Planning Commission
February 27, 2023
7:00 PM
Council Chambers, 6090 Woodson St.

AGENDA

I. Call to Order

II. Election of Officers - President and Vice President

III. Approval of Minutes from Planning Commission - November 28, 2022

IV. New Business

1. *Case #23-01 - Mission Vale Final Development Plan*
2. *Case #23-02 - Mission Vale Final Plat*

V. Old Business

VI. Planning Commission Comments

VII. Staff Updates

Questions concerning this meeting may be addressed to the staff contact, Karie Kneller, City Planner, at (913) 676-8366 or kkneller@missionks.org

AT A GLANCE

Applicant:
Koenig Building + Restoration

Location:
West 58th Terrace and Nall Avenue

Property ID:
KP350000000012A, KP350000000012B, KP350000000013, KP350000000014, KP350000000015

Current Zoning:
“DND” Downtown Neighborhood District

Proposed Zoning:
N/A

Current Land Use:
Vacant

Proposed Land Use:
Multi-family Townhomes

N/A Public Hearing Required

Legal Notice Date:
N/A

Case Number:
#23-01

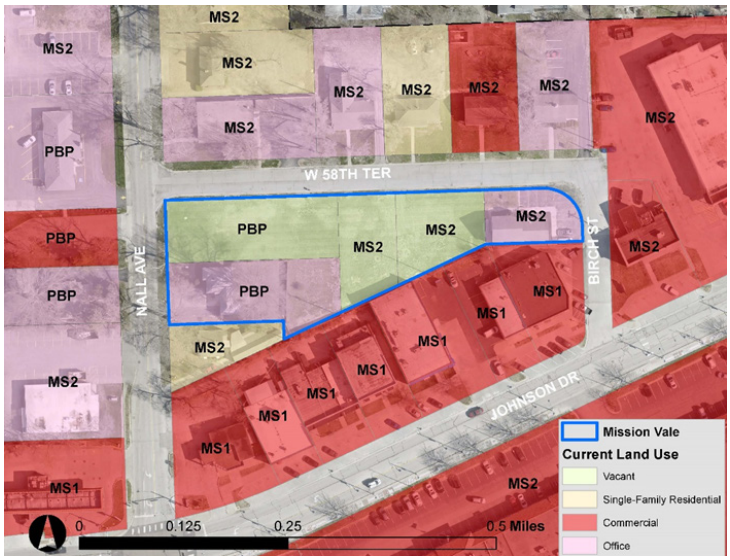
Project Name:
Mission Vale Final Development Plan

Project Summary:
The applicant is requesting approval of a final development plan for a 19-unit rental townhome development at the southeast corner of Nall Avenue and West 58th Terrace. The Preliminary Development Plan (Case #22-21), Rezoning (#22-20), and Preliminary Plat (#22-25) were recommended for approval by the Planning Commission in September 2022. The City Council approved these three cases in October 2022.

Staff Contact:
Karie Kneller

Background and Property Information

The site formerly contained existing vacant office buildings and surface parking that have been removed by the applicant/property owner. Surrounding properties are a mix of office and commercial uses zoned “PBP,” “MS1,” and “MS2.” The structure on Nall just south of the project site is zoned “MS2” with single-family residential land use.



The site is served by water, gas, sanitary sewer, and electrical utilities. A sanitary sewer easement runs north and south between the easternmost parcel and the adjacent property to the west. A gas utility easement is located parallel to the southern property line about 22 feet inside the property boundary, and overhead electrical utility, along with a water main, run along the southern property line. The plans propose a stormwater tie-in across Nall Avenue to serve the project development.

Project Proposal

The applicant, Koenig Building + Restoration submitted a Final Development Plan for a 19-unit multi-family townhome development for the property. The site is currently vacant. The City Council approved the Preliminary Development Plan for the project and rezoning of the property from “MS2” and “PBP” to “DND”, in October of 2022. The City Council also approved the Preliminary Plat for the same location.

Four two-story structures consisting of six, five, or two units are proposed for the site. Each unit would have two bedrooms and two-and-a-half baths with two parking spaces. Some of the units have a two-car garage, while some of the units have a one-car garage with surface parking either in a driveway, or in the interior parking lot. The proposed project has 38 parking spaces as required by municipal code. Building frontage is set back appropriately according to the municipal code, with front terraces and walkways for each unit. A six-foot side yard setback abutting the residential use (zoned MS-2) conforms with the municipal code. The back yard setback deviates from the municipal code, which requires an 18’ setback from shared drives and a 25’ setback for all other configurations, except for multi-family structures and condominiums, which do not have a back yard setback requirement. This deviation is consistent with the approved preliminary plans. Each of the four structures are separated by green space between 5.5’ and 24’ wide, and three of the units have back lawns with terraces.

The applicant proposes a five-foot sidewalk on the perimeter of the entire site set back from the curb, with two park benches along 58th Terrace. The Landscape Plan proposes 10 shade trees along the street frontage and four shade trees in the south yard. Decorative tree species will be dispersed on the site, and the total number of trees meets the requirement per municipal code. The plantings will be native,

non-invasive species of shade trees, ornamental trees, and shrubs. The parking area will be landscaped according to code requirements.

Plan Review and Analysis

Municipal Code

Consideration of Final Development Plans is outlined in the Mission Municipal Code at §440.190. A Final Development Plan which contains modifications from the approved Preliminary Development Plan but is in substantial compliance with the Preliminary Development Plan, may be approved by the Planning Commission without a public hearing if the landscaping and screening plan is adequate as determined by the Commission.

Modifications:

The dumpster location has been relocated in the final development plan to the area abutting the property's southern border.

The applicant proposed a sidewalk extension from the property south on Nall to connect with commercial properties on Johnson Drive that is indicated in the civil drawings as part of the packet.

The plans include photometrics on the site with 0.0 foot candles on the property border with residentially zoned properties.

Sustainability Commission

The applicant self-scored the preliminary development plan with a total of 43 points for a "silver" rating that was part of the preliminary development plan packet. The applicant met with the Sustainability Commission in September of 2022 and received feedback on the plans. The Sustainability Commission determined the project as proposed could receive a total of 35 points and a "bronze" rating. The rating could increase to "silver," according to the Sustainability Commission, if plans are expanded to include the following:

- Commitment to utilizing fixtures meeting Water Sense standards
- Commitment to employing Universal Design principles to improve unit accessibility standards
- Enhance storm water detention

Maintenance Agreement

Staff will work with the applicant to produce a maintenance agreement that includes maintaining all landscaping and site improvements to exclude the sidewalk extension off site; the extension shall be the responsibility of the City to maintain.

Recommendation

Staff recommends that the Planning Commission vote to approve the Final Development Plan for the multi-family townhome development known as Mission Vale with the following condition:

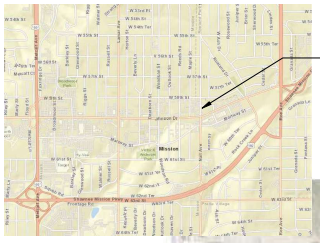
A. Maintenance agreement that states all site improvements and landscaping within the property boundaries is maintained in good condition in perpetuity; the agreement shall be completed and signed by the property owner and the City of Mission before issuance of building permit(s).

Planning Commission Action

The Planning Commission will hear Case #23-01, Mission Vale Final Development Plan, at its regularly scheduled meeting on February 27th, 2023.

City Council Action

No action.



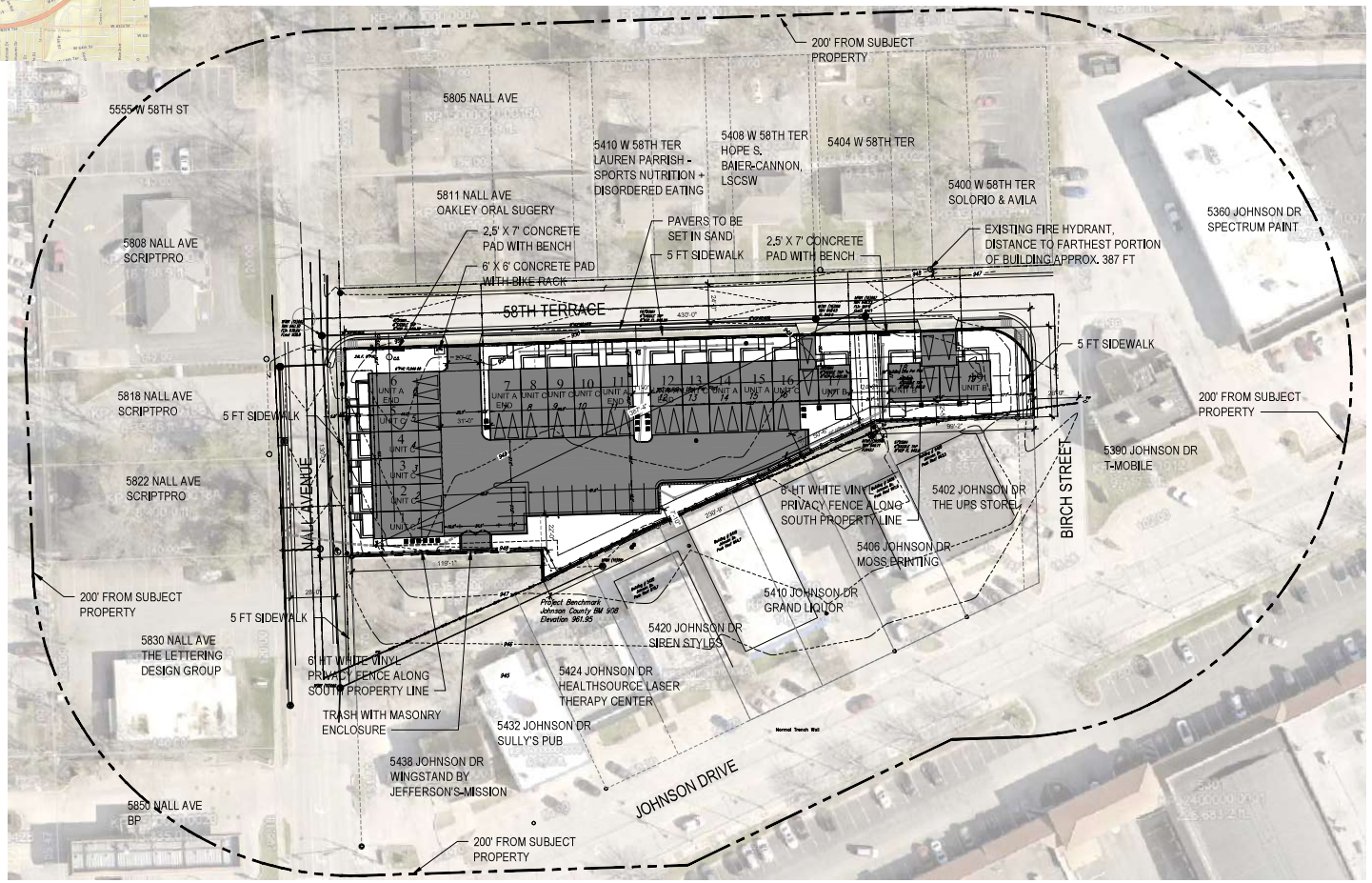
PROJECT DATA SUMMARY

19 TOWNHOUSES
TWO STORIES WITH PRIVATE GARAGES
1,331 SQUARE FEET PER UNIT
TOTAL FLOOR AREA - 29,221 SF (WITH GARAGES)
2 BEDROOM, 2.5 BATHS PER UNIT

PROPOSED ZONING - DND
EXISTING ZONING - PBP & MS2
SITE AREA - .978 ACRE, 42,602 SQUARE FEET
UNITS PER ACRE - 19.43 DUA DENSITY (25 DUA ALLOWED)

PARKING:
6 UNITS HAVE (2) CAR PRIVATE GARAGES
10 UNITS HAVE (1) CAR PRIVATE GARAGES
3 UNITS HAVE (1) CAR PRIVATE GARAGES AND A PRIVATE DRIVEWAY PARKING SPACE
(12) PARKING SPACES PROVIDED FOR RESIDENTS AND/OR GUESTS

REQUIRED	PROVIDED
38 SPACES REQUIRED	40 SPACES PROVIDED
(2) OFF-STREET PARKING SPACES PER UNIT	



OVERALL SITE PLAN
1" = 40'-0"

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A NEW TOWNHOUSE DEVELOPMENT FOR:
MISSION VALE
5819 NALL AVENUE
MISSION, KANSAS

DRAWING RELEASE LOG
01.23.23 PDF RESIDENTIAL
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01.23.23 PDF RESIDENTIAL
01.23.23 PDF RESIDENTIAL
01.23.23 PRINT SET

REVISIONS

JOB NO. 712922
DATE 01.23.23
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SHEET NAME

SHEET NO. SP1.00

VIEW OF UNITS 6-15

NOT TO SCALE

VIEW LOOKING SOUTHEAST FROM 58th TERRACE AND NALL

NOT TO SCALE

SUSTAINABLE MISSION

SITE DEVELOPMENT, LAND USE AND LOCATION, AND TRANSPORTATION IMPACT:
C. STORMWATER - THERE SHALL BE AN ONSITE UNDERGROUND STORMWATER DETENTION SYSTEM.
D. LANDSCAPE IRRIGATION - THE IRRIGATION SYSTEM WILL UTILIZE SMART PROGRAMMING WITH SEASONAL ADJUSTMENT AND A RAIN SENSOR.
E. MANAGE PLANTS/VEGETATION - LANDSCAPE SHALL INCLUDE SOME NATIVE SPECIES AND DROUGHT TOLERANT PLANTS.
H. WALKING/BICYCLE PATHS - NEW SIDEWALKS SHALL BE INSTALLED ALONG NALL AND 58th TERRACE.
I. BICYCLE STORAGE - EACH TOWNHOUSE WILL HAVE A PRIVATE GARAGE FOR BICYCLE STORAGE, PLUS THERE WILL BE A BIKE RACK ALONG 58TH TERRACE.
J. CHANGING/SHOWER FACILITIES - EACH TOWNHOUSE SHALL INCLUDE PRIVATE FACILITIES.
L. ELECTRIC VEHICLES - ALL PRIVATE GARAGES WILL BE EQUIPPED WITH AN ELECTRICAL PANEL FOR FUTURE EV CHARGING.
M. BUS ACCESS - THE PROJECT IS JUST NORTH OF THE TRANSIT CENTER.
O. REDUCE LIGHT POLLUTION - ALL EXTERIOR LIGHT FIXTURES SHALL BE DOWNWARD FACING WITH CUTOFFS TO AVOID SPREADING ILLUMINATION ONTO ADJACENT PROPERTIES.

MATERIALS AND RESOURCE USE:
B. CONSTRUCTION MANAGEMENT MATERIAL - ALL CONSTRUCTION PERSONNEL WILL BE BRIEFED ON WAYS TO MINIMIZE WASTE BEFORE STARTING THEIR RESPECTIVE SCOPE OF WORK.
E. OCCUPANT WASTE MANAGAMENT/RECYCLING/COMPOSTING - EACH TOWNHOUSE SHALL HAVE A RECYCLING BIN.

ENERGY CONSERVATION, EFFICIENCY AND CO2e EMISSION REDUCTION:
C. ENERGY METERING/MONITORING - EACH TOWNHOUSE SHALL HAVE A SEPARATE METER.
E. BUILDING ENVELOPE/INSULATION - THE PROJECT WILL BE INSULATED PER THE CURRENT ENERGY CODE WITH PENETRATIONS SEALED AND MOISTURE PROTECTION PART OF THE CONSTRUCTION.
G. ELECTRICAL/LIGHTING SYSTEMS - LIGHT FIXTURES SHALL USE LED BULBS. ALL LIVING SPACES WILL HAVE ACCESS TO NATURAL DAYLIGHT.
H. APPLIANCES/EQUIPMENT - ENERGY STAR APPLIANCES SHALL BE USED.
K. CONTROL AIR POLLUTION - THERE SHALL NOT BE ANY GAS FIRED APPLIANCES OR EQUIPMENT INSTALLED IN THE TOWNHOUSES.

WATER RESOURCE CONSERVATION AND EFFICIENCY:
A. WATER METERING - EACH TOWNHOUSE SHALL HAVE A SEPARATE METER.
B. FIXTURES/FITTINGS - FIXTURES SHALL BE EVALUATED FOR MEETING 'WATER SENSE' STANDARDS.
F. REDUCE IRRIGATION - NATIVE AND DROUGHT TOLERANT SPECIES SHALL BE INCLUDED IN THE LANDSCAPE.

INDOOR ENVIRONMENTAL QUALITY AND COMFORT:
B. AIR HANDLING FILTRATION - AIR FILTERS TO CLEAN THE AIR OF EACH TOWNHOUSE SHALL BE PROVIDED.
C. INCREASE VENTILATION - ALL LIVING SPACES WILL HAVE OPERABLE WINDOWS WITH SCREENS.
E. THERMAL COMFORT - THE BUILDING ENVELOPE WILL HAVE UPGRADED INSULATION ASSEMBLIES.
F. INDOOR POLLUTANT CONTROL - EACH TOWNHOUSE IS SEPARATED FROM EACH OTHER AND WILL NOT CONTAIN GAS FIRED EQUIPMENT.
H. ACOUSTICS - THERE ARE NO DWELLINGS ABOVE OR BELOW EACH OTHER. ALL TOWNHOUSES ARE SEPARATED BY A PARTY WALL WITH AN STC RATING OF 60 TO 64 MINIMUM.
I. DAYLIGHTING/VIEWS - ALL LIVING SPACES HAVE OPERABLE WINDOWS.

COMMISSIONING, OPERATIONS AND MAINTENANCE:
E. OPERATIONS AND MAINTENANCE (O+M) DOCUMENTATION/SCHEDULE - OPERATING MANUALS AND INSTRUCTIONS SHALL BE PROVIDED TO TENANTS AS WELL AS ROUTINE MAINTENANCE PROVIDED.

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NOT FOR CONSTRUCTION

A NEW TOWNHOUSE DEVELOPMENT FOR:

MISSION VALE

NALL AVENUE & 58TH TERRACE
MISSION, KANSAS

DRAWING RELEASE LOG
- 12.14.22 FDP SUBMITTAL

DATE 06.17.22
JOB NO. 712922
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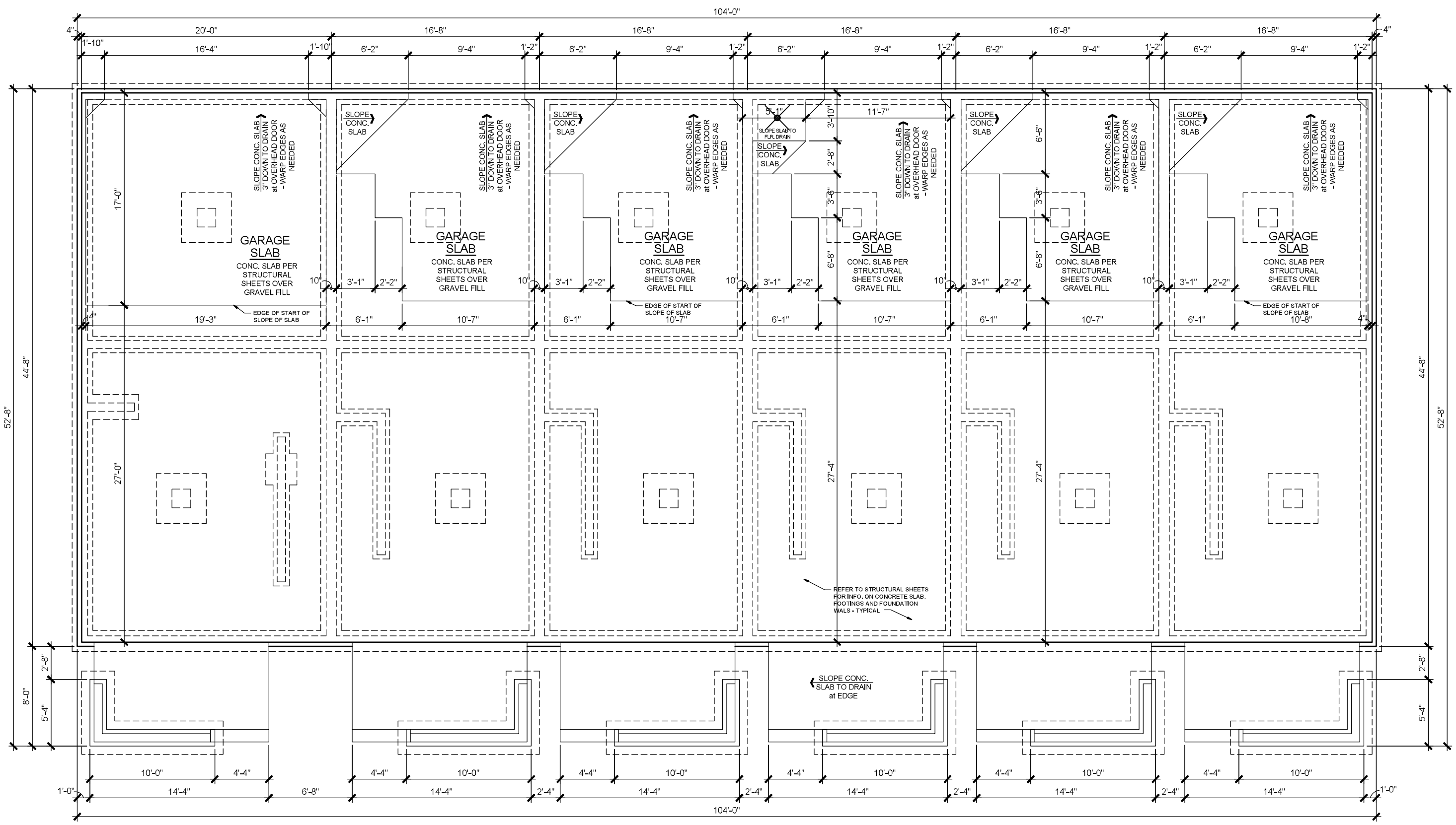
SHEET NO. A1.0



UNIT 6 - A END PLAN | UNIT 5 - C PLAN | UNIT 4 - C PLAN | UNIT 3 - C PLAN | UNIT 2 - C PLAN | UNIT 1 - C PLAN

BUILDING UNITS 1 to 6 FOUNDATION PLAN

SCALE - 1/4" = 1'-0"

NORTH

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A NEW TOWNHOUSE DEVELOPMENT FOR:

MISSION VALE

5819 NALL AVENUE
MISSION, KANSAS

DRAWING RELEASE LOG

REVISIONS

JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH

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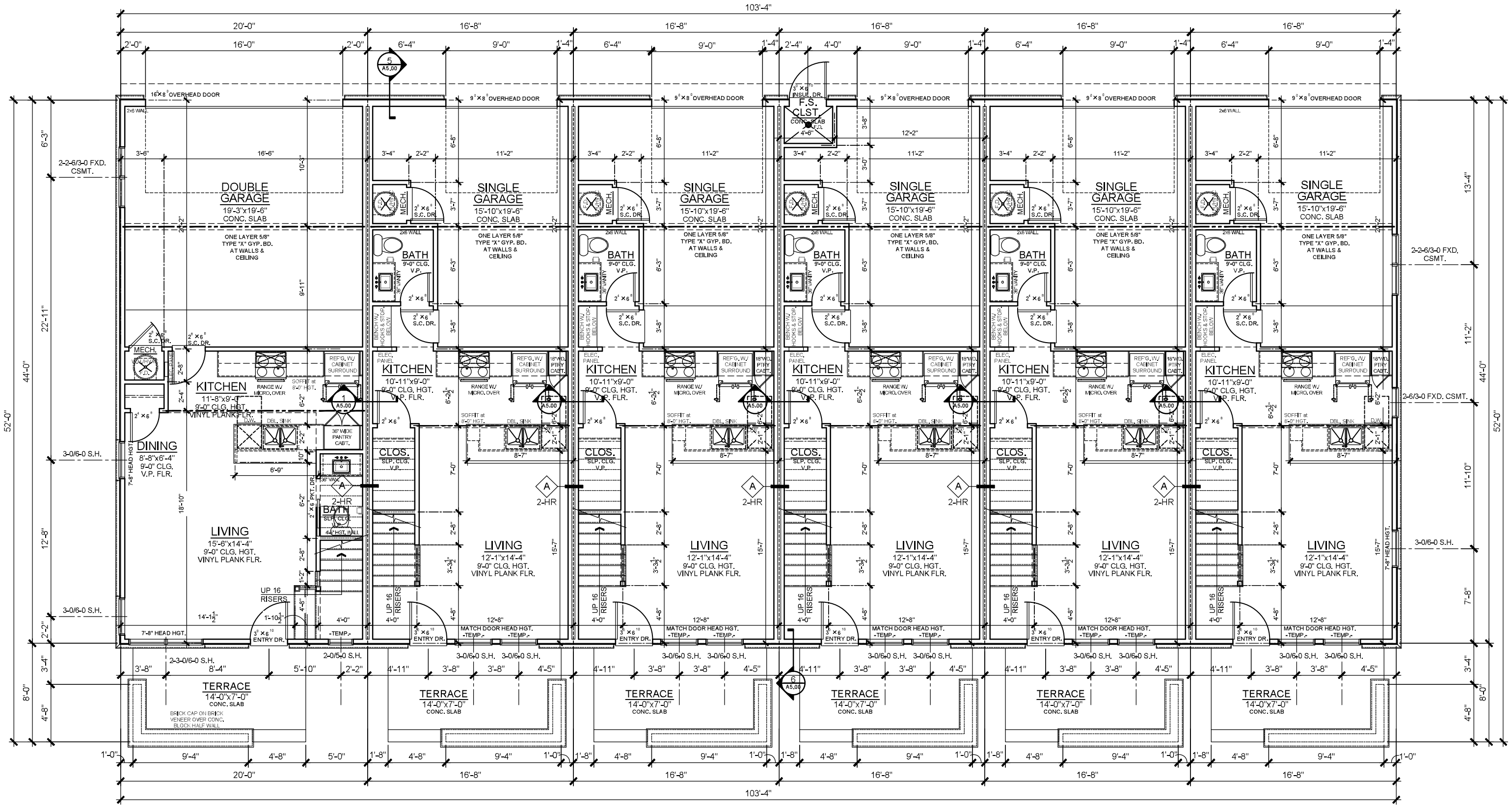

UNIT 6 - A END PLAN	
FIRST FLOOR	480 sq. ft.
SECOND FLOOR	851 sq. ft.
TOTAL LIVING	1,331 sq. ft.
GARAGE	400 sq. ft.

UNIT 5 - C PLAN	
FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

UNIT 4 - C PLAN	
FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

UNIT 3 - C PLAN	
FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

UNIT 2 - C PLAN	
FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

UNIT 1 - C PLAN	
FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

BUILDING UNITS 1 to 6
FIRST FLOOR PLAN

SCALE - 1/4" = 1'-0"

NORTH

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A NEW TOWNHOUSE DEVELOPMENT FOR:
MISSION VALE
5819 NALL AVENUE
MISSION, KANSAS

DRAWING RELEASE LOG
- 07.27.22 PDP RESUBMITTAL
- 08.11.22 PDP RESUBMITTAL
- 09.15.22 PDP RESUBMITTAL
- 12.15.22 FDP SUBMITTAL
- 01.23.23 PERMIT SET

REVISIONS

JOB NO. 712922
DATE 01.23.23
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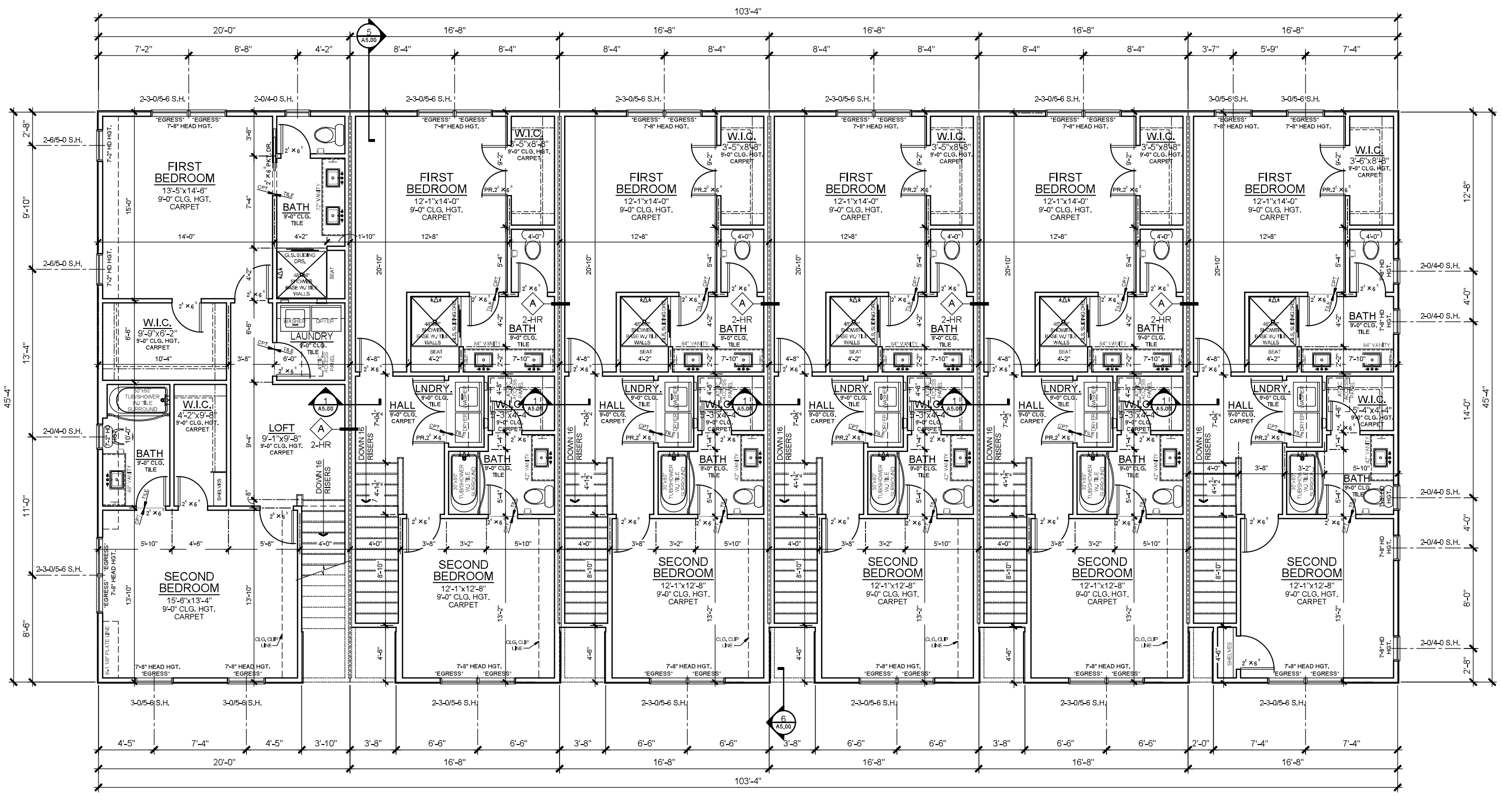

UNIT 6 - A END PLAN
SECOND FLOOR 851 sq. ft.

UNIT 5 - C PLAN
SECOND FLOOR 696 sq. ft.

UNIT 4 - C PLAN
SECOND FLOOR 696 sq. ft.

UNIT 3 - C PLAN
SECOND FLOOR 696 sq. ft.

UNIT 2 - C PLAN
SECOND FLOOR 696 sq. ft.

UNIT 1 - C PLAN
SECOND FLOOR 696 sq. ft.

BUILDING UNITS 1 to 6
SECOND FLOOR PLAN

SCALE - 1/4" = 1'-0"

NORTH

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A NEW TOWNHOUSE DEVELOPMENT FOR:
MISSION VALE
5819 NALL AVENUE
MISSION, KANSAS

DRAWING RELEASE LOG

REVISIONS

JOB NO. 712922
DATE 01.23.23
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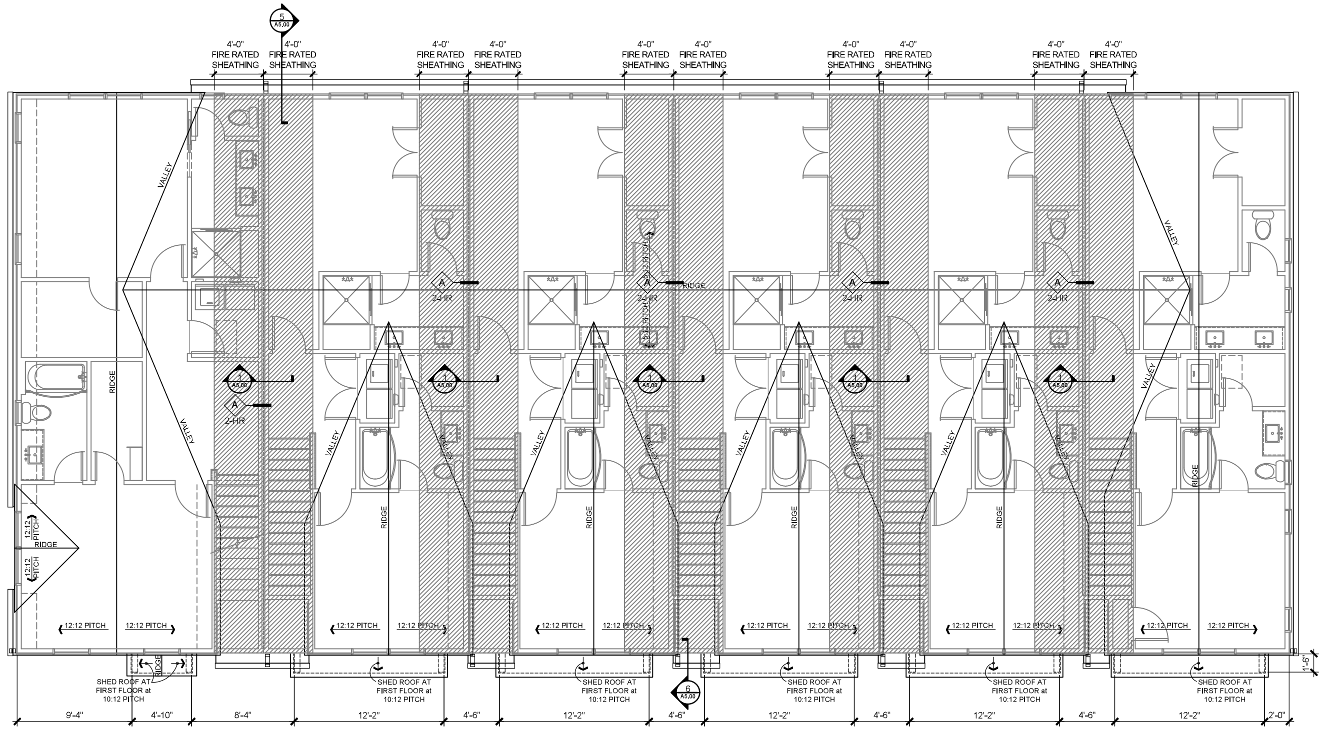


UNIT 6 - A END PLAN

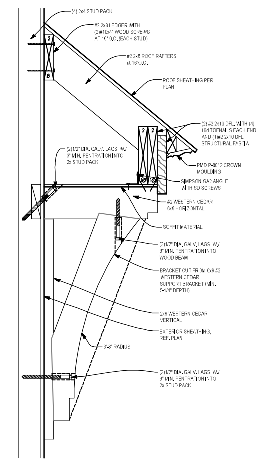
UNIT 5 - C PLAN

UNIT 4 - C PLAN

UNIT 3 - C PLAN

UNIT 2 - C PLAN

UNIT 1 - C PLAN



ROOF BRACKET DETAIL

SCALE - 1-1/2" = 1'-0"

NOTES:

ROOF VENTS SHALL NOT BE LOCATED within THE 4'-0" WIDE FIRE-RATED SHEATHING PANELS ON EACH SIDE OF THE CENTERLINE BETWEEN UNITS.

ALL ROOF PENETRATIONS TO BE LOCATED ON REAR ELEVATION SO AS NOT TO BE VISIBLE FROM THE STREET.

PROVIDE ATTIC VENTILATION, HALF FROM LOWER AND HALF UP HIGH.

BUILDING UNITS 1 to 6
ROOF PLAN

SCALE - 1/4" = 1'-0"

NORTH

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A NEW TOWNHOUSE DEVELOPMENT FOR:
MISSION VALE
5819 NALL AVENUE
MISSION, KANSAS

Drawing Release Log

REVISIONS

JOB NO. 712922
DATE 01.23.23
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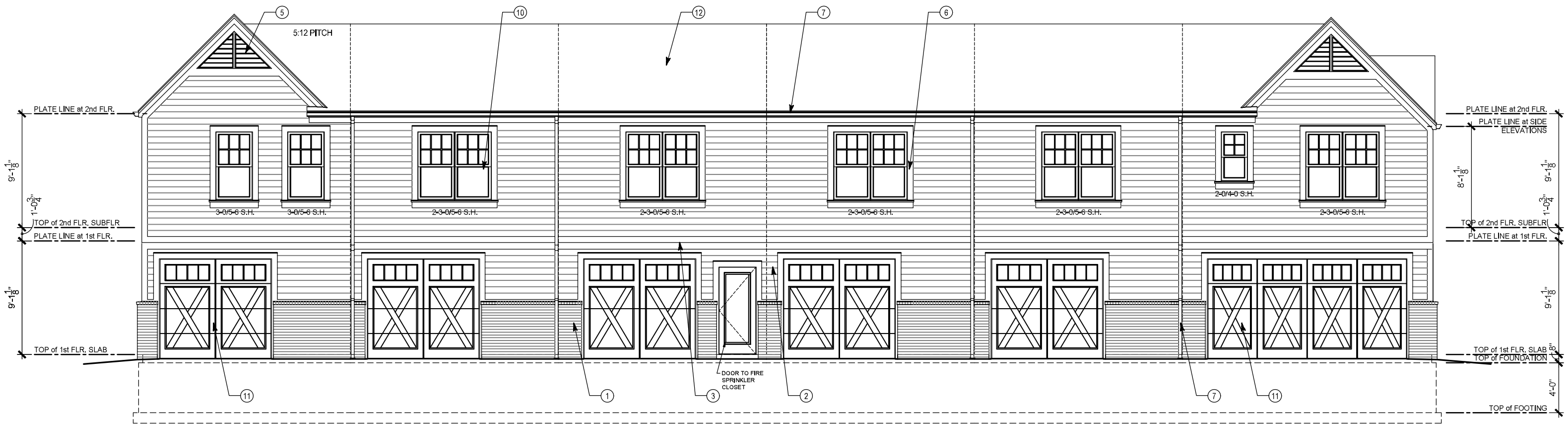
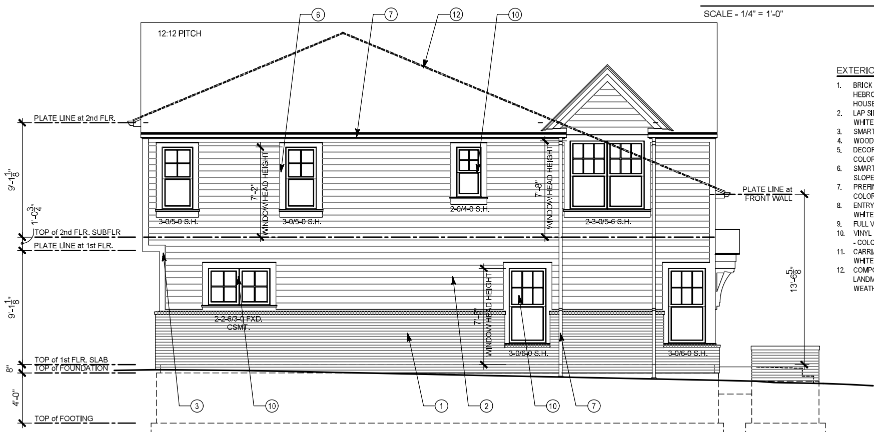
SHEET NAME

SHEET NO.
A1.03



REAR - EAST ELEVATION

SCALE - 1/4" = 1'-0"

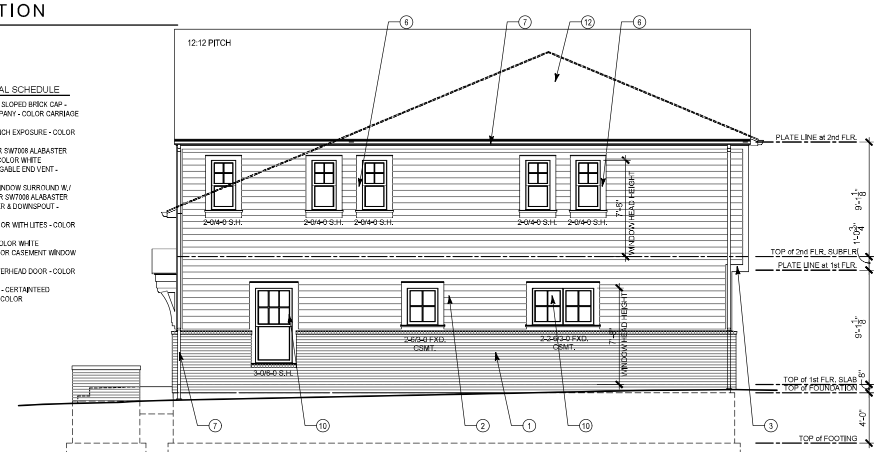


LEFT SIDE - NORTH ELEVATION

SCALE - 1/4" = 1'-0"

EXTERIOR MATERIAL SCHEDULE

1. BRICK VENEER WITH SLOPED BRICK CAP - HEBRON BRICK COMPANY - COLOR CARRIAGE HOUSE
2. LAP SIDING WITH 6 INCH EXPOSURE - COLOR WHITE
3. SMART TRIM - COLOR SW7008 ALABASTER
4. WOOD BRACKETS - COLOR WHITE
5. DECORATIVE FALSE GABLE END VENT - COLOR WHITE
6. SMART TRIM - 5/4x WINDOW SURROUND W./ SLOPED SILL - COLOR SW7008 ALABASTER
7. PREFINISHED GUTTER & DOWNSPOUT - COLOR WHITE
8. ENTRY DOOR, SOLID OR WITH LITES - COLOR WHITE
9. FULL VIEW DOOR - COLOR WHITE
10. VINYL SINGLE HUNG OR CASEMENT WINDOW - COLOR WHITE
11. CARRIAGE STYLE OVERHEAD DOOR - COLOR WHITE
12. COMPOSITION ROOF - CERTAINTEED LANDMARK SERIES - COLOR WEATHEREDWOOD



RIGHT SIDE - SOUTH ELEVATION

SCALE - 1/4" = 1'-0"

UNIT 6 - A END PLAN　UNIT 5 - C PLAN　UNIT 4 - C PLAN　UNIT 3 - C PLAN　UNIT 2 - C PLAN　UNIT 1 - C PLAN

FRONT - WEST ELEVATION

SCALE - 1/4" = 1'-0"

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CLINT EDD EVANS LICENSED 6309 KANSAS ARCHITECT 1/23/23

A NEW TOWNHOUSE DEVELOPMENT FOR:

MISSION VALE

5819 NALL AVENUE
MISSION, KANSAS

DRAWING RELEASE LOG
- 07.27.22 PDP RESUBMITTAL
- 08.11.22 PDP RESUBMITTAL
- 09.15.22 PDP RESUBMITTAL
- 12.15.22 FDP SUBMITTAL
- 01.23.23 PERMIT SET

REVISIONS

JOB NO. 712922　DATE 01.23.23
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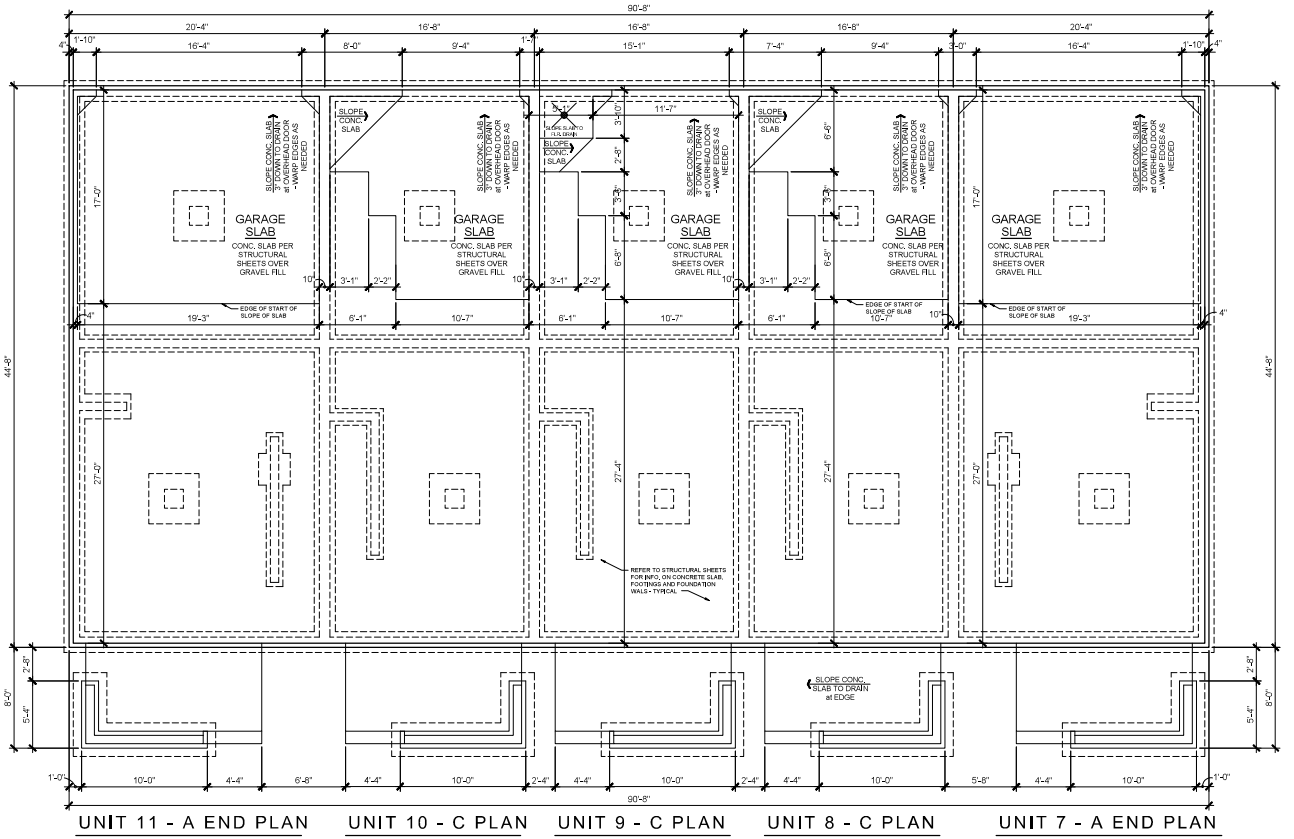

BUILDING UNITS 7 to 11
FOUNDATION PLAN

SCALE - 1/4" = 1'-0"

NORTH

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A NEW TOWNHOUSE DEVELOPMENT FOR:

MISSION VALE

5819 NALL AVENUE
MISSION, KANSAS

DRAWING RELEASE LOG
- 01/23/23 FOR PERMITTAL
- 01/23/23 FOR PERMITTAL
- 01/23/23 FOR PERMITTAL
- 01/23/23 FOR PERMITTAL
- 01/23/23 PERMIT SET

REVISIONS

JOB NO. 712922
DATE 01.23.23
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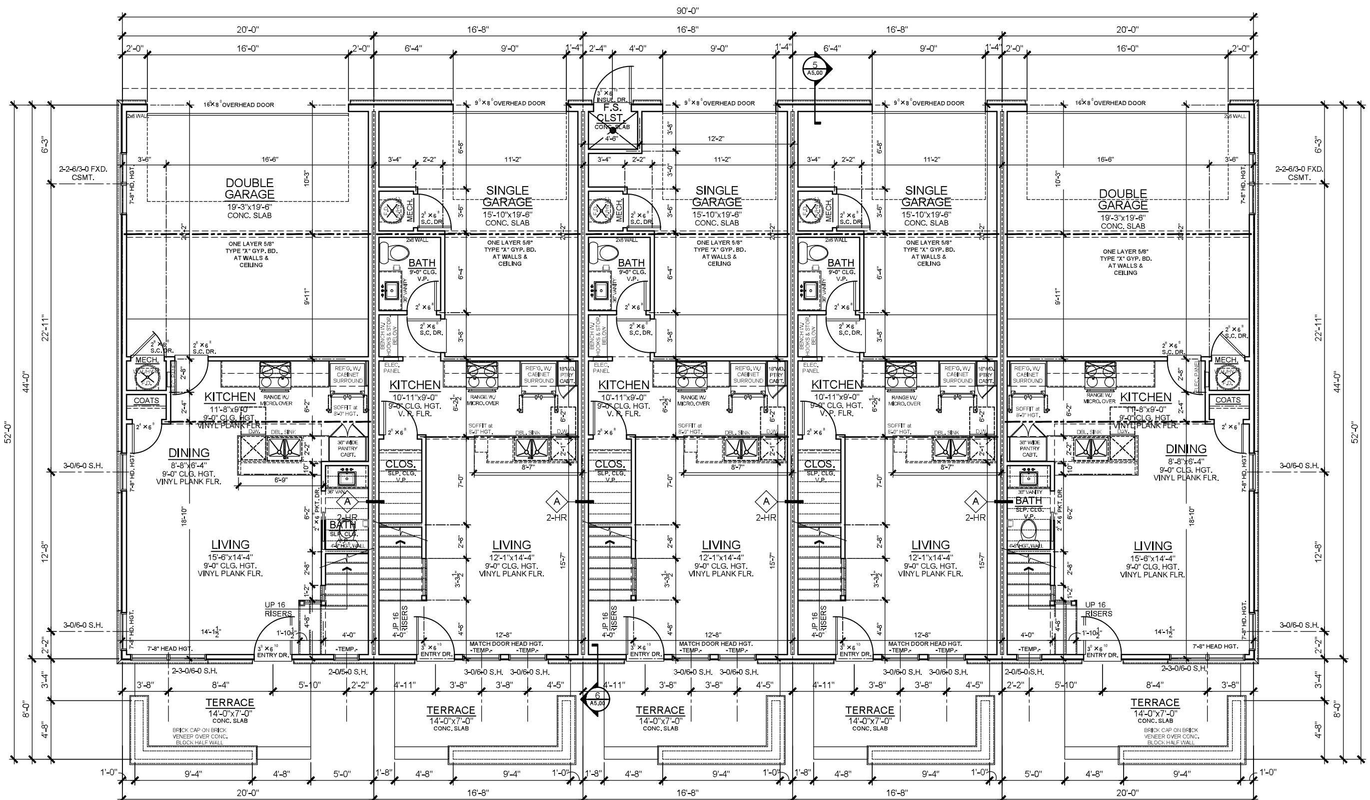
SHEET NAME

SHEET NO. A2.00



UNIT 11 - A END PLAN

FIRST FLOOR	480 sq. ft.
SECOND FLOOR	851 sq. ft.
TOTAL LIVING	1,331 sq. ft.
GARAGE	400 sq. ft.

UNIT 10 - C PLAN

FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

UNIT 9 - C PLAN

FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

UNIT 8 - C PLAN

FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

UNIT 7 - A END PLAN

FIRST FLOOR	480 sq. ft.
SECOND FLOOR	851 sq. ft.
TOTAL LIVING	1,331 sq. ft.
GARAGE	400 sq. ft.

BUILDING UNITS 7 to 11
FIRST FLOOR PLAN

SCALE - 1/4" = 1'-0"

NORTH

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A NEW TOWNHOUSE DEVELOPMENT FOR:
MISSION VALE
5819 NALL AVENUE
MISSION, KANSAS

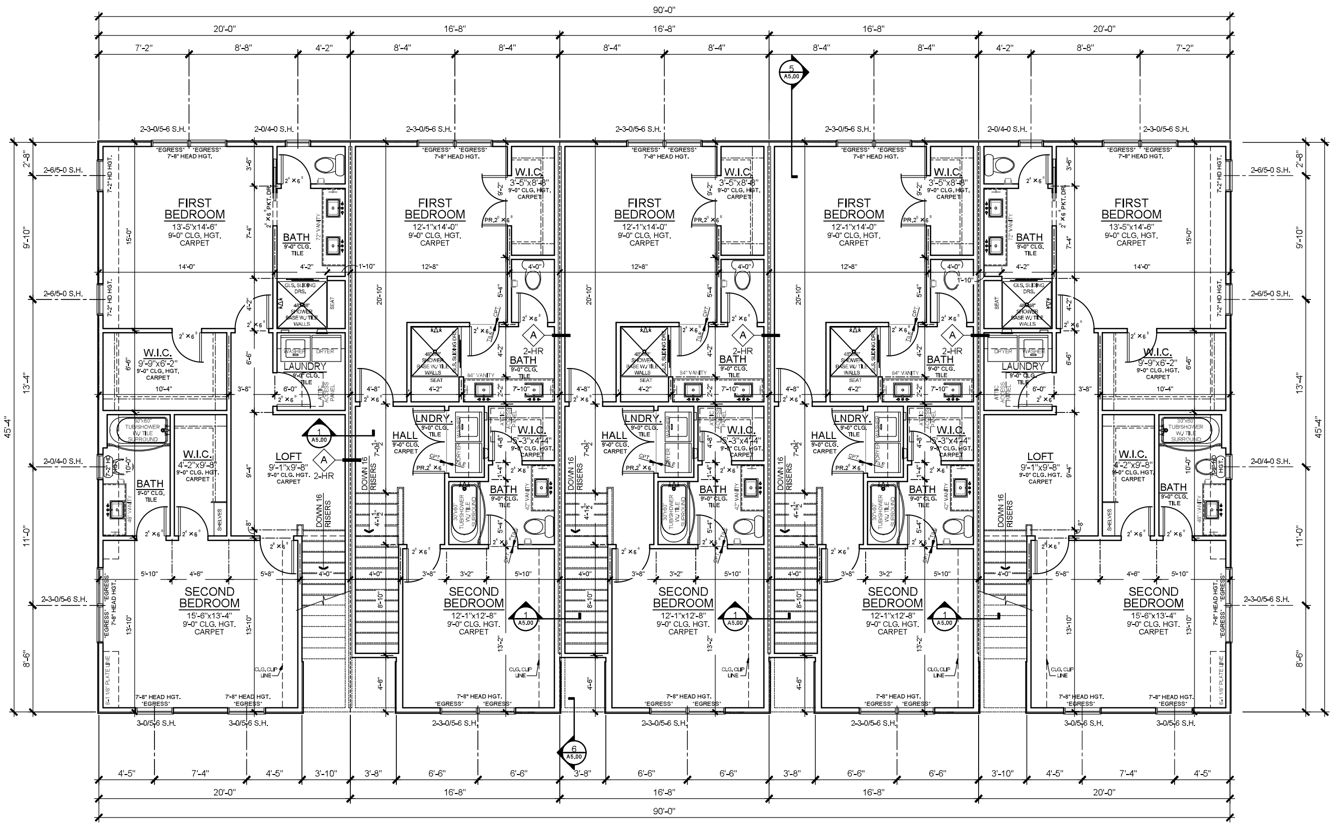
DRAWING RELEASE LOG

REVISIONS

JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH

SHEET NAME

SHEET NO. A2.01



UNIT 11 - A END PLAN
SECOND FLOOR 851 sq. ft.

UNIT 10 - C PLAN
SECOND FLOOR 696 sq. ft.

UNIT 9 - C PLAN
SECOND FLOOR 696 sq. ft.

UNIT 8 - C PLAN
SECOND FLOOR 696 sq. ft.

UNIT 7 - A END PLAN
SECOND FLOOR 851 sq. ft.

