated
Link-910		4257.40	4256.61	0.5000	8.040	0.00	0.00	331.75	0.00	0.00	Calculated
Link-911		4256.17	4255.65	0.2300	8.040	0.00	0.00	227.49	0.00	0.00	Calculated
Link-912		4255.44	4254.95	0.3300	8.040	0.00	0.00	271.03	0.00	0.00	Calculated
Link-913		4254.67	4254.50	0.1800	8.040	0.00	0.00	198.58	0.00	0.00	Calculated
Link-914		4254.14	4253.71	0.3300	8.040	0.00	0.00	268.13	0.00	0.00	Calculated
Link-915		4255.46	4254.57	0.8900	8.040	0.00	0.00	443.10	0.00	0.00	Calculated
Link-916		4254.57	4253.84	0.7200	8.040	0.00	0.00	392.87	0.00	0.00	Calculated
Link-917		4253.86	4252.58	0.8600	8.040	4.83	1.07	435.16	0.07	0.05	Calculated
Link-918		4252.54	4251.99	0.6200	8.040	4.65	0.85	370.67	0.08	0.05	Calculated
Link-919		4254.74	4253.80	1.4700	8.040	0.00	0.00	570.07	0.00	0.00	Calculated
Link-920		4253.72	4252.68	1.2300	8.040	0.00	0.00	521.79	0.00	0.00	Calculated
Link-921		4252.58	4251.81	0.7900	8.040	0.00	0.00	416.96	0.00	0.00	Calculated
Link-922		4251.78	4249.78	1.3100	8.040	13.97	1.61	538.64	0.11	0.08	Calculated
Link-923		4249.49	4249.12	0.2800	8.040	13.81	0.89	248.88	0.16	0.11	Calculated
Link-924		4250.97	4250.28	0.2800	9.960	14.79	0.86	452.02	0.12	0.10	Calculated
Link-925		4251.82	4250.22	0.9200	8.040	0.00	0.00	449.97	0.00	0.00	Calculated
Link-926		4251.79	4250.33	0.5400	8.040	0.00	0.00	346.48	0.00	0.00	Calculated
Link-927		4249.84	4249.20	0.4800	8.040	0.00	0.00	327.23	0.00	0.00	Calculated
Link-928		4250.00	4249.85	0.1800	8.040	26.79	0.81	163.28	0.27	0.18	Calculated
Link-929		4249.90	4249.38	0.7600	8.040	26.73	1.49	409.73	0.17	0.12	Calculated
Link-930		4249.31	4248.48	0.2800	8.040	26.79	1.07	248.04	0.22	0.15	Calculated
Link-931		4248.38	4246.82	0.5200	8.040	26.75	1.31	340.58	0.19	0.13	Calculated
Link-932		4246.78	4245.47	0.8800	8.040	26.73	1.56	439.73	0.17	0.11	Calculated