BUILDING UNITS 7 to 11
SECOND FLOOR PLAN

SCALE - 1/4" = 1'-0"

NORTH

NSPJ ARCHITECTS
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A NEW TOWNHOUSE DEVELOPMENT FOR:
MISSION VALE
5819 NALL AVENUE
MISSION, KANSAS

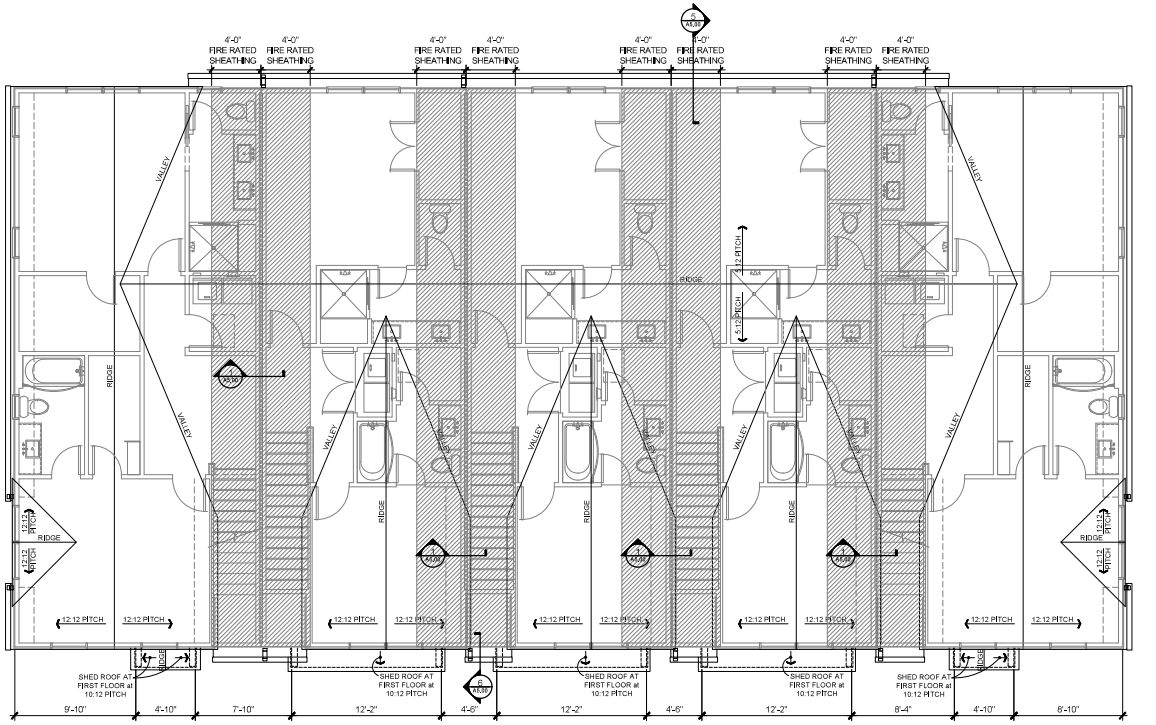
DRAWING RELEASE LOG

REVISIONS

JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH

SHEET NAME

SHEET NO.
A2.02



UNIT 11 - A END PLAN | UNIT 10 - C PLAN | UNIT 9 - C PLAN | UNIT 8 - C PLAN | UNIT 7 - A END PLAN

NOTES:

ROOF VENTS SHALL NOT BE LOCATED within THE 4'-0" WIDE FIRE-RATED SHEATHING PANELS ON EACH SIDE OF THE CENTERLINE BETWEEN UNITS.

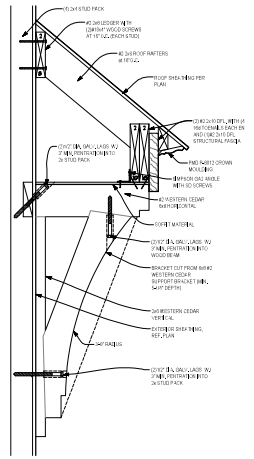
ALL ROOF PENETRATIONS TO BE LOCATED ON REAR ELEVATION SO AS NOT TO BE VISIBLE FROM THE STREET.

PROVIDE ATTIC VENTILATION, HALF FROM LOWER AND HALF UP HIGH.

BUILDING UNITS 7 to 11
ROOF PLAN

SCALE - 1/4" = 1'-0"

NORTH



ROOF BRACKET DETAIL

SCALE - 1-1/2" = 1'-0"

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A NEW TOWNHOUSE DEVELOPMENT FOR:

MISSION VALE

5819 NALL AVENUE
MISSION, KANSAS

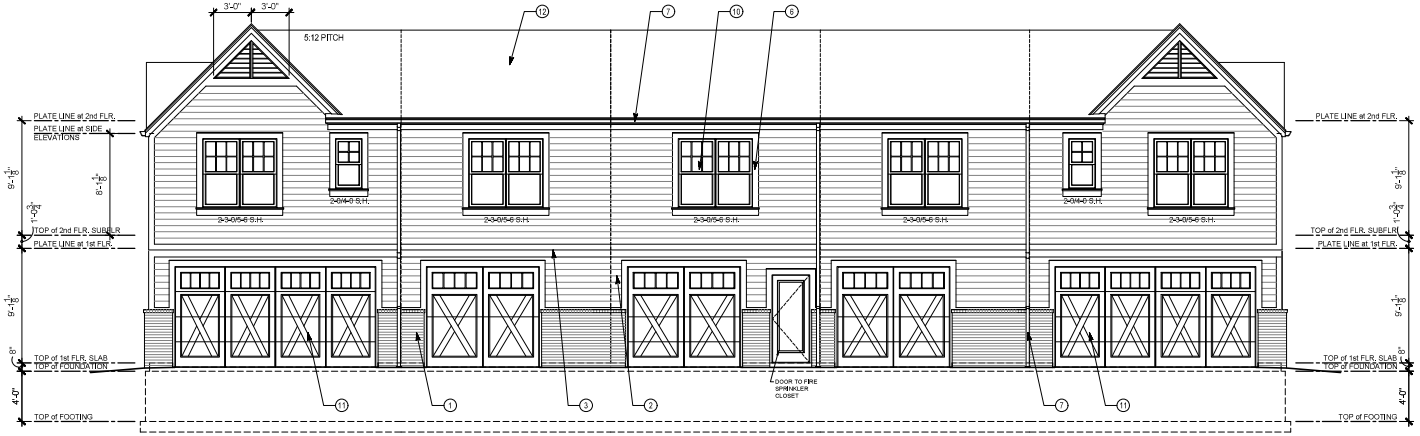
DRAWING RELEASE LOG

REVISIONS

JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH

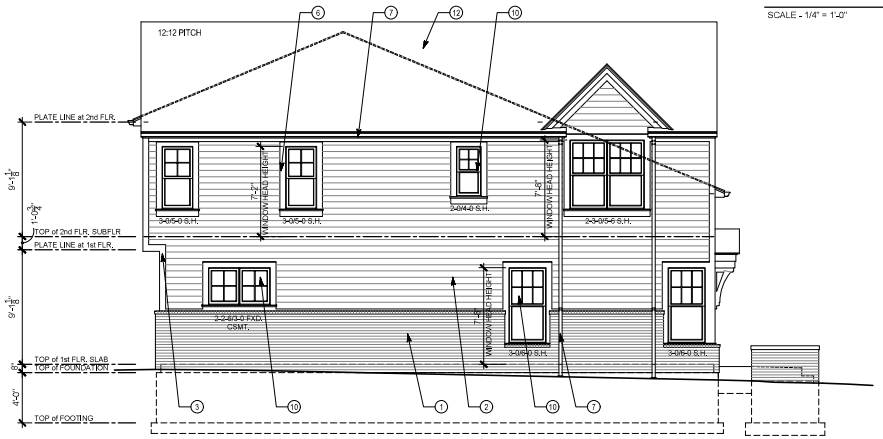
SHEET NAME

SHEET NO. A2.03



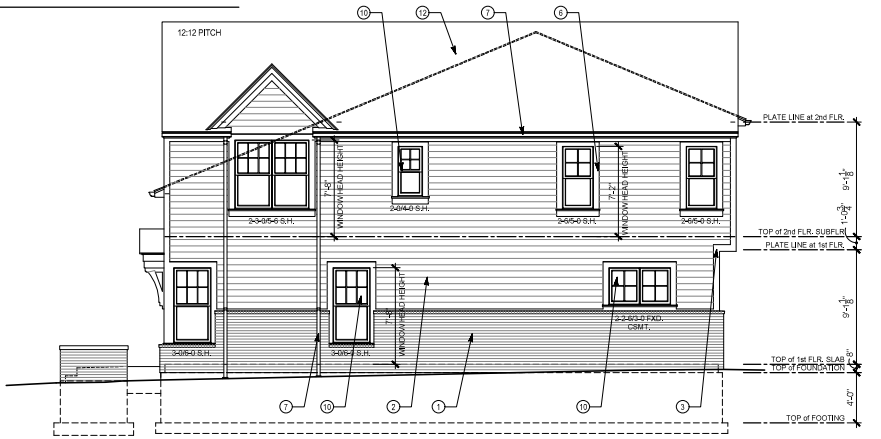
REAR - SOUTH ELEVATION

SCALE - 1/4" = 1'-0"



LEFT SIDE - EAST ELEVATION

SCALE - 1/4" = 1'-0"



RIGHT SIDE - EAST ELEVATION

SCALE - 1/4" = 1'-0"

EXTERIOR MATERIAL SCHEDULE

1. BRICK VENEER WITH SLOPED BRICK CAP - HEBRON BRICK COMPANY - COLOR CARRIAGE HOUSE
2. LAP SIDING WITH 6 INCH EXPOSURE - COLOR WHITE
3. SMART TRIM - COLOR SW7008 ALABASTER
4. WOOD BRACKETS - COLOR WHITE
5. DECORATIVE FALSE GABLE END VENT - COLOR WHITE
6. SMART TRIM - 5/4x WINDOW SURROUND W./ SLOPED SILL - COLOR SW7008 ALABASTER
7. PREFINISHED GUTTER & DOWNSPOUT - COLOR WHITE
8. ENTRY DOOR, SOLID OR WITH LITES - COLOR WHITE
9. FULL VIEW DOOR - COLOR WHITE
10. VINYL SINGLE HUNG OR CASEMENT WINDOW - COLOR WHITE
11. CARRIAGE STYLE OVERHEAD DOOR - COLOR WHITE
12. COMPOSITION ROOF - CERTAINTEED LANDMARK SERIES - COLOR WEATHEREDWOOD

UNIT 11 - A END PLAN UNIT 10 - C PLAN UNIT 9 - C PLAN UNIT 8 - C PLAN UNIT 7 - A END PLAN

FRONT - NORTH ELEVATION

SCALE - 1/4" = 1'-0"

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A NEW TOWNHOUSE DEVELOPMENT FOR:

MISSION VALE

5819 NALL AVENUE

MISSION, KANSAS

DRAWING RELEASE LOG

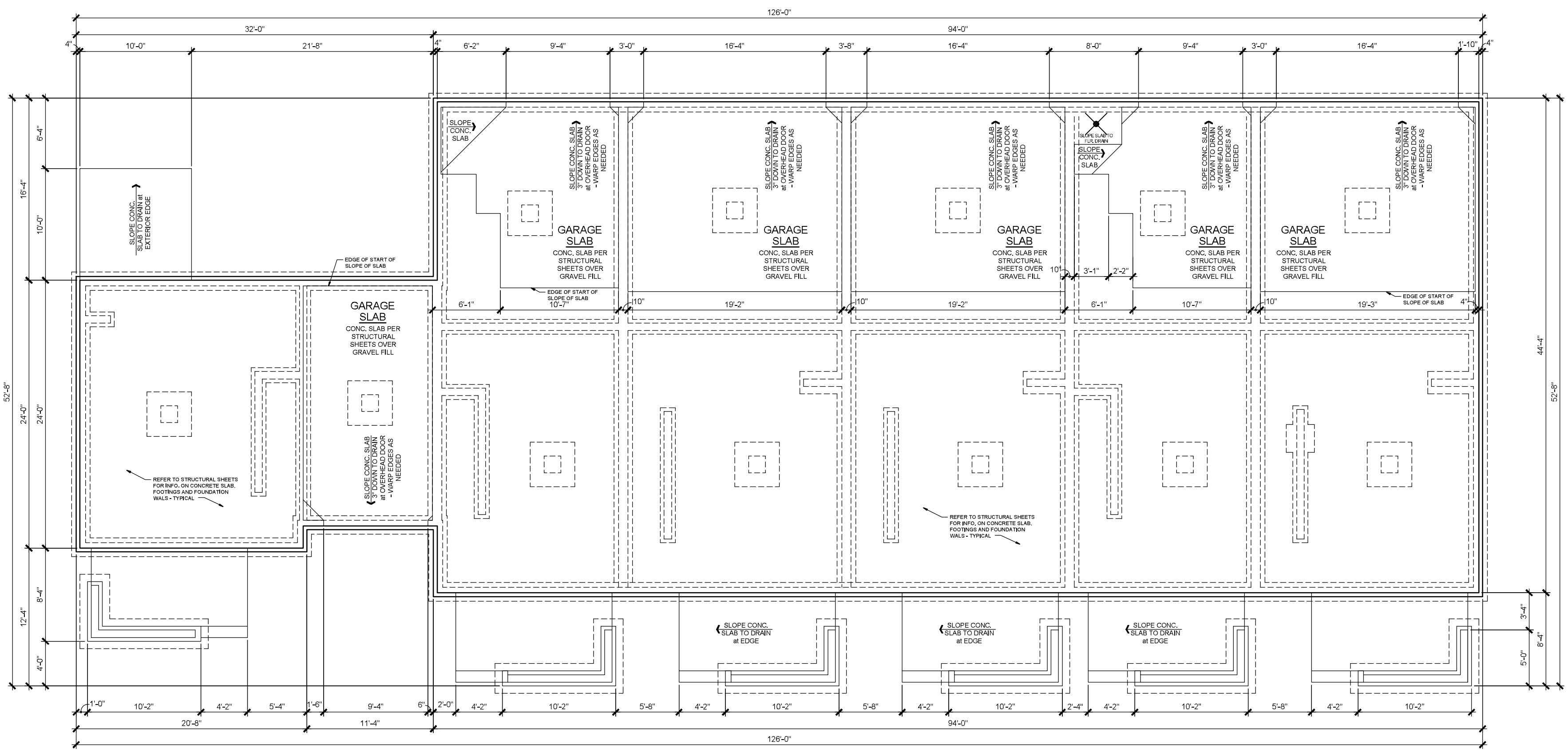
REVISIONS

JOB NO. 712922 | DATE 01.23.23

DRAWN BY TAH

SHEET NAME

SHEET NO. A2.04



UNIT 17 - B PLAN

FIRST FLOOR	480 sq. ft.
SECOND FLOOR	851 sq. ft.
TOTAL LIVING	1,331 sq. ft.
GARAGE	400 sq. ft.

UNIT 16 - C PLAN

FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

UNIT 15 - A PLAN

FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

UNIT 14 - A PLAN

FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

UNIT 13 - C PLAN

FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

UNIT 12 - A END PLAN

FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

BUILDING UNITS 12 to 17 FOUNDATION PLAN

SCALE - 1/4" = 1'-0"

NORTH

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A NEW TOWNHOUSE DEVELOPMENT FOR:
MISSION VALE
5819 NALL AVENUE
MISSION, KANSAS

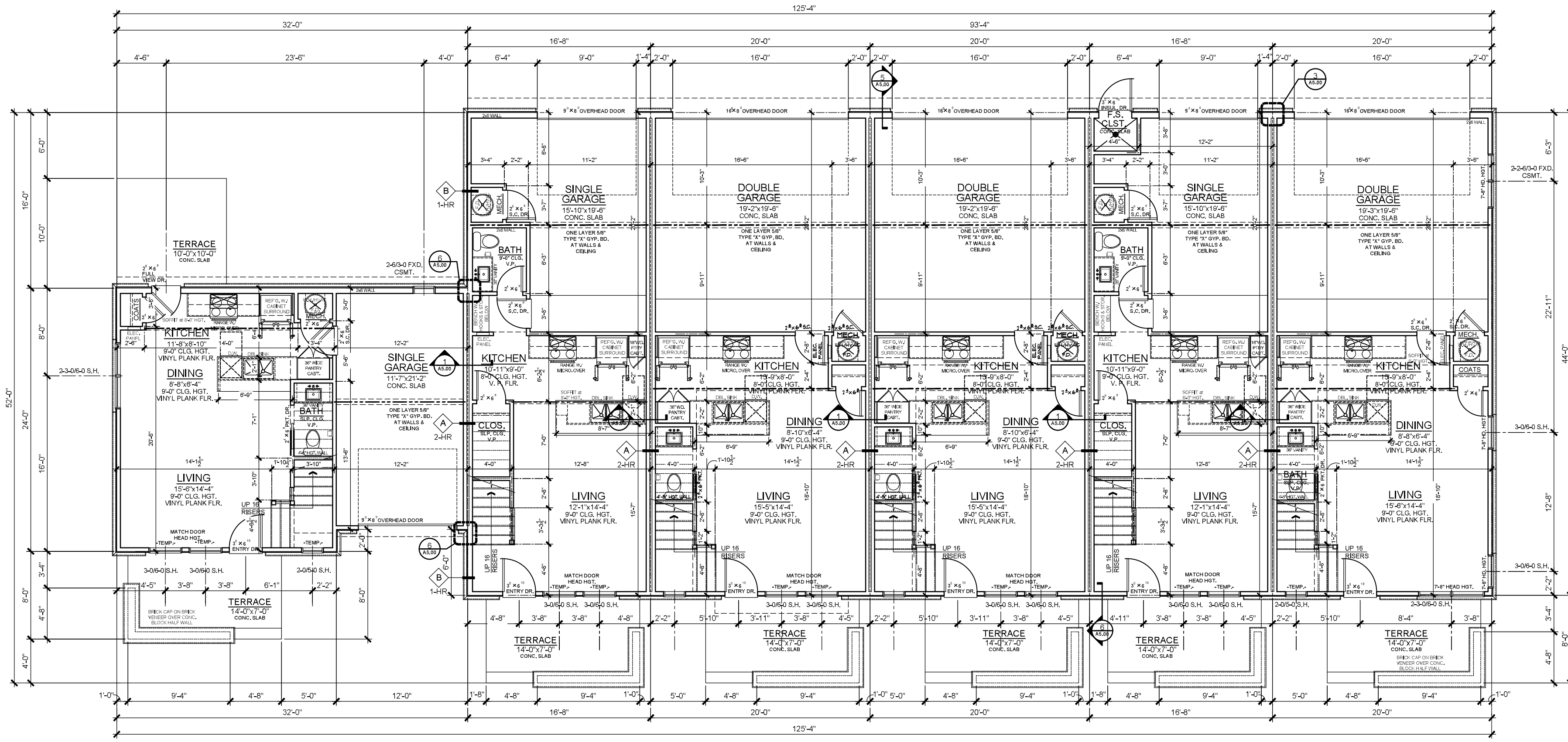
DRAWING RELEASE LOG

REVISIONS

JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH

SHEET NAME

SHEET NO.
A3.00



UNIT 17 - B PLAN

FIRST FLOOR	480 sq. ft.
SECOND FLOOR	734 sq. ft.
TOTAL LIVING	1,214 sq. ft.
GARAGE	264 sq. ft.

UNIT 16 - C PLAN

FIRST FLOOR	469 sq. ft.
SECOND FLOOR	712 sq. ft.
TOTAL LIVING	1,181 sq. ft.
GARAGE	264 sq. ft.

UNIT 15 - A PLAN

FIRST FLOOR	480 sq. ft.
SECOND FLOOR	871 sq. ft.
TOTAL LIVING	1,351 sq. ft.
GARAGE	400 sq. ft.

UNIT 14 - A PLAN

FIRST FLOOR	480 sq. ft.
SECOND FLOOR	851 sq. ft.
TOTAL LIVING	1,331 sq. ft.
GARAGE	400 sq. ft.

UNIT 13 - C PLAN

FIRST FLOOR	469 sq. ft.
SECOND FLOOR	696 sq. ft.
TOTAL LIVING	1,165 sq. ft.
GARAGE	264 sq. ft.

UNIT 12 - A END PLAN

FIRST FLOOR	480 sq. ft.
SECOND FLOOR	851 sq. ft.
TOTAL LIVING	1,331 sq. ft.
GARAGE	400 sq. ft.

BUILDING UNITS 12 to 17 FIRST FLOOR PLAN

SCALE - 1/4" = 1'-0"

NORTH

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A NEW TOWNHOUSE DEVELOPMENT FOR:
MISSION VALE
5819 NALL AVENUE
MISSION, KANSAS

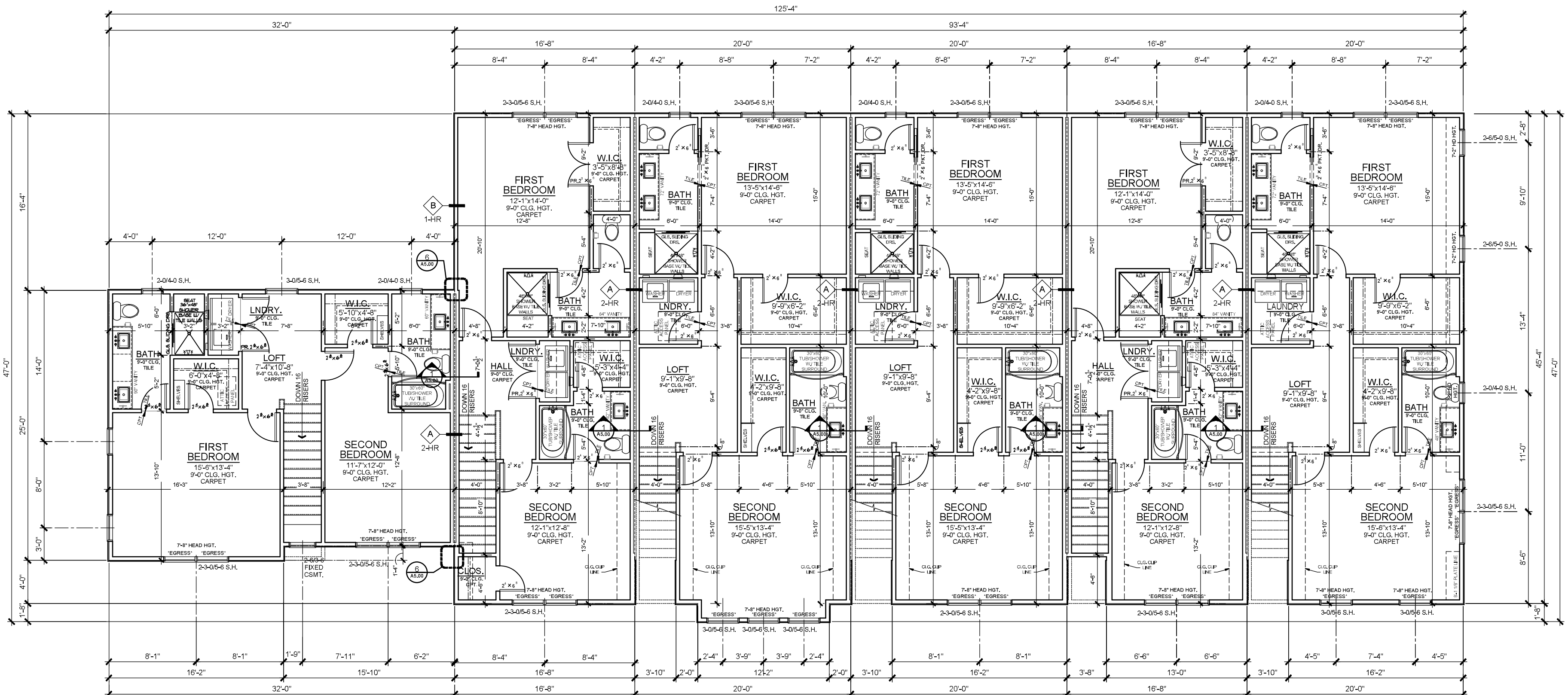
DRAWING RELEASE LOG

REVISIONS

JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH

SHEET NAME

SHEET NO.
A3.01



UNIT 17 - B PLAN
SECOND FLOOR 734 sq. ft.

UNIT 16 - C PLAN
SECOND FLOOR 712 sq. ft.

UNIT 15 - A PLAN
SECOND FLOOR 871 sq. ft.

UNIT 14 - A PLAN
SECOND FLOOR 851 sq. ft.

UNIT 13 - C PLAN
SECOND FLOOR 696 sq. ft.

UNIT 12 - A END PLAN
SECOND FLOOR 851 sq. ft.

BUILDING UNITS 12 to 17
SECOND FLOOR PLAN
SCALE - 1/4" = 1'-0"

NORTH

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A NEW TOWNHOUSE DEVELOPMENT FOR:
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5819 NALL AVENUE
MISSION, KANSAS

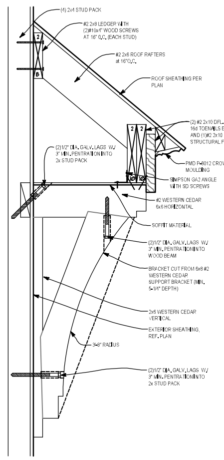
DRAWING RELEASE LOG

REVISIONS

JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH

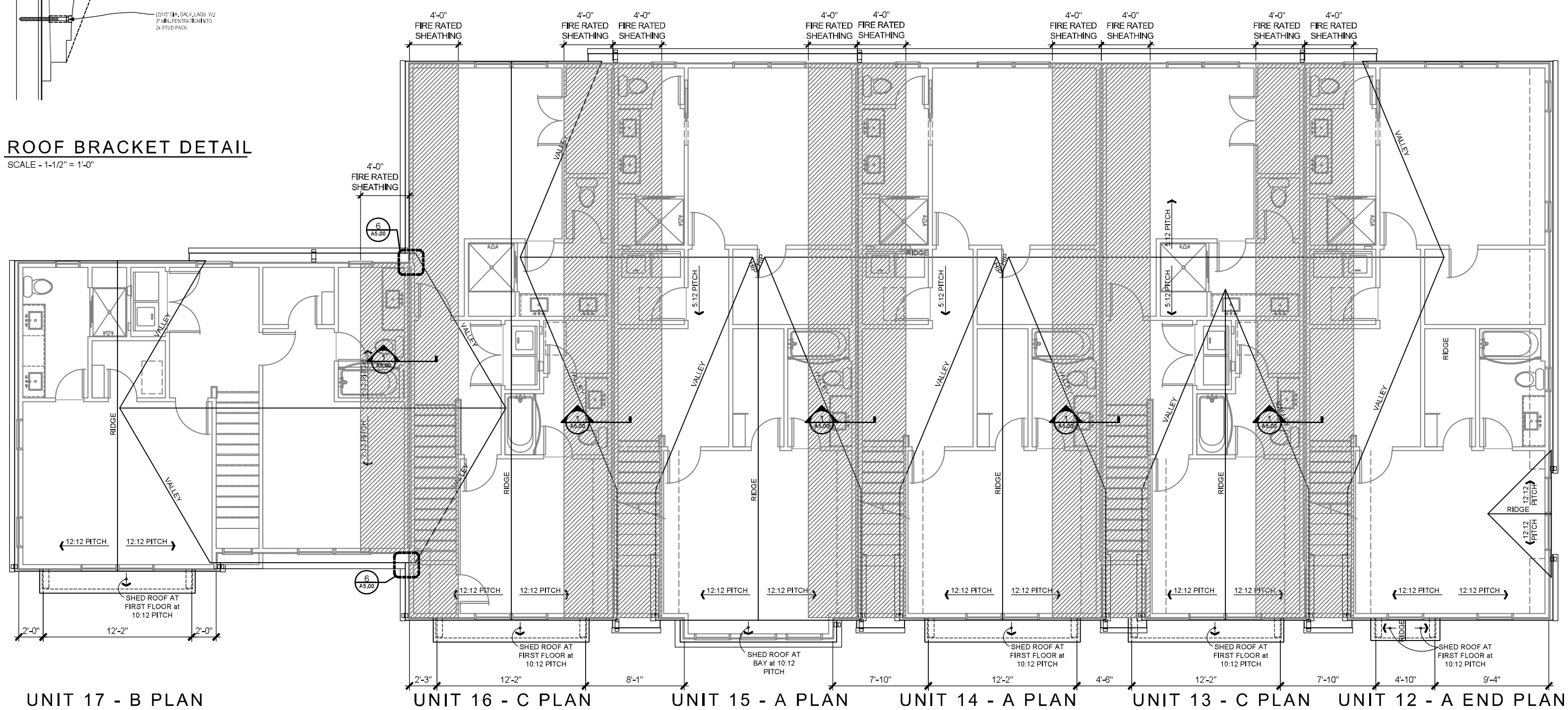
SHEET NAME

SHEET NO.
A3.02



ROOF BRACKET DETAIL

SCALE - 1-1/2" = 1'-0"



NOTES:

ROOF VENTS SHALL NOT BE LOCATED within THE 4'-0" WIDE FIRE-RATED SHEATHING PANELS ON EACH SIDE OF THE CENTERLINE BETWEEN UNITS.

ALL ROOF PENETRATIONS TO BE LOCATED ON REAR ELEVATION SO AS NOT TO BE VISIBLE FROM THE STREET.

PROVIDE ATTIC VENTILATION, HALF FROM LOWER AND HALF UP HIGH.

BUILDING UNITS 12 to 17 ROOF PLAN

SCALE - 1/4" = 1'-0"

NORTH

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CLINT EDD EVANS LICENSED 6309 KANSAS ARCHITECT 1/23/23

A NEW TOWNHOUSE DEVELOPMENT FOR:

MISSION VALE

5819 NALL AVENUE
MISSION, KANSAS

DRAWING RELEASE LOG

- 07.27.22 PDP RESUBMITTAL
- 08.11.22 PDP RESUBMITTAL
- 09.15.22 PDP RESUBMITTAL
- 12.15.22 FDP SUBMITTAL
- 01.23.23 PERMIT SET

REVISIONS

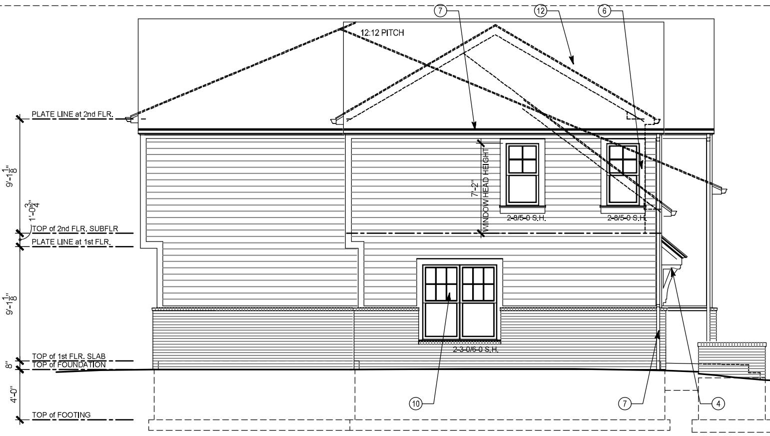
JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH

SHEET NAME

SHEET NO.
A3.03

EXTERIOR MATERIAL SCHEDULE

1. BRICK VENEER WITH SLOPED BRICK CAP - HEBRON BRICK COMPANY - COLOR CARRIAGE HOUSE
2. LAP SIDING WITH 6 INCH EXPOSURE - COLOR WHITE
3. SMART TRIM - COLOR SW7008 ALABASTER
4. WOOD BRACKETS - COLOR WHITE
5. DECORATIVE FALSE GABLE END VENT - COLOR WHITE
6. SMART TRIM - 5/4x WINDOW SURROUND W./ SLOPED SILL - COLOR SW7008 ALABASTER
7. PREFINISHED GUTTER & DOWNSPOUT - COLOR WHITE
8. ENTRY DOOR, SOLID OR WITH LITES - COLOR WHITE
9. FULL VIEW DOOR - COLOR WHITE
10. VINYL SINGLE HUNG OR CASEMENT WINDOW - COLOR WHITE
11. CARRIAGE STYLE OVERHEAD DOOR - COLOR WHITE
12. COMPOSITION ROOF - CERTAINTEED LANDMARK SERIES - COLOR WEATHEREDWOOD



LEFT SIDE - EAST ELEVATION

SCALE - 1/4" = 1'-0"

RIGHT SIDE - WEST ELEVATION

SCALE - 1/4" = 1'-0"

UNIT 17 - B PLAN | UNIT 16 - C PLAN | UNIT 15 - A PLAN | UNIT 14 - A PLAN | UNIT 13 - C PLAN | UNIT 12 - A END PLAN

FRONT - NORTH ELEVATION

SCALE - 1/4" = 1'-0"

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A NEW TOWNHOUSE DEVELOPMENT FOR:

MISSION VALE

5819 NALL AVENUE
MISSION, KANSAS

DRAWING RELEASE LOG

REVISIONS

JOB NO. 712922

DATE 01.23.23

DRAWN BY TAH

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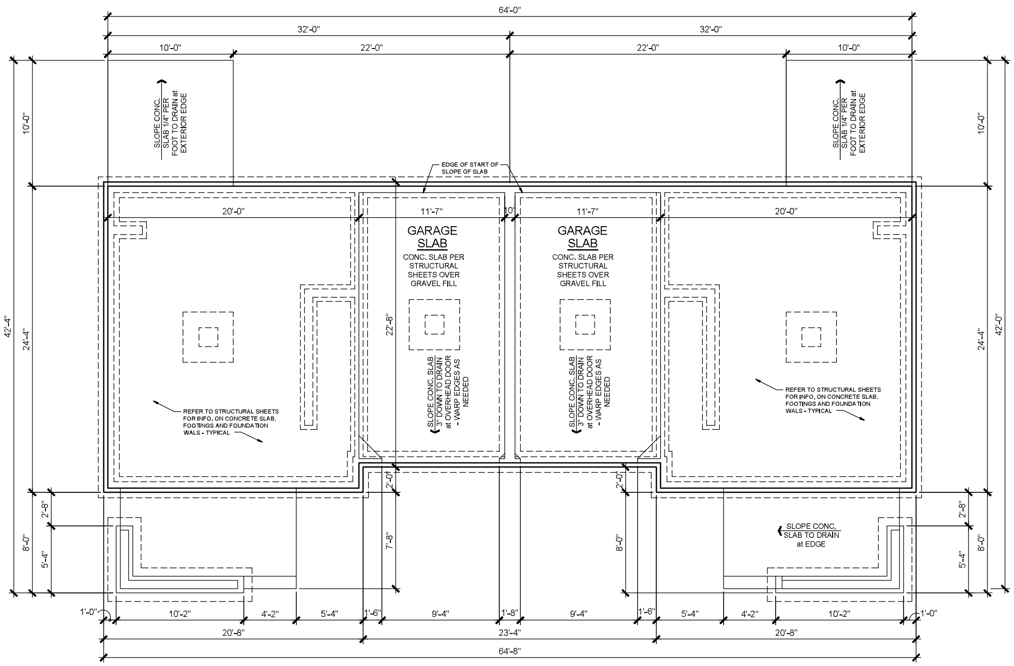
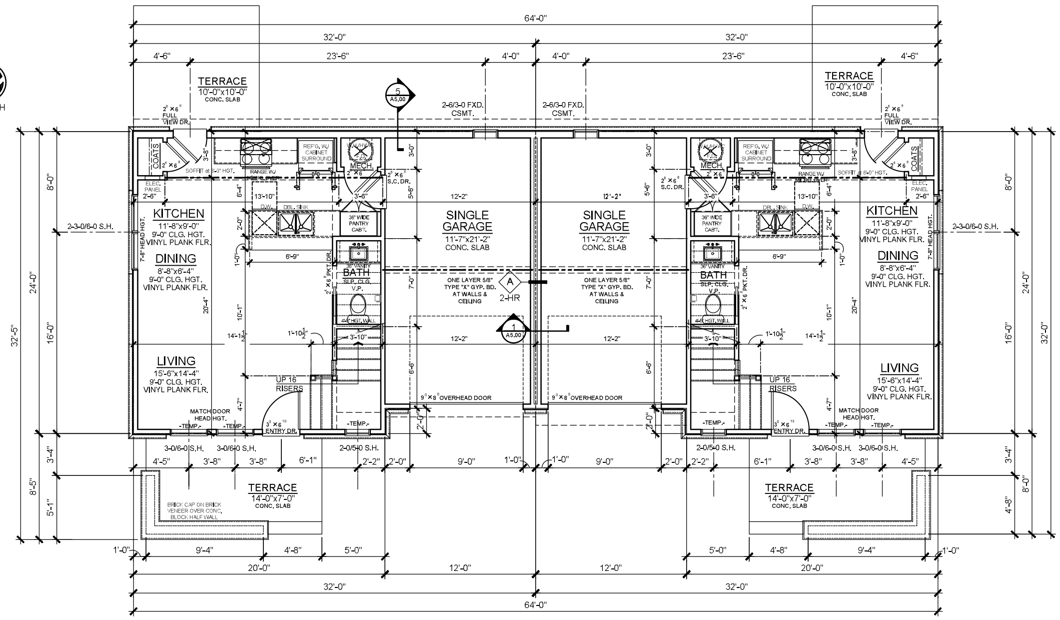


BUILDING UNITS 18 to 19
FOUNDATION PLAN

SCALE - 1/4" = 1'-0"

NORTH



UNIT 19 - B PLAN

FIRST FLOOR	480 sq. ft.
SECOND FLOOR	734 sq. ft.
TOTAL LIVING	1,214 sq. ft.
GARAGE	264 sq. ft.

UNIT 18 - B PLAN

FIRST FLOOR	480 sq. ft.
SECOND FLOOR	742 sq. ft.
TOTAL LIVING	1,232 sq. ft.
GARAGE	264 sq. ft.

BUILDING UNITS 18 to 19
FIRST FLOOR PLAN

SCALE - 1/4" = 1'-0"

NORTH

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A NEW TOWNHOUSE DEVELOPMENT FOR:
MISSION VALE
5819 NALL AVENUE
MISSION, KANSAS

DRAWING RELEASE LOG

REVISIONS

JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH

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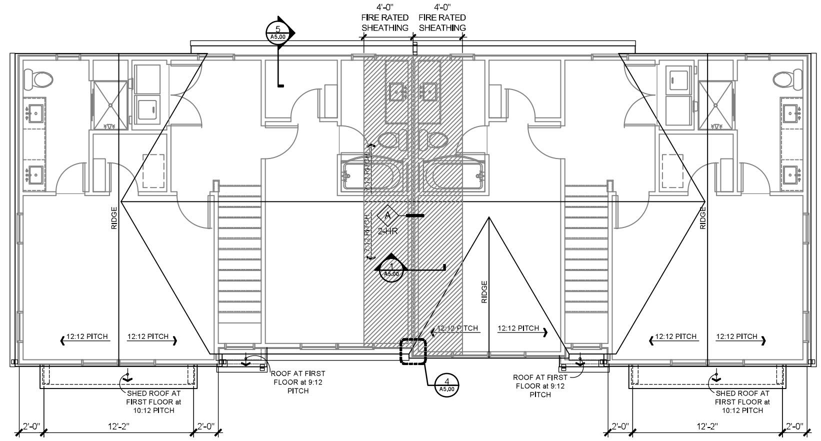
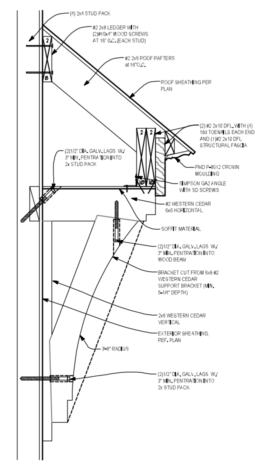
SHEET NO.
A4.00





ROOF BRACKET DETAIL

SCALE - 1-1/2" = 1'-0"

NOTES:

ROOF VENTS SHALL NOT BE LOCATED within THE 4'-0" WIDE FIRE-RATED SHEATHING PANELS ON EACH SIDE OF THE CENTERLINE BETWEEN UNITS.

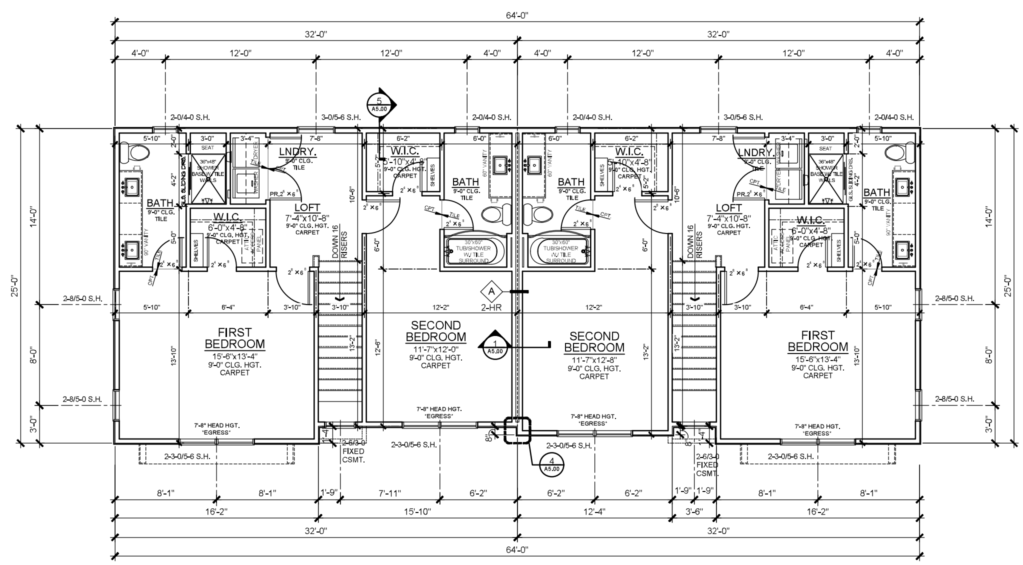
ALL ROOF PENETRATIONS TO BE LOCATED ON REAR ELEVATION SO AS NOT TO BE VISIBLE FROM THE STREET.

PROVIDE ATTIC VENTILATION, HALF FROM LOWER AND HALF UP HIGH.

BUILDING UNITS 18 to 19 ROOF PLAN

SCALE - 1/4" = 1'-0"

NORTH



UNIT 19 - B PLAN

SECOND FLOOR 734 sq. ft.

UNIT 18 - B PLAN

SECOND FLOOR 742 sq. ft.

BUILDING UNITS 18 to 19 SECOND FLOOR PLAN

SCALE - 1/4" = 1'-0"

NORTH

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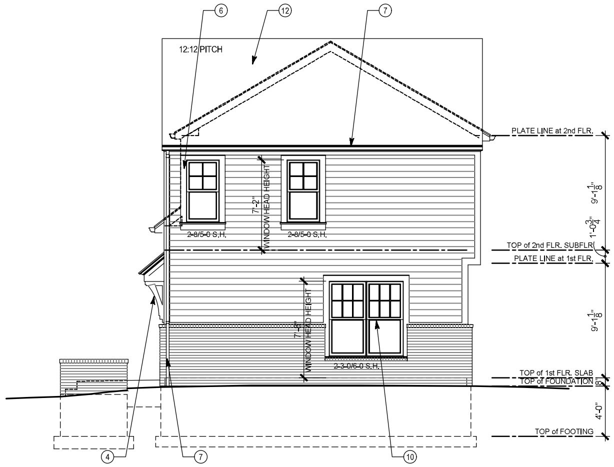
5819 NALL AVENUE
MISSION, KANSAS

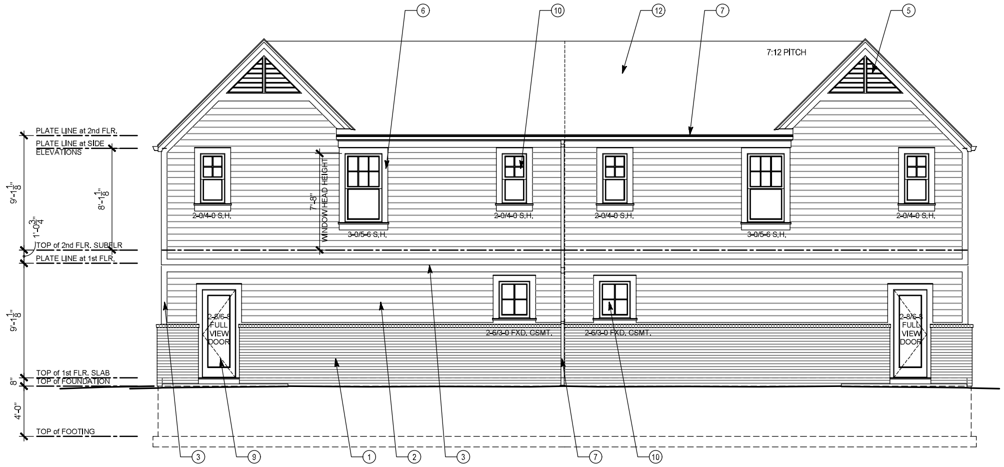
DRAWING RELEASE LOG

REVISIONS

JOB NO. 712922	DATE 01.23.23
DRAWN BY TAH	
SHEET NAME	
SHEET NO. A4.01	



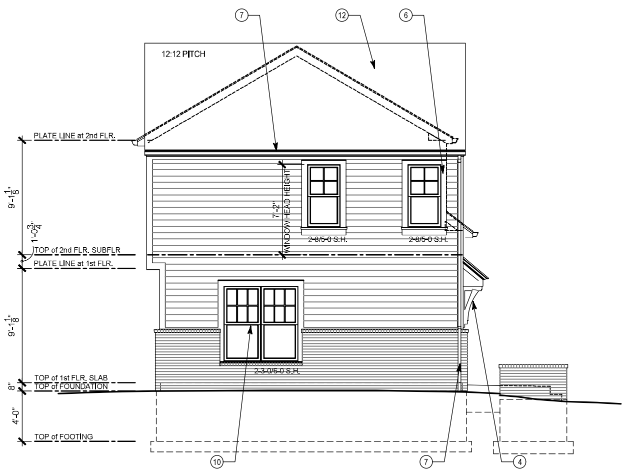
BUILDING UNITS 18 to 19
RIGHT SIDE - WEST ELEVATION
SCALE - 1/4" = 1'-0"



BUILDING UNITS 18 to 19
REAR - SOUTH ELEVATION
SCALE - 1/4" = 1'-0"

EXTERIOR MATERIAL SCHEDULE

1. BRICK VENEER WITH SLOPED BRICK CAP - HEBRON BRICK COMPANY - COLOR CARRIAGE HOUSE
2. LAP SIDING WITH 6 INCH EXPOSURE - COLOR WHITE
3. SMART TRIM - COLOR SW7008 ALABASTER
4. WOOD BRACKETS - COLOR WHITE
5. DECORATIVE FALSE GABLE END VENT - COLOR WHITE
6. SMART TRIM - 5/4x WINDOW SURROUND W./ SLOPED SILL - COLOR SW7008 ALABASTER
7. PREFINISHED GUTTER & DOWNSPOUT - COLOR WHITE
8. ENTRY DOOR, SOLID OR WITH LITES - COLOR WHITE
9. FULL VIEW DOOR - COLOR WHITE
10. VINYL SINGLE HUNG OR CASEMENT WINDOW - COLOR WHITE
11. CARRIAGE STYLE OVERHEAD DOOR - COLOR WHITE
12. COMPOSITION ROOF - CERTAINTEED LANDMARK SERIES - COLOR WEATHEREDWOOD



BUILDING UNITS 18 to 19
LEFT SIDE - EAST ELEVATION
SCALE - 1/4" = 1'-0"

UNIT 19 - B PLAN
UNIT 18 - B PLAN

BUILDING UNITS 18 to 19
FRONT - NORTH ELEVATION
SCALE - 1/4" = 1'-0"

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A NEW TOWNHOUSE DEVELOPMENT FOR:
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5819 NALL AVENUE
MISSION, KANSAS

DRAWING RELEASE LOG

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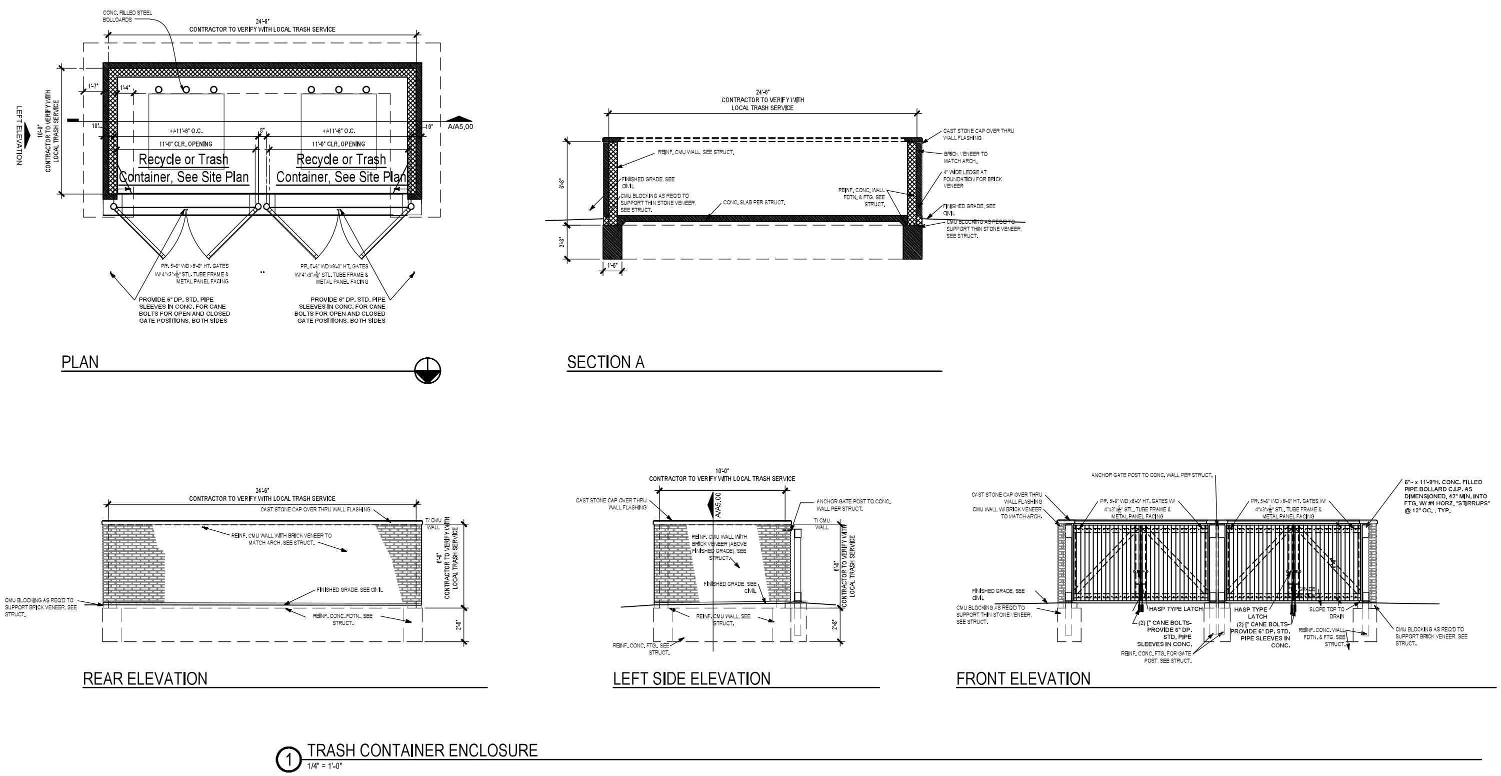
JOB NO.	DATE
712922	01.23.23

DRAWN BY
TAH

SHEET NAME

SHEET NO.
A4.02



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A NEW TOWNHOUSE DEVELOPMENT FOR:
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DRAWING RELEASE LOG

REVISIONS

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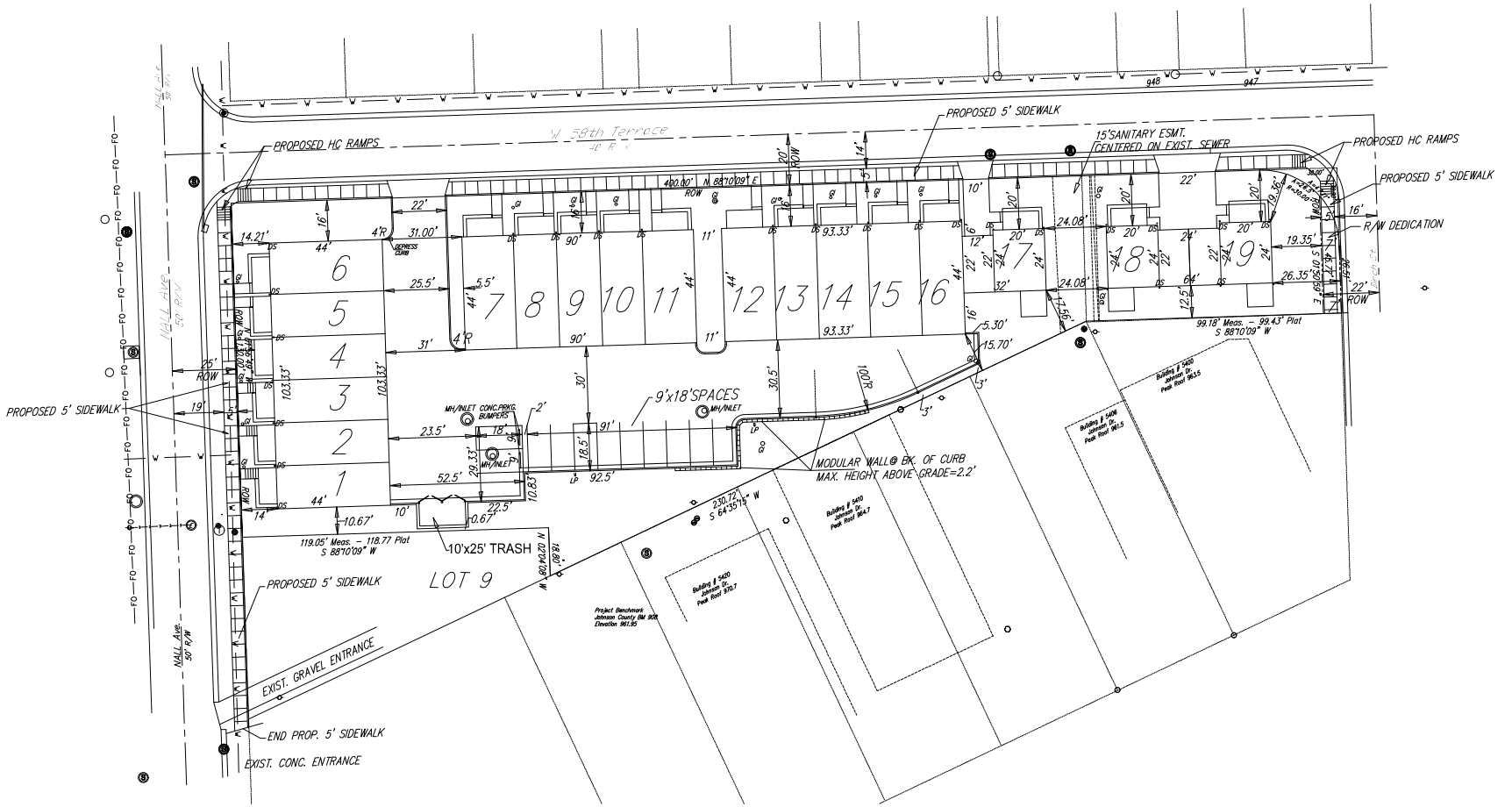
DATE 01.23.23
DRAWN BY TAH

SHEET NAME

SHEET NO.
A6.00



ROBERT C. WESSEL LICENSED 7183 KANSAS PROFESSIONAL ENGINEER
02/17/23

JOB NO.:	RCW0311	DRAWN:	RPP
FIELD BK./PG.:	XX/XX	CHECKED:	RCW

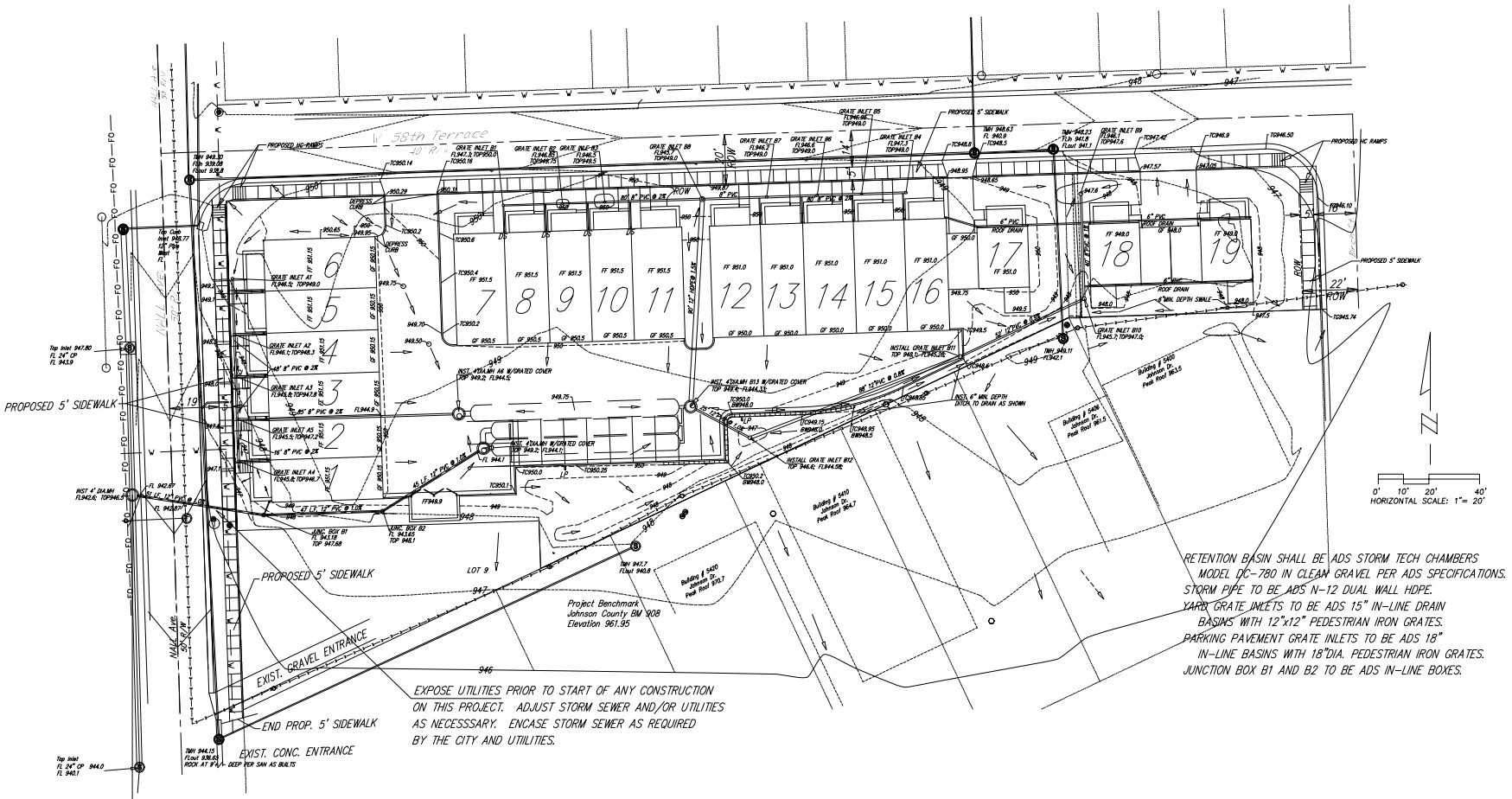
ISSUES / REVISIONS:	DATE
ISSUE	10/18/22
PERMIT ISSUE	12/12/22
RELOCATED TRASH	01/06/23
REVISED PER CITY COMMENTS	02/13/23
ADDED PROP SW ON NALL	02/17/23

ROBERT C. WESSEL P.E.
consulting engineer
4085 NORTH KOLB ROAD
TUCSON, ARIZONA 85750
913-207-6118
EMAIL robertcwessel47@gmail.com

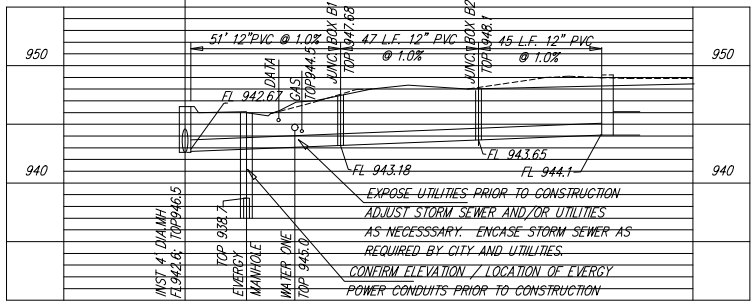
PREPARED FOR:
KOENIG BUILDING & RESTORATION
2500 WEST 43RD STREET
KANSAS CITY, KANSAS 66103

MISSION VALE TOWNHOMES
SITE PLAN
58th TERRACE & NALL
MISSION, KANSAS

SHEET NO.
C1
OF 9



BASIN DISCHARGE PIPE



UTILITY DEPTHS CONFIRMED 12/12/2022

SITE STORM SEWERS

INLET	D.A. acre	c	cA	Tc min	i10	Q10 cfs	i100	Q100 cfs	Pipe	Pipe cA	Q10 cfs	Q100 cfs	DIA.	n	S	QFull cfs
A1	0.030	0.7	0.021	5	7.35	0.15	10.32	0.27	A1-A2	0.021	0.15	0.27	8"	0.012	2%	1.85
A2	0.014	0.9	0.013	5	7.35	0.10	10.32	0.17	A2-A3	0.034	0.25	0.44	8"	0.012	2%	1.85
A3	0.014	0.9	0.013	5	7.35	0.10	10.32	0.17	A3-A5	0.047	0.35	0.61	8"	0.012	2%	1.85
A4	0.017	0.9	0.015	5	7.35	0.11	10.32	0.19	A3-A4	0.015	0.11	0.19	8"	0.012	2%	1.85
A5	0.014	0.9	0.013	5	7.35	0.10	10.32	0.17	A5-A6	0.075	0.55	0.97	8"	0.012	2%	1.85
A6	0.199	0.9	0.179	5	7.35	1.32	10.32	2.31	A6-RE	0.254	1.87	3.28	24"	0.012	2%	34.7
B1	0.022	0.9	0.020	5	7.35	0.15	10.32	0.26	B1-B2	0.020	0.15	0.26	8"	0.012	2%	1.85
B2	0.022	0.9	0.020	5	7.35	0.15	10.32	0.26	B2-B3	0.040	0.30	0.52	8"	0.012	2%	1.85
B3	0.022	0.9	0.020	5	7.35	0.15	10.32	0.26	B3-B8	0.060	0.60	0.78	8"	0.012	2%	1.85
B4	0.020	0.9	0.018	5	7.35	0.13	10.32	0.23	B4-B5	0.018	0.13	0.23	8"	0.012	2%	1.85
B5	0.015	0.9	0.014	5	7.35	0.10	10.32	0.18	B5-B6	0.032	0.24	0.41	8"	0.012	2%	1.85
B6	0.016	0.9	0.015	5	7.35	0.11	10.32	0.19	B6-B7	0.047	0.35	0.61	8"	0.012	2%	1.85
B7	0.017	0.9	0.015	5	7.35	0.11	10.32	0.19	B7-B8	0.062	0.46	0.80	8"	0.012	2%	1.85
B8	0.027	0.9	0.024	5	7.35	0.18	10.32	0.31	B8-B13	0.165	1.21	2.13	12"	0.012	1.5%	4.70
B9	0.085	0.85	0.072	5	7.35	0.53	10.32	0.93	B9-B10	0.072	0.53	0.93	8"	0.012	1%	1.31
B10	0.063	0.40	0.025	5	7.35	0.18	10.32	0.32	B10-B11	0.097	0.71	1.25	8"	0.012	0.9%	1.24
B11	0.092	0.9	0.083	5	7.35	0.61	10.32	1.07	B11-B12	0.180	1.32	2.32	12"	0.012	0.8%	3.45
B12	0.062	0.40	0.025	5	7.35	0.18	10.32	0.32	B12-B13	0.205	1.51	2.64	12"	0.012	1%	3.86
B13	0.112	0.9	0.101	5	7.35	0.74	10.32	1.30	B13-RE	0.471	3.46	6.08	15"	0.012	2%	9.90

02/17/23

JOB NO.: RCW0311 | DRAWN: RPP
FIELD BK./PG.: XX/XX | CHECKED: RCW

ISSUES / REVISIONS:	DATE:
PRELIMINARY ISSUE	09/12/22
REVISED PER CITY COMMENTS	10/17/22
PERMIT ISSUE	12/12/22
RELOCATED TRASH	01/06/23
REVISED PER CITY COMMENTS	02/13/23
ADDED SW ON NALL	02/17/23

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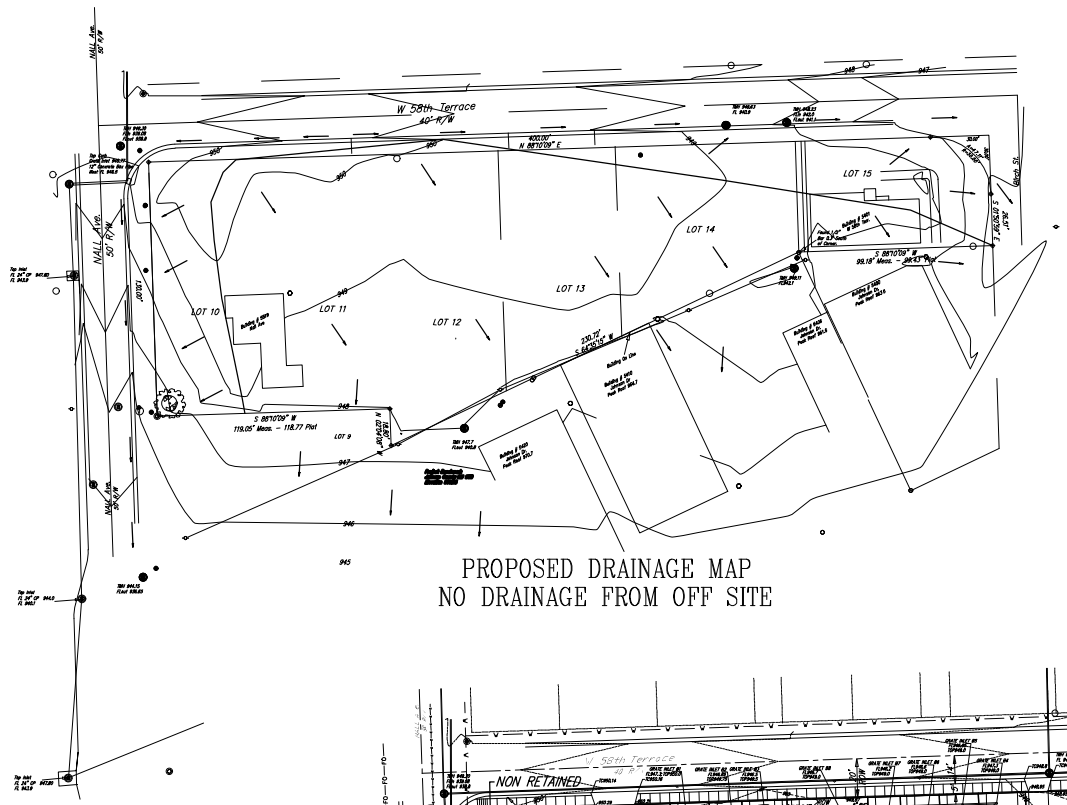
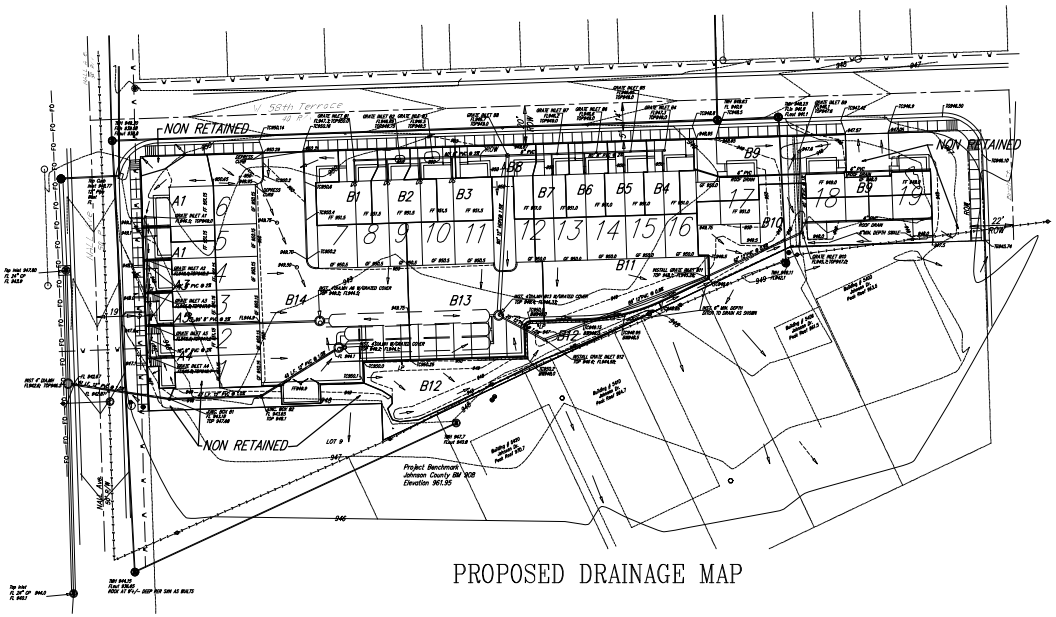
PREPARED FOR:
KOENIG BUILDING & RESTORATION
2500 WEST 43RD STREET
KANSAS CITY, KANSAS 66103

MISSION VALE TOWNHOMES
GRADING & DRAINAGE PLAN
58th TERRACE & NALL
MISSION, KANSAS

SHEET NO.
C2
OF 9



PROPOSED DRAINAGE MAP
NO DRAINAGE FROM OFF SITE



PROPOSED DRAINAGE MAP

0' 15' 30' 60'
HORIZONTAL SCALE: 1"= 30'

ROBERT C. WESSEL
LICENSED
7183
KANSAS
PROFESSIONAL ENGINEER
02/13/23

JOB NO.:	RCW0311	DRAWN:	RPP
FIELD BK./PG.:	XX/XX	CHECKED:	RCW

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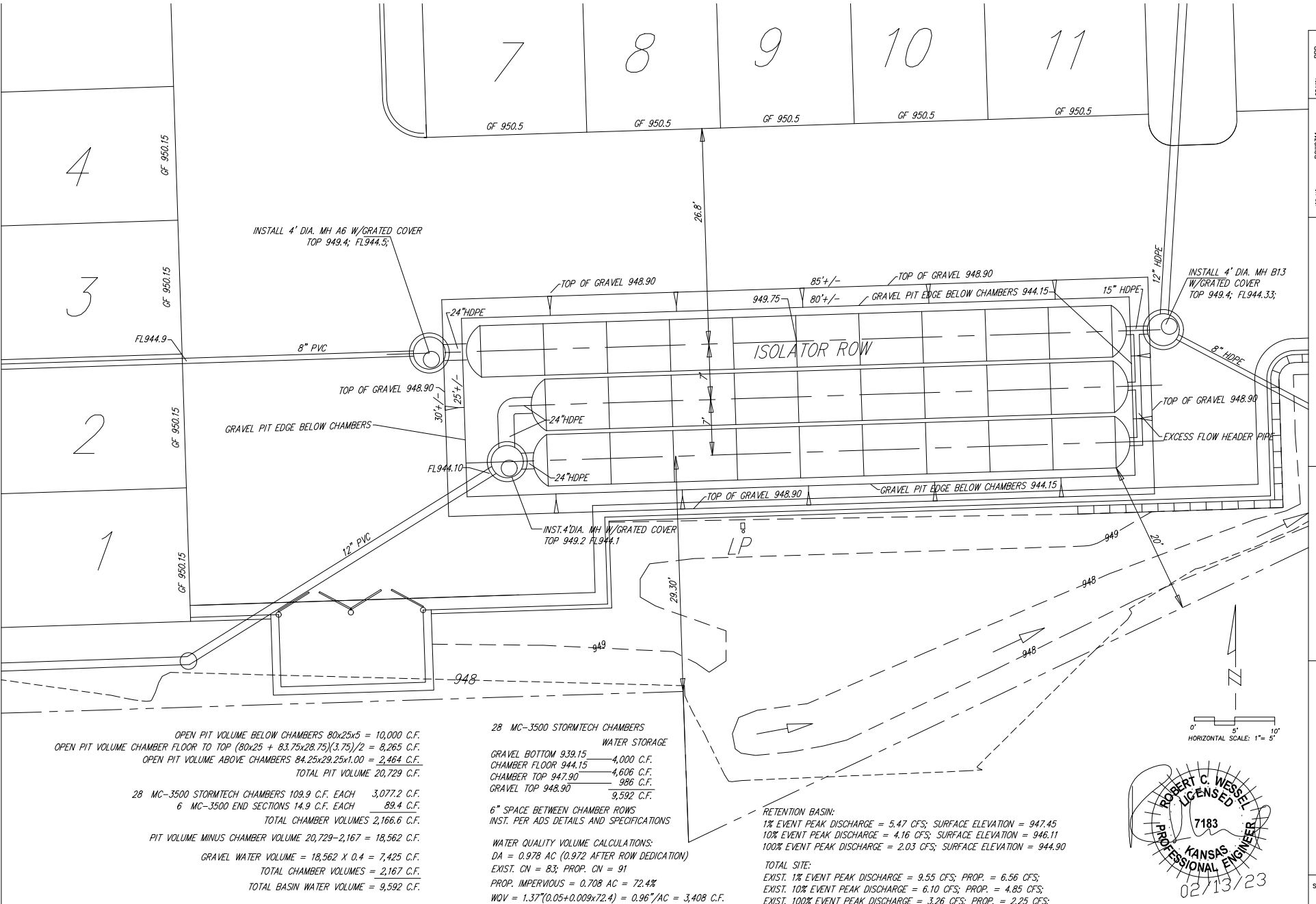
KANSAS CITY, KANSAS 66103

MISSION VALE TOWNHOMES
DRAINAGE BASIN MAP
58th TERRACE & NALL
MISSION, KANSAS

SHEET NO.
C2A
OF 9



OPEN PIT VOLUME BELOW CHAMBERS 80x25x5 = 10,000 C.F.
OPEN PIT VOLUME CHAMBER FLOOR TO TOP (80x25 + 83.75x28.75)(3.75)/2 = 8,265 C.F.
OPEN PIT VOLUME ABOVE CHAMBERS 84.25x29.25x1.00 = 2,464 C.F.
TOTAL PIT VOLUME 20,729 C.F.

28 MC-3500 STORMTECH CHAMBERS 109.9 C.F. EACH 3,077.2 C.F.
6 MC-3500 END SECTIONS 14.9 C.F. EACH 89.4 C.F.
TOTAL CHAMBER VOLUMES 2,166.6 C.F.

PIT VOLUME MINUS CHAMBER VOLUME 20,729-2,167 = 18,562 C.F.

GRAVEL WATER VOLUME = 18,562 X 0.4 = 7,425 C.F.
TOTAL CHAMBER VOLUMES = 2,167 C.F.
TOTAL BASIN WATER VOLUME = 9,592 C.F.

NOTE: PIT VOLUME CALCULATIONS ASSUME EXCAVATED 1:2 SIDE SLOPES FROM BOTTOM OF CHAMBERS TO TOP OF GRAVEL.

28 MC-3500 STORMTECH CHAMBERS

	WATER STORAGE
GRAVEL BOTTOM 939.15	
CHAMBER FLOOR 944.15	4,000 C.F.
CHAMBER TOP 947.90	4,606 C.F.
GRAVEL TOP 948.90	986 C.F.
	9,592 C.F.

6" SPACE BETWEEN CHAMBER ROWS
INST. PER ADS DETAILS AND SPECIFICATIONS

WATER QUALITY VOLUME CALCULATIONS:
DA = 0.978 AC (0.972 AFTER ROW DEDICATION)
EXIST. CN = 83; PROP. CN = 91
PROP. IMPERVIOUS = 0.708 AC = 72.4%
WQV = 1.37"(0.05+0.009x72.4) = 0.96"/AC = 3,408 C.F.
VOLUME RETAINED ON SITE = 4,000 C.F.

RETENTION BASIN:
1% EVENT PEAK DISCHARGE = 5.47 CFS; SURFACE ELEVATION = 947.45
10% EVENT PEAK DISCHARGE = 4.16 CFS; SURFACE ELEVATION = 946.11
100% EVENT PEAK DISCHARGE = 2.03 CFS; SURFACE ELEVATION = 944.90

TOTAL SITE:
EXIST. 1% EVENT PEAK DISCHARGE = 9.55 CFS; PROP. = 6.56 CFS;
EXIST. 10% EVENT PEAK DISCHARGE = 6.10 CFS; PROP. = 4.85 CFS;
EXIST. 100% EVENT PEAK DISCHARGE = 3.26 CFS; PROP. = 2.25 CFS;

ROBERT C. WESSEL LICENSED 7183 KANSAS PROFESSIONAL ENGINEER 02/13/23

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MISSION VALE TOWNHOMES
RETENTION BASIN DETAILS
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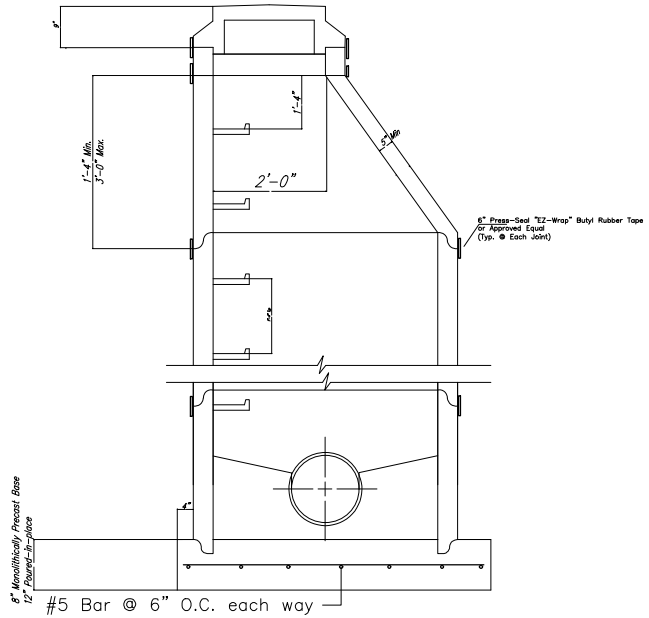
MANHOLE GENERAL NOTES:

1. All manhole rings shall be set in a minimum of two (2) rows of 3/4 to 1 inch pre-formed butyl joint sealer.
2. All manhole rings to be placed in pavement or in areas to be subsequently paved shall have "Machined Horizontal Bearing Surfaces" and shall comply with Class #25 as established in ASTM A-48.
3. The inside diameter of the manhole shall be 4'-0" for pipe diameters from 8" thru 24" and shall be 5'-0" for pipe diameters from 27" thru 36". In addition, the inside diameter (ID) of manholes up to 20 feet deep shall be 4'-0" ID shall be 5'-0" for depths up to 25 feet and ID shall be 6'-0" for depths exceeding 25 feet unless otherwise noted on the plans.
4. All manhole bases (pre-cast or poured-in-place) shallhave No. 5 reinforcing bars placed on 6" centers both ways.
5. Manhole rings and covers to be Heavy Duty. Cover shall be concave grated.
6. Standard manhole steps to be steel core, plastic coated steps (M.A. Ind., Inc. No. PS1- PF, PS2-PF, or approved equal).
7. Maximum grade adjustment allowable is 8". Minimum allowable thickness for precast concrete grade adjustment ring is 4".
8. Reinforcement in all precast sections shall equal or exceed A.S.T.M. C-478 specifications.
9. Butyl material to be used at all precast sections joints. O-Rings may be used for joints below the cone section, but the cone section itself shall not have O-ring joints.



4' DIA. STANDARD PRECAST MANHOLE (ECCENTRIC CONE)

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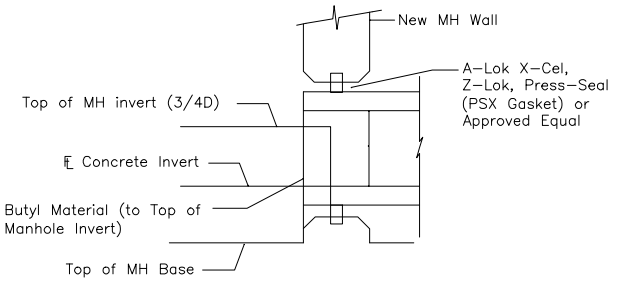
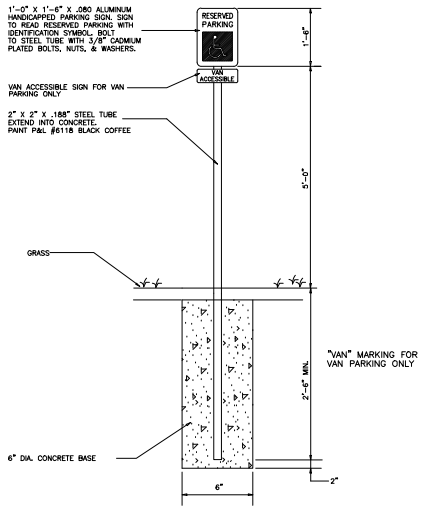


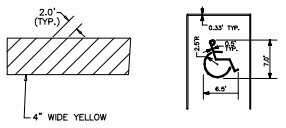
FLEXIBLE WALL CONNECTION DETAIL

No Scale

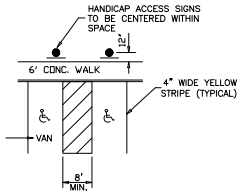


HANDICAP ACCESS SIGN

N.T.S.



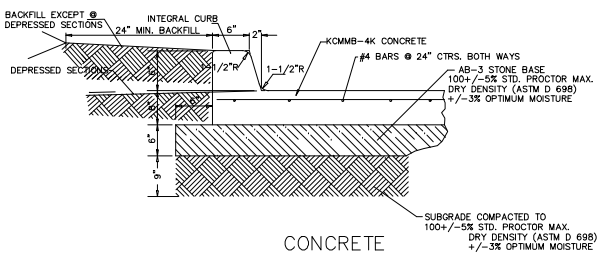
PATHWAY STRIPING SYMBOL STRIPING



NOTE:
SEE SITE PLAN FOR LOCATION OF HANDICAP SPACES.

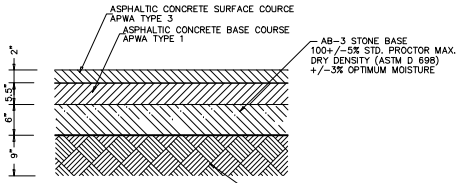
PAVEMENT MARKING DETAIL

N.T.S.



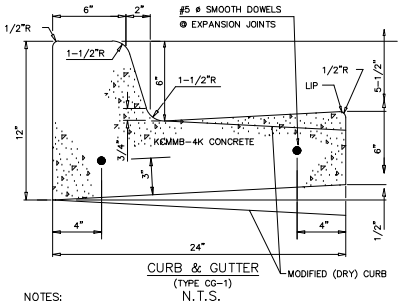
CONCRETE PVMT. DETAILS

N.T.S.



ASPHALT PVMT. DETAILS

N.T.S.



N.T.S.

NOTES:

1. 1/2" EXPANSION JOINTS WITH 2' DOWELS SHALL BE PLACED AT RADIUS POINTS AND AT 150' INTERVALS. THESE DOWELS SHALL BE GREASED AND WRAPPED ON ONE END WITH EXPANSION TUBES.
2. 1" DEEP CONTRACTION JOINTS SHALL BE INSTALLED AT APPROXIMATELY 10' INTERVALS. THESE JOINTS SHALL PASS ACROSS THE ENTIRE CURB SECTION.
3. FIX DOWELS WITH BAR SUPPORTS.
4. USE 5/8"Ø x 2' SMOOTH DOWELS AT LOCATIONS SHOWN ON EACH TYPICAL SECTION.
5. DEPTH OF CURB SHALL BE A MINIMUM OF 8" THRU THE HANDICAP ACCESS RAMP.
6. FOR MODIFIED (DRY) CURB, DROP LIP 1".

GENERAL NOTES:
ALL WORK IN PUBLIC EASEMENTS AND RIGHT OF WAY AND ALL EROSION CONTROL WORK MUST COMPLY WITH THE CITY OF MISSION AND THE KANSAS CITY METRO APWA REQUIREMENTS.
CONSTRUCTION SHALL CONFORM TO REQUIREMENTS OF THE CITY OF MISSON, KANSAS.
PERMITS ARE REQUIRED FOR TRAFFIC CONTROL DURING CONSTRUCTION

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MISSION VALE TOWNHOMES
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SHEET NO.
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OF 9

Advanced Drainage Systems, Inc.

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

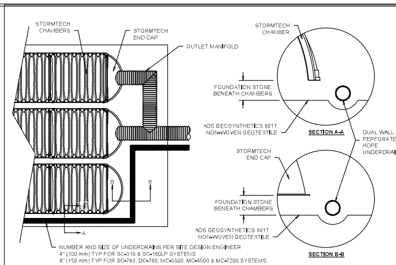
1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

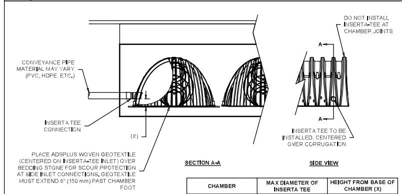
1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.



UNDERDRAIN DETAIL



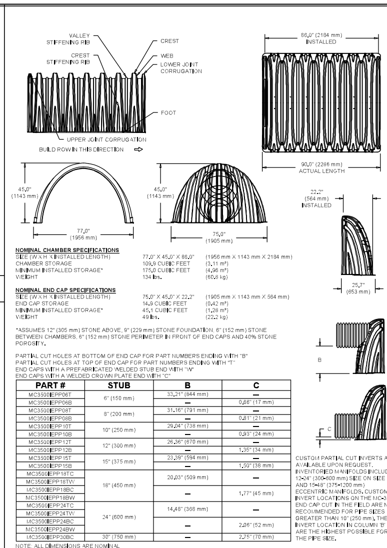
SECTION A-A

SIDE VIEW

CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
MC-7200	12" (300 mm)	8" (200 mm)
INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON		

NOTES:
- PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.
- CONTACT ADS ENGINEERING SERVICES IF INSERTA TEE INLET MUST BE RAISED AS NOT ALL INVERTS ARE POSSIBLE.

INSERTA-TEE SIDE INLET DETAIL



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	175.0 CUBIC FEET	(4.96 m³)
WEIGHT	134 lbs.	(60.8 kg)

NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	75.0" X 45.0" X 22.2"	(1905 mm X 1143 mm X 564 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	45.1 CUBIC FEET	(1.28 m³)
WEIGHT	49 lbs.	(22.2 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION, 6" (152 mm) STONE BETWEEN CHAMBERS, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

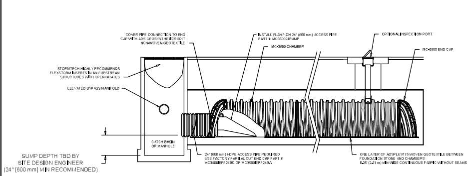
PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	—
MC3500IEPP06B		—	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	—
MC3500IEPP08B		—	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	—
MC3500IEPP10B		—	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	—
MC3500IEPP12B		—	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	—
MC3500IEPP15B		—	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	—
MC3500IEPP18TW			
MC3500IEPP18BC		—	1.77" (45 mm)
MC3500IEPP18BW			
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	—
MC3500IEPP24TW			
MC3500IEPP24BC		—	2.06" (52 mm)
MC3500IEPP24BW			
MC3500IEPP30BC	30" (750 mm)	—	2.75" (70 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL

CUSTOM PARTIAL CUT INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

MC-3500 TECHNICAL SPECIFICATIONS



INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

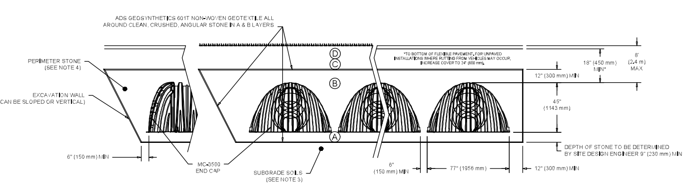
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

MC-3500 ISOLATOR ROW PLUS DETAIL

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

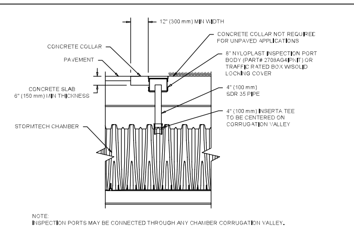
PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:

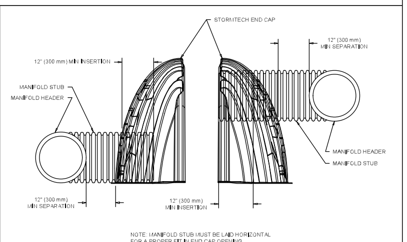
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

MC-3500 CROSS SECTION DETAIL



NOTE: INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.

4" PVC INSPECTION PORT DETAIL (MC SERIES CHAMBER)



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

MC-SERIES END CAP INSERTION DETAIL

MC-3500 STANDARD DETAILS

DRAWN: REVIEWED: REV: DATE: PROJECT NO: NOT TO SCALE

StormTech Chamber System

4640 TRUEMAN BLVD HILLIARD, OH 43026

SHEET

JOB NO.: RCW0311
FIELD BK./PG.: XX/XX
DRAWN: RPP
CHECKED: RCW

ISSUES / REVISIONS: DATE
ISSUE 10/17/22
PERMIT ISSUE 12/12/22

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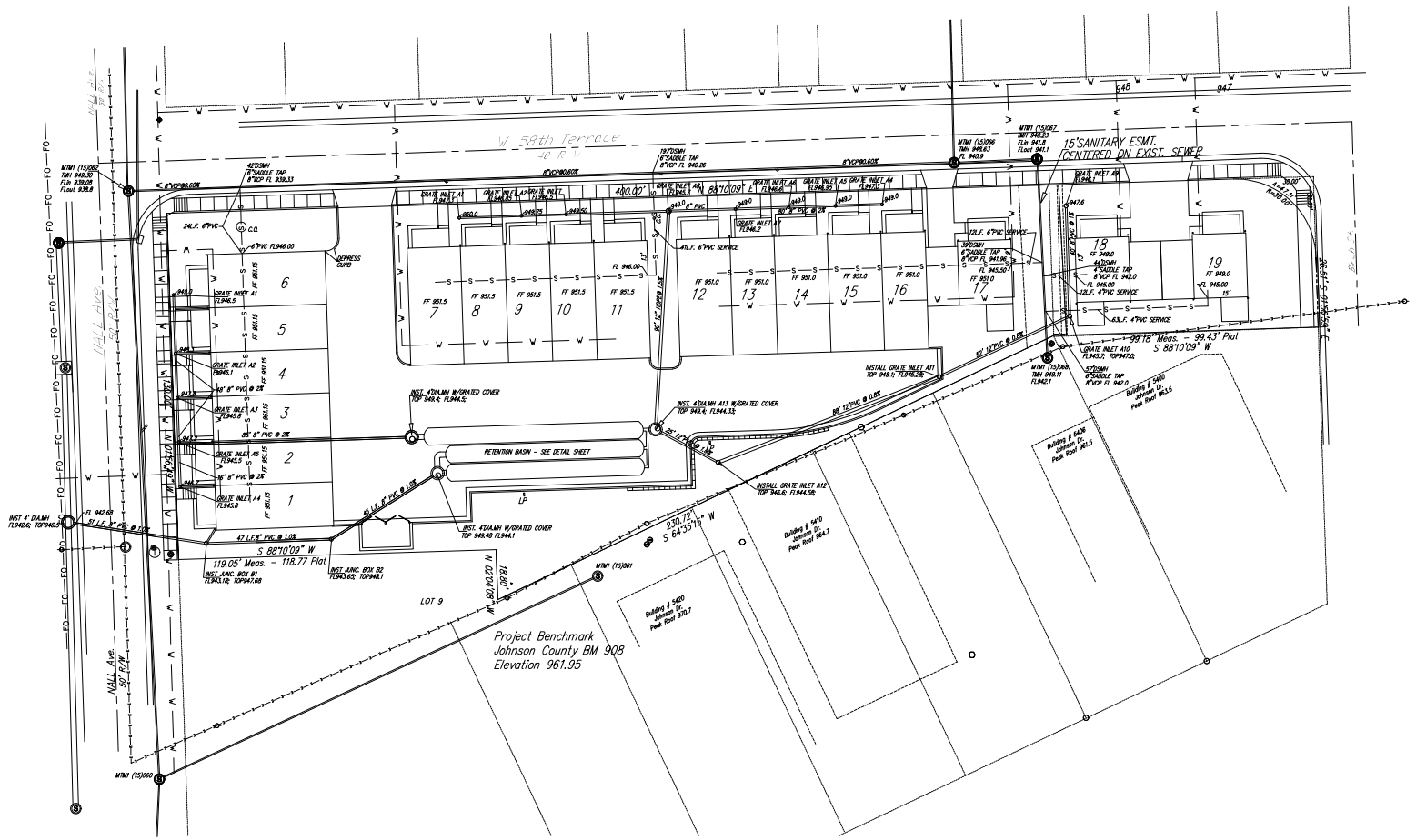
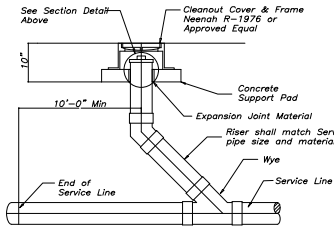
KOENIG BUILDING & RESTORATION
2500 WEST 43RD STREET
KANSAS CITY, KANSAS 66103

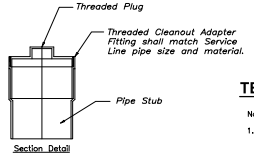
MISSION VALE TOWNHOMES
RETENTION BASIN DETAILS
58th TERRACE & NALL
MISSION, KANSAS

SHEET NO. C5 OF 9

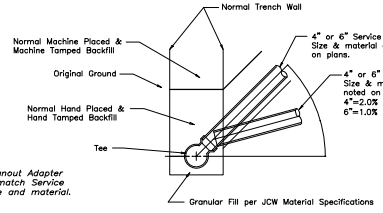




CLEANOUT DETAIL
No Scale



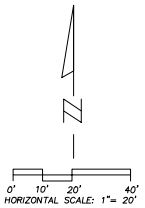
Section Detail

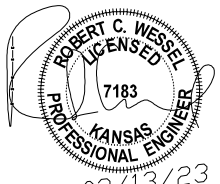


TEE ORIENTATION AND RISER DETAIL
No Scale

Note:

1. Concrete anchors will be required where the service line is installed at a grade of 30° or greater. See Section 2536 of the Specifications and detail on this sheet.
2. No service line shall be installed with a grade greater than 45°.





JOB NO.:	RCW0311	DRAWN:	RPP
FIELD BK./PG.:	XX/XX	CHECKED:	RCW

ISSUES / REVISIONS:	DATE
PRELIMINARY ISSUE	09/12/22
PRELIMINARY	12/12/22
RELOCATED TRASH	01/06/23
REVISED PER CITY COMMENTS	02/13/23

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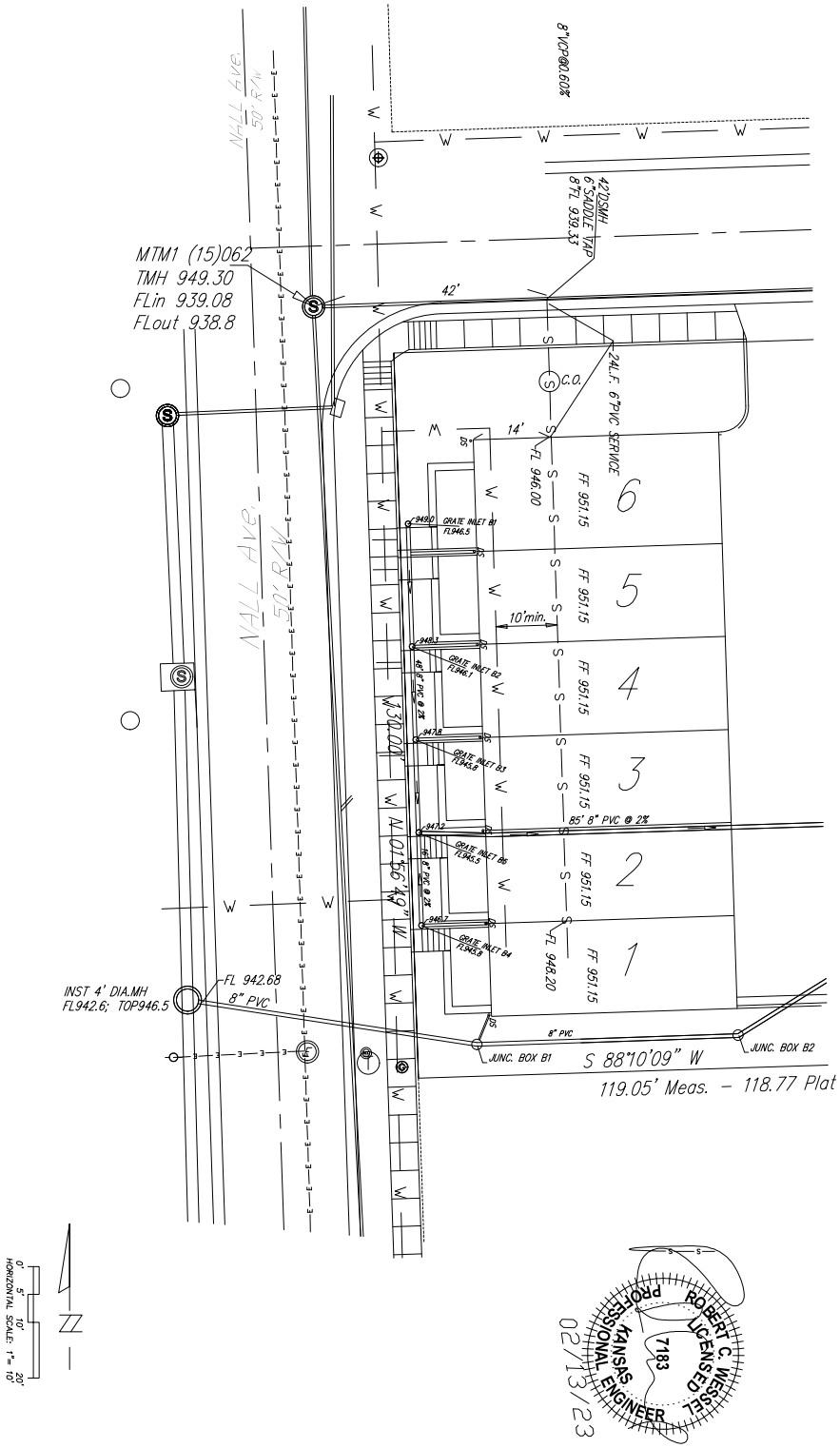
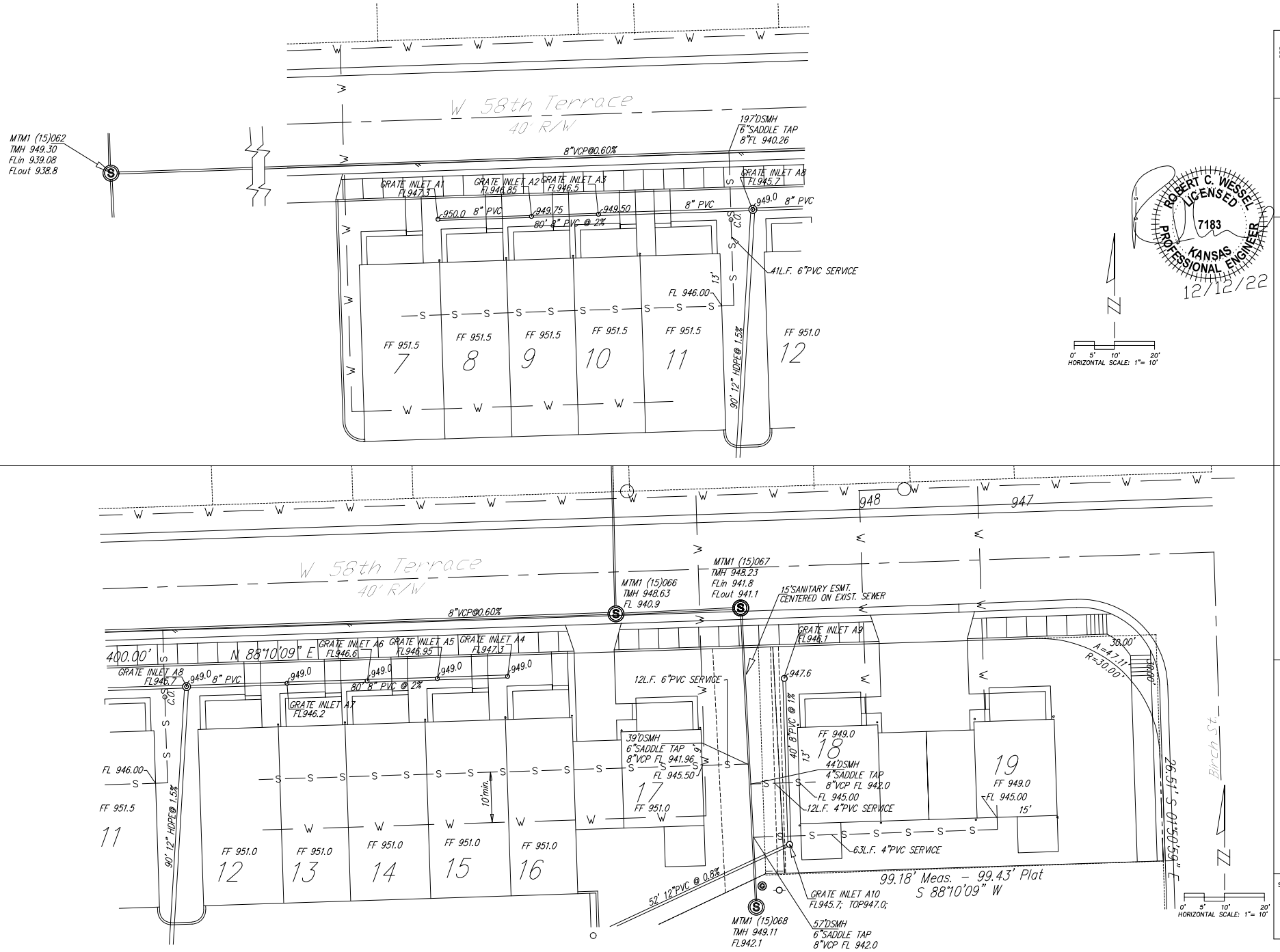
& RESTORATION
2500 WEST 43RD STREET
KANSAS CITY, KANSAS 66103

MISSION VALE TOWNHOMES
UTILITY PLAN
58th TERRACE & NALL
MISSION, KANSAS

SHEET NO.
C6
OF 9



SHEET NO. C7 OF 6	MISSION VALE TOWNHOMES UNITS 1 - 6 DETAILS 58th TERRACE & NALL MISSION, KANSAS	KOENIG BUILDING & RESTORATION 2500 WEST 43RD STREET KANSAS CITY, KANSAS 66103	ROBERT C. WESSEL P.E. consulting engineer 4085 NORTH KOLB ROAD TUCSON, ARIZONA 85750 913-207-6118 EMAIL robertcwessel47@gmail.com	JOB NO.: RCW0311 DRAWN: RPP FIELD BK./PG.: XX/XX CHECKED: RCW ISSUES / REVISIONS: DATE ISSUE 10/17/22 PERMIT ISSUE 12/12/22 RELOCATED TRASH 12/12/22



JOB NO.:	RCW0311
FIELD BK./PG.:	XX/XX
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ISSUE	
ISSUE	
PERMIT ISSUE	
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12/12/22	

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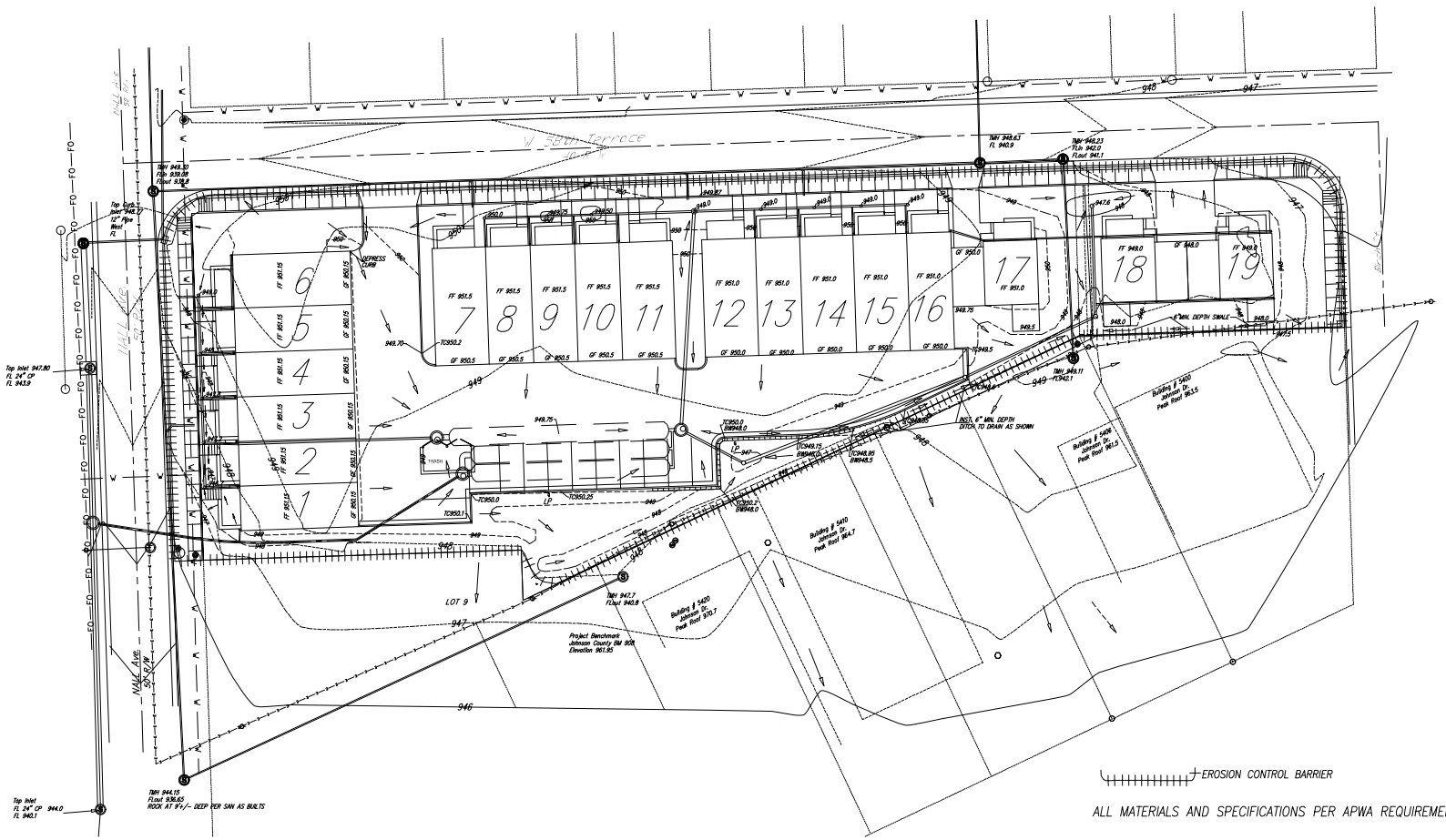
KANSAS CITY, KANSAS 66103

MISSION VALE TOWNHOMES
UNITS 7 - 19 DETAILS
58th TERRACE & NALL
MISSION, KANSAS

SHEET NO.
C8
OF 9



ALL MATERIALS AND SPECIFICATIONS PER APWA REQUIREMENTS

EROSION CONTROL NOTES

1. INSPECT AND MAINTAIN SILT FENCE.
2. INSTALL ADDITIONAL SILT FENCE AS NEEDED.
3. INSTALL STORM INLET BARRIERS ON ALL INLETS W/INLET INSTALLATION.
4. SEED, FERTILIZE, AND STRAW MULCH ALL DISTURBED AREAS.

NOTE: IF EROSION CONTROL PLANS FAIL TO ADEQUATELY CONTROL EROSION AND SEDIMENTATION, AN EROSION CONTROL PLAN MODIFICATION IS REQUIRED.

NOTE: INSPECT AND MAINTAIN ALL BMP'S. REFER TO APWA 2150. PRACTICE GOOD HOUSEKEEPING AND SPILL PREVENTION/CLEANUP AND SEDIMENTATION, A EROSION CONTROL PLAN MODIFICATION IS REQUIRED.

NOTE: ACCESS AND EROSION CONTROLS SHALL BE RETAINED AND MAINTAINED FOR ALL AREAS WHERE SEED HAS NOT ESTABLISHED 70% COVER.

NOTE: THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL DEVICES EVERY 7 DAYS AND WITHIN 24 HOURS OF A ONE HALF INCH OR MORE STORM EVENT. THE CONTRACTOR SHALL REPAIR DAMAGE, CLEAN OUT SEDIMENT, AND ADD ADDTIONAL EROSION CONTROL DEVICES AS NEEDED, AS SOON AS PRACTICABLE, AFTER INSPECTION.

NOTE: THE CONTRACTOR SHALL TAKE PREVENETIVE MEASURES TO INSURE THAT DUST, MUD, DEBRIS, ETC. DO NOT LEAVE THE SITE, RATHER THAN ADDRESSING THE PROBLEM AFTER IT HAS OCCURRED. PREVENTION , NOT REACTION.

0' 10' 20' 40'
HORIZONTAL SCALE: 1"= 20'

ROBERT C. WESSEL LICENSED 7183 KANSAS PROFESSIONAL ENGINEER
12/11/22

TOTAL DISTURBED AREA = 0.95 ACRES

JOB NO.:	RCW0311	DRAWN:	RPP
FIELD BK./PG.:	XX/XX	CHECKED:	RCW

ISSUES / REVISIONS:	DATE
PRELIMINARY ISSUE	09/12/22
REVISED PER CITY COMMENTS	10/17/22
PERMIT ISSUE	12/12/22

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PREPARED FOR:
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2500 WEST 43RD STREET
KANSAS CITY, KANSAS 66103

MISSION VALE TOWNHOMES
EROSION CONTROL PLAN
58th TERRACE & NALL
MISSION, KANSAS

SHEET NO.
C9
OF 9

PLANT LIST:

Shade Trees				
ARM	Armstrong Maple	Acer freemani 'Armstrong'	2" Cal.	B&B
CHB	Columnar Hornbeam	Carpinus betulus 'Frans Fontaine'	2" Cal.	B&B
LLL	Greenspire Littleleaf Linden	Tilia cordata 'Greenspire'	2" Cal.	B&B
ROK	Red Oak	Quercus rubra	2" Cal.	B&B
Ornamental Trees				
ERB	Eastern Redbud	Cercis Canadensis	1.5" Cal.	B&B
PFC	Prairiefire Crabapple	Malus x 'Prairiefire'	1.5" Cal.	B&B
SVB	Serviceberry	Amelanchier grandiflora 'Autumn Brilliance'	Multi-stem	8' Ht.

GENERAL NOTES:

1. EACH BIDDER SHALL VISIT THE SITE OF THE PROPOSED WORK AND EXAMINE THE SITE CONDITIONS. HE SHALL ALSO CAREFULLY EXAMINE THE DRAWINGS FOR THE PROPOSED WORK AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS, WHICH MAY AFFECT THE PROPOSED WORK.

2. THE PLANTING PLAN GRAPHICALLY ILLUSTRATES OVERALL PLANT MASSINGS. EACH PLANT SPECIES MASSING SHALL BE PLACED IN THE FIELD TO UTILIZE GREATEST COVERAGE OF GROUND PLANE. THE FOLLOWING APPLIES FOR INDIVIDUAL PLANTINGS:
   A. CREEPING GROUNDCOVER SHALL BE A MINIMUM OF 6" FROM PAVING EDGE.
   B. ALL TREES SHALL BE A MINIMUM OF 3' FROM PAVING EDGE.
   C. ALL PLANTS OF THE SAME SPECIES SHALL BE EQUALLY SPACED APART AND PLACED FOR BEST AESTHETIC VIEWING.
   D. ALL SHRUBS SHALL BE A MINIMUM OF 2' FROM PAVED EDGE.

3. NOTIFY LANDSCAPE ARCHITECT 1 WEEK PRIOR TO ANTICIPATED START OF PLANT MATERIAL INSTALLATION. LANDSCAPE CONTRACTOR SHALL STAKE ALL PROPOSED PLANTING BED EDGES, SET OUT SHRUBS IN INTENDED LOCATIONS, AND STAKE TREE LOCATIONS FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

4. ALL NEW PLANT BED AREAS TO BE IRRIGATED. REFER TO SPECIFICATIONS FOR IRRIGATION SYSTEM DESCRIPTION.

5. REFER TO L1.00 SERIES SHEETS FOR TREE AND SHRUB PLANTINGS.

6. REFER TO L3.00 SERIES SHEETS FOR PLANTING DETAILS & SPECIFICATIONS.

7. IN THE EVENT OF WORK IN OR ON THE JCW SANITARY MAIN. ANY TREES OR PLANTINGS PLACED WITHIN THE SEWER EASEMENT MAY BE REMOVED WITHOUT REPLACEMENT OR COMPENSATION THERE OF AND SHALL BE REPLACED BY THE PROPERTY OWNER AS REQUIRED BY THE CITY.