Element ID	Description	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Peak Flow (gpm)	Max Flow Velocity (ft/sec)	Design Flow Capacity (gpm)	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)	Reported Condition
Link-933		4244.90	4243.88	0.8000	8.040	11.16	1.17	421.51	0.11	0.07	Calculated
Link-934		4245.06	4243.82	0.3800	8.040	91.92	1.68	290.23	0.39	0.26	Calculated
Link-935		4245.08	4244.70	0.3100	8.040	0.00	0.00	261.59	0.00	0.00	Calculated
Link-936		4244.43	4243.09	0.4500	8.040	0.00	0.00	314.92	0.00	0.00	Calculated
Link-937		4243.83	4242.80	0.4100	8.040	105.48	1.76	300.14	0.41	0.27	Calculated
Link-938		4242.56	4242.43	0.1700	8.040	105.42	1.28	196.25	0.52	0.35	Calculated
Link-939		4247.70	4245.33	1.9400	8.040	0.00	0.00	654.75	0.00	0.00	Calculated
Link-940		4253.97	4252.84	0.6000	8.040	0.00	0.00	364.96	0.00	0.00	Calculated
Link-941		4251.35	4248.05	1.1300	8.040	0.00	0.00	499.48	0.00	0.00	Calculated
Link-944		4256.94	4253.16	1.1600	8.040	0.00	0.00	505.22	0.00	0.00	Calculated
Link-945		4253.00	4250.38	1.1200	8.040	0.00	0.00	496.88	0.00	0.00	Calculated
Link-946		4250.20	4249.26	1.4900	8.040	0.00	0.00	573.40	0.00	0.00	Calculated
Link-947		4249.03	4248.15	0.2400	8.040	33.30	1.16	230.64	0.25	0.17	Calculated
Link-948		4247.94	4246.33	1.3400	8.040	45.46	1.77	421.79	0.22	0.15	Calculated
Link-949	Assumed_30"CWSID_PipeInverts	4253.94	4251.08	1.1300	15.000	22.99	1.53	2671.58	0.07	0.08	Calculated
Link-950	Assumed_30"CWSID_PipeInverts	4250.88	4244.92	1.6100	15.000	33.33	1.94	3187.00	0.07	0.09	Calculated
Link-951	Assumed_30"CWSID_PipeInverts	4244.72	4241.53	0.8900	15.000	33.04	1.56	2374.75	0.08	0.10	Calculated
Link-952	Assumed_30"CWSID_PipeInverts	4241.33	4238.13	1.1500	15.000	32.87	1.68	2689.39	0.08	0.10	Calculated
Link-953	Assumed_30"CWSID_PipeInverts	4237.93	4237.66	0.4200	15.000	150.07	1.86	1637.86	0.20	0.26	Calculated
Link-954	Assumed_30"CWSID_PipeInverts	4237.46	4234.77	0.7700	15.000	150.30	2.32	2205.17	0.18	0.22	Calculated
Link-955	Assumed_30"CWSID_PipeInverts	4234.57	4229.79	1.3700	15.000	150.28	2.82	2937.62	0.15	0.19	Calculated
Link-956	Assumed_30"CWSID_PipeInverts	4229.59	4227.51	0.8800	15.000	150.20	2.40	2363.07	0.17	0.21	Calculated
Link-957	Assumed_30"CWSID_PipeInverts	4227.31	4226.71	0.5200	15.000	176.71	2.10	1813.75	0.21	0.26	Calculated
Link-958		4252.63	0.00	14781.4700	8.040	0.00	0.00	1159.31	0.00	0.00	Calculated
Link-959	inlet_flowline_calculated	4249.52	4249.09	0.5000	8.040	0.00	0.00	333.66	0.00	0.00	Calculated
Link-960		4249.06	4248.57	0.7500	8.040	0.00	0.00	407.62	0.00	0.00	Calculated
Link-961		4248.50	4246.56	0.5900	8.040	0.00	0.00	337.21	0.00	0.00	Calculated
Link-962		4247.77	4247.10	0.5000	8.040	0.00	0.00	317.86	0.00	0.00	Calculated
Link-963		4247.16	4246.86	0.3600	8.040	0.00	0.00	281.63	0.00	0.00	Calculated
Link-964		4246.80	4244.49	0.7700	8.040	11.75	1.25	374.13	0.12	0.08	Calculated
Link-965		4243.65	4243.37	0.5000	8.040	0.00	0.00	330.76	0.00	0.00	Calculated
Link-966		4244.50	4242.88	1.1300	8.040	0.00	0.00	355.68	0.00	0.00	Calculated
Link-967		4243.68	4243.31	0.3900	8.040	0.00	0.00	294.27	0.00	0.00	Calculated
Link-968		4243.23	4240.76	0.8300	8.040	7.95	1.25	427.67	0.09	0.06	Calculated
Link-969		4240.64	4238.31	1.0100	8.040	7.47	1.19	472.62	0.09	0.06	Calculated
Link-970		4238.27	4235.40	1.6800	8.040	7.44	1.36	608.73	0.08	0.05	Calculated
Link-971		4235.20	4232.56	1.6800	8.040	7.43	1.34	609.13	0.08	0.05	Calculated
Link-972		4232.36	4227.53	1.6800	8.040	7.41	1.35	609.42	0.08	0.05	Calculated
Link-973		4242.43	0.00	1087.5800	8.040	105.57	2.55	504.87	0.31	0.21	Calculated
Link-974		4270.09	4267.50	1.0100	8.040	0.00	0.00	266.30	0.00	0.00	Calculated
Link-975		4269.27	4265.41	1.0400	8.040	0.00	0.00	480.14	0.00	0.00	Calculated
Link-976		4265.18	4262.28	0.7900	8.040	0.00	0.00	417.56	0.00	0.00	Calculated
Link-977		4262.02	4261.93	0.0200	8.040	0.00	0.00	73.40	0.00	0.00	Calculated
Link-978		4261.93	4259.96	0.5100	9.960	0.00	0.00	609.54	0.00	0.00	Calculated
Link-979		4258.54	4257.71	0.2200	9.960	0.00	0.00	397.48	0.00	0.00	Calculated
Link-980		4257.57	4256.61	0.2700	9.960	0.00	0.00	446.49	0.00	0.00	Calculated
Link-981		4256.47	4255.55	0.2400	9.960	0.00	0.00	416.32	0.00	0.00	Calculated
Link-982		4255.35	4254.46	0.2500	9.960	22.89	1.09	427.78	0.15	0.12	Calculated
Link-983	inverts_calculated	4254.68	4254.14	0.5000	9.960	0.00	0.00	603.09	0.00	0.00	Calculated
Link-984		4253.87	4252.21	0.4100	8.040	0.00	0.00	299.98	0.00	0.00	Calculated
Link-985		4252.04	4250.68	0.3500	8.040	0.00	0.00	277.06	0.00	0.00	Calculated
Link-986		4250.65	4249.12	0.3700	8.040	0.00	0.00	287.30	0.00	0.00	Calculated
Link-987		4249.00	4247.42	0.4000	8.040	0.00	0.00	296.61	0.00	0.00	Calculated
Link-988		4247.40	4240.22	1.7900	8.040	0.00	0.00	629.49	0.00	0.00	Calculated
Link-989		4240.05	4238.64	0.3500	8.040	0.00	0.00	279.59	0.00	0.00	Calculated
Link-990		4238.53	4236.93	0.4100	8.040	19.64	1.24	300.43	0.16	0.11	Calculated
Link-991		4233.22	4227.95	1.4300	8.040	0.00	0.00	530.59	0.00	0.00	Calculated
Link-992		4228.52	4223.77	1.5000	8.040	0.00	0.00	575.89	0.00	0.00	Calculated
Link-993		4223.57	4218.05	1.3200	8.040	0.00	0.00	514.93	0.00	0.00	Calculated
Link-994		4218.24	4216.69	0.4700	8.040	0.00	0.00	321.65	0.00	0.00	Calculated
Link-995		4217.79	4216.37	1.2000	9.960	0.00	0.00	933.94	0.00	0.00	Calculated
Link-996		4216.24	4214.92	2.1900	9.960	18.39	1.52	828.55	0.10	0.09	Calculated
Link-997		4215.67	4215.14	0.1900	9.960	19.74	0.94	374.25	0.15	0.13	Calculated
Link-998		4215.01	4214.52	0.2500	9.960	18.79	0.83	361.40	0.15	0.13	Calculated