8. STRIP TOP SOIL & SAVE FOR PLANTING AREAS. EXCAVATE TO A DEPTH OF 18" FOR ALL PLANTING BEDS AND REPLACE WITH PLANTING SOIL MIX. REFER TO L3.00 FOR PLANTING SOIL MIX.

9. ALL LANDSCAPING SHALL BE MAINTAINED BY THE OWNER OR OWNER'S AGENT IN PERPETUITY AND DEAD OR DISEASED PLANTING WILL BE REMOVED OR TREATED AND REPLACED AS NECESSARY.

LANDSCAPE REQUIREMENTS (MISSION, KS)

STREET TREES (415.090):
1. 1 TREE PER 50 LF OF STREET FRONTAGE.

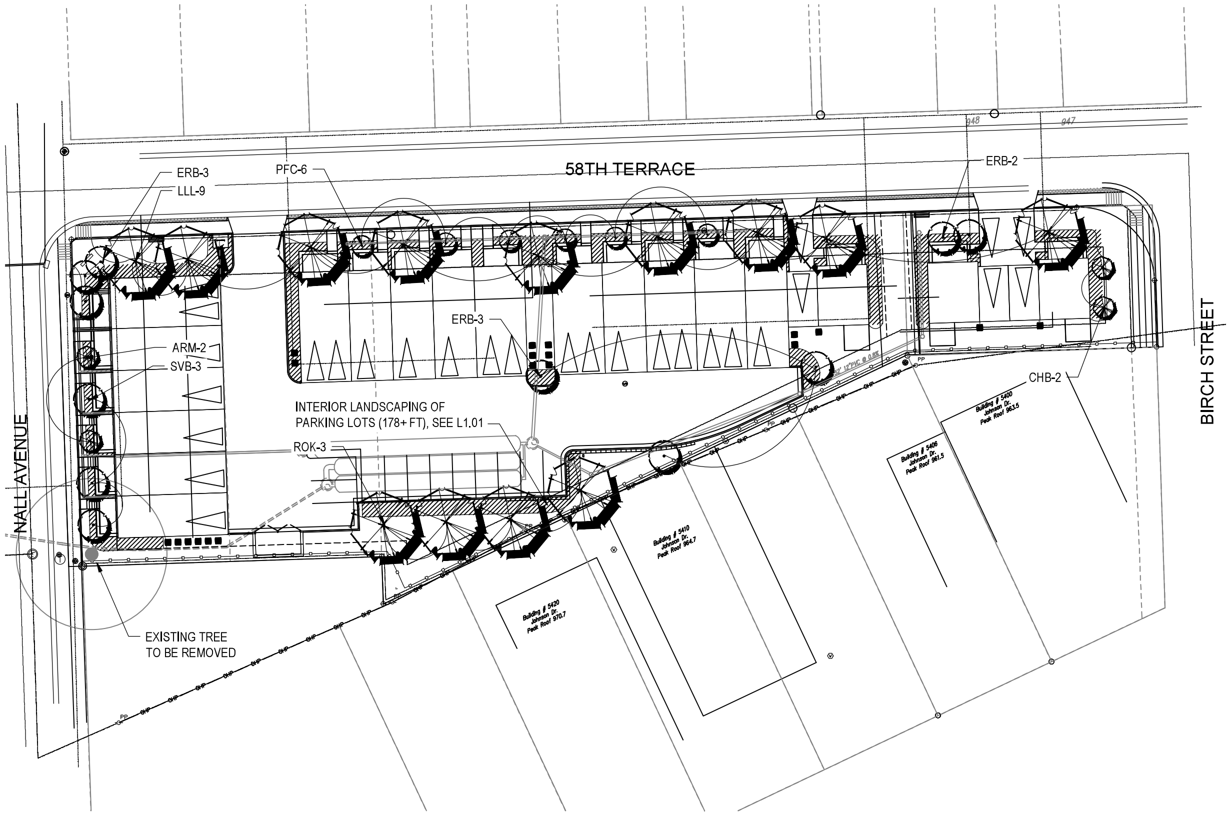
	REQUIRED:	PROVIDED:
NALL AVENUE= +/-130 LF/ 50 LF =	3 TREES	3 TREES
58TH TERRACE = +/-430 LF/ 50 LF =	9 TREES	9 TREES
BIRCH STREET = +/-56 LF/ 50 LF =	2 TREES	2 TREES

INTERIOR LANDSCAPING OF PARKING LOTS (415.110):
1. 6% OF PARKING SPACE SHALL BE LANDSCAPED.
2. 1 TREE PER 20 SPACES

	REQUIRED:	PROVIDED:
1. 11 PARKING SPACES x 270 / 6% SF =	178 SF	+178 SF
2. 11 PARKING SPACES / 20 =	1 TREE	1 TREE

TREES PER DWELLING UNIT (415.090):
1. 1 TREE FOR EACH DWELLING UNIT

	REQUIRED:	PROVIDED:
19 DWELLING UNITS =	19 TREES	19 TREES



TREE PLANTING PLAN
1" = 20'-0"

NSPJ ARCHITECTS PA
3515 W. 75TH ST., SUITE 201
PRAIRIE VILLAGE, KS 66208
ARCHITECTURE
LANDSCAPE ARCHITECTURE
ENERGY SERVICES
P. 913.831.1415
F. 913.831.1563
NSPJARCH.COM

KATHRYN MARTINOVIC LICENSED LA723 KANSAS ARCHITECT
01.23.2023

A NEW TOWNHOUSE DEVELOPMENT FOR:
MISSION VALE
5819 NALL AVENUE
MISSION, KANSAS

DRAWING RELEASE LOG
- 07.27.22 PDP RESUBMITTAL
- 08.11.22 PDP RESUBMITTAL
- 09.15.22 PDP RESUBMITTAL
- 12.15.22 FDP SUBMITTAL
- 01.23.23 PERMIT SET

REVISIONS

JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH

SHEET NAME

SHEET NO.
L1.00

PLANT LIST:

	Common Name	Botanical Name	Size	Notes
Evergreen Shrubs				
GOJ	Grey Owl Juniper	Juniperus virginiana 'Grey Owl'	5 Gal.	
WGB	Winter Green Boxwood	Buxus microphylla 'Winter Green'	5 Gal.	24-36"
Decidious Shrubs				
BBH	Bobo Hydrangea	Hydrangea paniculata 'Ilvobo'	2 Gal.	
CPR	Red Carpet Rose	Rosa 'Flower Carpet Red'	2 Gal.	
DBB	Dwarf Burning Bush	Euonymus Alatus 'Compacta'	2 Gal.	
GMS	Goldmound spirea	Spirea japonica 'Goldmound'	2 Gal.	
LHS	Little Henry Sweetspire	Itea virginica 'Little Henry's Garnet'	2 Gal.	
MCS	Magic Carpet Spirea	Spirea japonica 'Magic Carpet'	2 Gal.	
Grasses				
NWG	Northwind Switch Grass	Panicum virgatum 'Northwind'	2 Gal.	
Perennials				
DAY	Daylily	Hemercallis 'Black Eyed Stella' or 'Little Business'	1 Gal.	
IRS	Blue Flag Iris	Iris virginica v. shrevei	1 Gal.	

GENERAL NOTES:

1. EACH BIDDER SHALL VISIT THE SITE OF THE PROPOSED WORK AND EXAMINE THE SITE CONDITIONS. HE SHALL ALSO CAREFULLY EXAMINE THE DRAWINGS FOR THE PROPOSED WORK AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS, WHICH MAY AFFECT THE PROPOSED WORK.

2. THE PLANTING PLAN GRAPHICALLY ILLUSTRATES OVERALL PLANT MASSINGS. EACH PLANT SPECIES MASSING SHALL BE PLACED IN THE FIELD TO UTILIZE GREATEST COVERAGE OF GROUND PLANE. THE FOLLOWING APPLIES FOR INDIVIDUAL PLANTINGS:
   - A. CREEPING GROUNDCOVER SHALL BE A MINIMUM OF 6" FROM PAVING EDGE.
   - B. ALL TREES SHALL BE A MINIMUM OF 3' FROM PAVING EDGE.
   - C. ALL PLANTS OF THE SAME SPECIES SHALL BE EQUALLY SPACED APART AND PLACED FOR BEST AESTHETIC VIEWING.
   - D. ALL SHRUBS SHALL BE A MINIMUM OF 2' FROM PAVED EDGE.

3. NOTIFY LANDSCAPE ARCHITECT 1 WEEK PRIOR TO ANTICIPATED START OF PLANT MATERIAL INSTALLATION. LANDSCAPE CONTRACTOR SHALL STAKE ALL PROPOSED PLANTING BED EDGES, SET OUT SHRUBS IN INTENDED LOCATIONS, AND STAKE TREE LOCATIONS FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

4. ALL NEW PLANT BED AREAS TO BE IRRIGATED. REFER TO SPECIFICATIONS FOR IRRIGATION SYSTEM DESCRIPTION.

5. REFER TO L1.00 SERIES SHEETS FOR TREE AND SHRUB PLANTINGS.

6. REFER TO L3.00 SERIES SHEETS FOR PLANTING DETAILS & SPECIFICATIONS.

7. IN THE EVENT OF WORK IN OR ON THE JCW SANITARY MAIN. ANY TREES OR PLANTINGS PLACED WITHIN THE SEWER EASEMENT MAY BE REMOVED WITHOUT REPLACEMENT OR COMPENSATION THERE OF AND SHALL BE REPLACED BY THE PROPERTY OWNER AS REQUIRED BY THE CITY.

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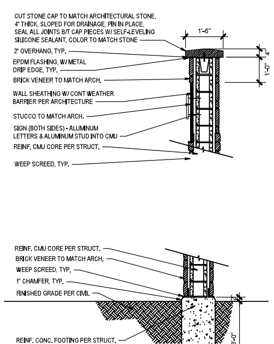
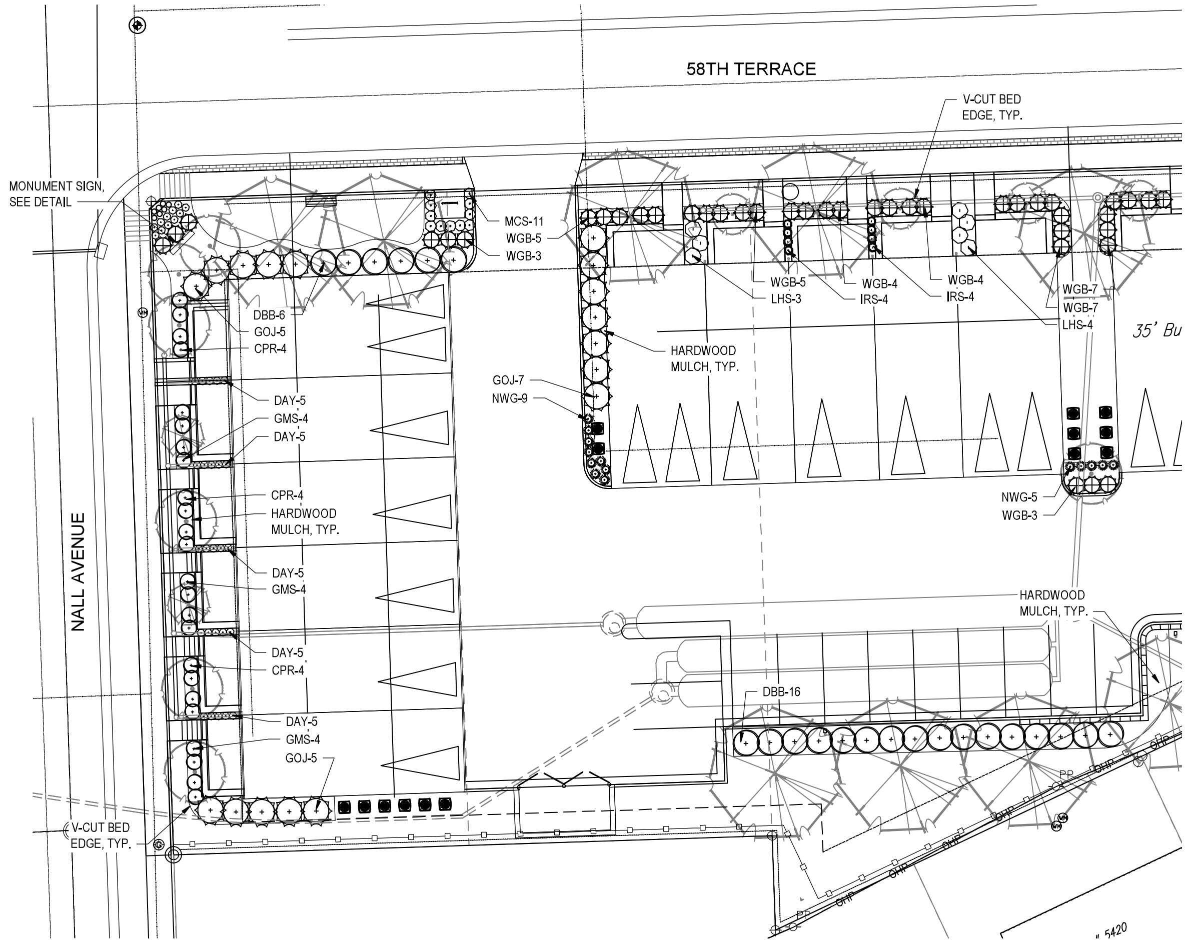


1 MONUMENT SIGN
1/2" = 1'-0"



TREE PLANTING PLAN
1" = 10'-0"

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REVISIONS

JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH

SHEET NAME

SHEET NO.
L1.01

30x42 SHEET (Arch E1)

10/3/2022 2:48:43 PM

30x42 SHEET (Arch E1)

PLANT LIST:

	Common Name	Botanical Name	Size	Notes
Evergreen Shrubs				
GOJ	Grey Owl Juniper	Junperus virginiana 'Grey Owl'	5 Gal.	
WGB	Winter Green Boxwood	Buxus microphylla 'Winter Green'	5 Gal.	24-36"
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3. NOTIFY LANDSCAPE ARCHITECT 1 WEEK PRIOR TO ANTICIPATED START OF PLANT MATERIAL INSTALLATION. LANDSCAPE CONTRACTOR SHALL STAKE ALL PROPOSED PLANTING BED EDGES, SET OUT SHRUBS IN INTENDED LOCATIONS, AND STAKE TREE LOCATIONS FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

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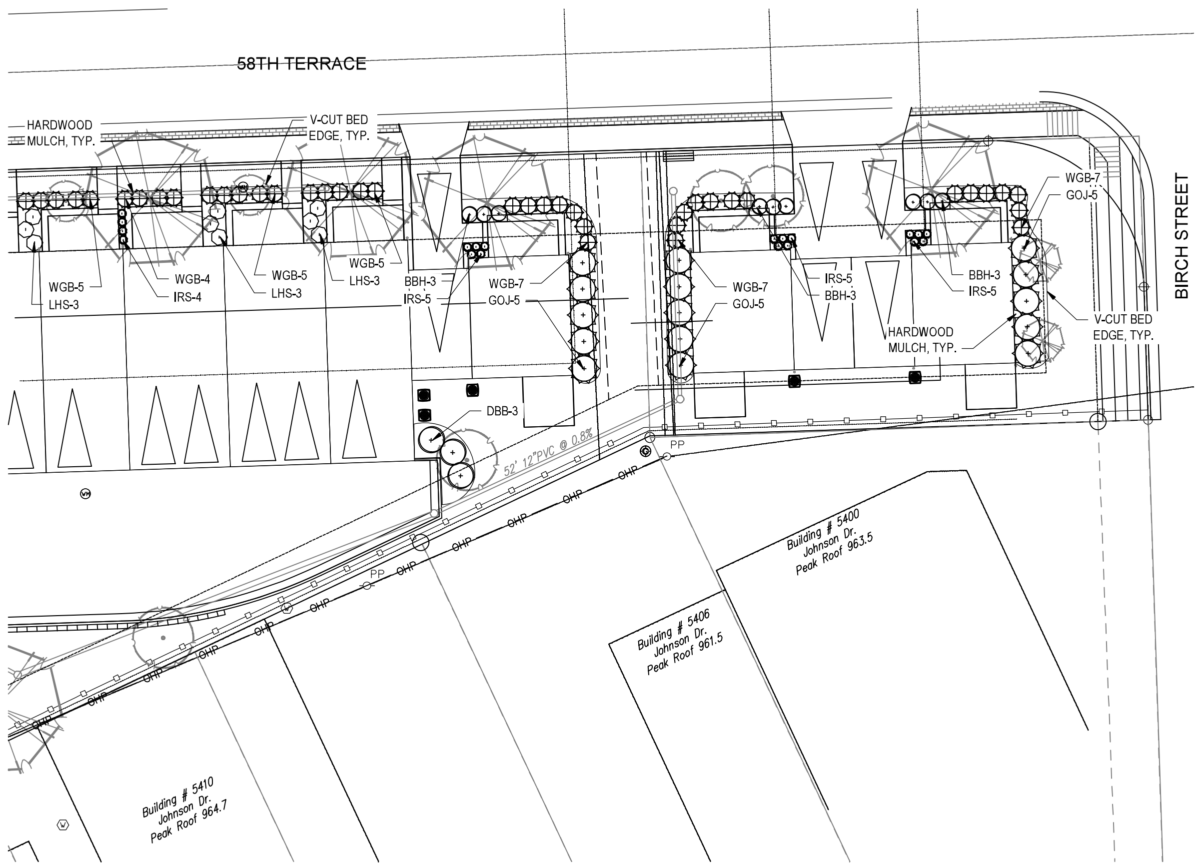

TREE PLANTING PLAN
1" = 10'-0"

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REVISIONS

JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH
SHEET NAME
SHEET NO.
L1.02

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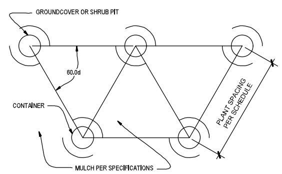
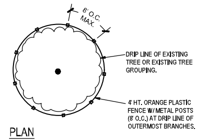


Inches Between Plants	Plant Quantities Per Square Foot
12"	Square Feet x 1.15
18"	Square Feet x .51
30"	Square Feet x .19
36"	Square Feet x .12
48"	Square Feet x .07

NOTES: 1. SPACING FOR GROUNDCOVERS, SHRUBS, AND PERENNIALS NOTED ON PLANS.
2. TILL SOIL IN BED TO A 12" MINIMUM DEPTH AND THOROUGHLY MIX IN SOIL AMENDMENTS AS SPECIFIED.

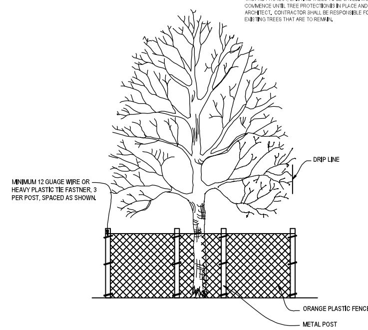
9 PLANT SPACING DETAIL

NOT TO SCALE



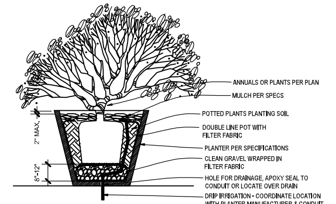
PLAN

NOTE:
PRIOR TO COMMENCEMENT OF WORK, THE CONTRACTOR SHALL IDENTIFY, TAG AND PROTECT, EXISTING TREES TO BE SAVED. WORK CANNOT COMMENCE UNTIL TREE PROTECTION IS IN PLACE AND APPROVED BY THE ARCHITECT. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING TREES THAT ARE TO REMAIN.



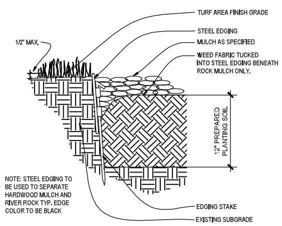
5 TREE PRESERVATION DETAIL

NOT TO SCALE



3 TYPICAL FREESTANDING PLANTER

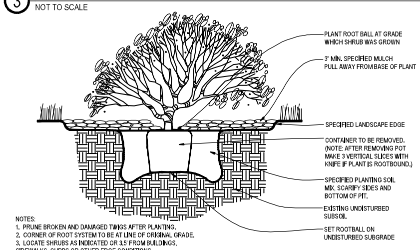
NOT TO SCALE



NOTE: STEEL EDGING TO BE USED TO SEPARATE HARDWOOD MULCH AND RIVER ROCK TYP. EDGE COLOR TO BE BLACK

8 STEEL EDGING DETAIL

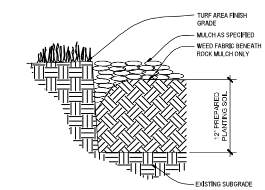
NOT TO SCALE



NOTES:
1. PRUNE BROKEN AND DAMAGED TWIGS AFTER PLANTING.
2. CORNER OF ROOT SYSTEM TO BE AT LINE OF ORIGINAL GRADE.
3. LOCATE SHRUBS AS INDICATED OR 3.5' FROM BUILDINGS, SIDEWALKS, CURBS OR OTHER EDGE CONDITIONS.

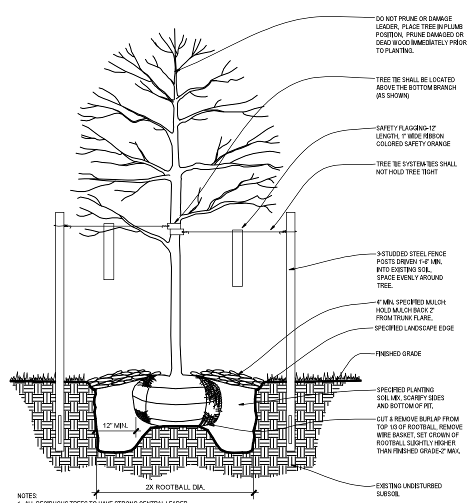
2 SHRUB PLANTING DETAIL

NOT TO SCALE



7 V-CUT EDGING DETAIL

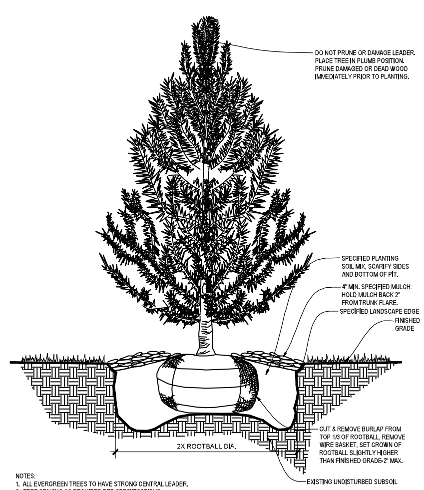
NOT TO SCALE



NOTES:
1. ALL DECIDUOUS TREES TO HAVE STRONG CENTRAL LEADER.
2. TREE STAKING AS REQUIRED PER SPECIFICATIONS.

4 DECIDUOUS TREE PLANTING DETAIL

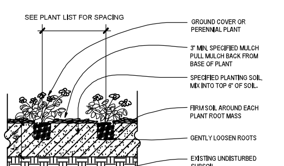
NOT TO SCALE



NOTES:
1. ALL EVERGREEN TREES TO HAVE STRONG CENTRAL LEADER.
2. TREE STAKING AS REQUIRED PER SPECIFICATIONS.

1 EVERGREEN TREE PLANTING DETAIL

NOT TO SCALE



6 PERENNIAL & GROUND COVER PLANTING

NOT TO SCALE

GENERAL NOTES:

1. EACH BIDDER SHALL VISIT THE SITE OF THE PROPOSED WORK AND EXAMINE THE SITE CONDITIONS. HE SHALL ALSO CAREFULLY EXAMINE THE DRAWINGS FOR THE PROPOSED WORK AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS, WHICH MAY AFFECT THE PROPOSED WORK.
2. THE PLANTING PLAN GRAPHICALLY ILLUSTRATES OVERALL PLANT MASSING. EACH PLANT SPECIES MASSING SHALL BE PLACED IN THE FIELD TO UTILIZE GREATEST COVERAGE OF GROUND PLANE. THE FOLLOWING APPLIES FOR INDIVIDUAL PLANTINGS:
   A. CREEPING GROUNDCOVER SHALL BE A MINIMUM OF 6" FROM PAVING EDGE.
   B. ALL TREES SHALL BE A MINIMUM OF 3' FROM PAVING EDGE.
   C. ALL PLANTS OF THE SAME SPECIES SHALL BE EQUALLY SPACED APART AND PLACED FOR BEST AESTHETIC VIEWING.
   D. ALL SHRUBS SHALL BE A MINIMUM OF 2' FROM PAVED EDGE.
3. NOTIFY LANDSCAPE ARCHITECT 1 WEEK PRIOR TO ANTICIPATED START OF PLANT MATERIAL INSTALLATION. LANDSCAPE CONTRACTOR SHALL STAKE ALL PROPOSED PLANTING BED EDGES, SET OUT SHRUBS IN INTENDED LOCATIONS, AND STAKE TREE LOCATIONS FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
4. LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY AND ALL PLANT MATERIALS PROPOSED FOR USE ON THE PROJECT.
5. CONTRACTOR WILL BE RESPONSIBLE FOR PLANTING ALL PLANT MATERIAL INDICATED ON THE PLANS. PLANT SCHEDULE IS FOR SUMMARY ONLY. VERIFY ALL PLANT QUANTITIES PRIOR TO BIDDING.
6. CONTRACTOR WILL BE RESPONSIBLE FOR REMOVAL OF EXISTING TREES & PLANT MATERIAL AS INDICATED ON PLAN AND AS DIRECTED BY LANDSCAPE ARCHITECT. RELOCATE PERENNIALS & SHRUBS TO LOCATION INDICATED ON PLAN AND AS DIRECTED BY LANDSCAPE ARCHITECT.
7. REPORT ANY DISCREPANCIES FOUND WITH REGARD TO EXISTING CONDITIONS OR PROPOSED DESIGN IMMEDIATELY TO THE LANDSCAPE ARCHITECT. DO NOT WILLFULLY PROCEED WITH CONSTRUCTION AS DESIGNED WHERE IT IS FOUND THAT KNOWN DISCREPANCIES EXIST. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ALL NECESSARY REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION WITH OTHER RELATED SITE WORK BEING PERFORMED TO ACCOMPLISH SITE CONSTRUCTION OPERATIONS.
9. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
10. PLANT MATERIAL SHALL BE MAINTAINED AND GUARANTEED FOR A PERIOD OF ONE YEAR AFTER OWNER'S ACCEPTANCE OF FINISHED JOB. ALL DEAD OR DAMAGED PLANT MATERIAL SHALL BE REPLACED AT LANDSCAPE CONTRACTOR'S EXPENSE PRIOR TO ACCEPTANCE. RECOMMENDED DATES FOR PLANT MATERIAL INSTALLATION SHALL BE FEBRUARY 15 - MAY 15 AND SEPTEMBER 15 - DECEMBER 15.
11. THE PROJECT MAY BE AWARDED COMPLETION IN PHASES BUT IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE OWNER & LANDSCAPE ARCHITECT WHEN A PHASE IS COMPLETE & A FINAL WALK THROUGH CAN TAKE PLACE. CONTRACTOR SHALL IDENTIFY ON THE PLANS THE LIMITS OF COMPLETED WORK AND/OR PHASES PRIOR TO THE WALK THROUGH.
12. LANDSCAPE CONTRACTOR SHALL MAINTAIN ALL PLANT MATERIAL UNTIL FINAL ACCEPTANCE, AT WHICH POINT THE ONE YEAR GUARANTEE BEGINS.

MATERIALS:

13. PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, AND FREE OF DISEASE AND INSECTS AS PER AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS.
14. PLANT MATERIAL SHALL NOT BE PRUNED PRIOR TO INSTALLATION. AFTER PLANTS HAVE BEEN INSTALLED, EACH PLANT SHALL BE PRUNED TO UNIFORMITY.
15. SHREDDED BARK MULCH SHALL BE FINELY CHIPPED AND SHREDDED DARK BROWN HARDWOOD CHIPS CONSISTING OF PURE WOOD PRODUCTS AND FREE OF ALL FOREIGN SUBSTANCES.
16. CONTRACTOR SHALL USE AN APPROVED TREE TIE SYSTEM THAT IS EASILY ADJUSTABLE, STRONG IN ALL WEATHER, AND EASILY ATTACHED AND REMOVED. HOSE AND WIRE ARE NOT ACCEPTABLE FOR STAKED TREES. PROVIDE THE FOLLOWING OR APPROVED EQUAL: "CINCH TIES" BY J. LICHTENTHALER, "ADJ-A-TYPE" BY HEAVYWEIGHT ONLY, A PLASTIC CHAIN TWIST TIE, OR "PLASTIC BINDER TYE" A TIE WITH TAPERED BEADS THAT SNAP LOCK BY A.M. LEONARD AND SONS.
17. SOD SHALL BE CERTIFIED TURFGRASS SOD COMPLYING WITH ASPA SPECIFICATIONS FOR MACHINE-CUT THICKNESS, SIZE, STRENGTH, MOISTURE CONTENT, AND MOWED HEIGHT, AND FREE OF WEEDS AND UNDESIRABLE NATIVE GRASSES. SOD SHALL BE A BLEND OF NOT LESS THAN 3 IMPROVED KENTUCKY BLUEGRASS (POSPARATENSIS) VARIETIES, A NATIVE MIXTURE OF HOUNDOG, REBEL, OR FALCON, FINE LEAFED TALL FESCUE (FESTUCA ARUNDINACEA), AND RYE (LOLIUM JULTIFLORUM AND PERENE DOMESTIC). IT SHALL BE A MIX OF 20% KENTUCKY BLUEGRASS, 70%FINELEAFED TALL FESCUE, AND 10%RYE. SOD SHALL BE WELL ROOTED, 2 YEAR OLD STOCK, HARVESTED IN ROLLS, FERTILIZED 2-3 WEEKS PRIOR TO CUTTING. ALL SOD SHALL BE MACHINE CUT AND VIGOROUSLY GROWING (NOT DORMANT). MAXIMUM TIME FROM STRIPPING TO PLANTING SHALL BE 24 HOURS.
18. ALL NEW PLANT BED AREAS TO BE IRRIGATED. REFER TO SPECIFICATIONS.
19. ROCK BEDS SHALL SHALL BE BUFFALO RIVER ROCK, 1"-2.5", BY HOUSE OF ROCKS OR APPROVED EQUAL. ALL ROCK BED AREAS SHALL HAVE FILTER FABRIC & BE 4" MIN. DEPTH.

INSTALLATION:

11. STRIP TOP SOIL & SAVE FOR PLANTING AREAS. EXCAVATE TO A DEPTH OF 12" FOR ALL PLANTING BEDS AND REPLACE WITH PLANTING SOIL MIX. A 10-10-10 FERTILIZER SHALL BE SPREAD OVER ALL PLANTING AREAS PRIOR TO PLANTING, AT A RATE OF 50 POUNDS PER 2,000 SQUARE FEET.
12. AFTER PLANTS HAVE BEEN INSTALLED, ALL PLANTING BEDS SHALL BE TREATED WITH DACTHAL PRE-EMERGENT HERBICIDE PRIOR TO MULCH APPLICATION.
13. PLANT PIT BACKFILL FOR TREES AND SHRUBS SHALL BE 25%COTTON BOLL COMPOST, AND 25%TOPSOIL, AND 50%EXISTING SOIL. TOPSOIL SHALL BE NATURAL FERTILE, FRIABLE SOIL POSSESSING CHARACTERISTICS OF REPRESENTATIVE PRODUCTIVE SOILS IN THE AREA. SOIL SHALL NOT BE EXCESSIVELY ACID, ALKALINE OR TOXIC THAT MAY BE HARMFUL TO PLANT GROWTH. ALSO, FREE OF CLAY LUMPS, STONES, STUMPS, ROOTS OR SUBSTANCE 2" OR MORE IN DIAMETER.
14. PLANTED BED EDGES SHALL BE IN STRAIGHT LINES OR GENTLE FLOWING CURVES. SUDDEN CURVES OR SHARP ANGLES SHOULD BE AVOIDED.
15. V-CUT EDGE SHALL BE DUG TO 6" DEPTH WITH ANGLED EDGE ON LANDSCAPE BED SIDE, AND VERTICAL EDGE ON TURF SIDE. BACKFILL V-CUT EDGE WITH SHREDDED HARDWOOD MULCH TO GRADE.
16. MULCH ALL PLANTING BED AREAS TO A MINIMUM DEPTH OF 3". MULCH INDIVIDUAL TREES TO A MINIMUM DEPTH OF 4".

IRRIGATION PERFORMANCE SPECIFICATIONS:

PROVIDE 100%COVERAGE COMPLETE WORKING IRRIGATION SYSTEM FOR ALL NEW TURF AREAS (SEED AND/OR SOD), ALL NEW PLANTING BEDS, AND ALL NEW TREES AND EXISTING TREES TO REMAIN. INCLUDE ELECTRICAL CONNECTION AND IRRIGATION SLEEVES AS NECESSARY. DRIP IRRIGATE ALL PLANTING BEDS. PRIOR TO INSTALLATION, PROVIDE PLAN SHOWING ALL IRRIGATION MATERIALS INCLUDING ALL EQUIPMENT SIZES AND DETAILS TO LANDSCAPE ARCHITECT FOR APPROVAL. COMPLY WITH REQUIREMENTS OF AUTHORITY WITH JURISDICTION FOR IRRIGATION SYSTEMS & BACKFLOW PREVENTOR. CONTRACTOR SHALL SUBMIT AS-BUILT DRAWINGS TO LANDSCAPE ARCHITECT & OWNER AFTER FINAL INSTALLATION AND PRIOR TO FINAL ACCEPTANCE. INCLUDING ALL HEAD & EQUIPMENT LOCATIONS & MAINTENANCE DATA FOR ALL EQUIPMENT PROVIDED. CONTRACTOR SHALL PROVIDE AN ON-SITE WALK THROUGH OF THE SYSTEM AND FULLY DESCRIBE ITS OPERATION WITH OWNER. CONTRACTOR SHALL ACHIEVE FINAL ACCEPTANCE WHEN SYSTEM IS FULLY OPERATIONAL, AND APPROVED BY OWNER, AND AS-BUILT DRAWINGS AND PROJECT MANUALS HAVE BEEN ACCEPTED AND APPROVED.

PIPING SPECIFICATIONS:

A. MINIMUM WORKING PRESSURE RATINGS:
   1. PRESSURE PIPING: 150 PSIG (1035 KPA).
   2. CIRCUIT AND DRAIN PIPING: 100 PSIG (690 KPA)
B. MAIN LINE TO BE CL-200 POLYVINYL CHLORIDE PIPE OR ASTM D 1785, PVC 1120, SCHEDULE 40, SOCKET-TYPE FITTINGS; AND SOLVENT-CEMENTED JOINTS OR APPROVED EQUAL.
   1. PIPE UP TO AND INCLUDING 2-1/2 INCHES IN DIAMETER SHALL HAVE BELL AND SOCKET JOINTS.
   2. PIPE GREATER THAT 2-1/2 INCHES IN DIAMETER SHALL HAVE SNAP CONNECTIONS WITH RUBBER GASKET JOINTS.
      A. THRUST BLOCKS SHALL BE REQUIRED IN CONJUNCTION WITH RUBBER GASKET JOINT PIPE.
C. LATERAL LINES TO BE CL-200 PVC PIPE OR APPROVED EQUAL.
D. DRIP TUBING: POLY TUBING OR APPROVED EQUAL.
E. SLEEVES: MINIMUM DIAMETER OF 2 TIMES LARGER THAN THE PIPE OR PIPE(S) SCHEDULED TO PASS THROUGH THEM. SLEEVES SHALL BE A MINIMUM OF 2 INCH DIAMETER AND SHALL BE SCHEDULE 40 PVC PIPE.
F. PLASTIC FITTINGS:
   1. UTILIZED THROUGHOUT THE SYSTEM (MAINS AND LATERALS) IN WARM CLIMATES AND MAIN LINES IN COLDER CLIMATES: SCHEDULE 40 PVC PIPE.
   2. UTILIZED FOR LATERALS OF FLEXIBLE POLYETHYLENE PIPE, TYPE 1 PVC INSERT FITTINGS DESIGNED FOR USE WITH THIS TYPE OF PIPE CONFORMING TO ASTM D 2609.
      A. PIPE AND FITTINGS SHALL BE JOINED WITH STAINLESS STEEL LOCKING PINCH CLAMPS OR STAINLESS STEEL SCREW CLAMPS.
G. MINIMUM COVER:
   1. IN LAWN AND PLANTING AREAS:
      A. MAINS - MINIMUM 18 INCHES BELOW FINISH GRADE.
      B. LATERALS AND CONTROL VALVES - MINIMUM 12 INCHES BELOW FINISH GRADE.
   2. ROADWAYS OR PARKING AREAS: MINIMUM 24 INCHES BELOW FINISH GRADE.
H. CLEARANCES: MINIMUM OF 3-INCHES BETWEEN PARALLEL LINES IN THE SAME TRENCH OR VERTICAL CLEARANCE BETWEEN LINES CROSSING AT ANGLES.

NSPJ ARCHITECTS PA
3515 W. 75TH ST., SUITE 201
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ARCHITECTURE
LANDSCAPE ARCHITECTURE
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P. 913.831.1415
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NSPJARCH.COM

KATHRYN MARTINOVIC LICENSED LA723 KANSAS ARCHITECT
01.23.2023

A NEW TOWNHOUSE DEVELOPMENT FOR:
MISSION VALE
5819 NALL AVENUE
MISSION, KANSAS

DRAWING RELEASE LOG
- 07.27.22 PDP RESUBMITTAL
- 08.11.22 PDP RESUBMITTAL
- 09.15.22 PDP RESUBMITTAL
- 12.15.22 FDP SUBMITTAL
- 01.23.23 PERMIT SET

REVISIONS

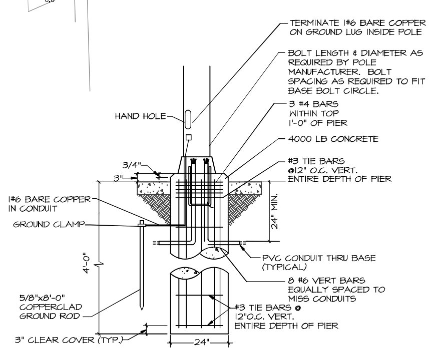
JOB NO. 712922
DATE 01.23.23
DRAWN BY TAH

SHEET NAME

SHEET NO.
L3.00

SITE PHOTOMETRIC PLAN

SCALE: 1" = 20'



POLE FOUNDATION DETAIL

SCALE: NONE

Schedule

Symbol	Label	Image	Quantity	Manufacturer	Catalog Number	Description	Number Lamps	Lumens Per Lamp	Light Loss Factor	Wattage	Plot
○	A		2	SIGNIFY LUMEC	MPTR-C-140L-450-WW-G1-2-UNV	DECORATIVE POST TOP LED LANTERN WITH FLAT GLASS LENS AND TYPE II DISTRIBUTION MOUNTED ON 12'-0" DECORATIVE POLE WITH 6" CONCRETE BASE.	1	1722	0.9	22	Max: 846cd
▭	B		17	Lithonia Lighting	WDGE2 LED P2 30K 70CRI TFTM	FULL CUTOFF LED AREA LIGHT WITH FORWARD THROW DISTRIBUTION. WALL MOUNT FIXTURE 12'-0" ABOVE GRADE.	1	2127	0.9	18.9815	Max: 1463cd
—	C		19	To Be Selected	N/A	DECORATIVE OUTDOOR PATIO SCONCE TO BE SELECTED	1	522	0.9	8.93	Max: 179cd

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #1	+	0.6 fc	3.7 fc	0.0 fc	N/A	N/A
Stat Zone # 1	✳	2.2 fc	3.7 fc	0.5 fc	7.4:1	4.4:1

BC ENGINEERS INCORPORATED
5720 Reeder
Shawnee, KS 66203
(913)262-1772

PE COA #E-359

11/4/2022

DARIN T. SEIDEL
LICENSED
20659
KANSAS
PROFESSIONAL ENGINEER

BC PROJECT #22820

A PROJECT FOR:
MISSION VALE TOWNHOMES
MISSION, KANSAS 58th TERRACE & NALL

ISSUE DATE:
11-4-2022

REVISION:

SHEET TITLE:
SITE PHOTOMETRIC PLAN

PH1

ROBERT C. WESSEL P.E.

consulting engineer
4085 NORTH KOLB ROAD
TUCSON, ARIZONA 85750
913-207-6118
EMAIL robertcwessel47@gmail.com

February 13, 2023

STORMWATER MANAGEMENT STUDY
SKYLINE PROPERTIES LLC
MISSION VALE TOWNHOMES
58th TERRACE & NALL AVENUE
MISSION, KANSAS

TABLE OF CONTENTS

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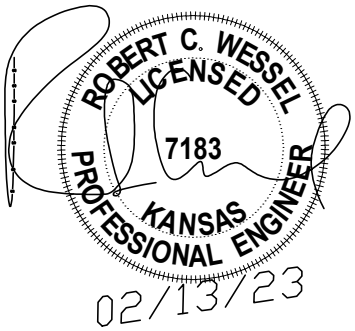


February 13, 2023

STORMWATER MANAGEMENT STUDY
SKYLINE PROPERTIE LLC
MISSION VALE TOWNHOMES
58th TERRACE & NALL AVENUE
MISSION, KANSAS

Mission Vale Townhomes project is located on a 42,620 s.f.(0.978 acre) site on the southeast corner of 58th Terrace and Nall Avenue. The site included 5 structures, 3 of which have recently been removed. The estimated total impervious area was 15,366 s.f. (CN=83). There is no off-site drainage flowing onto the site. The existing drainage patterns generally flow south between commercial buildings to and along Johnson Drive. A small strip of land along Nall Avenue flows onto Nall. Another small existing building and parking lot flow onto Birch Avenue. Runoff on Nall flows south to Johnson Drive to a curb inlet. Runoff onto Birch flows south to Johnson Drive then east to curb inlets. We are not aware of any specific drainage problems in the vicinity.

The site, in the Rock Creek drainge shed of Brush Creek, is not in a flood plain. The site is not in a flood plain and there are no waterways or wet lands. The project does not fall within the scope of the Corps of Engineers, FEMA, or DWR regulations.

The project proposes construction of 19 townhouse units. 6 units will front on Nall and the remainder on 58th Terrace. The project proposes 30,221 s.f. (CN=93) of impervious surfaces. Total developed 1% storm runoff is 10.46 cfs (0.528 ac-ft). Existing 1% event runoff is 9.55 cfs (0.457 ac-ft). The 1% event increase in runoff volume is 0.071 ac-ft (3,093 c.f.).

PROJECT CONCERNS:

The site generally flows onto and between existing commercial buildings on Johnson Drive. We are not aware of any drainage easements or other provisions that are in place for runoff flow routes between the buildings to Johnson Drive. Regardless, it is important to provide an adequate drainage system and avoid potential conflicts with neighboring properties.

The site is less than an acre. Mission has indicated stormwater treatment is not required. The site soil is the "Sharsburg Urban Land Complex" per NRCS soils report. The soil has an average Ksat of 0.4 inches per hour and a depth of over 3 feet to limiting layers.

Mission has informed the developer this project will require detention. We assume this is generated by the capacity of the storm sewer systems on Johnson Drive and backups from Rock Creek. Per direction from the City Engineer, the peak flow rates from the site must be less than the existing peak flows for the 1, 10, and 100 year events.

Per agreement with the city, the project will provide facilities to control the runoff. The total peak discharge rates will be less than existing site discharge rates. The project will also provide retention of the "First Flush" event.

An extensive collection system is planned to route almost all runoff to a retention and detention basin under the parking lost. The retained and detained flow will be collected in 28 Storm Tech Chambers and clean gravel below the parking lot. The clean gravel below the chambers will retain the First Flush flow. The net result of this system is peak total discharge rates significantly below existing and treatment of the First Flush runoff by retention and soil injection.

Concern has been noted regarding potential foundation damage/leaking of existing and proposed buildings near the proposed retetion basin. All of the commercial buildings along Johnson Drive are on grade without basements. All of the project townhomes are on grade without basements. That being the case, concerns over potential foundation problems are without merit.

PROJECT STORMWATER DESIGN:

All calculations are generated using Hydrocad Software, SCS Type II 24 hour storm distributions, Modified Plus routing. Reach routing has been changed to Muskingum-Cunge although there are no reach nodes in the project.

Almost all roof drains and pavement flow into the retention basin. Building units 18 and 19 driveway and unit 19 entry flow onto 58th Terrace. All roof drain downspouts will have trash seperators and all inlets will have limited small openings to limit trash entry into the basin. The proposed basin uses 5 feet of clean gravel and 28 STORM TECH chambers covered with clean gravel, all wrapped in fabric to retain the First Flush storm and provide detention. Inspection and cleaning access of the chambers is provide by the system.

The storm drainage system and detention/retention facility collect all of the flow currently flowing between the commercial buildings. The detention/retention facility routies discharge via an 12" PVC pipe to a new manhole on the west side of Nall. Routing the project discharge is a challenge due to existing utilities along Nall and the depth of the existing 24"RCP storm sewer on the west side of Nall. We have generated all the information available on the location and depth of the various utilities. The water line and gas line on the east side of Nall are practicably on top of each other. There does appear to be enough room between them to install the 12" PVC pipe.

Peak discharges, not routed through the basin, are 0.45cfs (1yr), 0.88cfs (10yr), and 1.41cfs (100yr) flows. Basin peak discharges are 3.26cfs (1yr), 6.10cfs (10yr), and 9.55cfs (100yr). Total developed peak discharge hydrographs from the project are 2.25cfs (1yr), 4.85cfs (10yr), and 6.56cfs (100yr).

The capacity of the existing 24"RCP storm sewer on the west side of Nall is 38.4cfs. The drainage shed of this pipe is 6.9 acres of residential (c=0.51). 10 year runoff at the connection point is 19.7 cfs and 100 year is 34.8 cfs. There is adequate capacity in the pipe for the flow from the basin without overflow onto the street. Note: Area storm sewer design when the sewers were installed was 10 year with a "c" of 0.40. It is unlikely that the storm sewer system intake capabilities would collect all of the 100 year flows above the project. We have assumed all flow is collected and in the existing pipe.

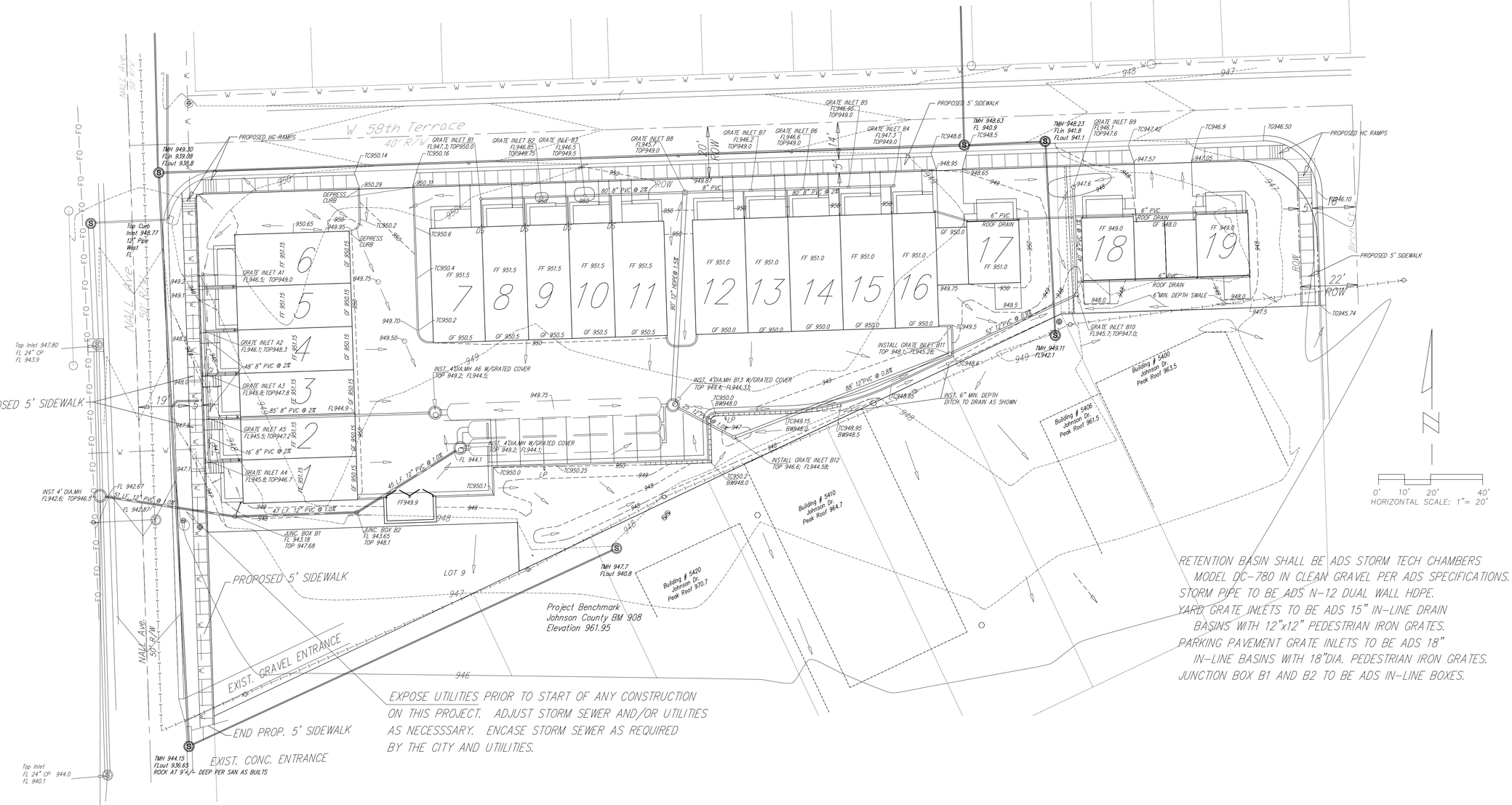
Due to the location of existing utility lines along Nall, the proposed 12" storm sewer crossing Nall may be in conflict with the utility lines. Adjustment of the storm sewer and/or utility lines may be necessary. The developer and construction contractors shall determine if conflicts exist prior to any construction on the project. Any and all conflicts will be resolved before construction of any portion of the project is initiated. City review and approval of any changes required in this critical area is necessary prior to intiation of site work.

The average infiltration rate of the basin is 0.4"/hr per NRCS. The 5 feet overall depth and 2,000s.f. of cantact surface provides 4,000c.f. water volume retention below the discharge pipe and chamber flow lines. Infiltration of the First Flush flow voume will take 60 hours.

SUMMARY

The design limits total runoff from the site to 3.18 cfs or less from all storms up to a 1% event. Non detained runoff sheet flows onto the streets without concentration. The infiltration portion of the basin provides retention and treatment of the "First Flush" event. The collection system and basin eliminate runoff from the site beween the commecial buildings to Johnson Drive.

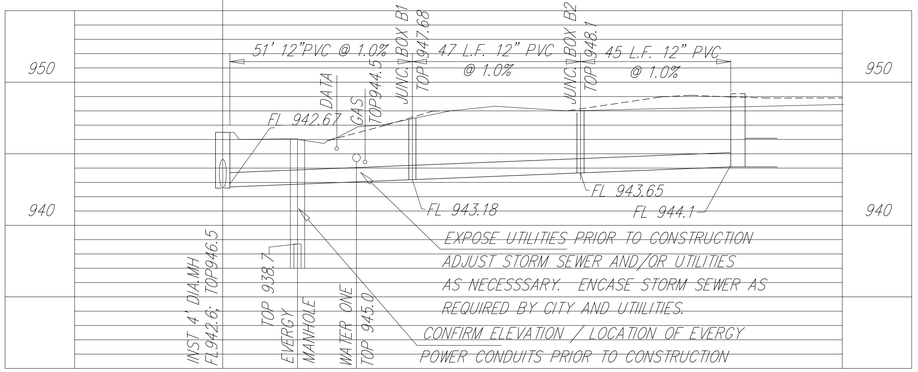
The stormwater management plan for this project significantly reduces runoff and improves water quality from this site.



RETENTION BASIN SHALL BE ADS STORM TECH CHAMBERS MODEL DC-780 IN CLEAN GRAVEL PER ADS SPECIFICATIONS.
STORM PIPE TO BE ADS N-12 DUAL WALL HDPE.
YARD GRATE INLETS TO BE ADS 15" IN-LINE DRAIN BASINS WITH 12"x12" PEDESTRIAN IRON GRATES.
PARKING PAVEMENT GRATE INLETS TO BE ADS 18" IN-LINE BASINS WITH 18"DIA. PEDESTRIAN IRON GRATES.
JUNCTION BOX B1 AND B2 TO BE ADS IN-LINE BOXES.

EXPOSE UTILITIES PRIOR TO START OF ANY CONSTRUCTION ON THIS PROJECT. ADJUST STORM SEWER AND/OR UTILITIES AS NECESSSARY. ENCASE STORM SEWER AS REQUIRED BY THE CITY AND UTIILITIES.

BASIN DISCHARGE PIPE



UTILITY DEPTHS CONFIRMED 12/12/2022

SITE STORM SEWERS

INLET	D.A. acre	c	cA	Tc min	i10	Q10 cfs	i100	Q100 cfs	Pipe	Pipe cA	Q10 cfs	Q100 cfs	DIA.	n	S	QFull cfs
A1	0.030	0.7	0.021	5	7.35	0.15	10.32	0.27	A1-A2	0.021	0.15	0.27	8"	0.012	2%	1.85
A2	0.014	0.9	0.013	5	7.35	0.10	10.32	0.17	A2-A3	0.034	0.25	0.44	8"	0.012	2%	1.85
A3	0.014	0.9	0.013	5	7.35	0.10	10.32	0.17	A3-A5	0.047	0.35	0.61	8"	0.012	2%	1.85
A4	0.017	0.9	0.015	5	7.35	0.11	10.32	0.19	A3-A4	0.015	0.11	0.19	8"	0.012	2%	1.85
A5	0.014	0.9	0.013	5	7.35	0.10	10.32	0.17	A5-A6	0.075	0.55	0.97	8"	0.012	2%	1.85
A6	0.199	0.9	0.179	5	7.35	1.32	10.32	2.31	A6-RE	0.254	1.87	3.28	24"	0.012	2%	34.7
B1	0.022	0.9	0.020	5	7.35	0.15	10.32	0.26	B1-B2	0.020	0.15	0.26	8"	0.012	2%	1.85
B2	0.022	0.9	0.020	5	7.35	0.15	10.32	0.26	B2-B3	0.040	0.30	0.52	8"	0.012	2%	1.85
B3	0.022	0.9	0.020	5	7.35	0.15	10.32	0.26	B3-B8	0.060	0.60	0.78	8"	0.012	2%	1.85
B4	0.020	0.9	0.018	5	7.35	0.13	10.32	0.23	B4-B5	0.018	0.13	0.23	8"	0.012	2%	1.85
B5	0.015	0.9	0.014	5	7.35	0.10	10.32	0.18	B5-B6	0.032	0.24	0.41	8"	0.012	2%	1.85
B6	0.016	0.9	0.015	5	7.35	0.11	10.32	0.19	B6-B7	0.047	0.35	0.61	8"	0.012	2%	1.85
B7	0.017	0.9	0.015	5	7.35	0.11	10.32	0.19	B7-B8	0.062	0.46	0.80	8"	0.012	2%	1.85
B8	0.027	0.9	0.024	5	7.35	0.18	10.32	0.31	B8-B13	0.165	1.21	2.13	12"	0.012	1.5%	4.70
B9	0.085	0.85	0.072	5	7.35	0.53	10.32	0.93	B9-B10	0.072	0.53	0.93	8"	0.012	1%	1.31
B10	0.063	0.40	0.025	5	7.35	0.18	10.32	0.32	B10-B11	0.097	0.71	1.25	8"	0.012	0.9%	1.24
B11	0.092	0.9	0.083	5	7.35	0.61	10.32	1.07	B11-B12	0.180	1.32	2.32	12"	0.012	0.8%	3.45
B12	0.062	0.40	0.025	5	7.35	0.18	10.32	0.32	B12-B13	0.205	1.51	2.64	12"	0.012	1%	3.86
B13	0.112	0.9	0.101	5	7.35	0.74	10.32	1.30	B13-RE	0.471	3.46	6.08	15"	0.012	2%	9.90

ROBERT C. WESSEL LICENSED 7183 KANSAS PROFESSIONAL ENGINEER
02/17/23

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EMAIL robertcwessel47@gmail.com

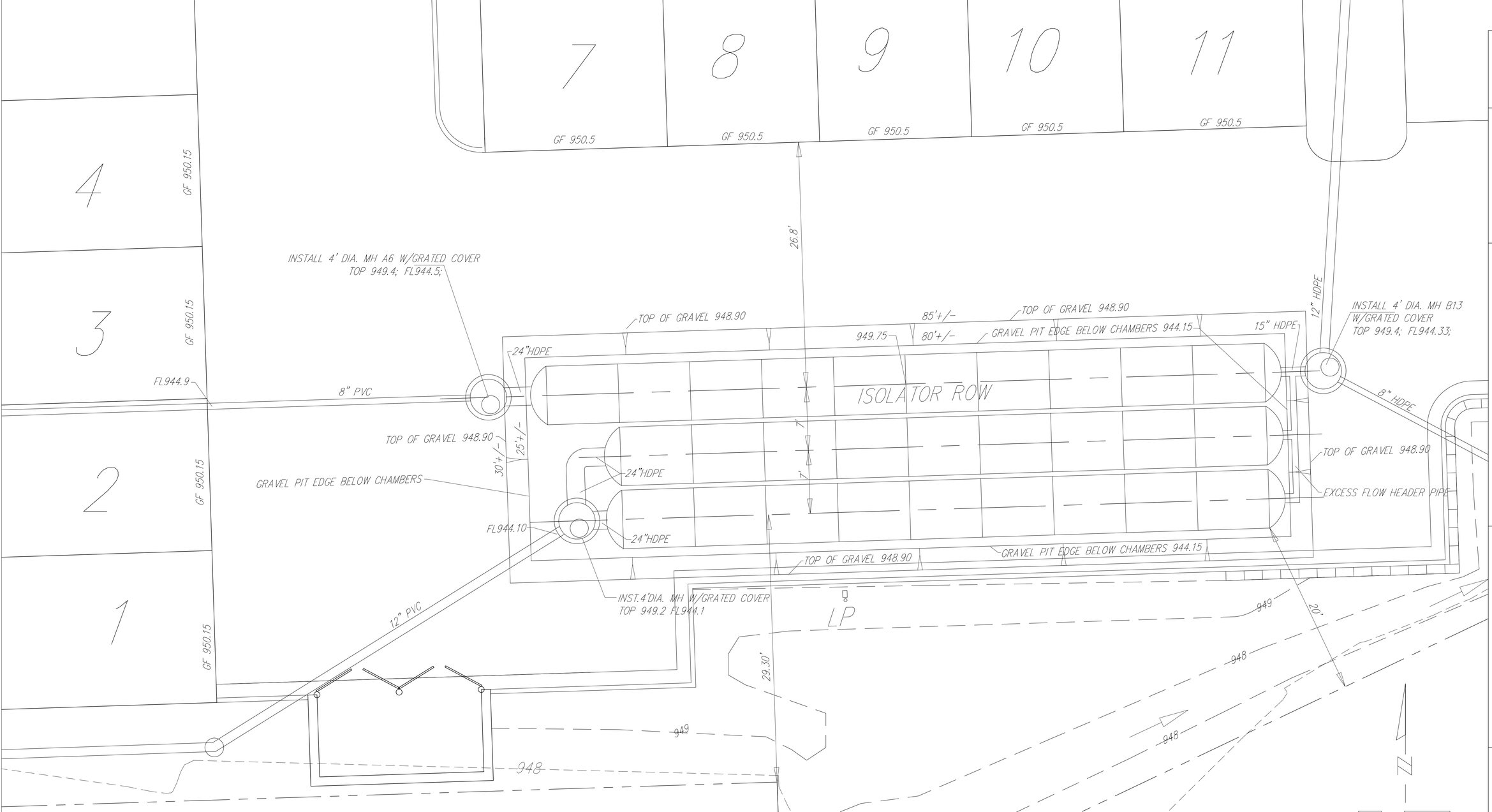
JOB NO.: RCW0311	DRAWN: RPP
FIELD BK./PG.: XX/XX	CHECKED: RCW

ISSUES / REVISIONS:	DATE
PRELIMINARY ISSUE	09/12/22
REVISED PER CITY COMMENTS	10/17/22
PERMIT ISSUE	12/12/22
RELOCATED TRASH	01/06/23
REVISED PER CITY COMMENTS	02/13/23
ADDED SW ON NALL	02/17/23

PREPARED FOR:
KOENIG BUILDING & RESTORATION
2500 WEST 43RD STREET
KANSAS CITY, KANSAS 66103

MISSION VALE TOWNHOMES
GRADING & DRAINAGE PLAN
58th TERRACE & NALL
MISSION, KANSAS

SHEET NO.
C2
OF 9



OPEN PIT VOLUME BELOW CHAMBERS 80x25x5 = 10,000 C.F.
OPEN PIT VOLUME CHAMBER FLOOR TO TOP (80x25 + 83.75x28.75)(3.75)/2 = 8,265 C.F.
OPEN PIT VOLUME ABOVE CHAMBERS 84.25x29.25x1.00 = 2,464 C.F.
TOTAL PIT VOLUME 20,729 C.F.

28 MC-3500 STORMTECH CHAMBERS 109.9 C.F. EACH 3,077.2 C.F.
6 MC-3500 END SECTIONS 14.9 C.F. EACH 89.4 C.F.
TOTAL CHAMBER VOLUMES 2,166.6 C.F.

PIT VOLUME MINUS CHAMBER VOLUME 20,729-2,167 = 18,562 C.F.

GRAVEL WATER VOLUME = 18,562 X 0.4 = 7,425 C.F.
TOTAL CHAMBER VOLUMES = 2,167 C.F.
TOTAL BASIN WATER VOLUME = 9,592 C.F.

NOTE: PIT VOLUME CALCULATIONS ASSUME EXCAVATED 1:2 SIDE SLOPES FROM BOTTOM OF CHAMBERS TO TOP OF GRAVEL.

28 MC-3500 STORMTECH CHAMBERS

	WATER STORAGE
GRAVEL BOTTOM 939.15	4,000 C.F.
CHAMBER FLOOR 944.15	4,606 C.F.
CHAMBER TOP 947.90	986 C.F.
GRAVEL TOP 948.90	9,592 C.F.

6" SPACE BETWEEN CHAMBER ROWS
INST. PER ADS DETAILS AND SPECIFICATIONS

WATER QUALITY VOLUME CALCULATIONS:
DA = 0.978 AC (0.972 AFTER ROW DEDICATION)
EXIST. CN = 83; PROP. CN = 91
PROP. IMPERVIOUS = 0.708 AC = 72.4%
WQV = 1.37"(0.05+0.009x72.4) = 0.96"/AC = 3,408 C.F.
VOLUME RETAINED ON SITE = 4,000 C.F.

RETENTION BASIN:
1% EVENT PEAK DISCHARGE = 5.47 CFS; SURFACE ELEVATION = 947.45
10% EVENT PEAK DISCHARGE = 4.16 CFS; SURFACE ELEVATION = 946.11
100% EVENT PEAK DISCHARGE = 2.03 CFS; SURFACE ELEVATION = 944.90

TOTAL SITE:
EXIST. 1% EVENT PEAK DISCHARGE = 9.55 CFS; PROP. = 6.56 CFS;
EXIST. 10% EVENT PEAK DISCHARGE = 6.10 CFS; PROP. = 4.85 CFS;
EXIST. 100% EVENT PEAK DISCHARGE = 3.26 CFS; PROP. = 2.25 CFS;

ROBERT C. WESSEL LICENSED 7183 PROFESSIONAL ENGINEER KANSAS
02/13/23

JOB NO.: RCW0311
FIELD BK./PG.: XX/XX
DRAWN: RPP
CHECKED: RCW

ISSUES / REVISIONS:

ISSUE	DATE
PERMIT ISSUE	10/17/22
RELOCATED TRASH	12/12/22
REVISED PER CITY COMMENTS	01/06/23
	02/13/23

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2500 WEST 43RD STREET
KANSAS CITY, KANSAS 66103

MISSION VALE TOWNHOMES
RETENTION BASIN DETAILS
58th TERRACE & NALL
MISSION, KANSAS

SHEET NO.
C3
OF 9

Advanced Drainage Systems, Inc.

SiteAssist®
FOR STORMTECH INSTALLATION INSTRUCTIONS VISIT OUR APP

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

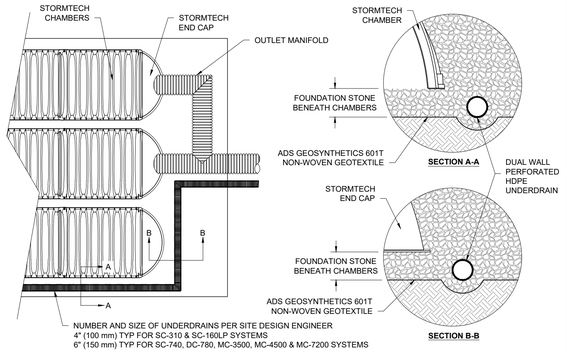
1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

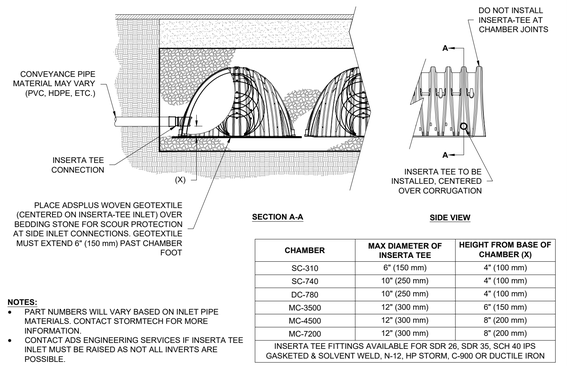
1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.



5 UNDERDRAIN DETAIL



NOTES:
- PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.
- CONTACT ADS ENGINEERING SERVICES IF INSERTA TEE INLET MUST BE RAISED AS NOT ALL INVERTS ARE POSSIBLE.

CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
MC-7200	12" (300 mm)	8" (200 mm)

INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON

6 INSERTA-TEE SIDE INLET DETAIL

NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	175.0 CUBIC FEET	(4.96 m³)
WEIGHT	134 lbs.	(60.8 kg)

NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	75.0" X 45.0" X 22.2"	(1905 mm X 1143 mm X 564 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	45.1 CUBIC FEET	(1.28 m³)
WEIGHT	49 lbs.	(22.2 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION, 6" (152 mm) STONE BETWEEN CHAMBERS, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18TW			
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP18BW			
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24TW			
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP24BW			
MC3500IEPP30BC	30" (750 mm)	---	2.75" (70 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL

CUSTOM PARTIAL CUT INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

2 MC-3500 TECHNICAL SPECIFICATIONS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

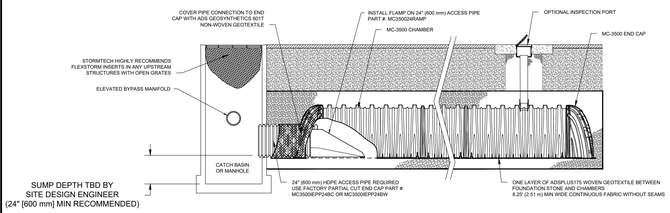
STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

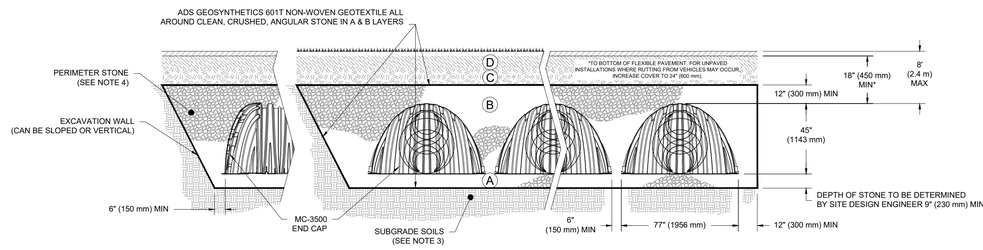


3 MC-3500 ISOLATOR ROW PLUS DETAIL

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

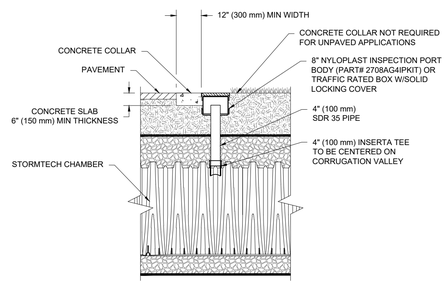
	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



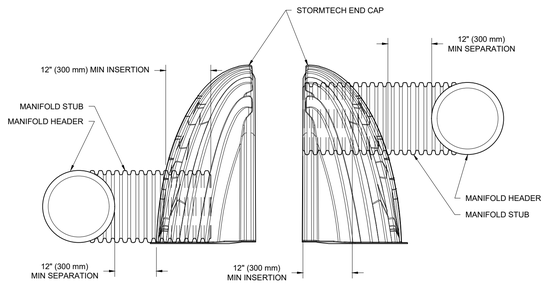
NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.

4 4" PVC INSPECTION PORT DETAIL (MC SERIES CHAMBER)



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

7 MC-SERIES END CAP INSERTION DETAIL

1 MC-3500 CROSS SECTION DETAIL

DRAWN: | DATE:
REVIEWED: | PROJECT NO:
REV: | NOT TO SCALE

MC-3500
STANDARD DETAILS

StormTech®
Chamber System
888-892-2694 | WWW.STORMTECH.COM

4640 TRUEMAN BLVD
HILLIARD, OH 43026

Advanced Drainage Systems, Inc.

SHEET

User Inputs

Chamber Model:	MC-3500
Outlet Control Structure:	Yes
Project Name:	mission vale town-homes copy
Engineer:	Robert C Wessel Wessel
Project Location:	Kansas
Measurement Type:	Imperial
Required Storage Volume:	8000 cubic ft.
Stone Porosity:	40%
Stone Foundation Depth:	60 in.
Stone Above Chambers:	12 in.
Average Cover Over Chambers:	30 in.
Design Constraint Dimensions:	(25 ft. x 80 ft.)

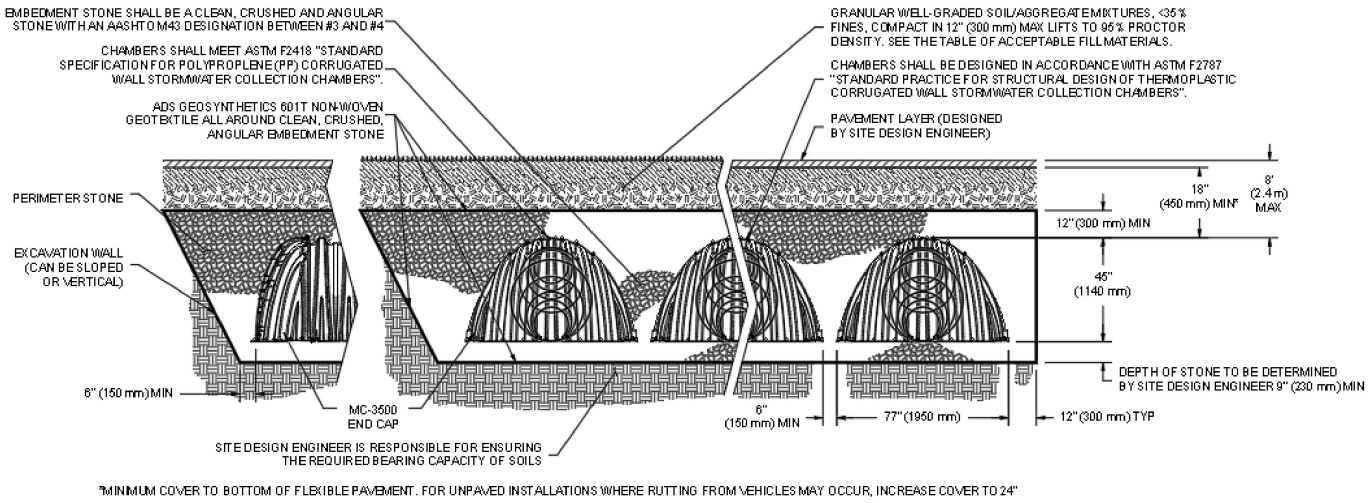
Results

System Volume and Bed Size

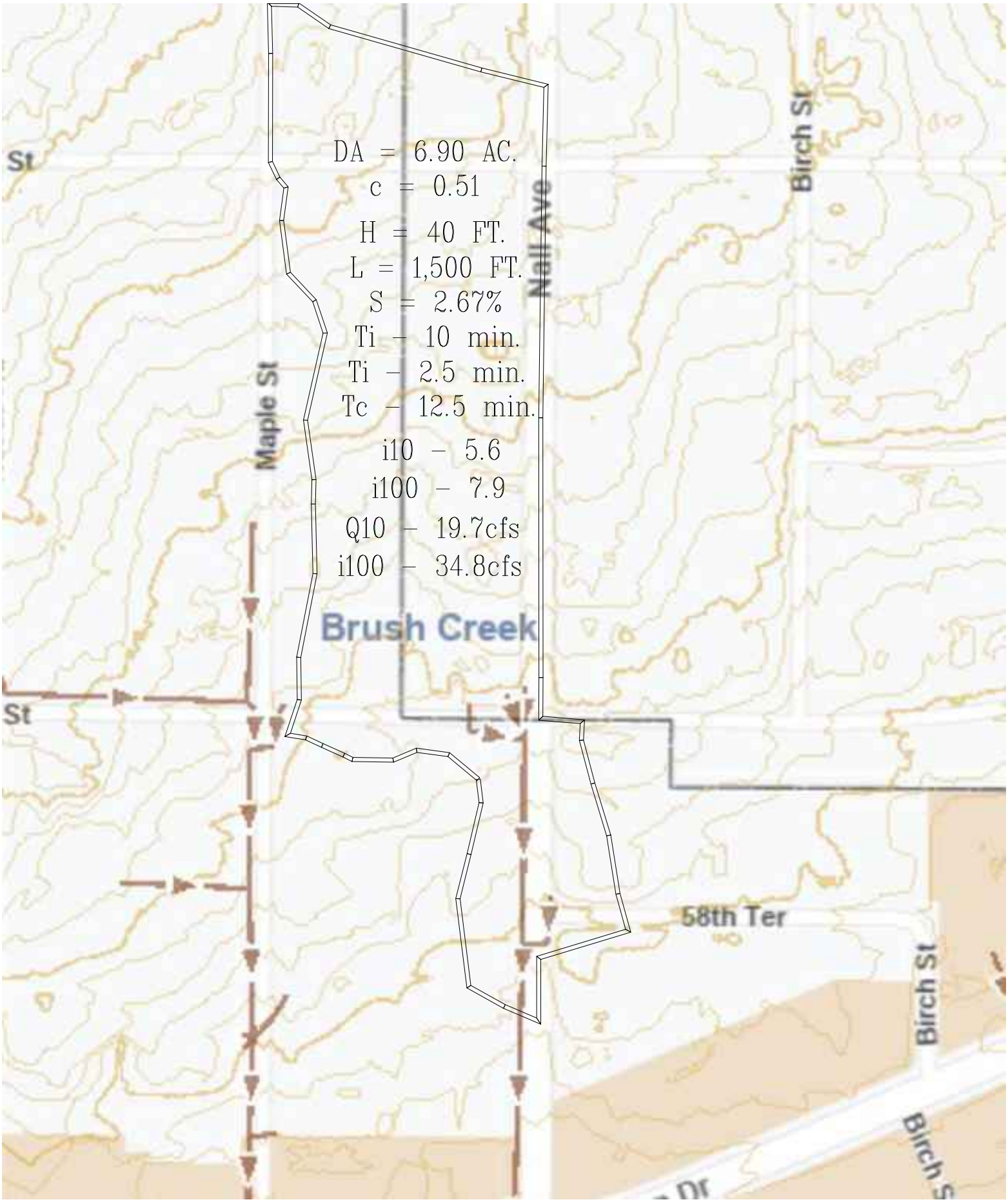
Installed Storage Volume:	8812.70 cubic ft.
Storage Volume Per Chamber:	109.90 cubic ft.
Number Of Chambers Required:	28
Number Of End Caps Required:	6
Chamber Rows:	3
Maximum Length:	81.55 ft.
Maximum Width:	22.25 ft.
Approx. Bed Size Required:	1772.50 square ft.

System Components

Amount Of Stone Required:	523 cubic yards
Volume Of Excavation (Not Including Fill):	641 cubic yards
Total Non-woven Geotextile Required:	743 square yards
Woven Geotextile Required (excluding Isolator Row):	34 square yards
Woven Geotextile Required (Isolator Row):	88 square yards
Total Woven Geotextile Required:	122 square yards



SHEET NO.				
8	MISSION VALE TOWNHOMES EXISTING AERIAL MAP STORMWATER MANAGEMENT STUDY 7528 WEST 79TH ST. OVERLAND PARK, KANSAS	**PREPARED FOR:** KOENIG BUILDING & RESTORATION 2500 WEST 43RD STREET KANSAS CITY, KANSAS 66103	ROBERT C. WESSEL P.E. consulting engineer 4085 NORTH KOLB ROAD TUCSON, ARIZONA 85750 913-207-6118 EMAIL rwessel@kc.rr.com	JOB NO.: RCW0311 — DRAWN: RPP FIELD BK./PG.: XX/XX — CHECKED: RCW ISSUES / REVISIONS: — DATE PRELIMINARY ISSUE — 06-06-22


DA = 6.90 AC.
c = 0.51
H = 40 FT.
L = 1,500 FT.
S = 2.67%
Ti = 10 min.
Ti = 2.5 min.
Tc = 12.5 min.
i10 = 5.6
i100 = 7.9
Q10 = 19.7cfs
i100 = 34.8cfs
Brush Creek
Maple St
Nall Ave
Birch St
58th Ter
St

Soil Map—Johnson County, Kansas
(MISSION TOWNHOME SITE)

Map Scale: 1:802 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Johnson County, Kansas
Survey Area Data: Version 20, Sep 14, 2021

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

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

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
7545	Sharpsburg-Urban land complex, 4 to 8 percent slopes	2.8	100.0%
Totals for Area of Interest		**2.8**	**100.0%**

Johnson County, Kansas

7545—Sharpsburg-Urban land complex, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: tq4z
Elevation: 1,000 to 1,300 feet
Mean annual precipitation: 31 to 47 inches
Mean annual air temperature: 45 to 64 degrees F
Frost-free period: 185 to 255 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Sharpsburg and similar soils: 55 percent
Urban land: 45 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sharpsburg

Setting

Landform: Hillslopes
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Silty and clayey loess

Typical profile

A - 0 to 9 inches: silt loam
AB - 9 to 13 inches: silty clay loam
Bt - 13 to 35 inches: silty clay loam
BC - 35 to 60 inches: silty clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 36 to 40 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R106XY015KS - Loamy Upland (PE 30-37)
Hydric soil rating: No

Summary for Subcatchment 8S: EXISTING RUNOFF

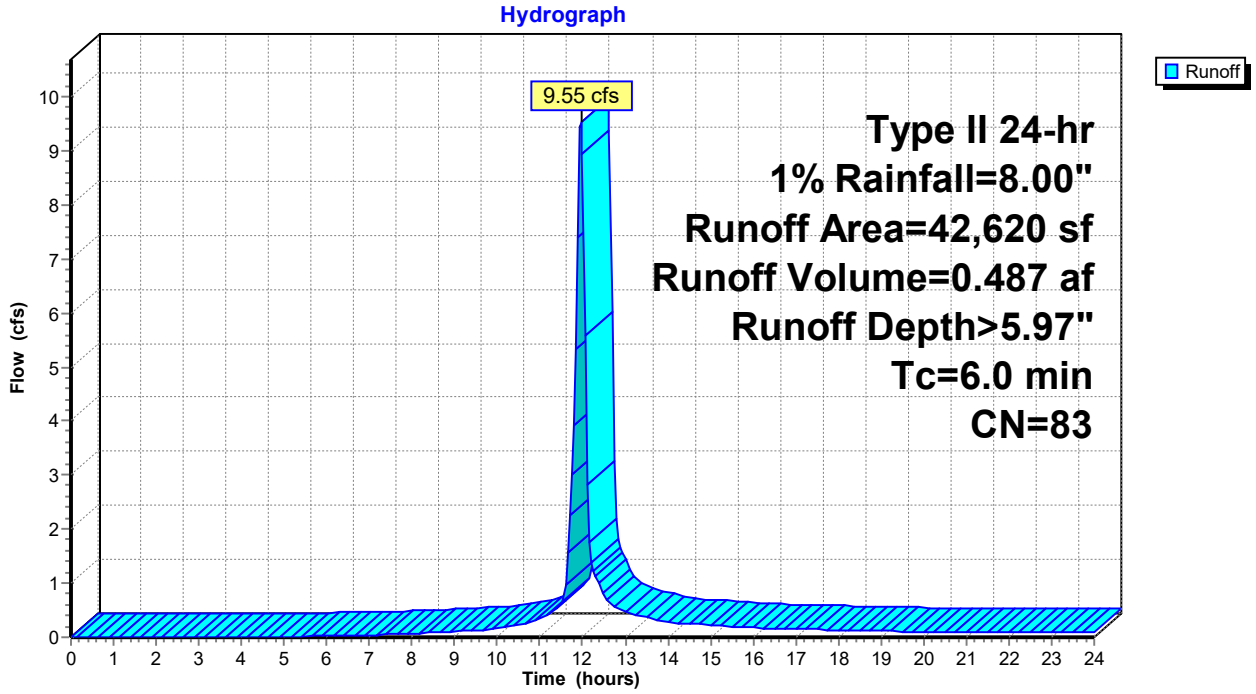
Runoff = 9.55 cfs @ 11.97 hrs, Volume= 0.487 af, Depth> 5.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1% Rainfall=8.00"

	Area (sf)	CN	Description
*	42,620	83	
	42,620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 8S: EXISTING RUNOFF



Hydrograph for Subcatchment 8S: EXISTING RUNOFF

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.02	0.00	0.00
0.50	0.04	0.00	0.00
0.75	0.06	0.00	0.00
1.00	0.08	0.00	0.00
1.25	0.11	0.00	0.00
1.50	0.13	0.00	0.00
1.75	0.15	0.00	0.00
2.00	0.18	0.00	0.00
2.25	0.20	0.00	0.00
2.50	0.23	0.00	0.00
2.75	0.25	0.00	0.00
3.00	0.28	0.00	0.00
3.25	0.30	0.00	0.00
3.50	0.33	0.00	0.00
3.75	0.36	0.00	0.00
4.00	0.38	0.00	0.00
4.25	0.41	0.00	0.00
4.50	0.44	0.00	0.00
4.75	0.47	0.00	0.01
5.00	0.50	0.00	0.01
5.25	0.54	0.01	0.01
5.50	0.57	0.01	0.02
5.75	0.60	0.02	0.02
6.00	0.64	0.02	0.03
6.25	0.68	0.03	0.03
6.50	0.71	0.04	0.03
6.75	0.75	0.05	0.04
7.00	0.79	0.06	0.04
7.25	0.83	0.07	0.05
7.50	0.87	0.09	0.05
7.75	0.92	0.10	0.06
8.00	0.96	0.12	0.06
8.25	1.01	0.13	0.07
8.50	1.06	0.16	0.09
8.75	1.11	0.18	0.10
9.00	1.18	0.21	0.11
9.25	1.24	0.24	0.12
9.50	1.30	0.27	0.13
9.75	1.37	0.31	0.14
10.00	1.45	0.35	0.17
10.25	1.53	0.40	0.20
10.50	1.63	0.46	0.24
10.75	1.75	0.53	0.29
11.00	1.88	0.61	0.35
11.25	2.05	0.73	0.47
11.50	2.26	0.88	0.62
11.75	3.10	1.52	**3.02**
12.00	5.30	3.45	**8.93**
12.25	5.65	3.77	1.22
12.50	5.88	3.98	0.79
12.75	6.04	4.13	0.58
13.00	6.18	4.25	0.48
13.25	6.29	4.36	0.42
13.50	6.39	4.46	0.37
13.75	6.48	4.54	0.32
14.00	6.56	4.61	0.29
14.25	6.63	4.68	0.27
14.50	6.70	4.75	0.25
14.75	6.77	4.81	0.24
15.00	6.83	4.87	0.23
15.25	6.89	4.92	0.21
15.50	6.94	4.97	0.20
15.75	6.99	5.02	0.19
16.00	7.04	5.07	0.18
16.25	7.09	5.11	0.17
16.50	7.13	5.15	0.16
16.75	7.17	5.19	0.16
17.00	7.21	5.23	0.15
17.25	7.25	5.27	0.15
17.50	7.29	5.31	0.15
17.75	7.33	5.34	0.14
18.00	7.37	5.38	0.14
18.25	7.40	5.41	0.13
18.50	7.44	5.44	0.13
18.75	7.47	5.47	0.12
19.00	7.50	5.50	0.12
19.25	7.53	5.53	0.11
19.50	7.56	5.56	0.11
19.75	7.59	5.59	0.10
20.00	7.62	5.61	0.10
20.25	7.64	5.64	0.10
20.50	7.67	5.66	0.10
20.75	7.69	5.68	0.10
21.00	7.72	5.71	0.09
21.25	7.74	5.73	0.09
21.50	7.77	5.76	0.09
21.75	7.79	5.78	0.09
22.00	7.82	5.80	0.09
22.25	7.84	5.82	0.09
22.50	7.86	5.85	0.09
22.75	7.89	5.87	0.09
23.00	7.91	5.89	0.09
23.25	7.93	5.91	0.09
23.50	7.96	5.93	0.09
23.75	7.98	5.96	0.08
24.00	**8.00**	**5.98**	0.08

Summary for Subcatchment 8S: EXISTING RUNOFF

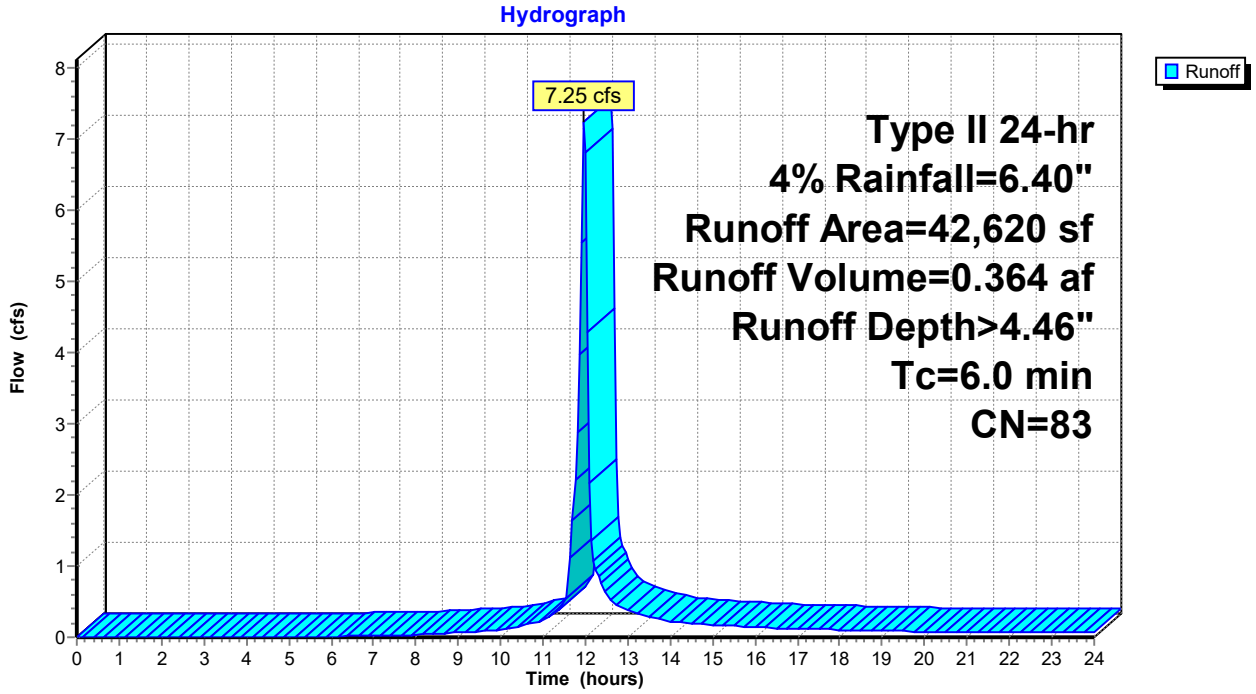
Runoff = 7.25 cfs @ 11.97 hrs, Volume= 0.364 af, Depth> 4.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 4% Rainfall=6.40"

	Area (sf)	CN	Description
*	42,620	83	
	42,620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 8S: EXISTING RUNOFF



Hydrograph for Subcatchment 8S: EXISTING RUNOFF

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.02	0.00	0.00
0.50	0.03	0.00	0.00
0.75	0.05	0.00	0.00
1.00	0.07	0.00	0.00
1.25	0.08	0.00	0.00
1.50	0.10	0.00	0.00
1.75	0.12	0.00	0.00
2.00	0.14	0.00	0.00
2.25	0.16	0.00	0.00
2.50	0.18	0.00	0.00
2.75	0.20	0.00	0.00
3.00	0.22	0.00	0.00
3.25	0.24	0.00	0.00
3.50	0.26	0.00	0.00
3.75	0.28	0.00	0.00
4.00	0.31	0.00	0.00
4.25	0.33	0.00	0.00
4.50	0.35	0.00	0.00
4.75	0.38	0.00	0.00
5.00	0.40	0.00	0.00
5.25	0.43	0.00	0.00
5.50	0.46	0.00	0.00
5.75	0.48	0.00	0.01
6.00	0.51	0.00	0.01
6.25	0.54	0.01	0.01
6.50	0.57	0.01	0.02
6.75	0.60	0.02	0.02
7.00	0.63	0.02	0.02
7.25	0.67	0.03	0.03
7.50	0.70	0.04	0.03
7.75	0.73	0.04	0.03
8.00	0.77	0.05	0.04
8.25	0.81	0.06	0.04
8.50	0.85	0.08	0.05
8.75	0.89	0.09	0.06
9.00	0.94	0.11	0.07
9.25	0.99	0.13	0.08
9.50	1.04	0.15	0.08
9.75	1.10	0.17	0.09
10.00	1.16	0.20	0.11
10.25	1.23	0.23	0.13
10.50	1.31	0.27	0.16
10.75	1.40	0.32	0.20
11.00	1.50	0.38	0.24
11.25	1.64	0.46	0.33
11.50	1.81	0.57	0.44
11.75	2.48	1.04	**2.21**
12.00	4.24	2.50	**6.81**
12.25	4.52	2.74	0.94
12.50	4.70	2.91	0.61
12.75	4.83	3.02	0.45
13.00	4.94	3.12	0.37
13.25	5.03	3.20	0.32
13.50	5.11	3.28	0.28
13.75	5.18	3.34	0.25
14.00	5.25	3.40	0.22
14.25	5.31	3.45	0.21
14.50	5.36	3.50	0.20
14.75	5.41	3.55	0.19
15.00	5.46	3.60	0.18
15.25	5.51	3.64	0.17
15.50	5.55	3.68	0.16
15.75	5.59	3.72	0.15
16.00	5.63	3.75	0.14
16.25	5.67	3.78	0.13
16.50	5.70	3.82	0.13
16.75	5.74	3.85	0.12
17.00	5.77	3.88	0.12
17.25	5.80	3.91	0.12
17.50	5.83	3.94	0.11
17.75	5.87	3.97	0.11
18.00	5.89	3.99	0.11
18.25	5.92	4.02	0.10
18.50	5.95	4.04	0.10
18.75	5.98	4.07	0.10
19.00	6.00	4.09	0.09
19.25	6.03	4.12	0.09
19.50	6.05	4.14	0.08
19.75	6.07	4.16	0.08
20.00	6.09	4.18	0.08
20.25	6.11	4.20	0.08
20.50	6.13	4.22	0.08
20.75	6.15	4.23	0.07
21.00	6.17	4.25	0.07
21.25	6.19	4.27	0.07
21.50	6.21	4.29	0.07
21.75	6.23	4.31	0.07
22.00	6.25	4.33	0.07
22.25	6.27	4.34	0.07
22.50	6.29	4.36	0.07
22.75	6.31	4.38	0.07
23.00	6.33	4.40	0.07
23.25	6.35	4.41	0.07
23.50	6.36	4.43	0.07
23.75	6.38	4.45	0.07
24.00	**6.40**	**4.46**	0.07

Summary for Subcatchment 8S: EXISTING RUNOFF

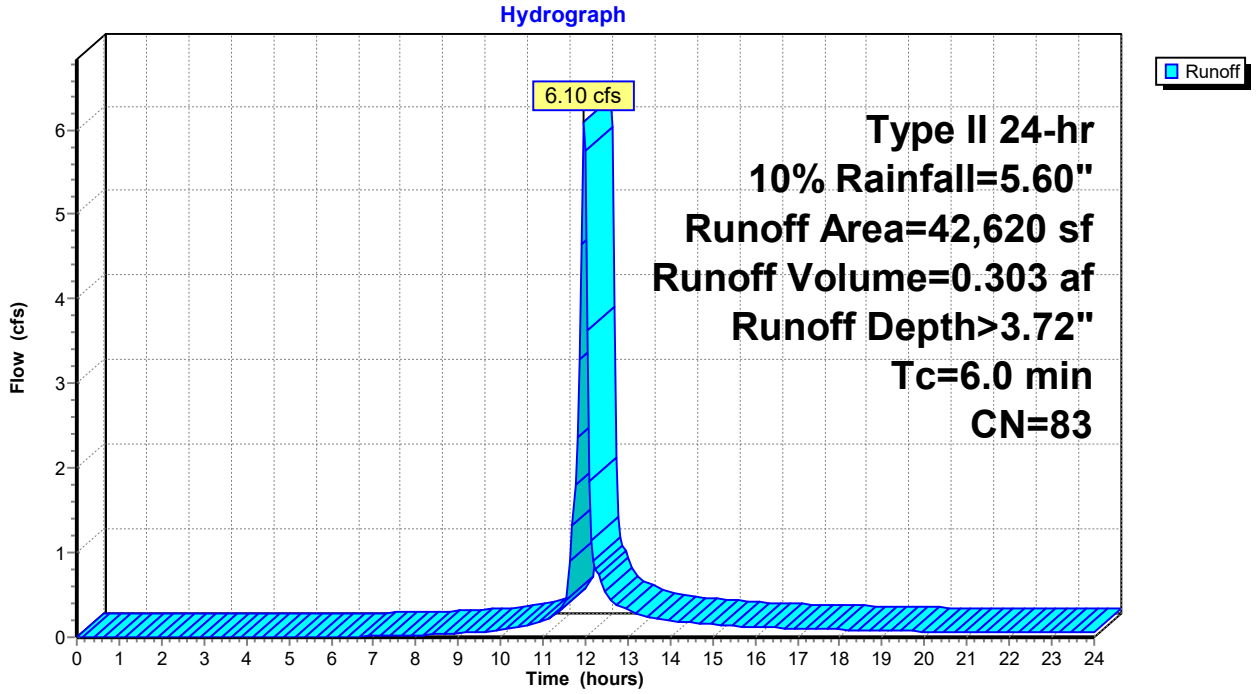
Runoff = 6.10 cfs @ 11.97 hrs, Volume= 0.303 af, Depth> 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10% Rainfall=5.60"

	Area (sf)	CN	Description
*	42,620	83	
	42,620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 8S: EXISTING RUNOFF



Hydrograph for Subcatchment 8S: EXISTING RUNOFF

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.03	0.00	0.00
0.75	0.04	0.00	0.00
1.00	0.06	0.00	0.00
1.25	0.07	0.00	0.00
1.50	0.09	0.00	0.00
1.75	0.11	0.00	0.00
2.00	0.12	0.00	0.00
2.25	0.14	0.00	0.00
2.50	0.16	0.00	0.00
2.75	0.18	0.00	0.00
3.00	0.19	0.00	0.00
3.25	0.21	0.00	0.00
3.50	0.23	0.00	0.00
3.75	0.25	0.00	0.00
4.00	0.27	0.00	0.00
4.25	0.29	0.00	0.00
4.50	0.31	0.00	0.00
4.75	0.33	0.00	0.00
5.00	0.35	0.00	0.00
5.25	0.38	0.00	0.00
5.50	0.40	0.00	0.00
5.75	0.42	0.00	0.00
6.00	0.45	0.00	0.00
6.25	0.47	0.00	0.01
6.50	0.50	0.00	0.01
6.75	0.53	0.01	0.01
7.00	0.55	0.01	0.01
7.25	0.58	0.01	0.02
7.50	0.61	0.02	0.02
7.75	0.64	0.02	0.02
8.00	0.67	0.03	0.02
8.25	0.70	0.04	0.03
8.50	0.74	0.05	0.04
8.75	0.78	0.06	0.04
9.00	0.82	0.07	0.05
9.25	0.87	0.08	0.06
9.50	0.91	0.10	0.06
9.75	0.96	0.12	0.07
10.00	1.01	0.14	0.08
10.25	1.07	0.16	0.10
10.50	1.14	0.19	0.12
10.75	1.22	0.23	0.15
11.00	1.32	0.28	0.19
11.25	1.43	0.34	0.26
11.50	1.58	0.43	0.36
11.75	2.17	0.81	**1.81**
12.00	3.71	2.04	**5.75**
12.25	3.95	2.25	0.80
12.50	4.12	2.39	0.52
12.75	4.23	2.49	0.38
13.00	4.32	2.57	0.32
13.25	4.40	2.64	0.28
13.50	4.47	2.70	0.24
13.75	4.54	2.76	0.22
14.00	4.59	2.81	0.19
14.25	4.64	2.85	0.18
14.50	4.69	2.90	0.17
14.75	4.74	2.94	0.16
15.00	4.78	2.98	0.15
15.25	4.82	3.01	0.14
15.50	4.86	3.05	0.14
15.75	4.89	3.08	0.13
16.00	4.93	3.11	0.12
16.25	4.96	3.14	0.11
16.50	4.99	3.17	0.11
16.75	5.02	3.19	0.11
17.00	5.05	3.22	0.10
17.25	5.08	3.24	0.10
17.50	5.11	3.27	0.10
17.75	5.13	3.29	0.09
18.00	5.16	3.32	0.09
18.25	5.18	3.34	0.09
18.50	5.21	3.36	0.09
18.75	5.23	3.38	0.08
19.00	5.25	3.40	0.08
19.25	5.27	3.42	0.08
19.50	5.29	3.44	0.07
19.75	5.31	3.46	0.07
20.00	5.33	3.48	0.07
20.25	5.35	3.49	0.07
20.50	5.37	3.51	0.06
20.75	5.39	3.52	0.06
21.00	5.40	3.54	0.06
21.25	5.42	3.56	0.06
21.50	5.44	3.57	0.06
21.75	5.45	3.59	0.06
22.00	5.47	3.60	0.06
22.25	5.49	3.62	0.06
22.50	5.50	3.63	0.06
22.75	5.52	3.65	0.06
23.00	5.54	3.66	0.06
23.25	5.55	3.68	0.06
23.50	5.57	3.69	0.06
23.75	5.58	3.71	0.06
24.00	**5.60**	**3.72**	0.06

Summary for Subcatchment 8S: EXISTING RUNOFF

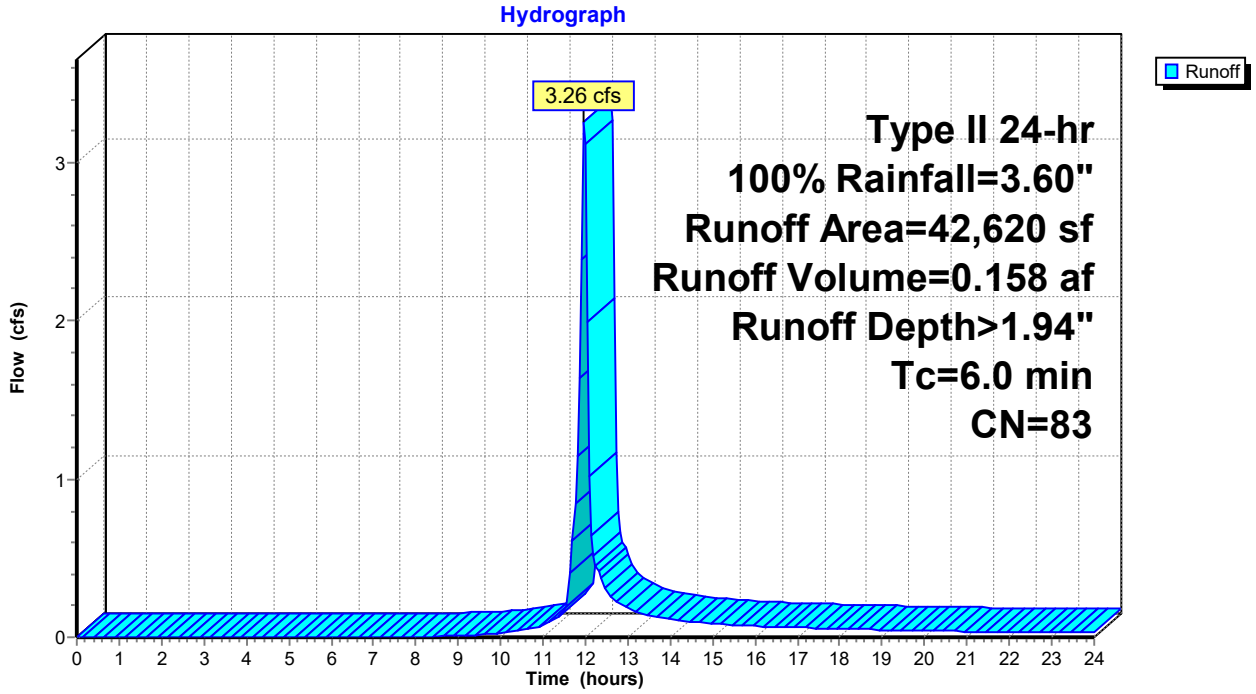
Runoff = 3.26 cfs @ 11.97 hrs, Volume= 0.158 af, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100% Rainfall=3.60"

	Area (sf)	CN	Description
*	42,620	83	
	42,620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 8S: EXISTING RUNOFF



Hydrograph for Subcatchment 8S: EXISTING RUNOFF

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.03	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.05	0.00	0.00
1.50	0.06	0.00	0.00
1.75	0.07	0.00	0.00
2.00	0.08	0.00	0.00
2.25	0.09	0.00	0.00
2.50	0.10	0.00	0.00
2.75	0.11	0.00	0.00
3.00	0.12	0.00	0.00
3.25	0.14	0.00	0.00
3.50	0.15	0.00	0.00
3.75	0.16	0.00	0.00
4.00	0.17	0.00	0.00
4.25	0.19	0.00	0.00
4.50	0.20	0.00	0.00
4.75	0.21	0.00	0.00
5.00	0.23	0.00	0.00
5.25	0.24	0.00	0.00
5.50	0.26	0.00	0.00
5.75	0.27	0.00	0.00
6.00	0.29	0.00	0.00
6.25	0.30	0.00	0.00
6.50	0.32	0.00	0.00
6.75	0.34	0.00	0.00
7.00	0.36	0.00	0.00
7.25	0.37	0.00	0.00
7.50	0.39	0.00	0.00
7.75	0.41	0.00	0.00
8.00	0.43	0.00	0.00
8.25	0.45	0.00	0.00
8.50	0.48	0.00	0.01
8.75	0.50	0.00	0.01
9.00	0.53	0.01	0.01
9.25	0.56	0.01	0.01
9.50	0.59	0.01	0.02
9.75	0.62	0.02	0.02
10.00	0.65	0.03	0.03
10.25	0.69	0.03	0.03
10.50	0.73	0.04	0.04
10.75	0.79	0.06	0.06
11.00	0.85	0.08	0.07
11.25	0.92	0.10	0.11
11.50	1.02	0.14	0.15
11.75	1.39	0.32	**0.85**
12.00	2.39	0.97	**3.11**
12.25	2.54	1.09	0.45
12.50	2.65	1.17	0.29
12.75	2.72	1.22	0.22
13.00	2.78	1.27	0.18
13.25	2.83	1.31	0.16
13.50	2.88	1.35	0.14
13.75	2.92	1.38	0.12
14.00	2.95	1.41	0.11
14.25	2.98	1.43	0.10
14.50	3.02	1.46	0.10
14.75	3.04	1.48	0.09
15.00	3.07	1.51	0.09
15.25	3.10	1.53	0.08
15.50	3.12	1.55	0.08
15.75	3.15	1.57	0.07
16.00	3.17	1.58	0.07
16.25	3.19	1.60	0.07
16.50	3.21	1.62	0.06
16.75	3.23	1.63	0.06
17.00	3.25	1.65	0.06
17.25	3.26	1.66	0.06
17.50	3.28	1.68	0.06
17.75	3.30	1.69	0.06
18.00	3.32	1.70	0.05
18.25	3.33	1.72	0.05
18.50	3.35	1.73	0.05
18.75	3.36	1.74	0.05
19.00	3.38	1.75	0.05
19.25	3.39	1.77	0.04
19.50	3.40	1.78	0.04
19.75	3.42	1.79	0.04
20.00	3.43	1.80	0.04
20.25	3.44	1.81	0.04
20.50	3.45	1.82	0.04
20.75	3.46	1.83	0.04
21.00	3.47	1.84	0.04
21.25	3.48	1.85	0.04
21.50	3.50	1.85	0.04
21.75	3.51	1.86	0.04
22.00	3.52	1.87	0.04
22.25	3.53	1.88	0.04
22.50	3.54	1.89	0.04
22.75	3.55	1.90	0.03
23.00	3.56	1.91	0.03
23.25	3.57	1.92	0.03
23.50	3.58	1.93	0.03
23.75	3.59	1.93	0.03
24.00	**3.60**	**1.94**	0.03

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1%	Type II 24-hr		Default	24.00	1	8.00	2
2	10%	Type II 24-hr		Default	24.00	1	5.60	2
3	100%	Type II 24-hr		Default	24.00	1	3.60	2

Summary for Subcatchment 8S: proposed runoff

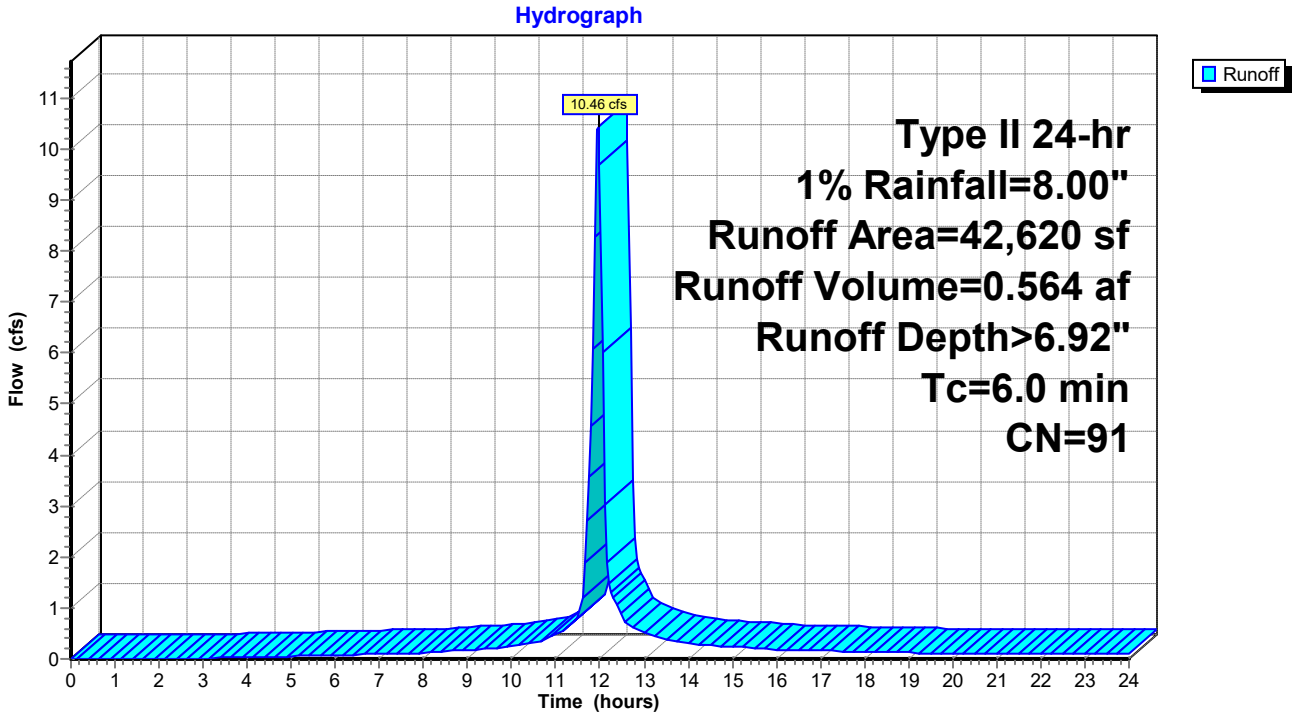
Runoff = 10.46 cfs @ 11.96 hrs, Volume= 0.564 af, Depth> 6.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1% Rainfall=8.00"

	Area (sf)	CN	Description
*	42,620	91	
	42,620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 8S: proposed runoff



Hydrograph for Subcatchment 8S: proposed runoff

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.02	0.00	0.00
0.50	0.04	0.00	0.00
0.75	0.06	0.00	0.00
1.00	0.08	0.00	0.00
1.25	0.11	0.00	0.00
1.50	0.13	0.00	0.00
1.75	0.15	0.00	0.00
2.00	0.18	0.00	0.00
2.25	0.20	0.00	0.00
2.50	0.23	0.00	0.00
2.75	0.25	0.00	0.01
3.00	0.28	0.01	0.01
3.25	0.30	0.01	0.02
3.50	0.33	0.02	0.02
3.75	0.36	0.02	0.03
4.00	0.38	0.03	0.03
4.25	0.41	0.04	0.04
4.50	0.44	0.05	0.04
4.75	0.47	0.06	0.05
5.00	0.50	0.07	0.05
5.25	0.54	0.09	0.06
5.50	0.57	0.10	0.06
5.75	0.60	0.12	0.07
6.00	0.64	0.14	0.07
6.25	0.68	0.16	0.08
6.50	0.71	0.18	0.08
6.75	0.75	0.20	0.09
7.00	0.79	0.22	0.09
7.25	0.83	0.25	0.10
7.50	0.87	0.27	0.11
7.75	0.92	0.30	0.11
8.00	0.96	0.33	0.12
8.25	1.01	0.36	0.13
8.50	1.06	0.40	0.15
8.75	1.11	0.44	0.16
9.00	1.18	0.49	0.18
9.25	1.24	0.53	0.19
9.50	1.30	0.58	0.19
9.75	1.37	0.64	0.21
10.00	1.45	0.70	0.24
10.25	1.53	0.77	0.28
10.50	1.63	0.85	0.33
10.75	1.75	0.94	0.39
11.00	1.88	1.06	0.46
11.25	2.05	1.21	0.60
11.50	2.26	1.40	0.78
11.75	3.10	2.16	**3.58**
12.00	5.30	4.28	**9.69**
12.25	5.65	4.61	1.30
12.50	5.88	4.84	0.83
12.75	6.04	5.00	0.61
13.00	6.18	5.13	0.51
13.25	6.29	5.24	0.44
13.50	6.39	5.34	0.38
13.75	6.48	5.43	0.34
14.00	6.56	5.51	0.30
14.25	6.63	5.58	0.28
14.50	6.70	5.64	0.26
14.75	6.77	5.71	0.25
15.00	6.83	5.77	0.24
15.25	6.89	5.83	0.22
15.50	6.94	5.88	0.21
15.75	6.99	5.93	0.20
16.00	7.04	5.98	0.18
16.25	7.09	6.02	0.18
16.50	7.13	6.07	0.17
16.75	7.17	6.11	0.17
17.00	7.21	6.15	0.16
17.25	7.25	6.19	0.16
17.50	7.29	6.23	0.15
17.75	7.33	6.26	0.15
18.00	7.37	6.30	0.14
18.25	7.40	6.34	0.14
18.50	7.44	6.37	0.13
18.75	7.47	6.40	0.13
19.00	7.50	6.43	0.12
19.25	7.53	6.46	0.12
19.50	7.56	6.49	0.11
19.75	7.59	6.52	0.11
20.00	7.62	6.55	0.10
20.25	7.64	6.57	0.10
20.50	7.67	6.60	0.10
20.75	7.69	6.62	0.10
21.00	7.72	6.65	0.10
21.25	7.74	6.67	0.10
21.50	7.77	6.69	0.10
21.75	7.79	6.72	0.09
22.00	7.82	6.74	0.09
22.25	7.84	6.77	0.09
22.50	7.86	6.79	0.09
22.75	7.89	6.81	0.09
23.00	7.91	6.84	0.09
23.25	7.93	6.86	0.09
23.50	7.96	6.88	0.09
23.75	7.98	6.90	0.09
24.00	**8.00**	**6.92**	0.09