Element ID	Description	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Pipe Diameter or Height (inches)	Peak Flow (gpm)	Max Flow Velocity (ft/sec)	Design Flow Capacity (gpm)	Max Flow Depth / Total Depth Ratio	Max Flow Depth (ft)	Reported Condition
Link-999	inlet_calculated	4240.66	4240.29	0.5000	9.960	0.00	0.00	605.64	0.00	0.00	Calculated

HARRISVILLE CITY

363 West Independence $ Harrisville, Utah 84404 $ (801) 782-4100

MAYOR:

Michelle N. Tait

COUNCIL MEMBERS:

Grover Wilhelmsen
Steve Weiss
Blair Christensen
Max Jackson
Kenny Loveland

MEMORANDUM

To: City Council
From: Justin Shinsel
Department: Public Works
Date: 2/3/2022
RE: Utility Trailer Purchases

As part of the procurement policy, I'm asking council approval for the purchase of 2 new Utility Trailers to haul city equipment and also make it easier to complete tasks for the city. With Growth and the addition of Irrigation systems we will be upgrading essential equipment the trailer we currently have has been in service over 15 years and is not able to withhold the jobs its required to do with pulling a skid loader, possible Mini Ex (future purchase), Tractors, lawn mowers and other city equipment. Asking to use 30 thousand of class c money to purchase the 2 trailers listed in the packet with pictures

LOAD TRAIL
Klein
251-709-0686
Semmes, AL
QUALITY TRAILERS.COM

$ 18,000.00

LOAD TRAIL

DH20 – Dump and Gooseneck Dump Trailers 20,000 lb w/12" I-Beam (19 lbs,

Available Sizes Standard Features Axles Available Colors Options

***DH20 stock photo. May be shown with optional equipment.**

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Standard Features

Axles:	2-10,000 Lb Cambered Dexter Torsion (UP) 2 Elec Brakes
Bed Crossmembers	3" Channel (3.5 lbs/ft)
Bed Frame:	2" x 5" Tubing
Couplers:	3" Bolt On Adjustable Pintle Eye
Crossmembers	2" x 5" Tubing
D-Rings:	3" Standard D-Rings
EWR Class	DUMP TRAILER
Fenders:	Weld On Diamond Plate
Finish (prep):	Mechanical and/or Chemical Pretreatment for Maximum Paint Adhesion
Finishing Coat/Primer	Sherwin-Williams Powdura OneCure Primer w/Polyester TGIC Gloss Powder Topcoat
Flooring:	7 Ga. Smooth Plate
Frame:	12" I-Beam (19 lbs/ft)
Gate	2-Way Spreader Gate
GAWR:	10,000 lbs (ea axle)
GVWR:	20,000 lb
Hydrulic Cylinder:	6" x 29" x 2-3/4"
Hydrulic Power Units:	Dual Acting Power Unit w/Manual Gravity-Down Valve
Jack:	2-10K Drop Leg Spring Return
Lights:	D.O.T. Stop, Tail, Turn and Clearance LED
Product Line	Dump and Gooseneck Dump Trailers