Summary for Subcatchment 8S: proposed runoff

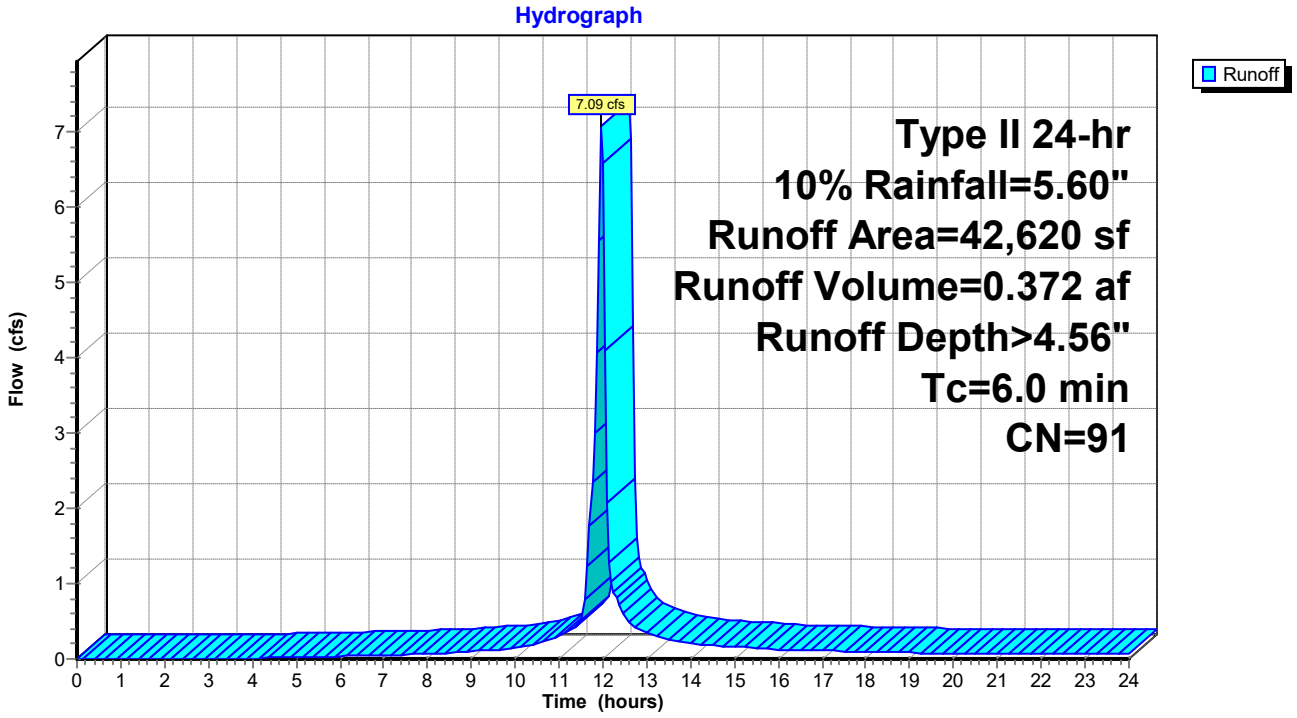
Runoff = 7.09 cfs @ 11.96 hrs, Volume= 0.372 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10% Rainfall=5.60"

	Area (sf)	CN	Description
*	42,620	91	
	42,620		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 8S: proposed runoff



Hydrograph for Subcatchment 8S: proposed runoff

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.03	0.00	0.00
0.75	0.04	0.00	0.00
1.00	0.06	0.00	0.00
1.25	0.07	0.00	0.00
1.50	0.09	0.00	0.00
1.75	0.11	0.00	0.00
2.00	0.12	0.00	0.00
2.25	0.14	0.00	0.00
2.50	0.16	0.00	0.00
2.75	0.18	0.00	0.00
3.00	0.19	0.00	0.00
3.25	0.21	0.00	0.00
3.50	0.23	0.00	0.00
3.75	0.25	0.00	0.01
4.00	0.27	0.00	0.01
4.25	0.29	0.01	0.01
4.50	0.31	0.01	0.01
4.75	0.33	0.02	0.02
5.00	0.35	0.02	0.02
5.25	0.38	0.03	0.02
5.50	0.40	0.03	0.03
5.75	0.42	0.04	0.03
6.00	0.45	0.05	0.03
6.25	0.47	0.06	0.04
6.50	0.50	0.07	0.04
6.75	0.53	0.08	0.05
7.00	0.55	0.09	0.05
7.25	0.58	0.11	0.05
7.50	0.61	0.12	0.06
7.75	0.64	0.14	0.06
8.00	0.67	0.15	0.06
8.25	0.70	0.17	0.07
8.50	0.74	0.19	0.08
8.75	0.78	0.22	0.09
9.00	0.82	0.24	0.11
9.25	0.87	0.27	0.11
9.50	0.91	0.30	0.12
9.75	0.96	0.33	0.13
10.00	1.01	0.37	0.15
10.25	1.07	0.41	0.17
10.50	1.14	0.46	0.20
10.75	1.22	0.52	0.24
11.00	1.32	0.59	0.29
11.25	1.43	0.69	0.38
11.50	1.58	0.81	0.50
11.75	2.17	1.31	**2.35**
12.00	3.71	2.74	**6.59**
12.25	3.95	2.97	0.89
12.50	4.12	3.13	0.57
12.75	4.23	3.24	0.42
13.00	4.32	3.33	0.35
13.25	4.40	3.41	0.30
13.50	4.47	3.47	0.26
13.75	4.54	3.53	0.23
14.00	4.59	3.59	0.21
14.25	4.64	3.64	0.19
14.50	4.69	3.68	0.18
14.75	4.74	3.73	0.17
15.00	4.78	3.77	0.16
15.25	4.82	3.81	0.15
15.50	4.86	3.85	0.15
15.75	4.89	3.88	0.14
16.00	4.93	3.91	0.13
16.25	4.96	3.94	0.12
16.50	4.99	3.97	0.12
16.75	5.02	4.00	0.11
17.00	5.05	4.03	0.11
17.25	5.08	4.06	0.11
17.50	5.11	4.08	0.10
17.75	5.13	4.11	0.10
18.00	5.16	4.14	0.10
18.25	5.18	4.16	0.09
18.50	5.21	4.18	0.09
18.75	5.23	4.20	0.09
19.00	5.25	4.23	0.08
19.25	5.27	4.25	0.08
19.50	5.29	4.27	0.08
19.75	5.31	4.29	0.07
20.00	5.33	4.30	0.07
20.25	5.35	4.32	0.07
20.50	5.37	4.34	0.07
20.75	5.39	4.36	0.07
21.00	5.40	4.37	0.07
21.25	5.42	4.39	0.07
21.50	5.44	4.41	0.07
21.75	5.45	4.42	0.07
22.00	5.47	4.44	0.06
22.25	5.49	4.46	0.06
22.50	5.50	4.47	0.06
22.75	5.52	4.49	0.06
23.00	5.54	4.50	0.06
23.25	5.55	4.52	0.06
23.50	5.57	4.54	0.06
23.75	5.58	4.55	0.06
24.00	**5.60**	**4.57**	0.06

Summary for Subcatchment 8S: proposed runoff

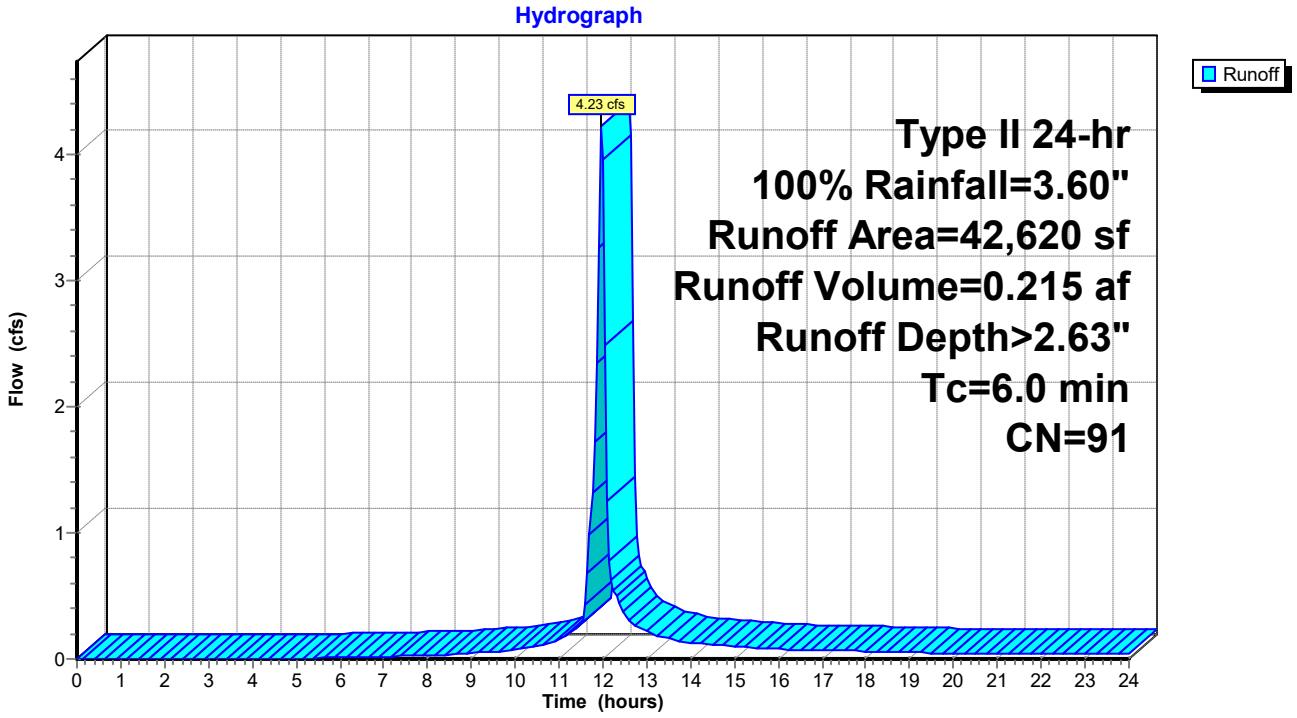
Runoff = 4.23 cfs @ 11.97 hrs, Volume= 0.215 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100% Rainfall=3.60"

	Area (sf)	CN	Description
*	42,620	91	
	42,620		100.00% Pervious Area

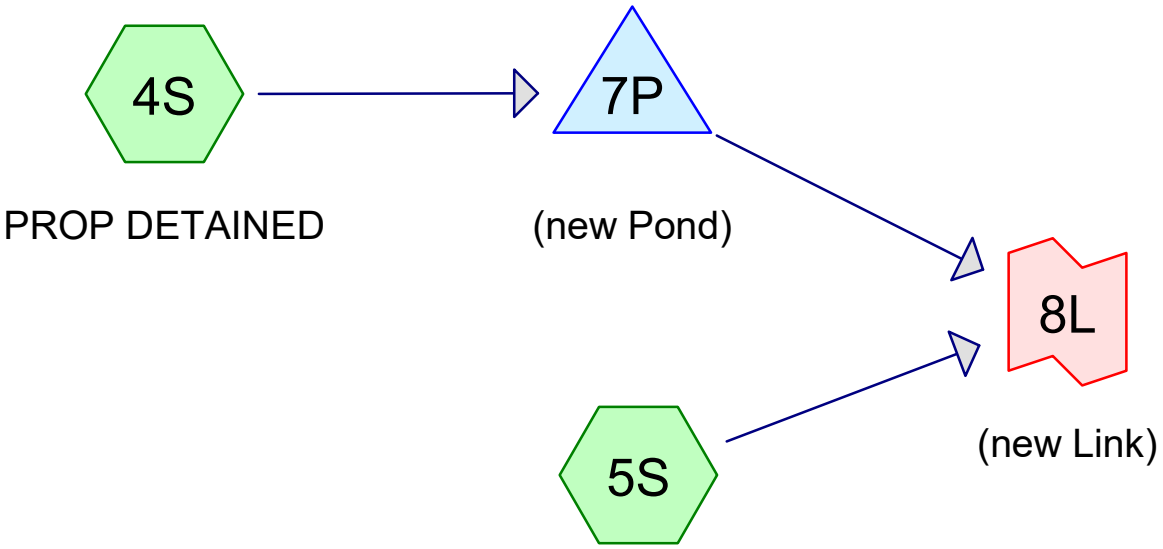
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 8S: proposed runoff



Hydrograph for Subcatchment 8S: proposed runoff

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.03	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.05	0.00	0.00
1.50	0.06	0.00	0.00
1.75	0.07	0.00	0.00
2.00	0.08	0.00	0.00
2.25	0.09	0.00	0.00
2.50	0.10	0.00	0.00
2.75	0.11	0.00	0.00
3.00	0.12	0.00	0.00
3.25	0.14	0.00	0.00
3.50	0.15	0.00	0.00
3.75	0.16	0.00	0.00
4.00	0.17	0.00	0.00
4.25	0.19	0.00	0.00
4.50	0.20	0.00	0.00
4.75	0.21	0.00	0.00
5.00	0.23	0.00	0.00
5.25	0.24	0.00	0.00
5.50	0.26	0.00	0.01
5.75	0.27	0.01	0.01
6.00	0.29	0.01	0.01
6.25	0.30	0.01	0.01
6.50	0.32	0.01	0.01
6.75	0.34	0.02	0.02
7.00	0.36	0.02	0.02
7.25	0.37	0.03	0.02
7.50	0.39	0.03	0.02
7.75	0.41	0.04	0.02
8.00	0.43	0.04	0.03
8.25	0.45	0.05	0.03
8.50	0.48	0.06	0.04
8.75	0.50	0.07	0.04
9.00	0.53	0.08	0.05
9.25	0.56	0.10	0.05
9.50	0.59	0.11	0.05
9.75	0.62	0.12	0.06
10.00	0.65	0.14	0.07
10.25	0.69	0.16	0.08
10.50	0.73	0.19	0.10
10.75	0.79	0.22	0.12
11.00	0.85	0.26	0.15
11.25	0.92	0.31	0.20
11.50	1.02	0.37	0.27
11.75	1.39	0.65	**1.32**
12.00	2.39	1.51	**3.96**
12.25	2.54	1.65	0.54
12.50	2.65	1.74	0.35
12.75	2.72	1.81	0.26
13.00	2.78	1.87	0.22
13.25	2.83	1.91	0.19
13.50	2.88	1.96	0.16
13.75	2.92	1.99	0.14
14.00	2.95	2.03	0.13
14.25	2.98	2.06	0.12
14.50	3.02	2.09	0.11
14.75	3.04	2.11	0.11
15.00	3.07	2.14	0.10
15.25	3.10	2.16	0.10
15.50	3.12	2.19	0.09
15.75	3.15	2.21	0.08
16.00	3.17	2.23	0.08
16.25	3.19	2.25	0.08
16.50	3.21	2.27	0.07
16.75	3.23	2.28	0.07
17.00	3.25	2.30	0.07
17.25	3.26	2.32	0.07
17.50	3.28	2.34	0.07
17.75	3.30	2.35	0.06
18.00	3.32	2.37	0.06
18.25	3.33	2.38	0.06
18.50	3.35	2.40	0.06
18.75	3.36	2.41	0.05
19.00	3.38	2.42	0.05
19.25	3.39	2.44	0.05
19.50	3.40	2.45	0.05
19.75	3.42	2.46	0.05
20.00	3.43	2.47	0.04
20.25	3.44	2.48	0.04
20.50	3.45	2.49	0.04
20.75	3.46	2.50	0.04
21.00	3.47	2.52	0.04
21.25	3.48	2.53	0.04
21.50	3.50	2.54	0.04
21.75	3.51	2.55	0.04
22.00	3.52	2.56	0.04
22.25	3.53	2.57	0.04
22.50	3.54	2.58	0.04
22.75	3.55	2.59	0.04
23.00	3.56	2.60	0.04
23.25	3.57	2.61	0.04
23.50	3.58	2.62	0.04
23.75	3.59	2.63	0.04
24.00	**3.60**	**2.64**	0.04



Subcat Reach Pond Link

Routing Diagram for KOENIG 55TH TERR AND NALL 021323 NEW
Prepared by Robert C Wessel Consulting Eng, Printed 2/13/2023
HydroCAD® 10.20-2f s/n 09646 © 2022 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1%	Type II 24-hr		Default	24.00	1	8.00	2
2	10%	Type II 24-hr		Default	24.00	1	5.60	2
3	100%	Type II 24-hr		Default	24.00	1	3.60	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.887	94	(4S)
0.151	80	(5S)
1.038	**92**	**TOTAL AREA**

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	7P	944.10	943.30	100.0	0.0080	0.012	0.0	12.0	0.0

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment 4S: PROP DETAINED Runoff Area=0.887 ac 0.00% Impervious Runoff Depth>7.28"
Tc=6.0 min CN=94 Runoff=9.69 cfs 0.538 af

Subcatchment 5S: PROP UNDETAINED Runoff Area=6,574 sf 0.00% Impervious Runoff Depth>5.62"
Tc=6.0 min CN=80 Runoff=1.41 cfs 0.071 af

Pond 7P: (new Pond) Peak Elev=947.45' Storage=8,053 cf Inflow=9.69 cfs 0.538 af
12.0" Round Culvert n=0.012 L=100.0' S=0.0080 '/' Outflow=5.47 cfs 0.444 af

Link 8L: (new Link) Inflow=6.56 cfs 0.514 af
Primary=6.56 cfs 0.514 af

Total Runoff Area = 1.038 ac Runoff Volume = 0.608 af Average Runoff Depth = 7.04"
100.00% Pervious = 1.038 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 4S: PROP DETAINED

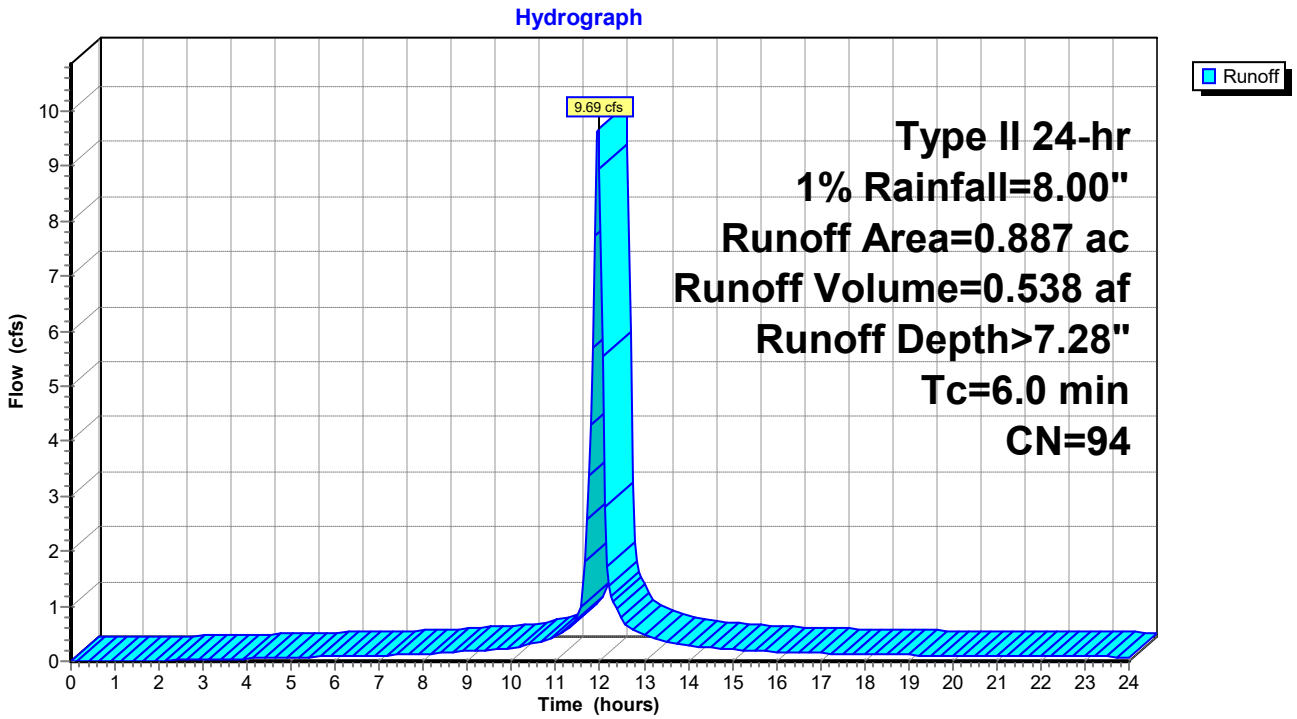
Runoff = 9.69 cfs @ 11.96 hrs, Volume= 0.538 af, Depth> 7.28"
Routed to Pond 7P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1% Rainfall=8.00"

	Area (ac)	CN	Description
*	0.887	94	
	0.887		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 4S: PROP DETAINED



Hydrograph for Subcatchment 4S: PROP DETAINED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.02	0.00	0.00
0.50	0.04	0.00	0.00
0.75	0.06	0.00	0.00
1.00	0.08	0.00	0.00
1.25	0.11	0.00	0.00
1.50	0.13	0.00	0.00
1.75	0.15	0.00	0.00
2.00	0.18	0.00	0.01
2.25	0.20	0.01	0.02
2.50	0.23	0.01	0.02
2.75	0.25	0.02	0.03
3.00	0.28	0.03	0.03
3.25	0.30	0.04	0.03
3.50	0.33	0.05	0.04
3.75	0.36	0.06	0.04
4.00	0.38	0.07	0.05
4.25	0.41	0.09	0.05
4.50	0.44	0.10	0.06
4.75	0.47	0.12	0.06
5.00	0.50	0.14	0.07
5.25	0.54	0.16	0.07
5.50	0.57	0.18	0.08
5.75	0.60	0.20	0.08
6.00	0.64	0.23	0.09
6.25	0.68	0.25	0.09
6.50	0.71	0.28	0.10
6.75	0.75	0.31	0.10
7.00	0.79	0.34	0.11
7.25	0.83	0.37	0.11
7.50	0.87	0.40	0.12
7.75	0.92	0.44	0.12
8.00	0.96	0.47	0.13
8.25	1.01	0.51	0.14
8.50	1.06	0.55	0.15
8.75	1.11	0.60	0.17
9.00	1.18	0.65	0.19
9.25	1.24	0.71	0.20
9.50	1.30	0.76	0.20
9.75	1.37	0.82	0.22
10.00	1.45	0.89	0.25
10.25	1.53	0.97	0.28
10.50	1.63	1.06	0.32
10.75	1.75	1.16	0.38
11.00	1.88	1.28	0.45
11.25	2.05	1.44	0.58
11.50	2.26	1.64	0.75
11.75	3.10	2.44	**3.39**
12.00	5.30	4.61	**8.96**
12.25	5.65	4.95	1.19
12.50	5.88	5.18	0.77
12.75	6.04	5.34	0.56
13.00	6.18	5.47	0.47
13.25	6.29	5.58	0.40
13.50	6.39	5.69	0.35
13.75	6.48	5.77	0.31
14.00	6.56	5.85	0.28
14.25	6.63	5.92	0.25
14.50	6.70	5.99	0.24
14.75	6.77	6.06	0.23
15.00	6.83	6.12	0.22
15.25	6.89	6.18	0.21
15.50	6.94	6.23	0.19
15.75	6.99	6.28	0.18
16.00	7.04	6.33	0.17
16.25	7.09	6.37	0.16
16.50	7.13	6.42	0.16
16.75	7.17	6.46	0.15
17.00	7.21	6.50	0.15
17.25	7.25	6.54	0.14
17.50	7.29	6.58	0.14
17.75	7.33	6.62	0.13
18.00	7.37	6.65	0.13
18.25	7.40	6.69	0.13
18.50	7.44	6.72	0.12
18.75	7.47	6.76	0.12
19.00	7.50	6.79	0.11
19.25	7.53	6.82	0.11
19.50	7.56	6.85	0.10
19.75	7.59	6.87	0.10
20.00	7.62	6.90	0.09
20.25	7.64	6.93	0.09
20.50	7.67	6.95	0.09
20.75	7.69	6.98	0.09
21.00	7.72	7.00	0.09
21.25	7.74	7.03	0.09
21.50	7.77	7.05	0.09
21.75	7.79	7.07	0.09
22.00	7.82	7.10	0.09
22.25	7.84	7.12	0.08
22.50	7.86	7.15	0.08
22.75	7.89	7.17	0.08
23.00	7.91	7.19	0.08
23.25	7.93	7.22	0.08
23.50	7.96	7.24	0.08
23.75	7.98	7.26	0.08
24.00	**8.00**	**7.28**	0.08

Summary for Subcatchment 5S: PROP UNDETAINED

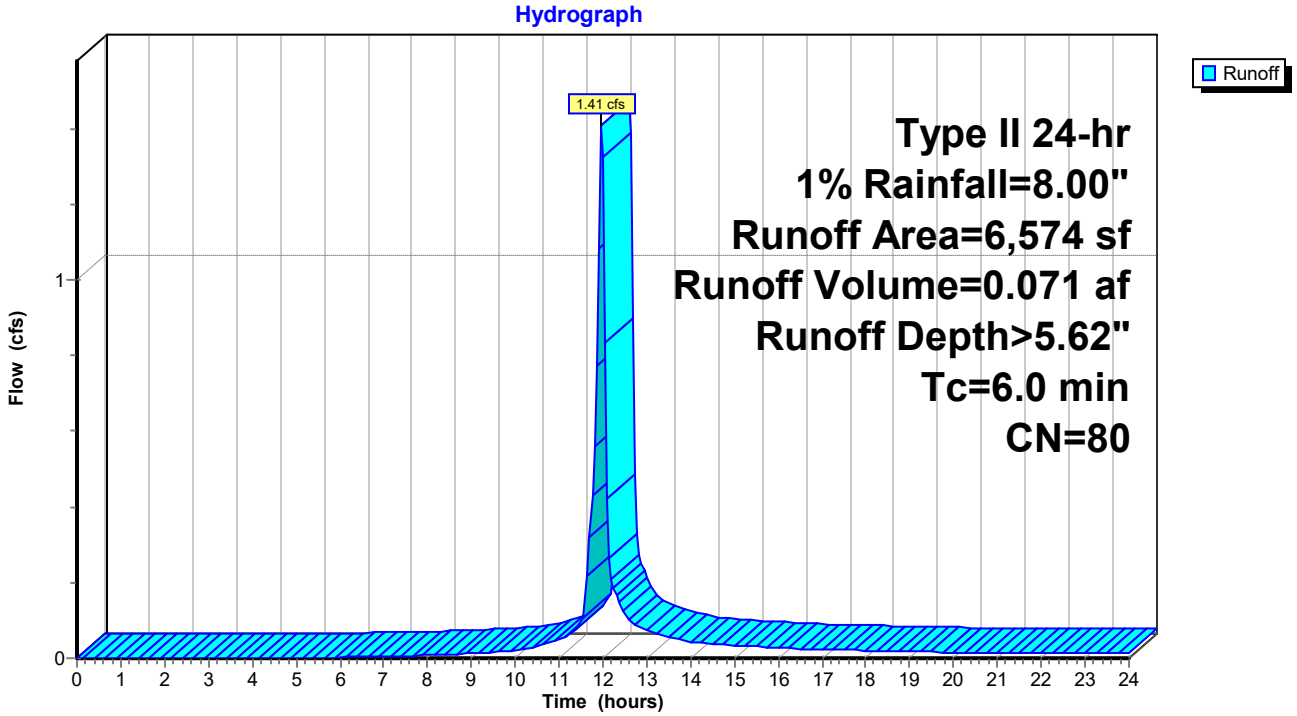
Runoff = 1.41 cfs @ 11.97 hrs, Volume= 0.071 af, Depth> 5.62"
Routed to Link 8L : (new Link)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 1% Rainfall=8.00"

	Area (sf)	CN	Description
*	6,574	80	
	6,574		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 5S: PROP UNDETAINED



Hydrograph for Subcatchment 5S: PROP UNDETAINED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	12.75	6.04	3.82	0.09
0.25	0.02	0.00	0.00	13.00	6.18	3.94	0.07
0.50	0.04	0.00	0.00	13.25	6.29	4.04	0.06
0.75	0.06	0.00	0.00	13.50	6.39	4.14	0.05
1.00	0.08	0.00	0.00	13.75	6.48	4.22	0.05
1.25	0.11	0.00	0.00	14.00	6.56	4.29	0.04
1.50	0.13	0.00	0.00	14.25	6.63	4.36	0.04
1.75	0.15	0.00	0.00	14.50	6.70	4.42	0.04
2.00	0.18	0.00	0.00	14.75	6.77	4.48	0.04
2.25	0.20	0.00	0.00	15.00	6.83	4.54	0.03
2.50	0.23	0.00	0.00	15.25	6.89	4.59	0.03
2.75	0.25	0.00	0.00	15.50	6.94	4.64	0.03
3.00	0.28	0.00	0.00	15.75	6.99	4.69	0.03
3.25	0.30	0.00	0.00	16.00	7.04	4.73	0.03
3.50	0.33	0.00	0.00	16.25	7.09	4.77	0.03
3.75	0.36	0.00	0.00	16.50	7.13	4.81	0.02
4.00	0.38	0.00	0.00	16.75	7.17	4.85	0.02
4.25	0.41	0.00	0.00	17.00	7.21	4.89	0.02
4.50	0.44	0.00	0.00	17.25	7.25	4.93	0.02
4.75	0.47	0.00	0.00	17.50	7.29	4.97	0.02
5.00	0.50	0.00	0.00	17.75	7.33	5.00	0.02
5.25	0.54	0.00	0.00	18.00	7.37	5.04	0.02
5.50	0.57	0.00	0.00	18.25	7.40	5.07	0.02
5.75	0.60	0.00	0.00	18.50	7.44	5.10	0.02
6.00	0.64	0.01	0.00	18.75	7.47	5.13	0.02
6.25	0.68	0.01	0.00	19.00	7.50	5.16	0.02
6.50	0.71	0.02	0.00	19.25	7.53	5.19	0.02
6.75	0.75	0.02	0.00	19.50	7.56	5.22	0.02
7.00	0.79	0.03	0.00	19.75	7.59	5.24	0.02
7.25	0.83	0.04	0.01	20.00	7.62	5.27	0.02
7.50	0.87	0.05	0.01	20.25	7.64	5.29	0.01
7.75	0.92	0.06	0.01	20.50	7.67	5.31	0.01
8.00	0.96	0.07	0.01	20.75	7.69	5.34	0.01
8.25	1.01	0.09	0.01	21.00	7.72	5.36	0.01
8.50	1.06	0.10	0.01	21.25	7.74	5.38	0.01
8.75	1.11	0.12	0.01	21.50	7.77	5.41	0.01
9.00	1.18	0.14	0.01	21.75	7.79	5.43	0.01
9.25	1.24	0.17	0.02	22.00	7.82	5.45	0.01
9.50	1.30	0.20	0.02	22.25	7.84	5.48	0.01
9.75	1.37	0.23	0.02	22.50	7.86	5.50	0.01
10.00	1.45	0.26	0.02	22.75	7.89	5.52	0.01
10.25	1.53	0.30	0.03	23.00	7.91	5.54	0.01
10.50	1.63	0.35	0.03	23.25	7.93	5.56	0.01
10.75	1.75	0.41	0.04	23.50	7.96	5.58	0.01
11.00	1.88	0.49	0.05	23.75	7.98	5.60	0.01
11.25	2.05	0.59	0.06	24.00	**8.00**	**5.63**	0.01
11.50	2.26	0.73	0.09				
11.75	3.10	1.32	**0.43**				
12.00	5.30	3.16	**1.32**				
12.25	5.65	3.47	0.18				
12.50	5.88	3.67	0.12				

Summary for Pond 7P: (new Pond)

Inflow Area = 0.887 ac, 0.00% Impervious, Inflow Depth > 7.28" for 1% event
Inflow = 9.69 cfs @ 11.96 hrs, Volume= 0.538 af
Outflow = 5.47 cfs @ 12.06 hrs, Volume= 0.444 af, Atten= 44%, Lag= 5.6 min
Primary = 5.47 cfs @ 12.06 hrs, Volume= 0.444 af
Routed to Link 8L : (new Link)

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 947.45' @ 12.06 hrs Storage= 8,053 cf

Plug-Flow detention time= 135.8 min calculated for 0.444 af (82% of inflow)
Center-of-Mass det. time= 62.0 min (819.0 - 757.0)

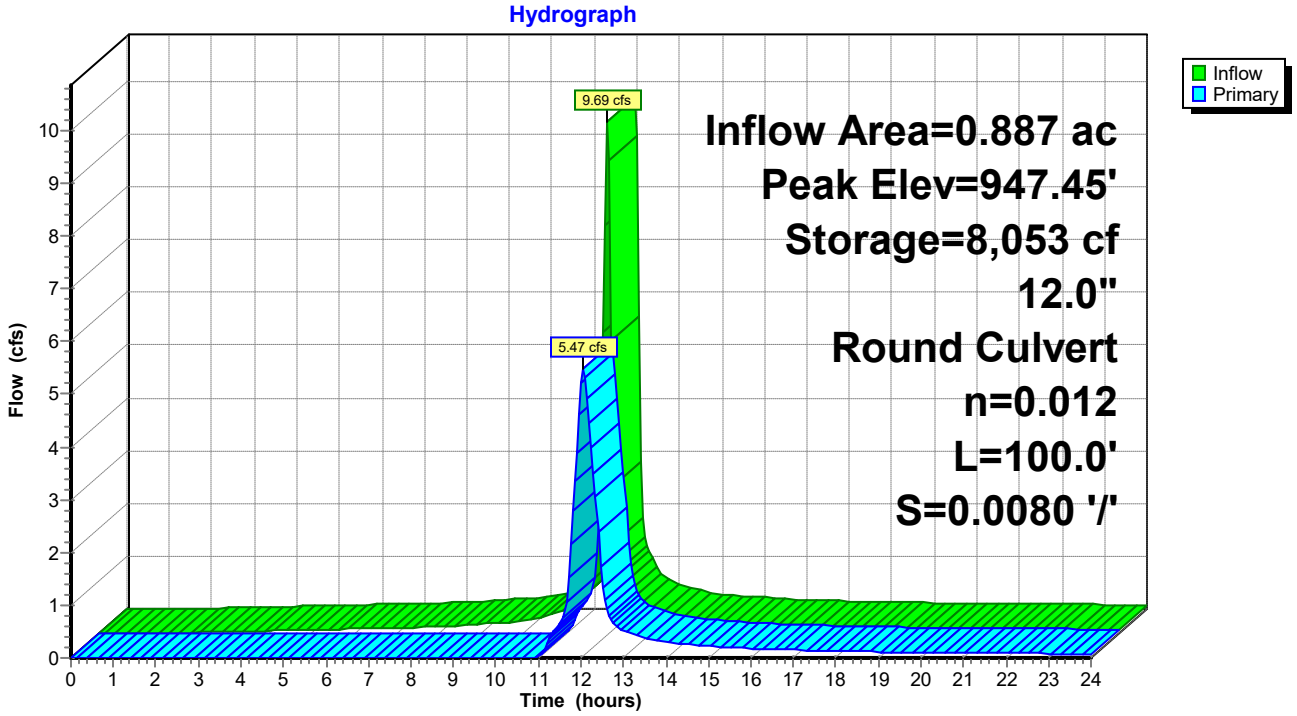
Volume	Invert	Avail.Storage	Storage Description
#1	939.15'	9,592 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
939.15	0	0
944.15	4,000	4,000
947.90	4,606	8,606
948.90	986	9,592

Device	Routing	Invert	Outlet Devices
#1	Primary	944.10'	**12.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 944.10' / 943.30' S= 0.0080 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=5.45 cfs @ 12.06 hrs HW=947.43' (Free Discharge)
1=Culvert (Barrel Controls 5.45 cfs @ 6.94 fps)

Pond 7P: (new Pond)



Hydrograph for Pond 7P: (new Pond)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	939.15	0.00
0.50	0.00	0	939.15	0.00
1.00	0.00	0	939.15	0.00
1.50	0.00	0	939.15	0.00
2.00	0.01	8	939.16	0.00
2.50	0.02	35	939.19	0.00
3.00	0.03	80	939.25	0.00
3.50	0.04	142	939.33	0.00
4.00	0.05	220	939.43	0.00
4.50	0.06	315	939.54	0.00
5.00	0.07	427	939.68	0.00
5.50	0.08	557	939.85	0.00
6.00	0.09	705	940.03	0.00
6.50	0.10	871	940.24	0.00
7.00	0.11	1,055	940.47	0.00
7.50	0.12	1,256	940.72	0.00
8.00	0.13	1,475	940.99	0.00
8.50	0.15	1,724	941.31	0.00
9.00	0.19	2,034	941.69	0.00
9.50	0.20	2,388	942.14	0.00
10.00	0.25	2,783	942.63	0.00
10.50	0.32	3,291	943.26	0.00
11.00	0.45	3,981	944.13	0.00
11.50	**0.75**	4,439	944.51	0.64
12.00	**8.96**	**7,706**	**947.17**	**5.22**
12.50	0.77	**4,698**	**944.72**	**1.34**
13.00	0.47	4,384	944.46	0.52
13.50	0.35	4,318	944.41	0.38
14.00	0.28	4,270	944.37	0.30
14.50	0.24	4,242	944.35	0.25
15.00	0.22	4,226	944.33	0.23
15.50	0.19	4,212	944.32	0.20
16.00	0.17	4,195	944.31	0.18
16.50	0.16	4,180	944.30	0.16
17.00	0.15	4,171	944.29	0.15
17.50	0.14	4,163	944.28	0.14
18.00	0.13	4,155	944.28	0.13
18.50	0.12	4,147	944.27	0.13
19.00	0.11	4,139	944.26	0.12
19.50	0.10	4,131	944.26	0.11
20.00	0.09	4,123	944.25	0.10
20.50	0.09	4,118	944.25	0.09
21.00	0.09	4,116	944.24	0.09
21.50	0.09	4,114	944.24	0.09
22.00	0.09	4,113	944.24	0.09
22.50	0.08	4,111	944.24	0.08
23.00	0.08	4,110	944.24	0.08
23.50	0.08	4,108	944.24	0.08
24.00	0.08	4,106	944.24	0.08

Stage-Discharge for Pond 7P: (new Pond)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
939.15	0.00	941.70	0.00	944.25	0.09	946.80	4.88
939.20	0.00	941.75	0.00	944.30	0.16	946.85	4.93
939.25	0.00	941.80	0.00	944.35	0.25	946.90	4.97
939.30	0.00	941.85	0.00	944.40	0.36	946.95	5.02
939.35	0.00	941.90	0.00	944.45	0.48	947.00	5.07
939.40	0.00	941.95	0.00	944.50	0.62	947.05	5.12
939.45	0.00	942.00	0.00	944.55	0.77	947.10	5.16
939.50	0.00	942.05	0.00	944.60	0.93	947.15	5.21
939.55	0.00	942.10	0.00	944.65	1.10	947.20	5.25
939.60	0.00	942.15	0.00	944.70	1.27	947.25	5.30
939.65	0.00	942.20	0.00	944.75	1.45	947.30	5.34
939.70	0.00	942.25	0.00	944.80	1.64	947.35	5.39
939.75	0.00	942.30	0.00	944.85	1.83	947.40	5.43
939.80	0.00	942.35	0.00	944.90	2.02	947.45	5.47
939.85	0.00	942.40	0.00	944.95	2.21	947.50	5.52
939.90	0.00	942.45	0.00	945.00	2.39	947.55	5.56
939.95	0.00	942.50	0.00	945.05	2.56	947.60	5.60
940.00	0.00	942.55	0.00	945.10	2.67	947.65	5.65
940.05	0.00	942.60	0.00	945.15	2.80	947.70	5.69
940.10	0.00	942.65	0.00	945.20	2.93	947.75	5.73
940.15	0.00	942.70	0.00	945.25	3.05	947.80	5.77
940.20	0.00	942.75	0.00	945.30	3.16	947.85	5.81
940.25	0.00	942.80	0.00	945.35	3.28	947.90	5.85
940.30	0.00	942.85	0.00	945.40	3.38	947.95	5.89
940.35	0.00	942.90	0.00	945.45	3.31	948.00	5.93
940.40	0.00	942.95	0.00	945.50	3.38	948.05	5.97
940.45	0.00	943.00	0.00	945.55	3.45	948.10	6.01
940.50	0.00	943.05	0.00	945.60	3.52	948.15	6.05
940.55	0.00	943.10	0.00	945.65	3.58	948.20	6.09
940.60	0.00	943.15	0.00	945.70	3.65	948.25	6.13
940.65	0.00	943.20	0.00	945.75	3.71	948.30	6.17
940.70	0.00	943.25	0.00	945.80	3.78	948.35	6.21
940.75	0.00	943.30	0.00	945.85	3.84	948.40	6.25
940.80	0.00	943.35	0.00	945.90	3.90	948.45	6.28
940.85	0.00	943.40	0.00	945.95	3.96	948.50	6.32
940.90	0.00	943.45	0.00	946.00	4.02	948.55	6.36
940.95	0.00	943.50	0.00	946.05	4.08	948.60	6.40
941.00	0.00	943.55	0.00	946.10	4.14	948.65	6.43
941.05	0.00	943.60	0.00	946.15	4.20	948.70	6.47
941.10	0.00	943.65	0.00	946.20	4.25	948.75	6.51
941.15	0.00	943.70	0.00	946.25	4.31	948.80	6.54
941.20	0.00	943.75	0.00	946.30	4.36	948.85	6.58
941.25	0.00	943.80	0.00	946.35	4.42	948.90	**6.62**
941.30	0.00	943.85	0.00	946.40	4.47		
941.35	0.00	943.90	0.00	946.45	4.52		
941.40	0.00	943.95	0.00	946.50	4.58		
941.45	0.00	944.00	0.00	946.55	4.63		
941.50	0.00	944.05	0.00	946.60	4.68		
941.55	0.00	944.10	0.00	946.65	4.73		
941.60	0.00	944.15	0.01	946.70	4.78		
941.65	0.00	944.20	0.04	946.75	4.83		

Stage-Area-Storage for Pond 7P: (new Pond)

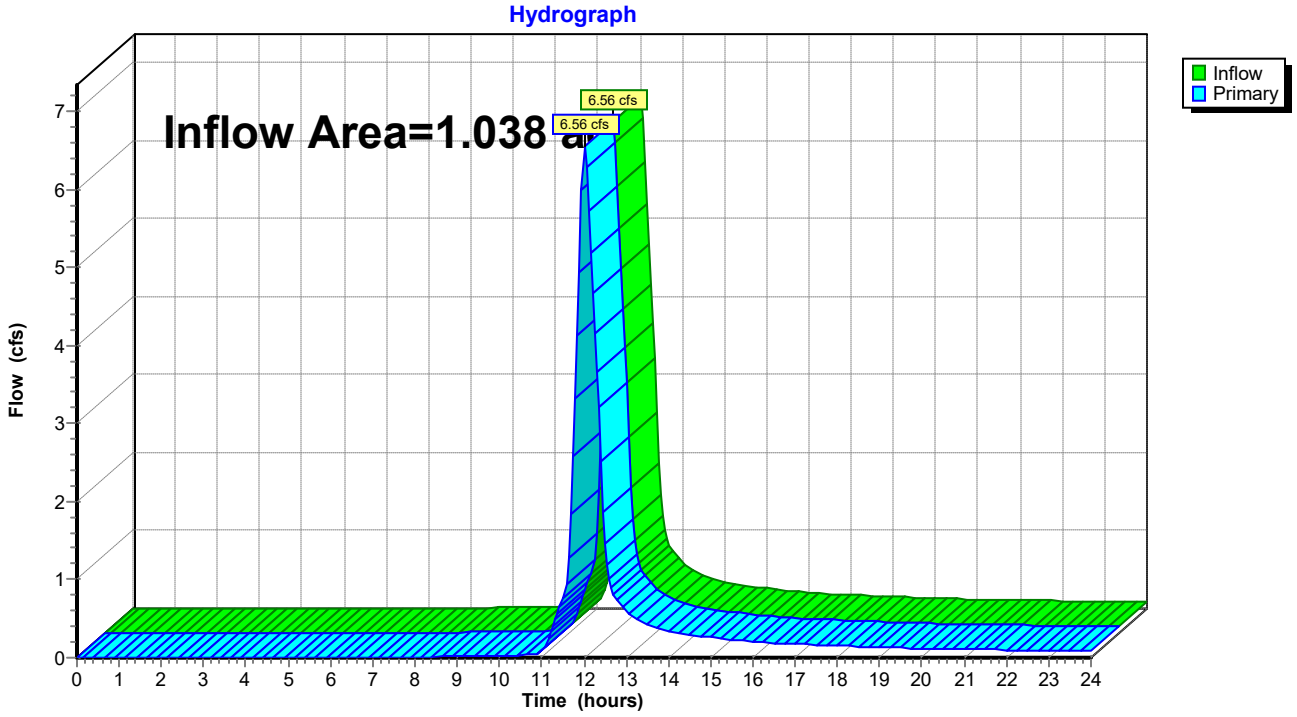
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
939.15	0	944.25	4,123
939.25	80	944.35	4,246
939.35	160	944.45	4,368
939.45	240	944.55	4,491
939.55	320	944.65	4,614
939.65	400	944.75	4,737
939.75	480	944.85	4,860
939.85	560	944.95	4,983
939.95	640	945.05	5,105
940.05	720	945.15	5,228
940.15	800	945.25	5,351
940.25	880	945.35	5,474
940.35	960	945.45	5,597
940.45	1,040	945.55	5,720
940.55	1,120	945.65	5,842
940.65	1,200	945.75	5,965
940.75	1,280	945.85	6,088
940.85	1,360	945.95	6,211
940.95	1,440	946.05	6,334
941.05	1,520	946.15	6,457
941.15	1,600	946.25	6,579
941.25	1,680	946.35	6,702
941.35	1,760	946.45	6,825
941.45	1,840	946.55	6,948
941.55	1,920	946.65	7,071
941.65	2,000	946.75	7,193
941.75	2,080	946.85	7,316
941.85	2,160	946.95	7,439
941.95	2,240	947.05	7,562
942.05	2,320	947.15	7,685
942.15	2,400	947.25	7,808
942.25	2,480	947.35	7,930
942.35	2,560	947.45	8,053
942.45	2,640	947.55	8,176
942.55	2,720	947.65	8,299
942.65	2,800	947.75	8,422
942.75	2,880	947.85	8,545
942.85	2,960	947.95	8,655
942.95	3,040	948.05	8,754
943.05	3,120	948.15	8,853
943.15	3,200	948.25	8,951
943.25	3,280	948.35	9,050
943.35	3,360	948.45	9,148
943.45	3,440	948.55	9,247
943.55	3,520	948.65	9,346
943.65	3,600	948.75	9,444
943.75	3,680	948.85	**9,543**
943.85	3,760		
943.95	3,840		
944.05	3,920		
944.15	4,000		

Summary for Link 8L: (new Link)

Inflow Area = 1.038 ac, 0.00% Impervious, Inflow Depth > 5.95" for 1% event
Inflow = 6.56 cfs @ 12.01 hrs, Volume= 0.514 af
Primary = 6.56 cfs @ 12.01 hrs, Volume= 0.514 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: (new Link)



Hydrograph for Link 8L: (new Link)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	12.75	0.75	0.00	0.75
0.25	0.00	0.00	0.00	13.00	0.59	0.00	0.59
0.50	0.00	0.00	0.00	13.25	0.50	0.00	0.50
0.75	0.00	0.00	0.00	13.50	0.44	0.00	0.44
1.00	0.00	0.00	0.00	13.75	0.39	0.00	0.39
1.25	0.00	0.00	0.00	14.00	0.34	0.00	0.34
1.50	0.00	0.00	0.00	14.25	0.31	0.00	0.31
1.75	0.00	0.00	0.00	14.50	0.29	0.00	0.29
2.00	0.00	0.00	0.00	14.75	0.27	0.00	0.27
2.25	0.00	0.00	0.00	15.00	0.26	0.00	0.26
2.50	0.00	0.00	0.00	15.25	0.25	0.00	0.25
2.75	0.00	0.00	0.00	15.50	0.23	0.00	0.23
3.00	0.00	0.00	0.00	15.75	0.22	0.00	0.22
3.25	0.00	0.00	0.00	16.00	0.21	0.00	0.21
3.50	0.00	0.00	0.00	16.25	0.19	0.00	0.19
3.75	0.00	0.00	0.00	16.50	0.19	0.00	0.19
4.00	0.00	0.00	0.00	16.75	0.18	0.00	0.18
4.25	0.00	0.00	0.00	17.00	0.18	0.00	0.18
4.50	0.00	0.00	0.00	17.25	0.17	0.00	0.17
4.75	0.00	0.00	0.00	17.50	0.16	0.00	0.16
5.00	0.00	0.00	0.00	17.75	0.16	0.00	0.16
5.25	0.00	0.00	0.00	18.00	0.15	0.00	0.15
5.50	0.00	0.00	0.00	18.25	0.15	0.00	0.15
5.75	0.00	0.00	0.00	18.50	0.14	0.00	0.14
6.00	0.00	0.00	0.00	18.75	0.14	0.00	0.14
6.25	0.00	0.00	0.00	19.00	0.13	0.00	0.13
6.50	0.00	0.00	0.00	19.25	0.13	0.00	0.13
6.75	0.00	0.00	0.00	19.50	0.12	0.00	0.12
7.00	0.00	0.00	0.00	19.75	0.12	0.00	0.12
7.25	0.01	0.00	0.01	20.00	0.11	0.00	0.11
7.50	0.01	0.00	0.01	20.25	0.11	0.00	0.11
7.75	0.01	0.00	0.01	20.50	0.11	0.00	0.11
8.00	0.01	0.00	0.01	20.75	0.11	0.00	0.11
8.25	0.01	0.00	0.01	21.00	0.10	0.00	0.10
8.50	0.01	0.00	0.01	21.25	0.10	0.00	0.10
8.75	0.01	0.00	0.01	21.50	0.10	0.00	0.10
9.00	0.01	0.00	0.01	21.75	0.10	0.00	0.10
9.25	0.02	0.00	0.02	22.00	0.10	0.00	0.10
9.50	0.02	0.00	0.02	22.25	0.10	0.00	0.10
9.75	0.02	0.00	0.02	22.50	0.10	0.00	0.10
10.00	0.02	0.00	0.02	22.75	0.10	0.00	0.10
10.25	0.03	0.00	0.03	23.00	0.10	0.00	0.10
10.50	0.03	0.00	0.03	23.25	0.10	0.00	0.10
10.75	0.04	0.00	0.04	23.50	0.09	0.00	0.09
11.00	0.05	0.00	0.05	23.75	0.09	0.00	0.09
11.25	0.41	0.00	0.41	24.00	0.09	0.00	0.09
11.50	0.73	0.00	0.73				
11.75	2.59	0.00	2.59				
12.00	**6.54**	0.00	**6.54**				
12.25	4.15	0.00	4.15				
12.50	1.46	0.00	1.46				

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment 4S: PROP DETAINED Runoff Area=0.887 ac 0.00% Impervious Runoff Depth>4.90"
Tc=6.0 min CN=94 Runoff=6.67 cfs 0.362 af

Subcatchment 5S: PROP UNDETAINED Runoff Area=6,574 sf 0.00% Impervious Runoff Depth>3.42"
Tc=6.0 min CN=80 Runoff=0.88 cfs 0.043 af

Pond 7P: (new Pond) Peak Elev=946.11' Storage=6,413 cf Inflow=6.67 cfs 0.362 af
12.0" Round Culvert n=0.012 L=100.0' S=0.0080 '/' Outflow=4.16 cfs 0.268 af

Link 8L: (new Link) Inflow=4.85 cfs 0.311 af
Primary=4.85 cfs 0.311 af

Total Runoff Area = 1.038 ac Runoff Volume = 0.405 af Average Runoff Depth = 4.68"
100.00% Pervious = 1.038 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 4S: PROP DETAINED

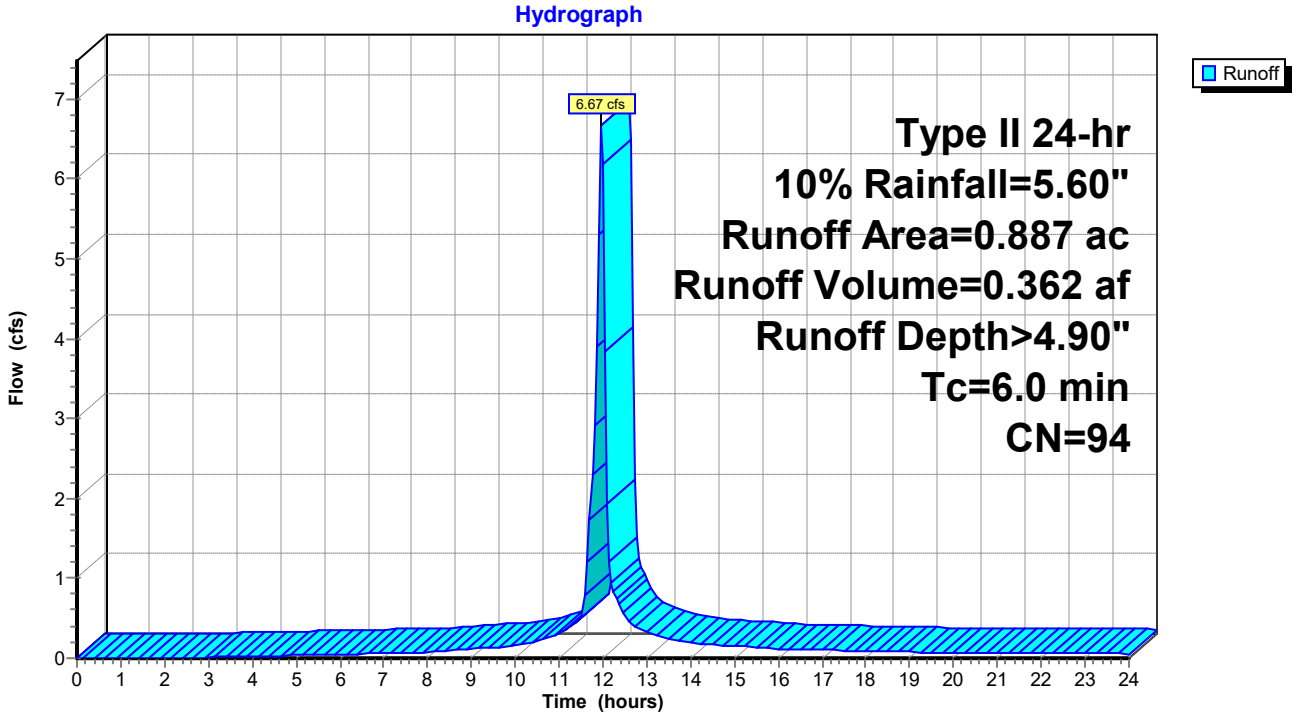
Runoff = 6.67 cfs @ 11.96 hrs, Volume= 0.362 af, Depth> 4.90"
Routed to Pond 7P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10% Rainfall=5.60"

	Area (ac)	CN	Description
*	0.887	94	
	0.887		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 4S: PROP DETAINED



Hydrograph for Subcatchment 4S: PROP DETAINED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.03	0.00	0.00
0.75	0.04	0.00	0.00
1.00	0.06	0.00	0.00
1.25	0.07	0.00	0.00
1.50	0.09	0.00	0.00
1.75	0.11	0.00	0.00
2.00	0.12	0.00	0.00
2.25	0.14	0.00	0.00
2.50	0.16	0.00	0.00
2.75	0.18	0.00	0.01
3.00	0.19	0.01	0.01
3.25	0.21	0.01	0.01
3.50	0.23	0.01	0.02
3.75	0.25	0.02	0.02
4.00	0.27	0.03	0.02
4.25	0.29	0.03	0.03
4.50	0.31	0.04	0.03
4.75	0.33	0.05	0.03
5.00	0.35	0.06	0.04
5.25	0.38	0.07	0.04
5.50	0.40	0.08	0.04
5.75	0.42	0.09	0.05
6.00	0.45	0.11	0.05
6.25	0.47	0.12	0.05
6.50	0.50	0.14	0.06
6.75	0.53	0.15	0.06
7.00	0.55	0.17	0.06
7.25	0.58	0.19	0.07
7.50	0.61	0.21	0.07
7.75	0.64	0.23	0.07
8.00	0.67	0.25	0.08
8.25	0.70	0.27	0.08
8.50	0.74	0.30	0.10
8.75	0.78	0.33	0.11
9.00	0.82	0.36	0.12
9.25	0.87	0.40	0.13
9.50	0.91	0.43	0.13
9.75	0.96	0.47	0.14
10.00	1.01	0.51	0.16
10.25	1.07	0.56	0.18
10.50	1.14	0.62	0.21
10.75	1.22	0.69	0.25
11.00	1.32	0.77	0.30
11.25	1.43	0.88	0.39
11.50	1.58	1.01	0.50
11.75	2.17	1.55	**2.29**
12.00	3.71	3.04	**6.18**
12.25	3.95	3.28	0.83
12.50	4.12	3.44	0.53
12.75	4.23	3.55	0.39
13.00	4.32	3.64	0.32
13.25	4.40	3.72	0.28
13.50	4.47	3.79	0.24
13.75	4.54	3.85	0.22
14.00	4.59	3.91	0.19
14.25	4.64	3.96	0.18
14.50	4.69	4.00	0.17
14.75	4.74	4.05	0.16
15.00	4.78	4.09	0.15
15.25	4.82	4.13	0.14
15.50	4.86	4.17	0.13
15.75	4.89	4.20	0.13
16.00	4.93	4.24	0.12
16.25	4.96	4.27	0.11
16.50	4.99	4.30	0.11
16.75	5.02	4.33	0.11
17.00	5.05	4.36	0.10
17.25	5.08	4.39	0.10
17.50	5.11	4.41	0.10
17.75	5.13	4.44	0.09
18.00	5.16	4.46	0.09
18.25	5.18	4.49	0.09
18.50	5.21	4.51	0.08
18.75	5.23	4.53	0.08
19.00	5.25	4.56	0.08
19.25	5.27	4.58	0.07
19.50	5.29	4.60	0.07
19.75	5.31	4.62	0.07
20.00	5.33	4.63	0.07
20.25	5.35	4.65	0.06
20.50	5.37	4.67	0.06
20.75	5.39	4.69	0.06
21.00	5.40	4.71	0.06
21.25	5.42	4.72	0.06
21.50	5.44	4.74	0.06
21.75	5.45	4.76	0.06
22.00	5.47	4.77	0.06
22.25	5.49	4.79	0.06
22.50	5.50	4.81	0.06
22.75	5.52	4.82	0.06
23.00	5.54	4.84	0.06
23.25	5.55	4.85	0.06
23.50	5.57	4.87	0.06
23.75	5.58	4.89	0.06
24.00	**5.60**	**4.90**	0.05

Summary for Subcatchment 5S: PROP UNDETAINED

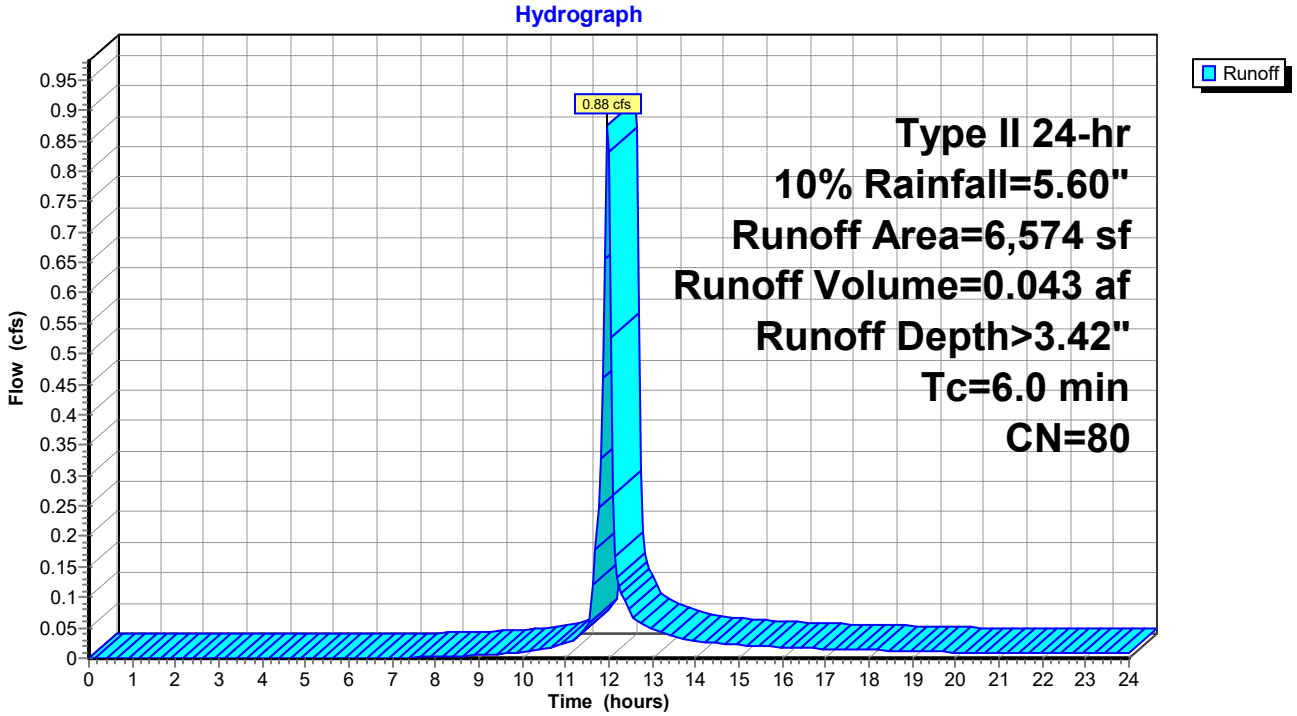
Runoff = 0.88 cfs @ 11.97 hrs, Volume= 0.043 af, Depth> 3.42"
Routed to Link 8L : (new Link)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 10% Rainfall=5.60"

	Area (sf)	CN	Description
*	6,574	80	
	6,574		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 5S: PROP UNDETAINED



Hydrograph for Subcatchment 5S: PROP UNDETAINED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	12.75	4.23	2.23	0.06
0.25	0.01	0.00	0.00	13.00	4.32	2.31	0.05
0.50	0.03	0.00	0.00	13.25	4.40	2.38	0.04
0.75	0.04	0.00	0.00	13.50	4.47	2.44	0.04
1.00	0.06	0.00	0.00	13.75	4.54	2.49	0.03
1.25	0.07	0.00	0.00	14.00	4.59	2.54	0.03
1.50	0.09	0.00	0.00	14.25	4.64	2.58	0.03
1.75	0.11	0.00	0.00	14.50	4.69	2.62	0.03
2.00	0.12	0.00	0.00	14.75	4.74	2.66	0.02
2.25	0.14	0.00	0.00	15.00	4.78	2.70	0.02
2.50	0.16	0.00	0.00	15.25	4.82	2.74	0.02
2.75	0.18	0.00	0.00	15.50	4.86	2.77	0.02
3.00	0.19	0.00	0.00	15.75	4.89	2.80	0.02
3.25	0.21	0.00	0.00	16.00	4.93	2.83	0.02
3.50	0.23	0.00	0.00	16.25	4.96	2.86	0.02
3.75	0.25	0.00	0.00	16.50	4.99	2.88	0.02
4.00	0.27	0.00	0.00	16.75	5.02	2.91	0.02
4.25	0.29	0.00	0.00	17.00	5.05	2.94	0.02
4.50	0.31	0.00	0.00	17.25	5.08	2.96	0.01
4.75	0.33	0.00	0.00	17.50	5.11	2.99	0.01
5.00	0.35	0.00	0.00	17.75	5.13	3.01	0.01
5.25	0.38	0.00	0.00	18.00	5.16	3.03	0.01
5.50	0.40	0.00	0.00	18.25	5.18	3.05	0.01
5.75	0.42	0.00	0.00	18.50	5.21	3.07	0.01
6.00	0.45	0.00	0.00	18.75	5.23	3.09	0.01
6.25	0.47	0.00	0.00	19.00	5.25	3.11	0.01
6.50	0.50	0.00	0.00	19.25	5.27	3.13	0.01
6.75	0.53	0.00	0.00	19.50	5.29	3.15	0.01
7.00	0.55	0.00	0.00	19.75	5.31	3.17	0.01
7.25	0.58	0.00	0.00	20.00	5.33	3.18	0.01
7.50	0.61	0.00	0.00	20.25	5.35	3.20	0.01
7.75	0.64	0.01	0.00	20.50	5.37	3.22	0.01
8.00	0.67	0.01	0.00	20.75	5.39	3.23	0.01
8.25	0.70	0.02	0.00	21.00	5.40	3.25	0.01
8.50	0.74	0.02	0.00	21.25	5.42	3.26	0.01
8.75	0.78	0.03	0.00	21.50	5.44	3.28	0.01
9.00	0.82	0.04	0.01	21.75	5.45	3.29	0.01
9.25	0.87	0.05	0.01	22.00	5.47	3.31	0.01
9.50	0.91	0.06	0.01	22.25	5.49	3.32	0.01
9.75	0.96	0.07	0.01	22.50	5.50	3.34	0.01
10.00	1.01	0.09	0.01	22.75	5.52	3.35	0.01
10.25	1.07	0.11	0.01	23.00	5.54	3.37	0.01
10.50	1.14	0.13	0.02	23.25	5.55	3.38	0.01
10.75	1.22	0.16	0.02	23.50	5.57	3.39	0.01
11.00	1.32	0.20	0.02	23.75	5.58	3.41	0.01
11.25	1.43	0.25	0.03	24.00	**5.60**	**3.42**	0.01
11.50	1.58	0.33	0.05				
11.75	2.17	0.67	**0.25**				
12.00	3.71	1.81	**0.83**				
12.25	3.95	2.00	0.12				
12.50	4.12	2.14	0.08				

Summary for Pond 7P: (new Pond)

Inflow Area = 0.887 ac, 0.00% Impervious, Inflow Depth > 4.90" for 10% event
Inflow = 6.67 cfs @ 11.96 hrs, Volume= 0.362 af
Outflow = 4.16 cfs @ 12.05 hrs, Volume= 0.268 af, Atten= 38%, Lag= 5.1 min
Primary = 4.16 cfs @ 12.05 hrs, Volume= 0.268 af
Routed to Link 8L : (new Link)

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 946.11' @ 12.05 hrs Storage= 6,413 cf

Plug-Flow detention time= 158.1 min calculated for 0.268 af (74% of inflow)
Center-of-Mass det. time= 70.1 min (836.3 - 766.2)

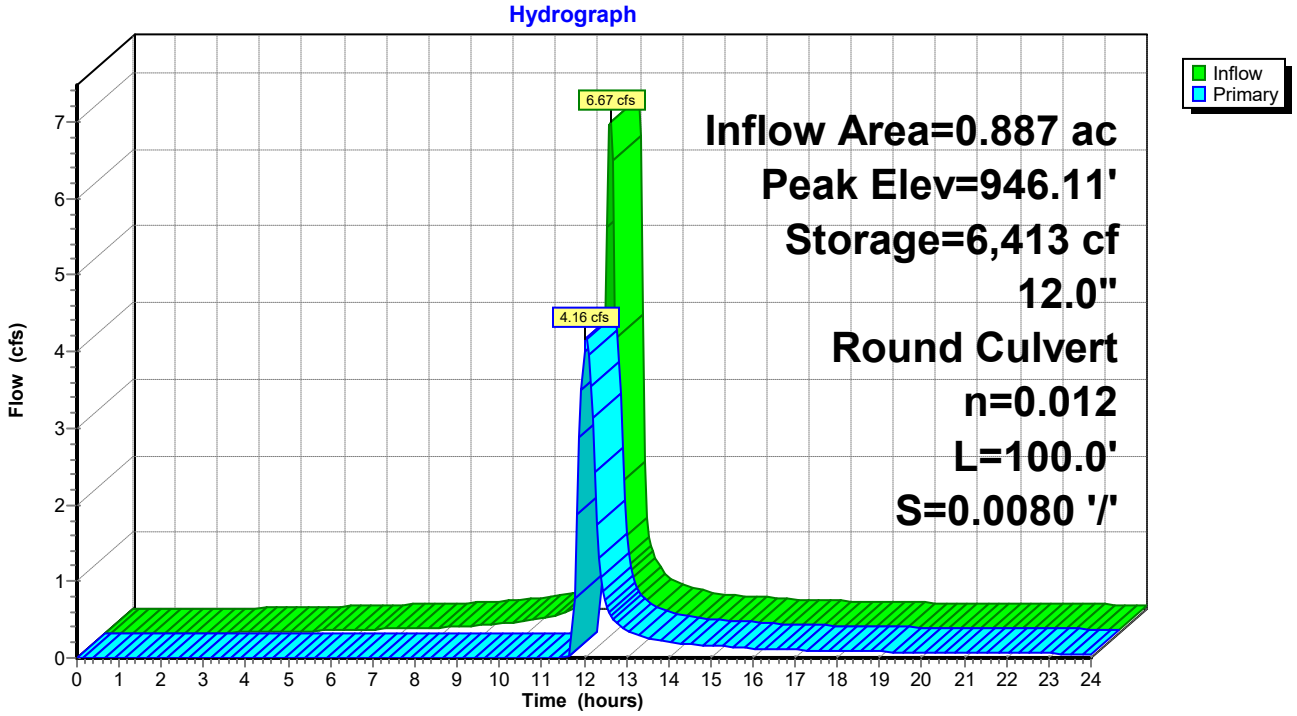
Volume	Invert	Avail.Storage	Storage Description
#1	939.15'	9,592 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
939.15	0	0
944.15	4,000	4,000
947.90	4,606	8,606
948.90	986	9,592

Device	Routing	Invert	Outlet Devices
#1	Primary	944.10'	**12.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 944.10' / 943.30' S= 0.0080 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=4.15 cfs @ 12.05 hrs HW=946.11' (Free Discharge)
↑—**1=Culvert** (Barrel Controls 4.15 cfs @ 5.28 fps)

Pond 7P: (new Pond)



Hydrograph for Pond 7P: (new Pond)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	939.15	0.00
0.50	0.00	0	939.15	0.00
1.00	0.00	0	939.15	0.00
1.50	0.00	0	939.15	0.00
2.00	0.00	0	939.15	0.00
2.50	0.00	3	939.15	0.00
3.00	0.01	16	939.17	0.00
3.50	0.02	40	939.20	0.00
4.00	0.02	75	939.24	0.00
4.50	0.03	120	939.30	0.00
5.00	0.04	177	939.37	0.00
5.50	0.04	246	939.46	0.00
6.00	0.05	328	939.56	0.00
6.50	0.06	422	939.68	0.00
7.00	0.06	529	939.81	0.00
7.50	0.07	649	939.96	0.00
8.00	0.08	781	940.13	0.00
8.50	0.10	934	940.32	0.00
9.00	0.12	1,128	940.56	0.00
9.50	0.13	1,352	940.84	0.00
10.00	0.16	1,604	941.16	0.00
10.50	0.21	1,934	941.57	0.00
11.00	0.30	2,387	942.13	0.00
11.50	**0.50**	3,090	943.01	0.00
12.00	**6.18**	**6,245**	**945.98**	**4.00**
12.50	0.53	**4,486**	**944.55**	**0.76**
13.00	0.32	4,310	944.40	0.37
13.50	0.24	4,252	944.35	0.27
14.00	0.19	4,216	944.33	0.21
14.50	0.17	4,194	944.31	0.18
15.00	0.15	4,178	944.30	0.16
15.50	0.13	4,163	944.28	0.14
16.00	0.12	4,147	944.27	0.13
16.50	0.11	4,136	944.26	0.11
17.00	0.10	4,130	944.26	0.11
17.50	0.10	4,124	944.25	0.10
18.00	0.09	4,119	944.25	0.09
18.50	0.08	4,113	944.24	0.09
19.00	0.08	4,108	944.24	0.08
19.50	0.07	4,102	944.23	0.07
20.00	0.07	4,097	944.23	0.07
20.50	0.06	4,093	944.23	0.06
21.00	0.06	4,092	944.22	0.06
21.50	0.06	4,090	944.22	0.06
22.00	0.06	4,089	944.22	0.06
22.50	0.06	4,088	944.22	0.06
23.00	0.06	4,087	944.22	0.06
23.50	0.06	4,086	944.22	0.06
24.00	0.05	4,084	944.22	0.06

Stage-Discharge for Pond 7P: (new Pond)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
939.15	0.00	941.70	0.00	944.25	0.09	946.80	4.88
939.20	0.00	941.75	0.00	944.30	0.16	946.85	4.93
939.25	0.00	941.80	0.00	944.35	0.25	946.90	4.97
939.30	0.00	941.85	0.00	944.40	0.36	946.95	5.02
939.35	0.00	941.90	0.00	944.45	0.48	947.00	5.07
939.40	0.00	941.95	0.00	944.50	0.62	947.05	5.12
939.45	0.00	942.00	0.00	944.55	0.77	947.10	5.16
939.50	0.00	942.05	0.00	944.60	0.93	947.15	5.21
939.55	0.00	942.10	0.00	944.65	1.10	947.20	5.25
939.60	0.00	942.15	0.00	944.70	1.27	947.25	5.30
939.65	0.00	942.20	0.00	944.75	1.45	947.30	5.34
939.70	0.00	942.25	0.00	944.80	1.64	947.35	5.39
939.75	0.00	942.30	0.00	944.85	1.83	947.40	5.43
939.80	0.00	942.35	0.00	944.90	2.02	947.45	5.47
939.85	0.00	942.40	0.00	944.95	2.21	947.50	5.52
939.90	0.00	942.45	0.00	945.00	2.39	947.55	5.56
939.95	0.00	942.50	0.00	945.05	2.56	947.60	5.60
940.00	0.00	942.55	0.00	945.10	2.67	947.65	5.65
940.05	0.00	942.60	0.00	945.15	2.80	947.70	5.69
940.10	0.00	942.65	0.00	945.20	2.93	947.75	5.73
940.15	0.00	942.70	0.00	945.25	3.05	947.80	5.77
940.20	0.00	942.75	0.00	945.30	3.16	947.85	5.81
940.25	0.00	942.80	0.00	945.35	3.28	947.90	5.85
940.30	0.00	942.85	0.00	945.40	3.38	947.95	5.89
940.35	0.00	942.90	0.00	945.45	3.31	948.00	5.93
940.40	0.00	942.95	0.00	945.50	3.38	948.05	5.97
940.45	0.00	943.00	0.00	945.55	3.45	948.10	6.01
940.50	0.00	943.05	0.00	945.60	3.52	948.15	6.05
940.55	0.00	943.10	0.00	945.65	3.58	948.20	6.09
940.60	0.00	943.15	0.00	945.70	3.65	948.25	6.13
940.65	0.00	943.20	0.00	945.75	3.71	948.30	6.17
940.70	0.00	943.25	0.00	945.80	3.78	948.35	6.21
940.75	0.00	943.30	0.00	945.85	3.84	948.40	6.25
940.80	0.00	943.35	0.00	945.90	3.90	948.45	6.28
940.85	0.00	943.40	0.00	945.95	3.96	948.50	6.32
940.90	0.00	943.45	0.00	946.00	4.02	948.55	6.36
940.95	0.00	943.50	0.00	946.05	4.08	948.60	6.40
941.00	0.00	943.55	0.00	946.10	4.14	948.65	6.43
941.05	0.00	943.60	0.00	946.15	4.20	948.70	6.47
941.10	0.00	943.65	0.00	946.20	4.25	948.75	6.51
941.15	0.00	943.70	0.00	946.25	4.31	948.80	6.54
941.20	0.00	943.75	0.00	946.30	4.36	948.85	6.58
941.25	0.00	943.80	0.00	946.35	4.42	948.90	**6.62**
941.30	0.00	943.85	0.00	946.40	4.47		
941.35	0.00	943.90	0.00	946.45	4.52		
941.40	0.00	943.95	0.00	946.50	4.58		
941.45	0.00	944.00	0.00	946.55	4.63		
941.50	0.00	944.05	0.00	946.60	4.68		
941.55	0.00	944.10	0.00	946.65	4.73		
941.60	0.00	944.15	0.01	946.70	4.78		
941.65	0.00	944.20	0.04	946.75	4.83		

Stage-Area-Storage for Pond 7P: (new Pond)

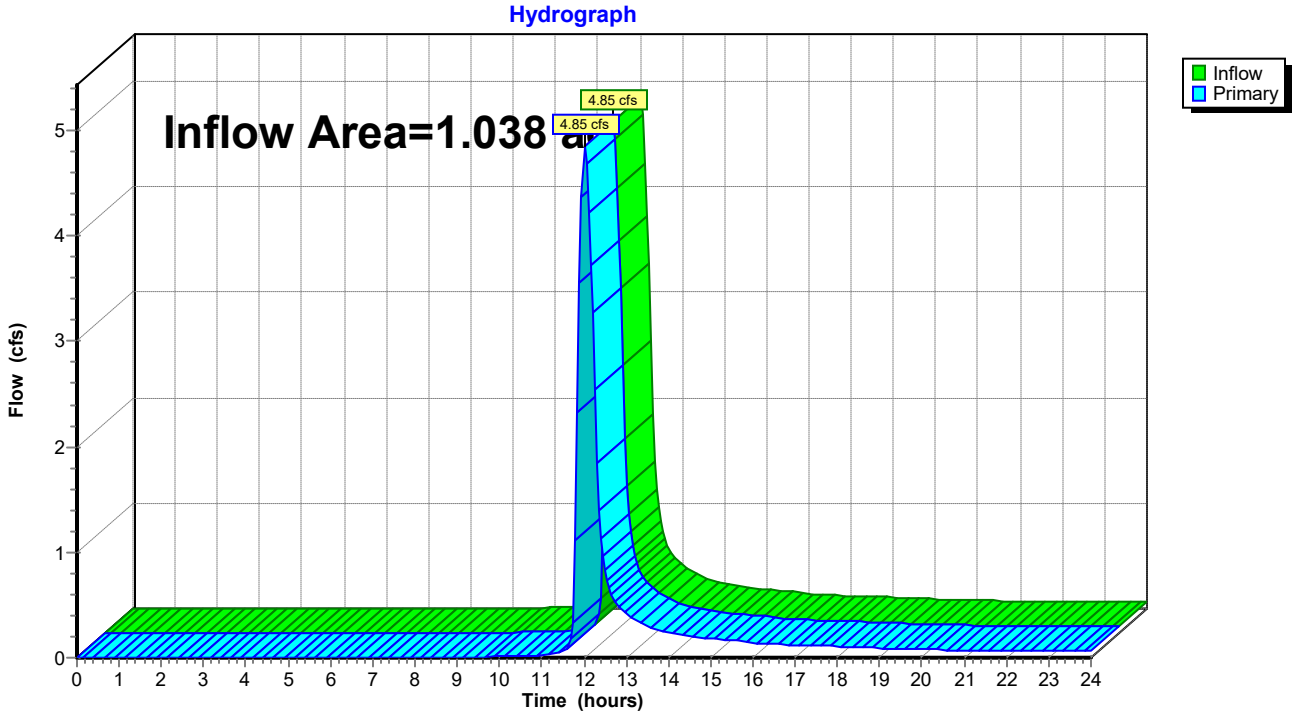
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
939.15	0	944.25	4,123
939.25	80	944.35	4,246
939.35	160	944.45	4,368
939.45	240	944.55	4,491
939.55	320	944.65	4,614
939.65	400	944.75	4,737
939.75	480	944.85	4,860
939.85	560	944.95	4,983
939.95	640	945.05	5,105
940.05	720	945.15	5,228
940.15	800	945.25	5,351
940.25	880	945.35	5,474
940.35	960	945.45	5,597
940.45	1,040	945.55	5,720
940.55	1,120	945.65	5,842
940.65	1,200	945.75	5,965
940.75	1,280	945.85	6,088
940.85	1,360	945.95	6,211
940.95	1,440	946.05	6,334
941.05	1,520	946.15	6,457
941.15	1,600	946.25	6,579
941.25	1,680	946.35	6,702
941.35	1,760	946.45	6,825
941.45	1,840	946.55	6,948
941.55	1,920	946.65	7,071
941.65	2,000	946.75	7,193
941.75	2,080	946.85	7,316
941.85	2,160	946.95	7,439
941.95	2,240	947.05	7,562
942.05	2,320	947.15	7,685
942.15	2,400	947.25	7,808
942.25	2,480	947.35	7,930
942.35	2,560	947.45	8,053
942.45	2,640	947.55	8,176
942.55	2,720	947.65	8,299
942.65	2,800	947.75	8,422
942.75	2,880	947.85	8,545
942.85	2,960	947.95	8,655
942.95	3,040	948.05	8,754
943.05	3,120	948.15	8,853
943.15	3,200	948.25	8,951
943.25	3,280	948.35	9,050
943.35	3,360	948.45	9,148
943.45	3,440	948.55	9,247
943.55	3,520	948.65	9,346
943.65	3,600	948.75	9,444
943.75	3,680	948.85	**9,543**
943.85	3,760		
943.95	3,840		
944.05	3,920		
944.15	4,000		

Summary for Link 8L: (new Link)

Inflow Area = 1.038 ac, 0.00% Impervious, Inflow Depth > 3.60" for 10% event
Inflow = 4.85 cfs @ 12.01 hrs, Volume= 0.311 af
Primary = 4.85 cfs @ 12.01 hrs, Volume= 0.311 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: (new Link)



Hydrograph for Link 8L: (new Link)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	12.75	0.52	0.00	0.52
0.25	0.00	0.00	0.00	13.00	0.41	0.00	0.41
0.50	0.00	0.00	0.00	13.25	0.35	0.00	0.35
0.75	0.00	0.00	0.00	13.50	0.30	0.00	0.30
1.00	0.00	0.00	0.00	13.75	0.27	0.00	0.27
1.25	0.00	0.00	0.00	14.00	0.24	0.00	0.24
1.50	0.00	0.00	0.00	14.25	0.21	0.00	0.21
1.75	0.00	0.00	0.00	14.50	0.20	0.00	0.20
2.00	0.00	0.00	0.00	14.75	0.19	0.00	0.19
2.25	0.00	0.00	0.00	15.00	0.18	0.00	0.18
2.50	0.00	0.00	0.00	15.25	0.17	0.00	0.17
2.75	0.00	0.00	0.00	15.50	0.16	0.00	0.16
3.00	0.00	0.00	0.00	15.75	0.15	0.00	0.15
3.25	0.00	0.00	0.00	16.00	0.14	0.00	0.14
3.50	0.00	0.00	0.00	16.25	0.13	0.00	0.13
3.75	0.00	0.00	0.00	16.50	0.13	0.00	0.13
4.00	0.00	0.00	0.00	16.75	0.12	0.00	0.12
4.25	0.00	0.00	0.00	17.00	0.12	0.00	0.12
4.50	0.00	0.00	0.00	17.25	0.12	0.00	0.12
4.75	0.00	0.00	0.00	17.50	0.11	0.00	0.11
5.00	0.00	0.00	0.00	17.75	0.11	0.00	0.11
5.25	0.00	0.00	0.00	18.00	0.11	0.00	0.11
5.50	0.00	0.00	0.00	18.25	0.10	0.00	0.10
5.75	0.00	0.00	0.00	18.50	0.10	0.00	0.10
6.00	0.00	0.00	0.00	18.75	0.10	0.00	0.10
6.25	0.00	0.00	0.00	19.00	0.09	0.00	0.09
6.50	0.00	0.00	0.00	19.25	0.09	0.00	0.09
6.75	0.00	0.00	0.00	19.50	0.09	0.00	0.09
7.00	0.00	0.00	0.00	19.75	0.08	0.00	0.08
7.25	0.00	0.00	0.00	20.00	0.08	0.00	0.08
7.50	0.00	0.00	0.00	20.25	0.08	0.00	0.08
7.75	0.00	0.00	0.00	20.50	0.07	0.00	0.07
8.00	0.00	0.00	0.00	20.75	0.07	0.00	0.07
8.25	0.00	0.00	0.00	21.00	0.07	0.00	0.07
8.50	0.00	0.00	0.00	21.25	0.07	0.00	0.07
8.75	0.00	0.00	0.00	21.50	0.07	0.00	0.07
9.00	0.01	0.00	0.01	21.75	0.07	0.00	0.07
9.25	0.01	0.00	0.01	22.00	0.07	0.00	0.07
9.50	0.01	0.00	0.01	22.25	0.07	0.00	0.07
9.75	0.01	0.00	0.01	22.50	0.07	0.00	0.07
10.00	0.01	0.00	0.01	22.75	0.07	0.00	0.07
10.25	0.01	0.00	0.01	23.00	0.07	0.00	0.07
10.50	0.02	0.00	0.02	23.25	0.07	0.00	0.07
10.75	0.02	0.00	0.02	23.50	0.07	0.00	0.07
11.00	0.02	0.00	0.02	23.75	0.06	0.00	0.06
11.25	0.03	0.00	0.03	24.00	0.06	0.00	0.06
11.50	0.05	0.00	0.05				
11.75	0.32	0.00	0.32				
12.00	**4.83**	0.00	**4.83**				
12.25	2.54	0.00	2.54				
12.50	0.83	0.00	0.83				

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment 4S: PROP DETAINED Runoff Area=0.887 ac 0.00% Impervious Runoff Depth>2.93"
Tc=6.0 min CN=94 Runoff=4.13 cfs 0.217 af

Subcatchment 5S: PROP UNDETAINED Runoff Area=6,574 sf 0.00% Impervious Runoff Depth>1.71"
Tc=6.0 min CN=80 Runoff=0.45 cfs 0.022 af

Pond 7P: (new Pond) Peak Elev=944.90' Storage=4,925 cf Inflow=4.13 cfs 0.217 af
12.0" Round Culvert n=0.012 L=100.0' S=0.0080 '/' Outflow=2.03 cfs 0.124 af

Link 8L: (new Link) Inflow=2.25 cfs 0.145 af
Primary=2.25 cfs 0.145 af

Total Runoff Area = 1.038 ac Runoff Volume = 0.238 af Average Runoff Depth = 2.75"
100.00% Pervious = 1.038 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 4S: PROP DETAINED

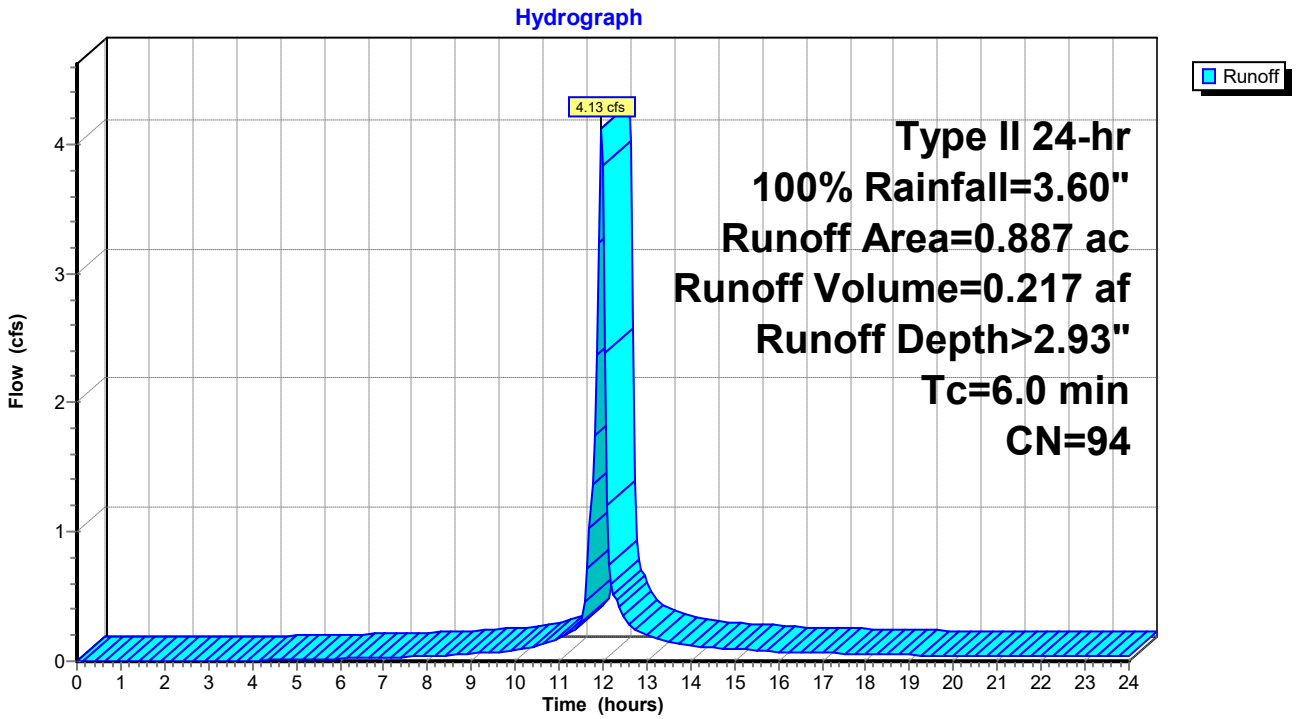
Runoff = 4.13 cfs @ 11.96 hrs, Volume= 0.217 af, Depth> 2.93"
Routed to Pond 7P : (new Pond)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100% Rainfall=3.60"

	Area (ac)	CN	Description
*	0.887	94	
	0.887		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 4S: PROP DETAINED



Hydrograph for Subcatchment 4S: PROP DETAINED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.03	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.05	0.00	0.00
1.50	0.06	0.00	0.00
1.75	0.07	0.00	0.00
2.00	0.08	0.00	0.00
2.25	0.09	0.00	0.00
2.50	0.10	0.00	0.00
2.75	0.11	0.00	0.00
3.00	0.12	0.00	0.00
3.25	0.14	0.00	0.00
3.50	0.15	0.00	0.00
3.75	0.16	0.00	0.00
4.00	0.17	0.00	0.01
4.25	0.19	0.00	0.01
4.50	0.20	0.01	0.01
4.75	0.21	0.01	0.01
5.00	0.23	0.01	0.01
5.25	0.24	0.02	0.01
5.50	0.26	0.02	0.02
5.75	0.27	0.03	0.02
6.00	0.29	0.03	0.02
6.25	0.30	0.04	0.02
6.50	0.32	0.05	0.02
6.75	0.34	0.05	0.03
7.00	0.36	0.06	0.03
7.25	0.37	0.07	0.03
7.50	0.39	0.08	0.03
7.75	0.41	0.09	0.04
8.00	0.43	0.10	0.04
8.25	0.45	0.11	0.04
8.50	0.48	0.12	0.05
8.75	0.50	0.14	0.05
9.00	0.53	0.16	0.06
9.25	0.56	0.17	0.07
9.50	0.59	0.19	0.07
9.75	0.62	0.21	0.07
10.00	0.65	0.24	0.09
10.25	0.69	0.26	0.10
10.50	0.73	0.30	0.12
10.75	0.79	0.33	0.14
11.00	0.85	0.38	0.17
11.25	0.92	0.44	0.22
11.50	1.02	0.52	0.29
11.75	1.39	0.84	**1.37**
12.00	2.39	1.76	**3.84**
12.25	2.54	1.91	0.52
12.50	2.65	2.01	0.33
12.75	2.72	2.08	0.24
13.00	2.78	2.14	0.20
13.25	2.83	2.19	0.18
13.50	2.88	2.23	0.15
13.75	2.92	2.27	0.14
14.00	2.95	2.30	0.12
14.25	2.98	2.34	0.11
14.50	3.02	2.37	0.11
14.75	3.04	2.39	0.10
15.00	3.07	2.42	0.10
15.25	3.10	2.45	0.09
15.50	3.12	2.47	0.08
15.75	3.15	2.49	0.08
16.00	3.17	2.51	0.07
16.25	3.19	2.53	0.07
16.50	3.21	2.55	0.07
16.75	3.23	2.57	0.07
17.00	3.25	2.59	0.06
17.25	3.26	2.61	0.06
17.50	3.28	2.62	0.06
17.75	3.30	2.64	0.06
18.00	3.32	2.66	0.06
18.25	3.33	2.67	0.06
18.50	3.35	2.69	0.05
18.75	3.36	2.70	0.05
19.00	3.38	2.71	0.05
19.25	3.39	2.73	0.05
19.50	3.40	2.74	0.05
19.75	3.42	2.75	0.04
20.00	3.43	2.76	0.04
20.25	3.44	2.78	0.04
20.50	3.45	2.79	0.04
20.75	3.46	2.80	0.04
21.00	3.47	2.81	0.04
21.25	3.48	2.82	0.04
21.50	3.50	2.83	0.04
21.75	3.51	2.84	0.04
22.00	3.52	2.85	0.04
22.25	3.53	2.86	0.04
22.50	3.54	2.87	0.04
22.75	3.55	2.88	0.04
23.00	3.56	2.89	0.04
23.25	3.57	2.90	0.04
23.50	3.58	2.91	0.04
23.75	3.59	2.92	0.04
24.00	**3.60**	**2.93**	0.03

Summary for Subcatchment 5S: PROP UNDETAINED

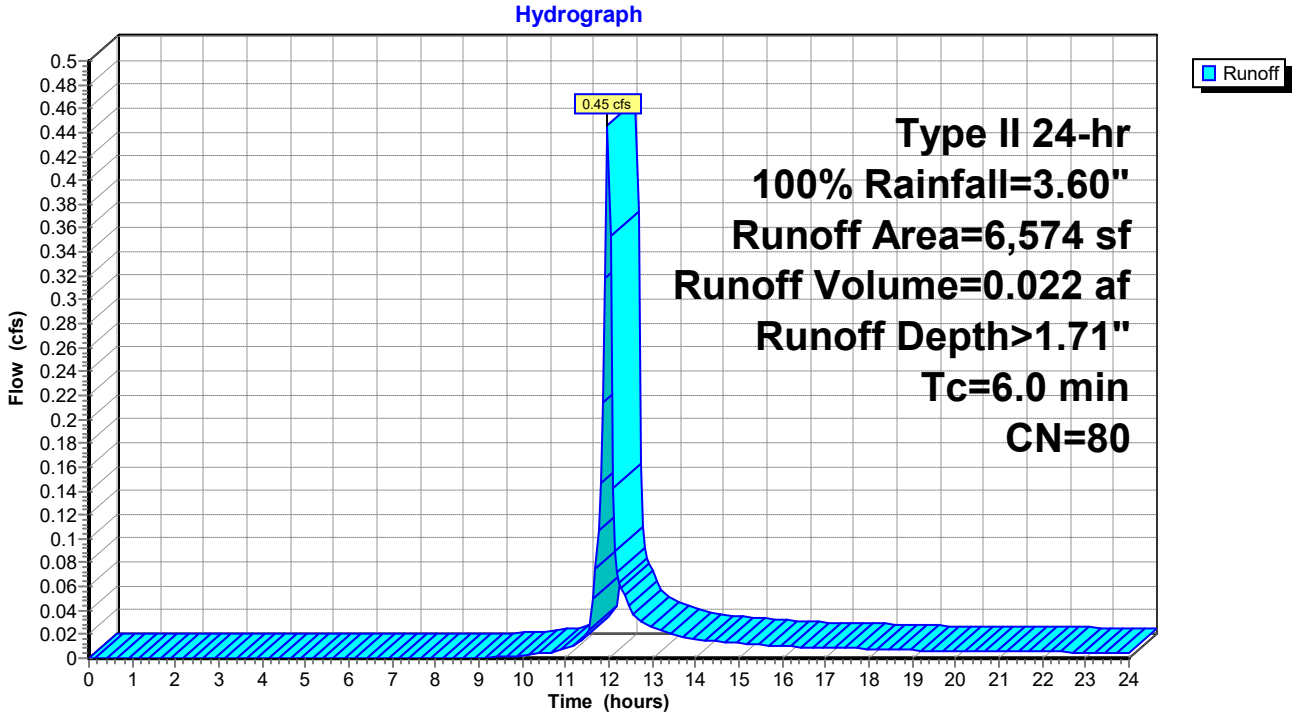
Runoff = 0.45 cfs @ 11.97 hrs, Volume= 0.022 af, Depth> 1.71"
Routed to Link 8L : (new Link)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type II 24-hr 100% Rainfall=3.60"

	Area (sf)	CN	Description
*	6,574	80	
	6,574		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 5S: PROP UNDETAINED



Hydrograph for Subcatchment 5S: PROP UNDETAINED

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.25	0.01	0.00	0.00
0.50	0.02	0.00	0.00
0.75	0.03	0.00	0.00
1.00	0.04	0.00	0.00
1.25	0.05	0.00	0.00
1.50	0.06	0.00	0.00
1.75	0.07	0.00	0.00
2.00	0.08	0.00	0.00
2.25	0.09	0.00	0.00
2.50	0.10	0.00	0.00
2.75	0.11	0.00	0.00
3.00	0.12	0.00	0.00
3.25	0.14	0.00	0.00
3.50	0.15	0.00	0.00
3.75	0.16	0.00	0.00
4.00	0.17	0.00	0.00
4.25	0.19	0.00	0.00
4.50	0.20	0.00	0.00
4.75	0.21	0.00	0.00
5.00	0.23	0.00	0.00
5.25	0.24	0.00	0.00
5.50	0.26	0.00	0.00
5.75	0.27	0.00	0.00
6.00	0.29	0.00	0.00
6.25	0.30	0.00	0.00
6.50	0.32	0.00	0.00
6.75	0.34	0.00	0.00
7.00	0.36	0.00	0.00
7.25	0.37	0.00	0.00
7.50	0.39	0.00	0.00
7.75	0.41	0.00	0.00
8.00	0.43	0.00	0.00
8.25	0.45	0.00	0.00
8.50	0.48	0.00	0.00
8.75	0.50	0.00	0.00
9.00	0.53	0.00	0.00
9.25	0.56	0.00	0.00
9.50	0.59	0.00	0.00
9.75	0.62	0.01	0.00
10.00	0.65	0.01	0.00
10.25	0.69	0.01	0.00
10.50	0.73	0.02	0.00
10.75	0.79	0.03	0.01
11.00	0.85	0.04	0.01
11.25	0.92	0.06	0.01
11.50	1.02	0.09	0.02
11.75	1.39	0.24	**0.11**
12.00	2.39	0.81	**0.43**
12.25	2.54	0.92	0.06
12.50	2.65	0.99	0.04
12.75	2.72	1.04	0.03
13.00	2.78	1.09	0.03
13.25	2.83	1.12	0.02
13.50	2.88	1.16	0.02
13.75	2.92	1.19	0.02
14.00	2.95	1.21	0.02
14.25	2.98	1.24	0.01
14.50	3.02	1.26	0.01
14.75	3.04	1.28	0.01
15.00	3.07	1.30	0.01
15.25	3.10	1.32	0.01
15.50	3.12	1.34	0.01
15.75	3.15	1.36	0.01
16.00	3.17	1.38	0.01
16.25	3.19	1.39	0.01
16.50	3.21	1.41	0.01
16.75	3.23	1.42	0.01
17.00	3.25	1.44	0.01
17.25	3.26	1.45	0.01
17.50	3.28	1.47	0.01
17.75	3.30	1.48	0.01
18.00	3.32	1.49	0.01
18.25	3.33	1.50	0.01
18.50	3.35	1.52	0.01
18.75	3.36	1.53	0.01
19.00	3.38	1.54	0.01
19.25	3.39	1.55	0.01
19.50	3.40	1.56	0.01
19.75	3.42	1.57	0.01
20.00	3.43	1.58	0.01
20.25	3.44	1.59	0.01
20.50	3.45	1.60	0.01
20.75	3.46	1.61	0.01
21.00	3.47	1.62	0.01
21.25	3.48	1.62	0.01
21.50	3.50	1.63	0.01
21.75	3.51	1.64	0.01
22.00	3.52	1.65	0.01
22.25	3.53	1.66	0.01
22.50	3.54	1.67	0.01
22.75	3.55	1.68	0.01
23.00	3.56	1.68	0.01
23.25	3.57	1.69	0.00
23.50	3.58	1.70	0.00
23.75	3.59	1.71	0.00
24.00	**3.60**	**1.72**	0.00

Summary for Pond 7P: (new Pond)

Inflow Area = 0.887 ac, 0.00% Impervious, Inflow Depth > 2.93" for 100% event
Inflow = 4.13 cfs @ 11.96 hrs, Volume= 0.217 af
Outflow = 2.03 cfs @ 12.07 hrs, Volume= 0.124 af, Atten= 51%, Lag= 6.5 min
Primary = 2.03 cfs @ 12.07 hrs, Volume= 0.124 af
Routed to Link 8L : (new Link)

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 944.90' @ 12.07 hrs Storage= 4,925 cf

Plug-Flow detention time= 207.6 min calculated for 0.123 af (57% of inflow)
Center-of-Mass det. time= 102.2 min (881.6 - 779.4)

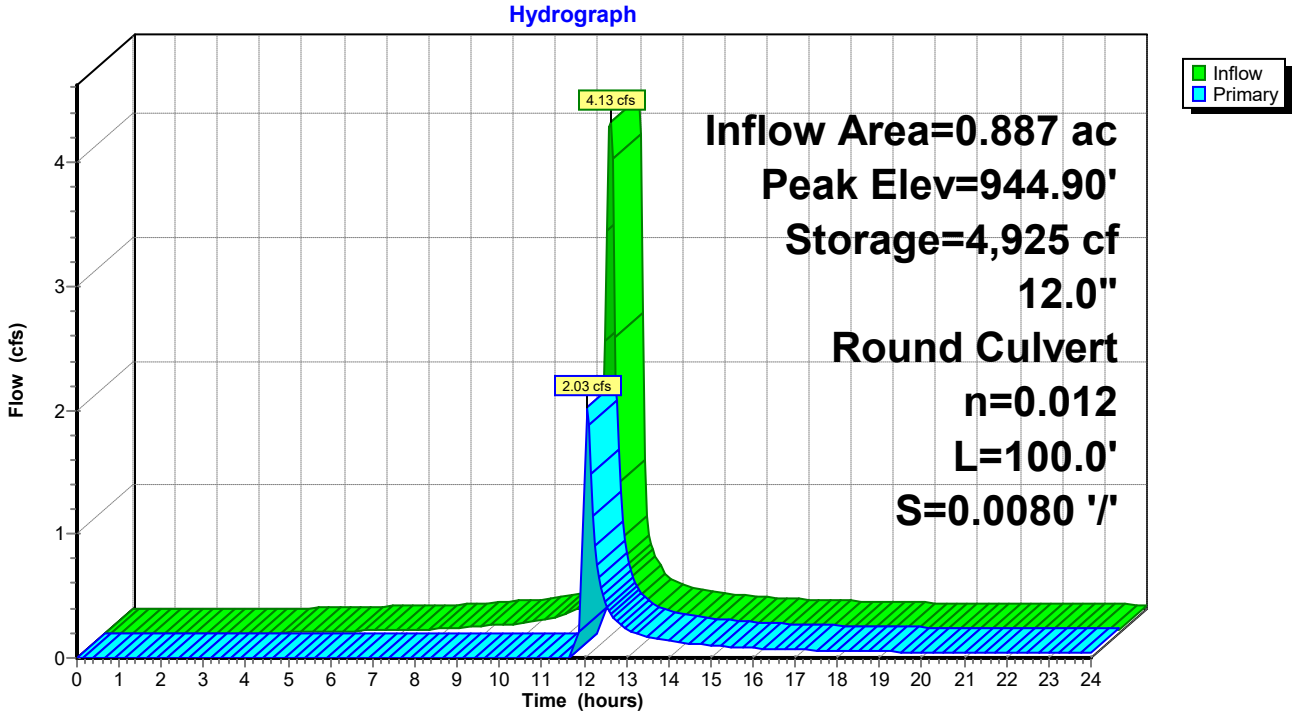
Volume	Invert	Avail.Storage	Storage Description
#1	939.15'	9,592 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
939.15	0	0
944.15	4,000	4,000
947.90	4,606	8,606
948.90	986	9,592

Device	Routing	Invert	Outlet Devices
#1	Primary	944.10'	**12.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 944.10' / 943.30' S= 0.0080 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.91 cfs @ 12.07 hrs HW=944.87' (Free Discharge)
1=Culvert (Barrel Controls 1.91 cfs @ 4.06 fps)

Pond 7P: (new Pond)



Hydrograph for Pond 7P: (new Pond)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	939.15	0.00
0.50	0.00	0	939.15	0.00
1.00	0.00	0	939.15	0.00
1.50	0.00	0	939.15	0.00
2.00	0.00	0	939.15	0.00
2.50	0.00	0	939.15	0.00
3.00	0.00	0	939.15	0.00
3.50	0.00	1	939.15	0.00
4.00	0.01	8	939.16	0.00
4.50	0.01	20	939.18	0.00
5.00	0.01	39	939.20	0.00
5.50	0.02	64	939.23	0.00
6.00	0.02	97	939.27	0.00
6.50	0.02	137	939.32	0.00
7.00	0.03	185	939.38	0.00
7.50	0.03	240	939.45	0.00
8.00	0.04	304	939.53	0.00
8.50	0.05	380	939.62	0.00
9.00	0.06	478	939.75	0.00
9.50	0.07	596	939.89	0.00
10.00	0.09	731	940.06	0.00
10.50	0.12	912	940.29	0.00
11.00	0.17	1,167	940.61	0.00
11.50	**0.29**	1,571	941.11	0.00
12.00	**3.84**	**4,607**	**944.64**	**1.08**
12.50	0.33	**4,355**	**944.44**	**0.46**
13.00	0.20	4,233	944.34	0.24
13.50	0.15	4,191	944.31	0.17
14.00	0.12	4,158	944.28	0.14
14.50	0.11	4,137	944.26	0.11
15.00	0.10	4,126	944.25	0.10
15.50	0.08	4,116	944.24	0.09
16.00	0.07	4,106	944.24	0.08
16.50	0.07	4,099	944.23	0.07
17.00	0.06	4,095	944.23	0.07
17.50	0.06	4,092	944.22	0.06
18.00	0.06	4,088	944.22	0.06
18.50	0.05	4,084	944.22	0.06
19.00	0.05	4,079	944.21	0.05
19.50	0.05	4,073	944.21	0.05
20.00	0.04	4,066	944.20	0.05
20.50	0.04	4,060	944.20	0.04
21.00	0.04	4,057	944.20	0.04
21.50	0.04	4,055	944.20	0.04
22.00	0.04	4,054	944.19	0.04
22.50	0.04	4,052	944.19	0.04
23.00	0.04	4,051	944.19	0.04
23.50	0.04	4,049	944.19	0.04
24.00	0.03	4,048	944.19	0.04

Stage-Discharge for Pond 7P: (new Pond)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
939.15	0.00	941.70	0.00	944.25	0.09	946.80	4.88
939.20	0.00	941.75	0.00	944.30	0.16	946.85	4.93
939.25	0.00	941.80	0.00	944.35	0.25	946.90	4.97
939.30	0.00	941.85	0.00	944.40	0.36	946.95	5.02
939.35	0.00	941.90	0.00	944.45	0.48	947.00	5.07
939.40	0.00	941.95	0.00	944.50	0.62	947.05	5.12
939.45	0.00	942.00	0.00	944.55	0.77	947.10	5.16
939.50	0.00	942.05	0.00	944.60	0.93	947.15	5.21
939.55	0.00	942.10	0.00	944.65	1.10	947.20	5.25
939.60	0.00	942.15	0.00	944.70	1.27	947.25	5.30
939.65	0.00	942.20	0.00	944.75	1.45	947.30	5.34
939.70	0.00	942.25	0.00	944.80	1.64	947.35	5.39
939.75	0.00	942.30	0.00	944.85	1.83	947.40	5.43
939.80	0.00	942.35	0.00	944.90	2.02	947.45	5.47
939.85	0.00	942.40	0.00	944.95	2.21	947.50	5.52
939.90	0.00	942.45	0.00	945.00	2.39	947.55	5.56
939.95	0.00	942.50	0.00	945.05	2.56	947.60	5.60
940.00	0.00	942.55	0.00	945.10	2.67	947.65	5.65
940.05	0.00	942.60	0.00	945.15	2.80	947.70	5.69
940.10	0.00	942.65	0.00	945.20	2.93	947.75	5.73
940.15	0.00	942.70	0.00	945.25	3.05	947.80	5.77
940.20	0.00	942.75	0.00	945.30	3.16	947.85	5.81
940.25	0.00	942.80	0.00	945.35	3.28	947.90	5.85
940.30	0.00	942.85	0.00	945.40	3.38	947.95	5.89
940.35	0.00	942.90	0.00	945.45	3.31	948.00	5.93
940.40	0.00	942.95	0.00	945.50	3.38	948.05	5.97
940.45	0.00	943.00	0.00	945.55	3.45	948.10	6.01
940.50	0.00	943.05	0.00	945.60	3.52	948.15	6.05
940.55	0.00	943.10	0.00	945.65	3.58	948.20	6.09
940.60	0.00	943.15	0.00	945.70	3.65	948.25	6.13
940.65	0.00	943.20	0.00	945.75	3.71	948.30	6.17
940.70	0.00	943.25	0.00	945.80	3.78	948.35	6.21
940.75	0.00	943.30	0.00	945.85	3.84	948.40	6.25
940.80	0.00	943.35	0.00	945.90	3.90	948.45	6.28
940.85	0.00	943.40	0.00	945.95	3.96	948.50	6.32
940.90	0.00	943.45	0.00	946.00	4.02	948.55	6.36
940.95	0.00	943.50	0.00	946.05	4.08	948.60	6.40
941.00	0.00	943.55	0.00	946.10	4.14	948.65	6.43
941.05	0.00	943.60	0.00	946.15	4.20	948.70	6.47
941.10	0.00	943.65	0.00	946.20	4.25	948.75	6.51
941.15	0.00	943.70	0.00	946.25	4.31	948.80	6.54
941.20	0.00	943.75	0.00	946.30	4.36	948.85	6.58
941.25	0.00	943.80	0.00	946.35	4.42	948.90	**6.62**
941.30	0.00	943.85	0.00	946.40	4.47		
941.35	0.00	943.90	0.00	946.45	4.52		
941.40	0.00	943.95	0.00	946.50	4.58		
941.45	0.00	944.00	0.00	946.55	4.63		
941.50	0.00	944.05	0.00	946.60	4.68		
941.55	0.00	944.10	0.00	946.65	4.73		
941.60	0.00	944.15	0.01	946.70	4.78		
941.65	0.00	944.20	0.04	946.75	4.83		

Stage-Area-Storage for Pond 7P: (new Pond)

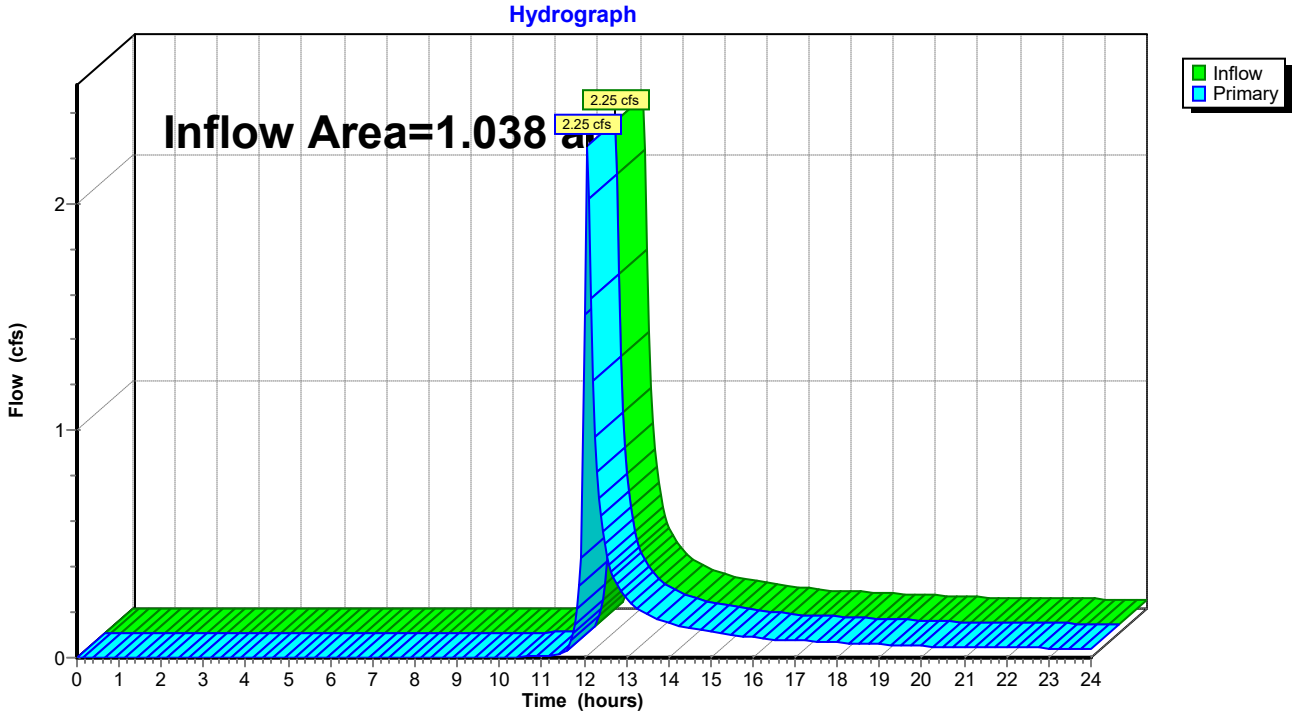
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
939.15	0	944.25	4,123
939.25	80	944.35	4,246
939.35	160	944.45	4,368
939.45	240	944.55	4,491
939.55	320	944.65	4,614
939.65	400	944.75	4,737
939.75	480	944.85	4,860
939.85	560	944.95	4,983
939.95	640	945.05	5,105
940.05	720	945.15	5,228
940.15	800	945.25	5,351
940.25	880	945.35	5,474
940.35	960	945.45	5,597
940.45	1,040	945.55	5,720
940.55	1,120	945.65	5,842
940.65	1,200	945.75	5,965
940.75	1,280	945.85	6,088
940.85	1,360	945.95	6,211
940.95	1,440	946.05	6,334
941.05	1,520	946.15	6,457
941.15	1,600	946.25	6,579
941.25	1,680	946.35	6,702
941.35	1,760	946.45	6,825
941.45	1,840	946.55	6,948
941.55	1,920	946.65	7,071
941.65	2,000	946.75	7,193
941.75	2,080	946.85	7,316
941.85	2,160	946.95	7,439
941.95	2,240	947.05	7,562
942.05	2,320	947.15	7,685
942.15	2,400	947.25	7,808
942.25	2,480	947.35	7,930
942.35	2,560	947.45	8,053
942.45	2,640	947.55	8,176
942.55	2,720	947.65	8,299
942.65	2,800	947.75	8,422
942.75	2,880	947.85	8,545
942.85	2,960	947.95	8,655
942.95	3,040	948.05	8,754
943.05	3,120	948.15	8,853
943.15	3,200	948.25	8,951
943.25	3,280	948.35	9,050
943.35	3,360	948.45	9,148
943.45	3,440	948.55	9,247
943.55	3,520	948.65	9,346
943.65	3,600	948.75	9,444
943.75	3,680	948.85	**9,543**
943.85	3,760		
943.95	3,840		
944.05	3,920		
944.15	4,000		

Summary for Link 8L: (new Link)

Inflow Area = 1.038 ac, 0.00% Impervious, Inflow Depth > 1.68" for 100% event
Inflow = 2.25 cfs @ 12.06 hrs, Volume= 0.145 af
Primary = 2.25 cfs @ 12.06 hrs, Volume= 0.145 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Link 8L: (new Link)



Hydrograph for Link 8L: (new Link)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	**0.00**	0.00	12.75	0.33	0.00	0.33
0.25	0.00	0.00	0.00	13.00	0.26	0.00	0.26
0.50	0.00	0.00	0.00	13.25	0.22	0.00	0.22
0.75	0.00	0.00	0.00	13.50	0.19	0.00	0.19
1.00	0.00	0.00	0.00	13.75	0.17	0.00	0.17
1.25	0.00	0.00	0.00	14.00	0.15	0.00	0.15
1.50	0.00	0.00	0.00	14.25	0.14	0.00	0.14
1.75	0.00	0.00	0.00	14.50	0.13	0.00	0.13
2.00	0.00	0.00	0.00	14.75	0.12	0.00	0.12
2.25	0.00	0.00	0.00	15.00	0.11	0.00	0.11
2.50	0.00	0.00	0.00	15.25	0.11	0.00	0.11
2.75	0.00	0.00	0.00	15.50	0.10	0.00	0.10
3.00	0.00	0.00	0.00	15.75	0.10	0.00	0.10
3.25	0.00	0.00	0.00	16.00	0.09	0.00	0.09
3.50	0.00	0.00	0.00	16.25	0.08	0.00	0.08
3.75	0.00	0.00	0.00	16.50	0.08	0.00	0.08
4.00	0.00	0.00	0.00	16.75	0.08	0.00	0.08
4.25	0.00	0.00	0.00	17.00	0.08	0.00	0.08
4.50	0.00	0.00	0.00	17.25	0.07	0.00	0.07
4.75	0.00	0.00	0.00	17.50	0.07	0.00	0.07
5.00	0.00	0.00	0.00	17.75	0.07	0.00	0.07
5.25	0.00	0.00	0.00	18.00	0.07	0.00	0.07
5.50	0.00	0.00	0.00	18.25	0.06	0.00	0.06
5.75	0.00	0.00	0.00	18.50	0.06	0.00	0.06
6.00	0.00	0.00	0.00	18.75	0.06	0.00	0.06
6.25	0.00	0.00	0.00	19.00	0.06	0.00	0.06
6.50	0.00	0.00	0.00	19.25	0.06	0.00	0.06
6.75	0.00	0.00	0.00	19.50	0.06	0.00	0.06
7.00	0.00	0.00	0.00	19.75	0.05	0.00	0.05
7.25	0.00	0.00	0.00	20.00	0.05	0.00	0.05
7.50	0.00	0.00	0.00	20.25	0.05	0.00	0.05
7.75	0.00	0.00	0.00	20.50	0.05	0.00	0.05
8.00	0.00	0.00	0.00	20.75	0.05	0.00	0.05
8.25	0.00	0.00	0.00	21.00	0.05	0.00	0.05
8.50	0.00	0.00	0.00	21.25	0.05	0.00	0.05
8.75	0.00	0.00	0.00	21.50	0.04	0.00	0.04
9.00	0.00	0.00	0.00	21.75	0.04	0.00	0.04
9.25	0.00	0.00	0.00	22.00	0.04	0.00	0.04
9.50	0.00	0.00	0.00	22.25	0.04	0.00	0.04
9.75	0.00	0.00	0.00	22.50	0.04	0.00	0.04
10.00	0.00	0.00	0.00	22.75	0.04	0.00	0.04
10.25	0.00	0.00	0.00	23.00	0.04	0.00	0.04
10.50	0.00	0.00	0.00	23.25	0.04	0.00	0.04
10.75	0.01	0.00	0.01	23.50	0.04	0.00	0.04
11.00	0.01	0.00	0.01	23.75	0.04	0.00	0.04
11.25	0.01	0.00	0.01	24.00	0.04	0.00	0.04
11.50	0.02	0.00	0.02				
11.75	0.11	0.00	0.11				
12.00	**1.51**	0.00	**1.51**				
12.25	**0.98**	0.00	**0.98**				
12.50	0.50	0.00	0.50				

Traffic Impact Study
for
Mission Vale Townhomes

(SEC of Nall Avenue and W. 58th Terrace)
Mission, Kansas

Prepared
for
NSPJ Architects

Prepared by

EXCELLENCE
FROM START TO FINISH
Pars Consulting Engineers, Inc.
California, Kansas, Missouri & Virginia

May 2022

Traffic Impact Study
for
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by
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Mehrdad Givechi, PE, PTOE
May 2022

According to the *City of Mission's Transportation Impact Study Guidelines*, preparation of a traffic impact study is required for all land development and redevelopment applications. Different level of traffic study is warranted at certain thresholds depending on the number of trips that the development generates and/or its deviation from the comprehensive plan. For developments generating under 100 trip-ends during the peak-hour of a typical weekday, the study should address the first five Tasks listed in the guidelines. The information presented in this document is compiled to fulfill these requirements for the proposed *Mission Vale Townhomes* development located on the southeast corner of Nall Avenue and W. 58th Terrace in Mission, Kansas (See *Location Map,* ***Figure 1 of Appendix I***).