Available Sizes

Part	Description	Weight
DH8316102	83" x 16' Tandem Axle 12" I-Beam Heavy duty Dump	
DH8320102	83" x 20' Tandem Axle 12" I-Beam Heavy duty Dump	

Product Series:	DH20
Ramps:	8' Slide-In Ramps
Safety Chains:	26400 Lb 3/8 x 36 G#70
Scissor Lift	Scissor Lift
Side Rails:	10 Ga. 24" High Sides w/MAX Rail
Suspension:	Torsion Axle
Tarp:	E-Z Lock Mesh Tarp System with Cover
Tires:	215/75 R17.5 LRH (w/spare)
Tool Box:	Front Tongue Mount Max Storage Box
Tougue & Neck:	12" I-Beam (19 lbs/ft)
Wheels:	17.5" 8-Hole
Wire Harness:	16 Ga. 5-Way Double Insulated Harness w/Cold Weather Cord 7-way plug

Axles

Available Colors

Tires Upgrades:

Couplers

Fenders

Fork Holders

Cross Members

Dump Sides

Ramps

Jacks

Lights

D-Rings

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Mud Flaps

Hydraulics

Extensions

Solar Panel Charger

Wireless Remote Control

Remote Switch

Battery Charger

Rear Support Jacks

Side Steps

Spare Tires

Spare Tire Mount (universal)

Road Service Program

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TH20 – Tilt Decks 20,000 lb w/10" I-Beam (19 lbs/ft) Frame

Available Sizes Standard Features Axles Available Colors Options

***TH20 stock photo. May be shown with optional equipment.**

Standard Features

Axles:	2-10,000 Lb Cambered Dexter Torsion (UP) 2 Elec Brakes
Couplers:	2-5/16" Adjustable
Crossmembers	3" Channel 16" OC (3.5 lbs/ft)
D-Rings:	3" Standard D-Rings
EWR Class	TILT DECK
Fenders:	Weld On Diamond Plate
Finish (prep):	Mechanical and/or Chemical Pretreatment for Maximum Paint Adhesion
Finishing Coat/Primer	Sherwin-Williams Powdura OneCure Primer w/Polyester TGIC Gloss Powder Topcoat
Flooring:	Treated Wood
Frame:	10" I-Beam (19 lbs/ft)
GAWR:	10,000 lbs (ea axle)

Available Sizes

Part	Description	Weight*
TH8320102	83" X 20' Tilt-N-Go Tandem Axle Tilt Deck I-Beam Frame	
TH8322102	83" X 22' Tilt-N-Go Tandem Axle Tilt Deck I-Beam Frame	
TH8324102	83" X 24' Tilt-N-Go Tandem Axle Tilt Deck I-Beam Frame	

Lights:	D.O.T. Stop, Tail, Turn and Clearance LED
Product Line	Tilt Decks
Product Series:	TH20
Safety Chains:	26400 Lb 3/8 x 36 G#70
Stationary Deck	8' Stationary Deck
Suspension:	Torsion Axle
Tires:	215/75 R17.5 LRH
Top Rail:	2" X 2" 1/8" Tubing
Tougue & Neck:	10" I-Beam (19 lbs/ft)
Up Rights:	2" X 2" 3/16" Angle Iron
Wheels:	17.5" 8-Hole
Wire Harness:	16 Ga. 5-Way Double Insulated Harness w/7-way plug

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Axles

Available Colors

Tires Upgrades:

Couplers

Floor/Stationary Decks

Fenders

Fork Holders

Cross Members

Lights

D-Rings

Mud Flaps

Front Toolbox

Winch

Rub Rail

Side Steps

Solar Panel Charger

Wireless Remote Control

Battery Charger

Spare Tires

Stake Pockets

Spare Tire Mount (universal)

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HARRISVILLE CITY
363 W. Independence Blvd · Harrisville, Utah 84404 · 801-782-4100
www.cityofharrisville.com

MAYOR:
Michelle Tait

COUNCIL MEMBERS:
Grover Wilhelmsen
Steve Weiss
Blair Christensen
Max Jackson
Kenny Loveland

2021 Goals

1. Economic Development
2. Strategic Planning
3. Update Impact Fee Analysis
4. New Municipal Complex Concept Plan
5. Approval for Ben Lomond Development
6. West Harrisville Road Reconstruction
7. Cemetery Plan
8. Department and Staff Improvements