1. ***Proposed Development Plan*** - The project site is bounded by Nall Avenue on the west; W. 58th Terrace on the north, Birch Street on the east, and a commercial/retail development on the south. The site is currently occupied by two small businesses under one ownership *(ScriptPro)*, one on the southwest corner of the site at 5819 Nall Avenue with one driveway on Nall Avenue providing access to three (3) parking stalls; and another on the northeast corner of the site at 5401 W. 58th Terrace with two not well-defined driveways, one on W. 58th Terrace and one on Birch Street collectively providing access to eleven (11) parking stalls.

   Under the proposed development plan, the existing buildings on the site and their access drives will be demolished and replaced with 17 residential townhome units arranged along the north and west side of the site with their fronts facing Nall Avenue and W. 58th Terrace as illustrated on the Site Plan, ***Figure 2 of Appendix I***. The project consists of thirteen (13) Type A and three (4) Type B dwelling units.

   - Each Type A will have its own attached two-car garage in the back of the unit. Access to these units is provided at one point on W. 58th Terrace with its centerline approximately 110 ft. from the Nall Avenue centerline.
   - Each Type B will also have its own attached one-car garage, but on the side of the unit. Because these units are located on the narrow part of the site with limited space in the back, access to them will be provided via two private

driveways onto W. 58th Terrace as illustrated on the Site Plan, ***Figure 2 of Appendix I***. The two driveways will have centerline spacing of approximately 65 ft. with the centerline of the easternmost driveway approximately 80 ft. from the Birch Street centerline.

- Parking for the project is provided on site consisting of 30 garage spaces, four (4) driveway spaces (on the two east driveways) and three (3) guest stalls on the south side of the site for a total of 37 stalls as illustrated on the Site Plan, ***Figure 2 of Appendix I***.

The surrounding land uses abutting the site and across the street from the site include:

- A couple of small office buildings *(The Lettering Design Group and ScriptPro)* west of Nall Avenue with individual access onto Nall Avenue.
- A small dental office building *(Oakley Oral Surgery)* on the northeast corner of Nall Avenue and W. 58th Terrace with access on Nall Avenue.
- A social service office building *(Hope S. Baier-Cannon LSCSW)* on the north side of W. 58th Terrace with one access on W. 58th Terrace.
- A small office building (*Solorio & Avila Law firm)* on the northwest corner of Birch Street and W. 58th Terrace with one access on W. 58th Terrace.
- A commercial/retail development on the east side of Birch Street with access on Birch Street and Johnson Drive.
- A commercial/retail development abutting the project south to the south with access on Johnson Drive.

2. ***Land Use, Zoning and Roadway Classifications*** - The existing zoning for the site is PBP and MS-2. The proposed zoning is MS-3.

   According to the *Comprehensive Plan 2007 with updates adopted March 16, 2011*, the existing land use for the project site is *single-family residential* and the future land use is *Downtown District.* The *Linkage Map* of the same document indicates that the streets abutting the project site are not designated as transit, trail, or bicycle facilities.

However, Johnson Drive is designated as *Local Transit corridor*.

According to the *City Traffic Code, Schedule III, Table III-A, Ordinance No. 1109,* Nall Avenue and Johnson Drive are designated main trafficway whose primary function are the movement of through traffic between areas of concentrated activity within the city limits or between such areas within the city limits and traffic facilities outside the city limits performing the function of a main trafficway.

According to the *East Gateway Long-Range Development Plan, June 2006,* Nall Avenue is a primary north/south street, Johnson Drive is a primary east/west street, and W. 58th Terrace and Birch Street are secondary streets.

3. ***Roadway Characteristics*** **-** Near the project site,
    - Nall Avenue is a 2-lane street with mountable curb/gutter sections on both sides and posted speed limit of 25 mph. On-street parking is prohibited on both sides. Currently, there is no sidewalk on the east side of the street along the frontage of the project site.
    - W. 58th Terrace is an east/west 2-lane street with mountable curb/gutter sections on both sides and posted speed limit of 25 mph. There are no sidewalks on either side of the street. Furthermore, on-street parking is not prohibited on either side. The street turns south onto Birch Street approximately 450 ft. east of Nall Avenue and intersects with Johnson Drive; controlled by stop sign.
    - Birch Street is a north/south 2-lane street with high curb/gutter section on the east side, and gutter pan on the south half of the west side. There are no sidewalks on either side of the street, and no posted speed limit (Note: In Kansas, the statutory speed limit is 30 mph when not posted).
    - The intersection of Nall Avenue and W. 58th Terrace is a "T" intersection controlled by stop sign on W. 58th Terrace. It lines up with a private driveway on the west side of Nall Avenue.

4. ***Proposed Site Access Characteristics –*** As stated earlier, access to the site is currently provided at three locations; the building at 5819 Nall Avenue is served by one driveway on Nall Avenue, and the building at 5401 W. 58th Terrace is served by two not well-defined driveways, one on W. 58th Terrace and one on Birch Street. Under the proposed development plan, all three driveways will be eliminated, and three new concrete driveways will be constructed on W. 58th Terrace as illustrated on the Site Plan, ***Figure 2B of Appendix I*** and described in the following paragraphs:
    - The west driveway will be 24 ft. wide with its centerline approximately 110 ft. east of the Nall Avenue centerline. This driveway will provide access to the back sides of 14 dwelling units.
    - The east driveway will be 26 ft. wide with its centerline approximately 87 ft. west of the Birch Street centerline. This driveway will be a shared access drive for the two (2) easternmost dwelling units.
    - The middle driveway will be 26 ft. wide with centerline spacing of approximately 196 ft. from the west driveway and 92 ft. from the east driveway.

    Field investigations indicate that sight distance is not restricted at the proposed driveway locations to the site.

5. ***Site Generated Traffic*** **-** Trip generation of a proposed land development project is typically estimated using trip generation rates suggested by the latest edition of the *Institute of Transportation Engineers, Trip Generation Manual (Currently, the 11th Edition).* For this analysis, *ITE Land Use Code 215 (Single-Family Attached Housing)* is selected. Results of the analysis, as shown in ***Appendix II***, indicate that the trips generated by the proposed development is less than 100 vph during peak-hours of a typical weekday as described below:
    - On average, 8 trip-ends (2 inbound – 6 outbound) during morning peak-hour of the *adjacent street network*.
    - On average, 9 trip-ends (2 inbound – 7 outbound) during morning peak-hour of

the *generator*.

- On average, 10 trip-ends (6 inbound – 4 outbound) during afternoon peak-hour of the *adjacent street network* and the *generator*.
- On average, 122 new trip-ends during a 24-hour period.

In summary, the proposed development project generates insignificant number of trips with nominal impact on the street network. Furthermore, it improves the existing conditions for pedestrians because new sidewalks will be constructed along the frontage of the site on the east side of Nall Avenue, south side of W. 58th Terrace, and west side of Birch Street. Moreover, its proposed driveways configuration is an improvement to the existing conditions from access management and safety standpoint because it does not have direct access on Nall Avenue, which is a primary street with higher traffic volumes. It also consolidates the two not well-defined access drives on the southwest corner of W. 58th Terrace and Birch Street into one driveway on W. 58th Terrace with no direct access on Birth Street, which is a non-residential street.

APPENDIX I

Figures

Figure 1 – Location Map

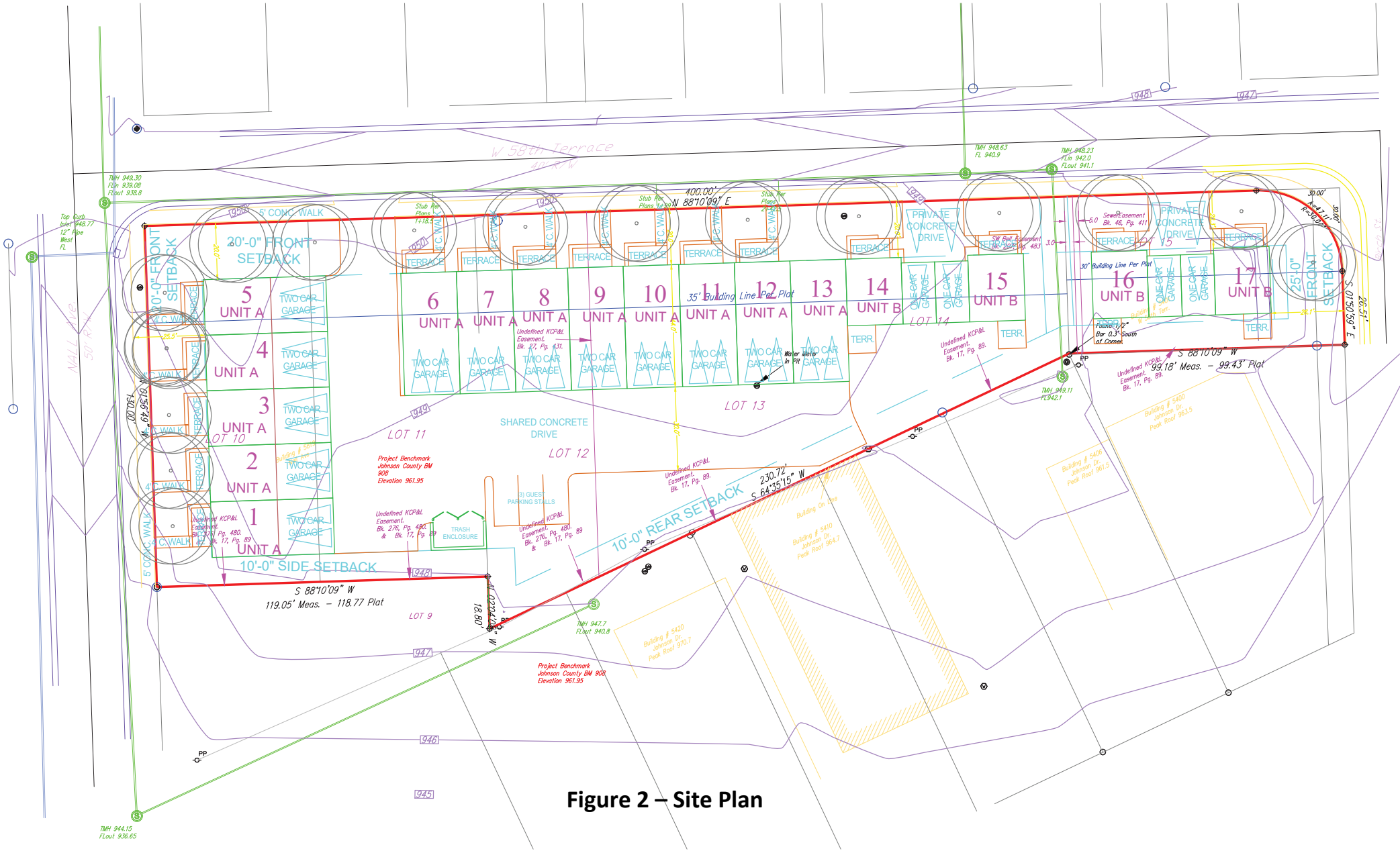


Figure 2 – Site Plan

APPENDIX II

Results of Trip Generation Analysis
Using
The ITE Trip Generation Manual, 11th Edition

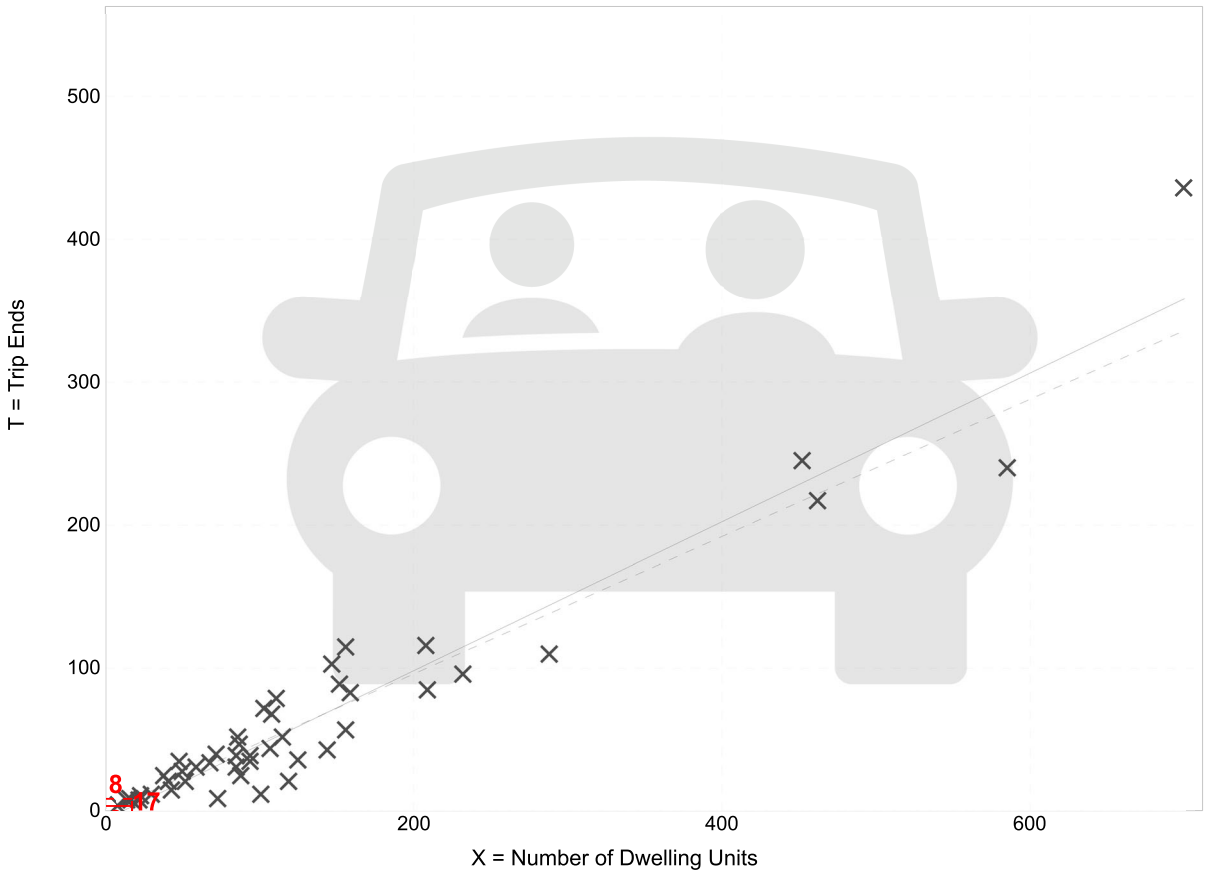
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	46
Avg. Num. of Dwelling Units:	135
Directional Distribution:	31% entering, 69% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Single-Family Attached Housing
(215)

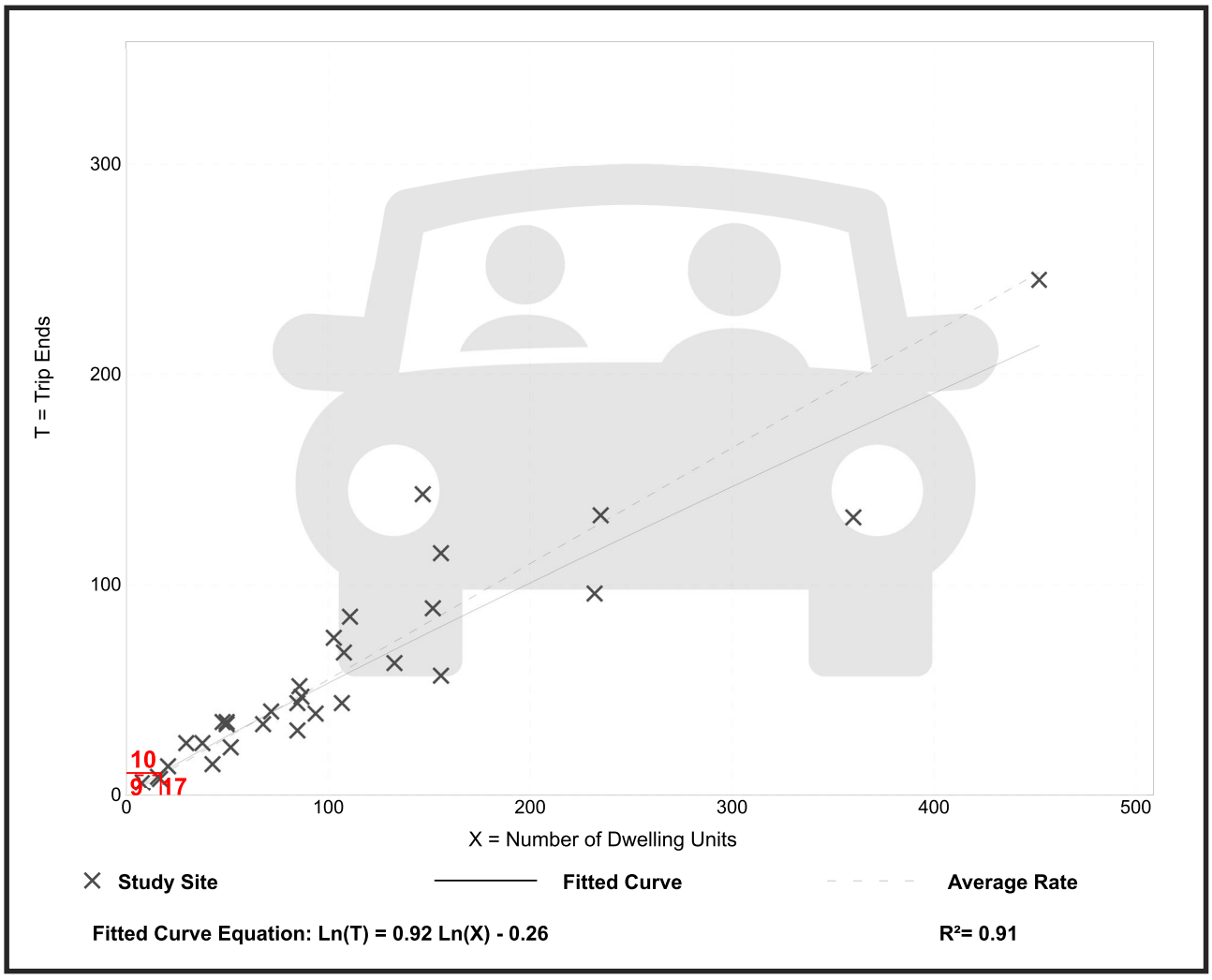
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 31
Avg. Num. of Dwelling Units: 110
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.55	0.35 - 0.97	0.16

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

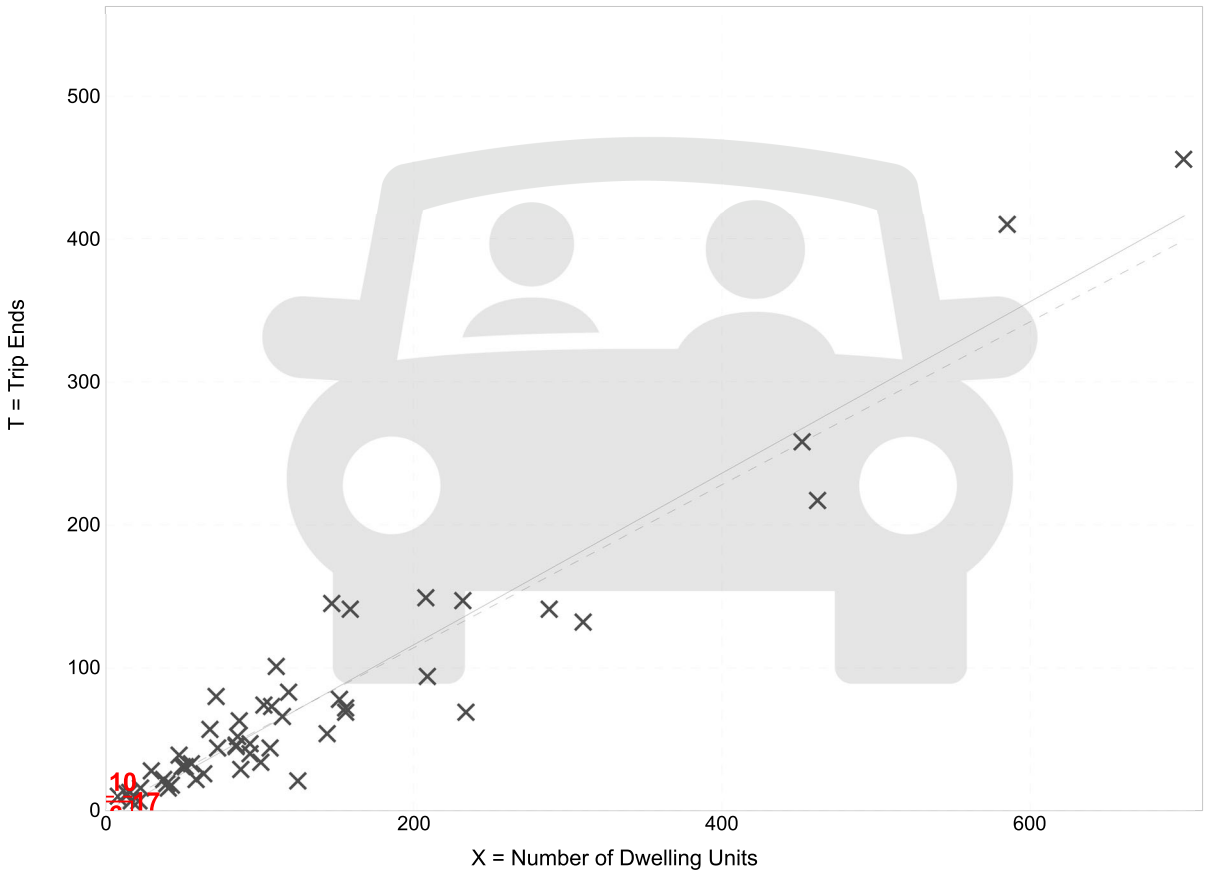
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	51
Avg. Num. of Dwelling Units:	136
Directional Distribution:	57% entering, 43% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Single-Family Attached Housing
(215)

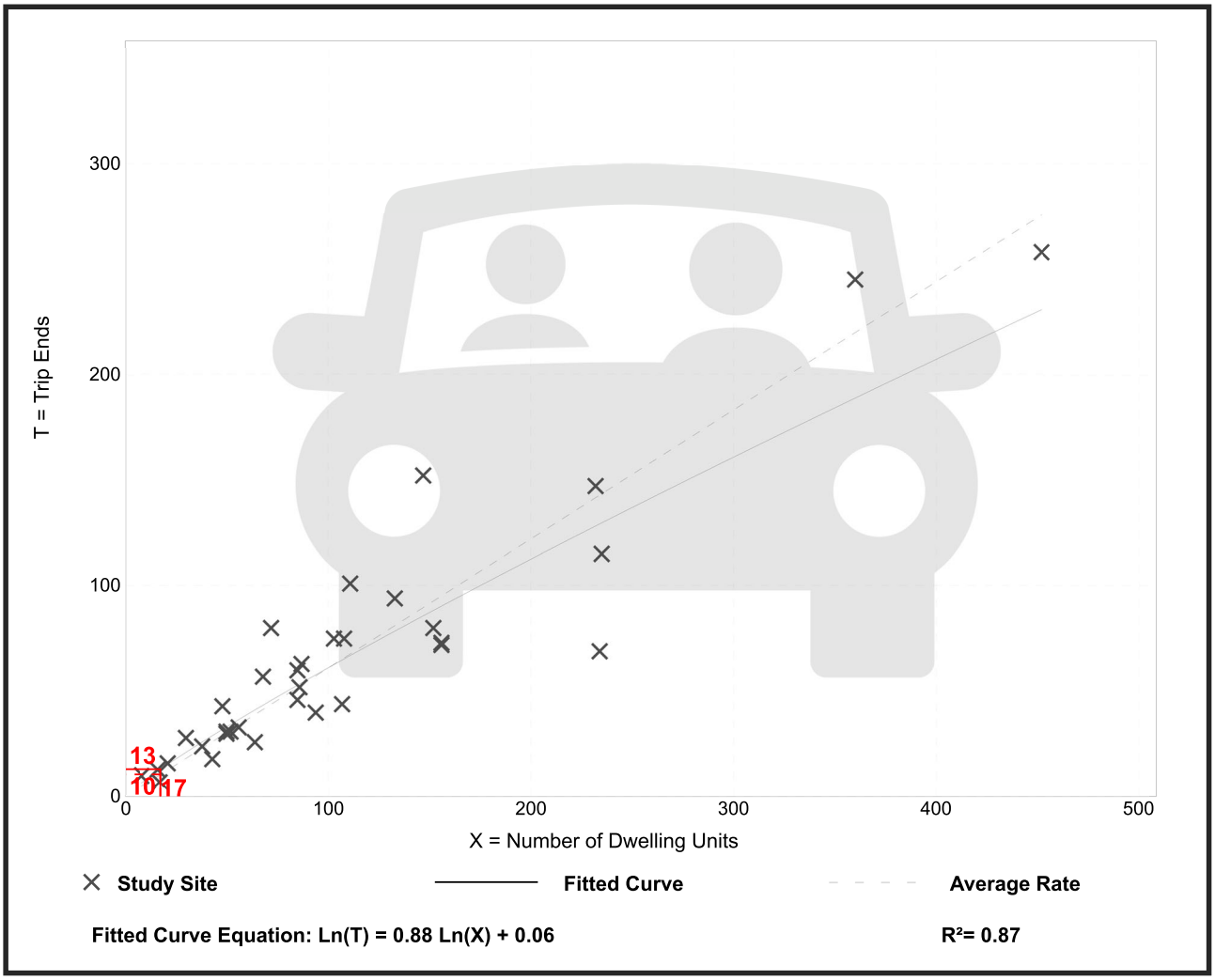
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 34
Avg. Num. of Dwelling Units: 110
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.61	0.29 - 1.25	0.18

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Single-Family Attached Housing
(215)

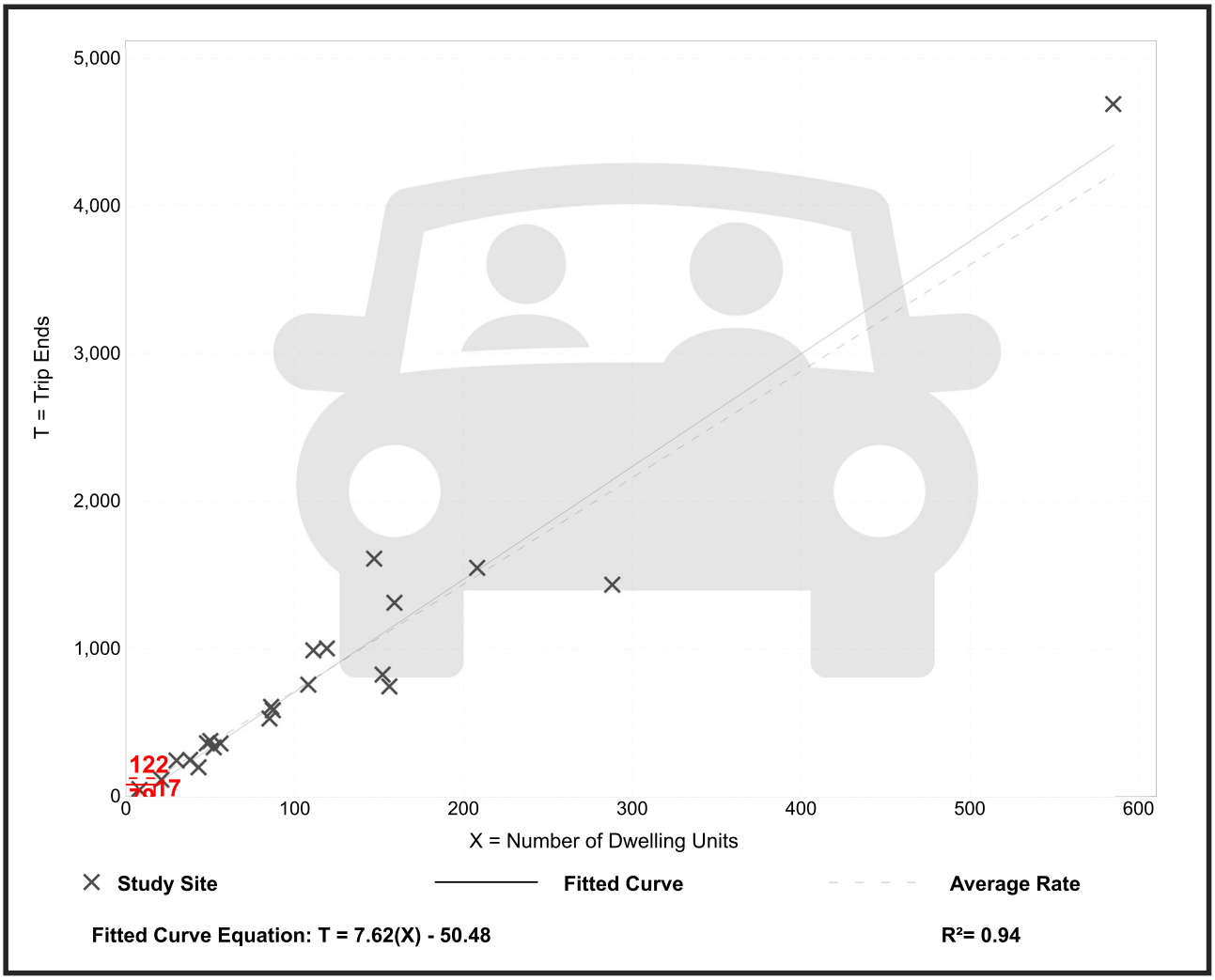
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 22
Avg. Num. of Dwelling Units: 120
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.20	4.70 - 10.97	1.61

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

AT A GLANCE

Applicant:
Koenig Building + Construction

Location:
58th Terrace and Nall Avenue

Property ID:
KP350000000012A, KP350000000012B, KP350000000013, KP350000000014, KP350000000015

Current Zoning:
"DND" Downtown Neighborhood District

Proposed Zoning:
N/A

Current Land Use:
Vacant

Proposed Land Use:
Multi-family Townhomes

N/A Public Hearing Required

Legal Notice Date:
N/A

Case Number:
#23-02

Project Name:
5819 Nall Townhomes Final Plat

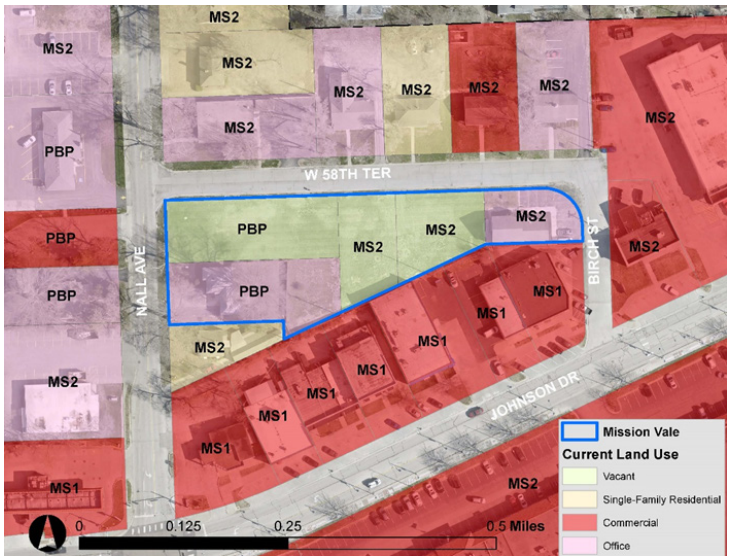
Project Summary:
The applicant is requesting approval of a final plat for the consolidation of six parcels into one lot for a future multi-family townhome development. The project site is at the southeast corner of West 58th Terrace and Nall Avenue. The preliminary plat was approved by City Council at its October 2022 meeting.

Staff Contact:
Karie Kneller

Background and Property Information

The site formerly contained existing vacant office buildings and surface parking that have been removed by the applicant/property owner. Surrounding properties are a mix of office and commercial uses zoned “PBP,” “MS1,” and “MS2.” The structure to the south of the site on Nall Avenue is zoned “MS2” containing a single-family residence.

The site is served by water, gas, sanitary sewer, and electrical utilities. A sanitary sewer easement runs north and south between the easternmost parcel and the adjacent property to the west. A gas utility easement is located parallel to the southern property line about 22 feet inside the property boundary, and overhead electrical along with a water main run along the property line on the south.



Project Proposal

The property has been rezoned “DND” Downtown Neighborhood District, which will be recorded with the Johnson County Register of Deeds. The preliminary plat was approved by the City Council at its October 2022 meeting, and the plat will consolidate six parcels into one lot known as “5819 Nall Townhomes.” This final plat proposal provides for the easements and lot consolidation that were part of the approved preliminary plat.

Plan Review and Analysis

Municipal Code

Mission municipal code at §440.220 states that Preliminary Plats shall be approved by the Planning Commission if it determines that:

1. The proposed preliminary plat conforms to the requirements of this Title, the applicable zoning district regulations and any other applicable provisions of this Code, subject only to acceptable rule exceptions.

Analysis: It is Staff’s determination that the proposed plat is in conformance with the requirements, applicable zoning regulations and provisions.

2. The subdivision or platting represents an overall development pattern that is consistent with the Master Plan and the Official Street Map.

Analysis: It is Staff's determination that the plat represents a development pattern already established and supported by the Comprehensive Plan.

3. The plat contains a sound, well-conceived parcel and land subdivision layout which is consistent with good land planning and site engineering design principles.

Analysis: It is Staff's determination that the plat supports good land planning and allows for future redevelopment in compliance with adopted standards.

4. The spacing and design of proposed curb cuts and intersection locations is consistent with good traffic engineering design and public safety considerations.

Analysis: It is Staff's determination that the plat does not propose changes to curb cuts or intersections.

5. All submission requirements have been satisfied.

Analysis: All the submission requirements of 440.220-Submission of Preliminary Plats have been satisfied.

Recommendation

Staff recommends that the Planning Commission approve Case #23-02, 5819 Nall Townhomes Final Plat.

Planning Commision Action

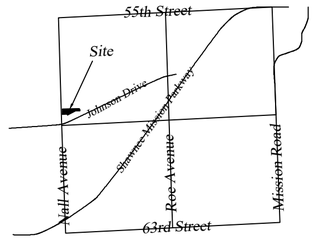
The Planning Commission will consider the final plat at their February 27, 2023 meeting.

City Council Action

No action.

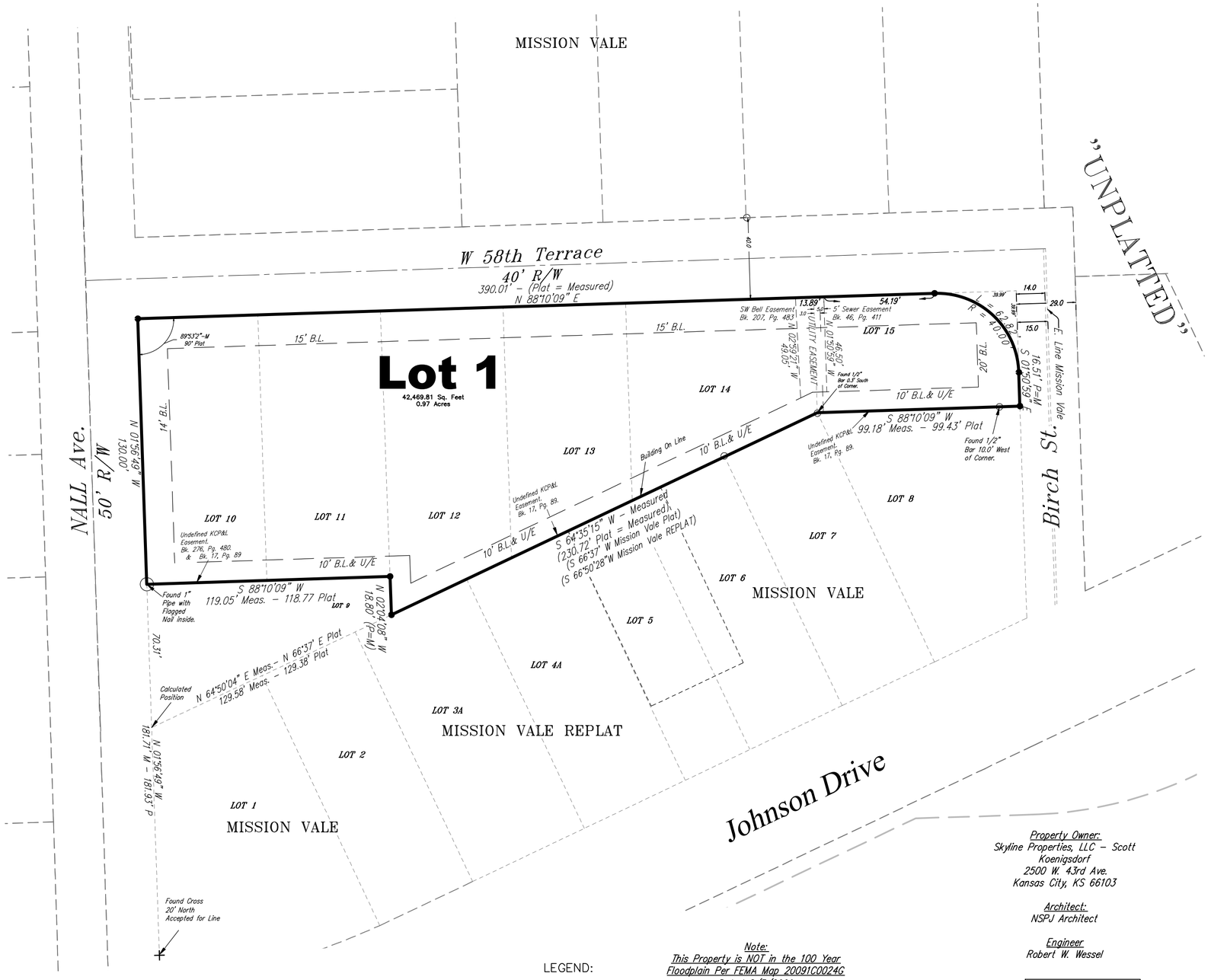
Final Plat
5819 Nall Townhomes
Lot 1

A SUBDIVISION OF LAND IN THE CITY OF MISSION, JOHNSON COUNTY, KANSAS
A Replat of Lots 10 thru 15, MISSION VALE
NW 1/4 of Section 9, T12S, R25E



LOCATION MAP
SEC. 9, T12S, R25E

1 Mile = 2"



Description:

This is a resurvey and replat of Lots 10, 11, 12, 13, 14 and 15, MISSION VALE, a subdivision in the City of Mission, Johnson County, Kansas,

Containing 42,620.0 Square Feet, or 0.9784 Acres +/-
Closure Precision = 1 part in 141,009.9

The undersigned proprietor of the above described tract of land has caused the same to be subdivided in the manner as shown on the accompanying plat, which subdivision and plat shall hereafter be known as "5819 Nall Townhomes", a subdivision in the City of Mission, Johnson County, Kansas.

The proprietors, successors, and assigns, of property described on this plat hereby dedicate for public use all land described on this plat as streets or public ways not heretofore dedicated. Acceptance of the dedication of land for public right-of-way purposes described on this plat is for the sole purpose of maintaining right-of-way, and does not constitute acceptance of any terms or conditions set forth in any agreement not shown on this plat.

In accordance with KSA 12-512b, all rights, obligations, reservations, easements, or interest not shown on this plat shall be vacated as to use and as to title, upon filing and recording of this plat. The proprietors, successors, and assigns, of property shown on this plat hereby absolve and agree, jointly and severally, to indemnify the City of Mission, Kansas, of any expense incident to the relocation of any existing utility improvements heretofore installed and required to be relocated in accordance with proposed improvements described in this plat.

An easement is hereby granted to the City of Mission, Kansas to enter upon, construct, maintain, use, and authorize the location, of conduits for providing water, gas, cable, electric, sewers, and other utility services, including related facilities and appurtenances thereto, and drainage facilities, upon, under, over, and across those areas outlined and designated on this plat as "Utility Easement" or "U/E", and further, subject to administration and regulation by the City, the subordinate use of such areas by other governmental entities and utilities, franchised or authorized to do business in the City of Mission, Kansas.

The undersigned proprietor of the above described land hereby consents and agrees that the Governing Body of any special assessment district shall have the power to release such land proposed to be dedicated for streets and roads, or parts thereof, for public use from the lien and effect of any special assessments, and that the amount of the unpaid special assessments on such land dedicated, shall become and remain a lien on the remainder of this land fronting or abutting on such dedicated road or street.

IN TESTIMONY WHEREOF, the undersigned proprietor of the above described tract of land has caused this instrument to be executed this _____day of_____ 20 ____.

SKYLINE PROPERTIES, L.L.C.
BY: SCOTT KOENIGSDORF PARTNER

_____
SCOTT KOENIGSDORF

STATE OF KANSAS)
) SS
COUNTY OF JOHNSON)

BE IT REMEMBERED, that on this_____day of_____ 20_____, before me, a Notary Public in and for said County and State, came SCOTT KOENIGSDORF OF SKYLINE PROPERTIES, LLC, who executed the within instrument of writing on behalf of said Corporation, and such person duly acknowledged the execution of the same to be the act and deed of said Corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and seal on the day and year last written above.

_____ *My Appointment Expires:*_____
Notary Public

APPROVALS

APPROVED BY, the City Council of the City of Mission, Johnson County, Kansas. on this_____day of_____ 20_____.

_____ *ATTEST*_____
SOLANA FLORA, MAYOR *ROBYN FULKS, CITY CLERK*

APPROVED BY, the Planning Commission of the City of Mission, Johnson County, Kansas. on this_____day of_____ 20 ____.

_____
KIMBERLY STEFFENS, PLANNING COMMISSION SECRETARY

_____
MIKE LEE, PLANNING COMMISSION CHAIRPERSON

Property Owner:
Skyline Properties, LLC - Scott Koenigsdorf
2500 W. 43rd Ave.
Kansas City, KS 66103

Architect:
NSPJ Architect

Engineer
Robert W. Wessel

LOT AREA:
Lot 1 = 42,469.8 Sq.Ft.
0.975 Acres +/-

Closure Calculations:
Area: 42469.81 S.F., 0.9750 Acres
Total Perimeter Distance: 1067.09
Closure Error Distance: 0.01
Error Bearing: N 87°41'16" W
Closure Precision: 1 in 121132.5

LEGEND:

O	DENOTES 1/2" REBAR FOUND ORIGIN UNKNOWN (Unless Otherwise Noted)
●	DENOTES 1/2" REBAR SET CAP # 1093
B.L.	DENOTES BUILDING LINE
U/E	DENOTES UTILITY EASEMENT
SS/E	DENOTES SANITARY SEWER EASEMENT
D/E	DENOTES DRAINAGE EASEMENT
P	PLATTED DISTANCE
M	MEASURED DISTANCE

Note:
This Property is NOT in the 100 Year Floodplain Per FEMA Map 20091C0024G Dated 8/3/2009

NORTH
0 40'
SCALE IN FEET
Date: 7.19/22

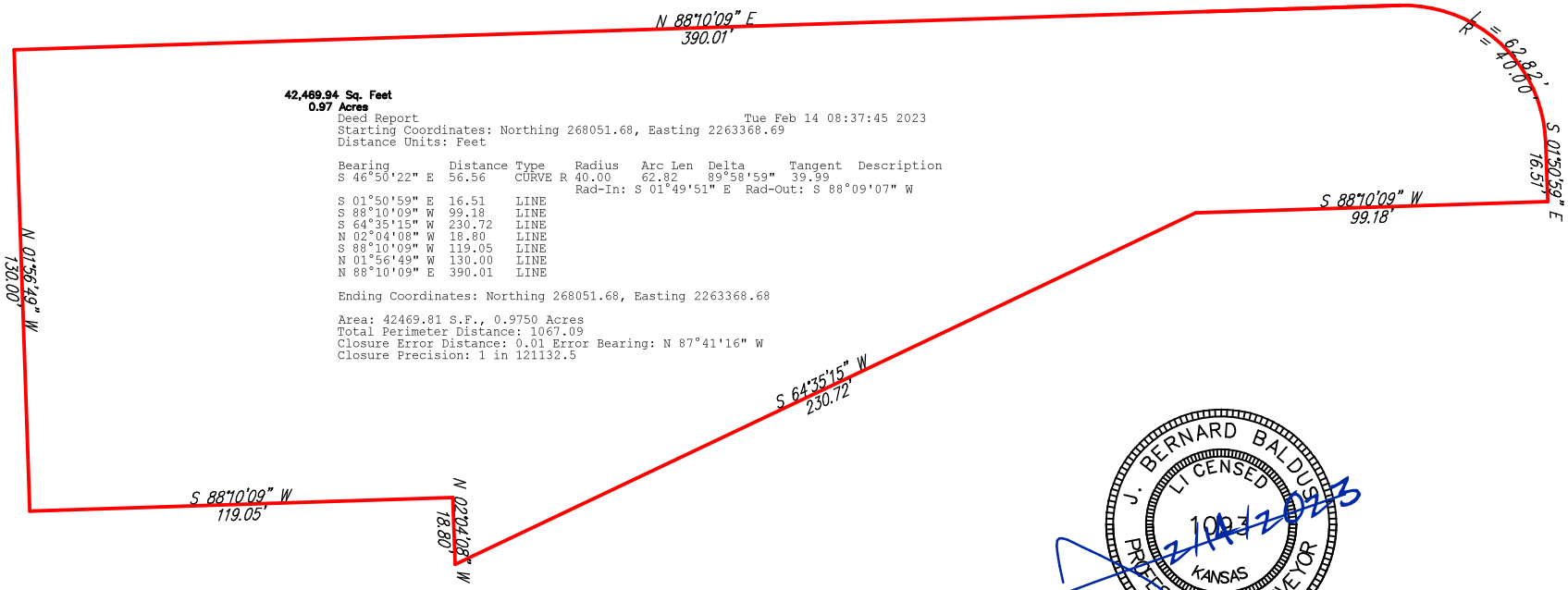
Note:
The South line of this Plat does not match the Original Plat Bearings of Mission Vale and Mission Vale Replat as they do not match each other (As shown). Basis of Bearings is Kansas State Plane Coordinates. The North Line of this plat is N 88°10'09" E.

J. BERNARD BALDUS
LICENSED
10/17/2022
KANSAS
PROFESSIONAL SURVEYOR

I hereby Certify that the above Drawing is the result of an actual survey performed under my direct supervision which meets or exceeds the current Minimum Standards for Property Boundary Surveys according to K.A.R. 66-12-1. to the best of my knowledge, information and belief.

LAND SURVEY COMPANY
A Division of Migar Enterprises, Inc.
Certificate of Authority: KS, LS#79 - MO, #000224
Quality since 1959
P.O. BOX 528, GRANDVIEW, MISSOURI 64030
PHONE: (816) 966-0839 FAX: (816) 763-1761

CALCULATION SHEET



42,469.94 Sq. Feet
0.97 Acres

Deed Report Tue Feb 14 08:37:45 2023
Starting Coordinates: Northing 268051.68, Easting 2263368.69
Distance Units: Feet

Bearing	Distance	Type	Radius	Arc Len	Delta	Tangent	Description
S 46°50'22" E	56.56	CURVE R	40.00	62.82	89°58'59"	39.99	
			Rad-In: S 01°49'51" E Rad-Out: S 88°09'07" W				
S 01°50'59" E	16.51	LINE					
S 88°10'09" W	99.18	LINE					
S 64°35'15" W	230.72	LINE					
N 02°04'08" W	18.80	LINE					
S 88°10'09" W	119.05	LINE					
N 01°56'49" W	130.00	LINE					
N 88°10'09" E	390.01	LINE					

Ending Coordinates: Northing 268051.68, Easting 2263368.68

Area: 42469.81 S.F., 0.9750 Acres
Total Perimeter Distance: 1067.09
Closure Error Distance: 0.01 Error Bearing: N 87°41'16" W
Closure Precision: 1 in 121132.5

J. BERNARD BALDUS
LICENSED
1093
KANSAS
PROFESSIONAL SURVEYOR

2/14/2023

LAND SURVEY COMPANY
A Division of Migar Enterprises, Inc.
Certificate of Authority: KS, LS#79 - MO, #000224
Quality since 1959
P.O. BOX 528, GRANDVIEW, MISSOURI 64030
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