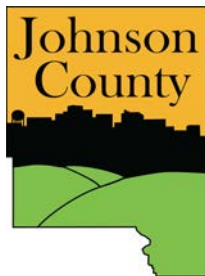


PLANNING APPLICATION COVER SHEET**PROJECT TYPE: Site Plan****NO. SP26-000002****APPLICATION DATE: 02/27/2026****PROPERTY OWNER: JORDAN CREEK CHURCH INC****APPLICANT: Paul Desmond****WORK DESCRIPTION: Site of Jordan Creek Church****SITE ADDRESS:****PROPERTY INFORMATION**

Parcel ID (PPN)	Acres in Parcel	Current zoning classification
0215451004	11.23	A - Agricultural

**Planning, Development and Sustainability****913 S. Dubuque St. Iowa City, IA 52240****planning@johnsoncountyiowa.gov. 319-356-6083****<https://www.johnsoncountyiowa.gov/pds>**

To Elevate the Everyday.

“Story Telling of the Built Environment”

Jordan Creek Church - Johnson County Site Plan

Initial Site Plan Submission

August 14th, 2026





Form Function Studio

Design For More.

Cover Letter - Site Plan Submission - Johnson County - Jordan Creek Church

Johnson County - Planning, Development, + Zoning

PDZ Team,

We are currently working on designing Jordan Creek Church within Johnson County at the parcel - 0215451004

Per Site Plan Requirements:

- Jordan Creek Church - A place of Worship - Christian
- Days and Hours of Operations:
 - Monday, Tuesday, Thursday, Friday - 8a - 5p [Office Hours, no worship]
 - Wednesday - 8a - 9p [Children's Ministry]
 - Saturday - Closed [Unless Wedding Ceremony / Private Event]
 - Sunday - 8a - 2p [Open to Public for Worship]
- Expected Number of FT Employees: 4
- Parking:
 - Phase 1 - 82 Stalls, 4 ADA
 - Phase 2 - 48 Stalls added
 - Code Minimum [1 Space / 6 Seats]
- Plan for Water / Septic: Attached
 - Public Well + Private Septic + Field

This is the first submission for feedback on our Site Plan that will be used to gauge feedback from Johnson County and the City of Solon due to the Fringe Area Agreement.

Let me know if there are any questions, comments, or additional needs.

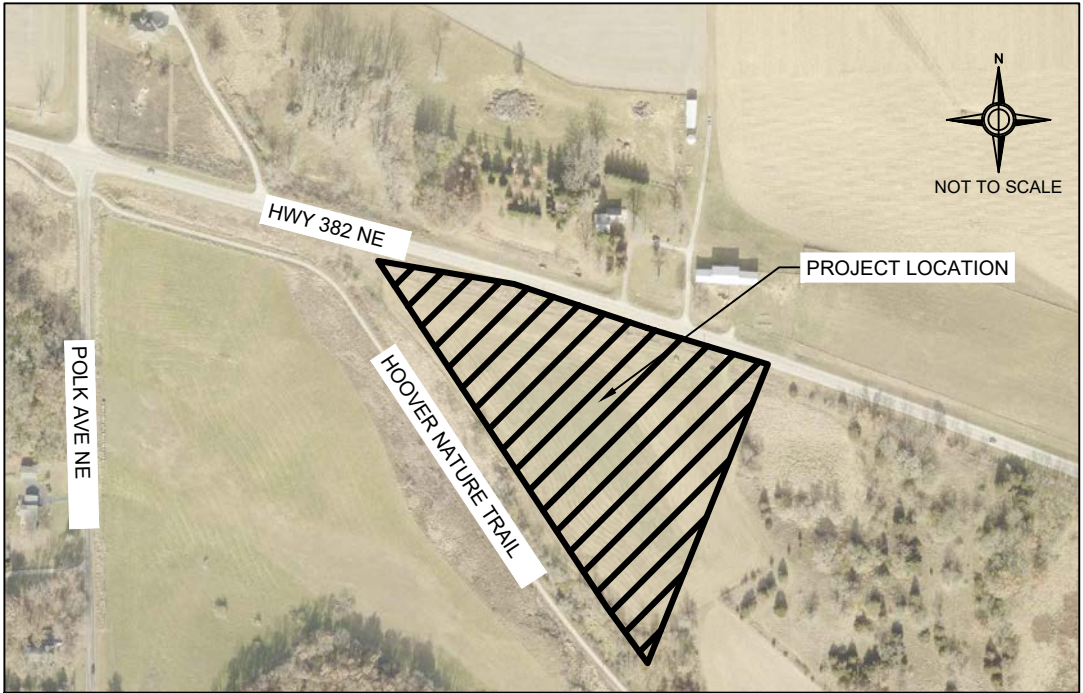
Paul R. Desmond AIA, LEED AP BD+C

847.858.6551

paul@formfunctionstudio.com

26.08.14

PLAN FOR:
JORDAN CREEK CHURCH SITE PLAN
4237 HWY 382 NE SOLON, IA 52333
ABES PROJECT NUMBER: 224074



LOCATION MAP

NOTE:

THE PROPOSED IMPROVEMENTS INCLUDED IN THESE DRAWINGS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE CURRENT VERSION OF THE STATEWIDE URBAN DESIGN AND SPECIFICATIONS WITH THE FOLLOWING EXCEPTIONS:

- NONE

LEGAL DESCRIPTION:

AUDITOR'S PARCEL 2025023 LYING NE OF RR IN SECTIONS 15 & 22, TWP 81 RANGE 6 AS DESC IN SURVEY BK 68 PG 231

UTILITY AND EMERGENCY PHONE NUMBERS

CITY OF SOLON, IOWA	CITY HALL	(319) 624-3755
	PUBLIC WORKS	(319) 624-3755
POLICE DEPARTMENT	BUSINESS	(319) 356-6020
	EMERGENCY	911
FIRE DEPARTMENT	BUSINESS	(319) 624-2386
	EMERGENCY	911
ONE CALL (UTILITIES)		(800) 292-8989
IOWA DEPARTMENT OF TRANSPORTATION	DISTRICT ENGINEER	(319) 364-0235
	MAINTENANCE GARAGES	(319) 365-3558
MEDIACOM		(319) 393-1914
WINSTREAM		(877) 340-2600
MID AMERICAN ENERGY		(888) 427-5632
CENTURY LINK		(800) 475-7526
USA COMMUNICATIONS		(319) 436-2224
CORRIDOR ENERGY COOPERATIVE		(319) 377-1587
ALLIANT ENERGY		(800) 255-4288
IMON CABLE		(319) 261-2000

INDEX OF SHEETS

SHEET No.	DESCRIPTION
C001	TITLE SHEET AND INDEX OF DRAWINGS
C100	SITE TOPOGRAPHIC SURVEY AND CONTROL AND REMOVALS
C200	SITE EROSION CONTROL PLAN
C300	SITE LAYOUT & PAVING PLAN
C400 - C401	SITE UTILITY PLAN
C500	SITE GRADING PLAN
C501 - C502	SPOT ELEVATION PLAN
C600 - C603	SITE DETAILS AND NOTES

COUNTY APPROVAL



I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

DREW J. DIGMAN IOWA LICENSE NO. 30860

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2027

PAGES COVERED BY THIS SEAL: ALL 'C' SHEETS

LEGEND	
Existing	Proposed
ACC Gravel	PCC Drive
Curb Building Centerline	Curb Building Centerline
CATV	CATV
Electric (Underground)	Electric (Underground)
Electric (Overhead)	Electric (Overhead)
Fiber Optic Cable	Fiber Optic Cable
Force Main	Force Main
Gas	Gas
Sanitary Sewer (Size Unknown)	Sanitary Sewer (Size Unknown)
6" Sanitary Sewer	6" Sanitary Sewer
8" Sanitary Sewer	8" Sanitary Sewer
Storm Sewer (Size Unknown)	Storm Sewer (Size Unknown)
6" Storm Sewer	6" Storm Sewer
12" Storm Sewer	12" Storm Sewer
Subdrain	Subdrain
Steam	Steam
Telephone	Telephone
Water (Size Unknown)	Water (Size Unknown)
8" Water	8" Water
10" Water	10" Water
Fence	Fence
Wall	Wall
Right of Way	Right of Way
Utility Easement	Utility Easement
Temporary Construction Easement	Temporary Construction Easement
Boundary Line	Boundary Line
Adjoining Lot Line	Adjoining Lot Line
Section Line	Section Line
Proposed Property Lot Line	Proposed Property Lot Line
Building Setback	Building Setback
Grading Limits	Grading Limits
Light Pole w/o Mast	Light Pole w/o Mast
Fire Hydrant	Fire Hydrant
Utility Pole	Utility Pole
Guy Anchor	Guy Anchor
Telephone Pedestal	Telephone Pedestal
Handhole	Handhole
Utility/Control Cabinet	Utility/Control Cabinet
Drainage/Sanitary/Utility Manhole	Drainage/Sanitary/Utility Manhole
Grate Intake	Grate Intake
RA-3 or RA-5 Intake	RA-3 or RA-5 Intake
RA-6 Intake	RA-6 Intake
RA-8 Intake	RA-8 Intake
Valve, Water or Gas	Valve, Water or Gas
Valve Manhole	Valve Manhole
Cleanout, Storm or Sanitary	Cleanout, Storm or Sanitary
Water Blowoff	Water Blowoff
Flared End Section	Flared End Section
Benchmark	Benchmark
Soil Boring	Soil Boring
Light Pole w/ Mast	Light Pole w/ Mast
Traffic Signal	Traffic Signal
Mailbox	Mailbox
Bollard	Bollard
CATV Pedestal	CATV Pedestal
Sign	Sign
Well	Well
Deciduous Tree	Deciduous Tree
Coniferous Tree	Coniferous Tree
Bush	Bush

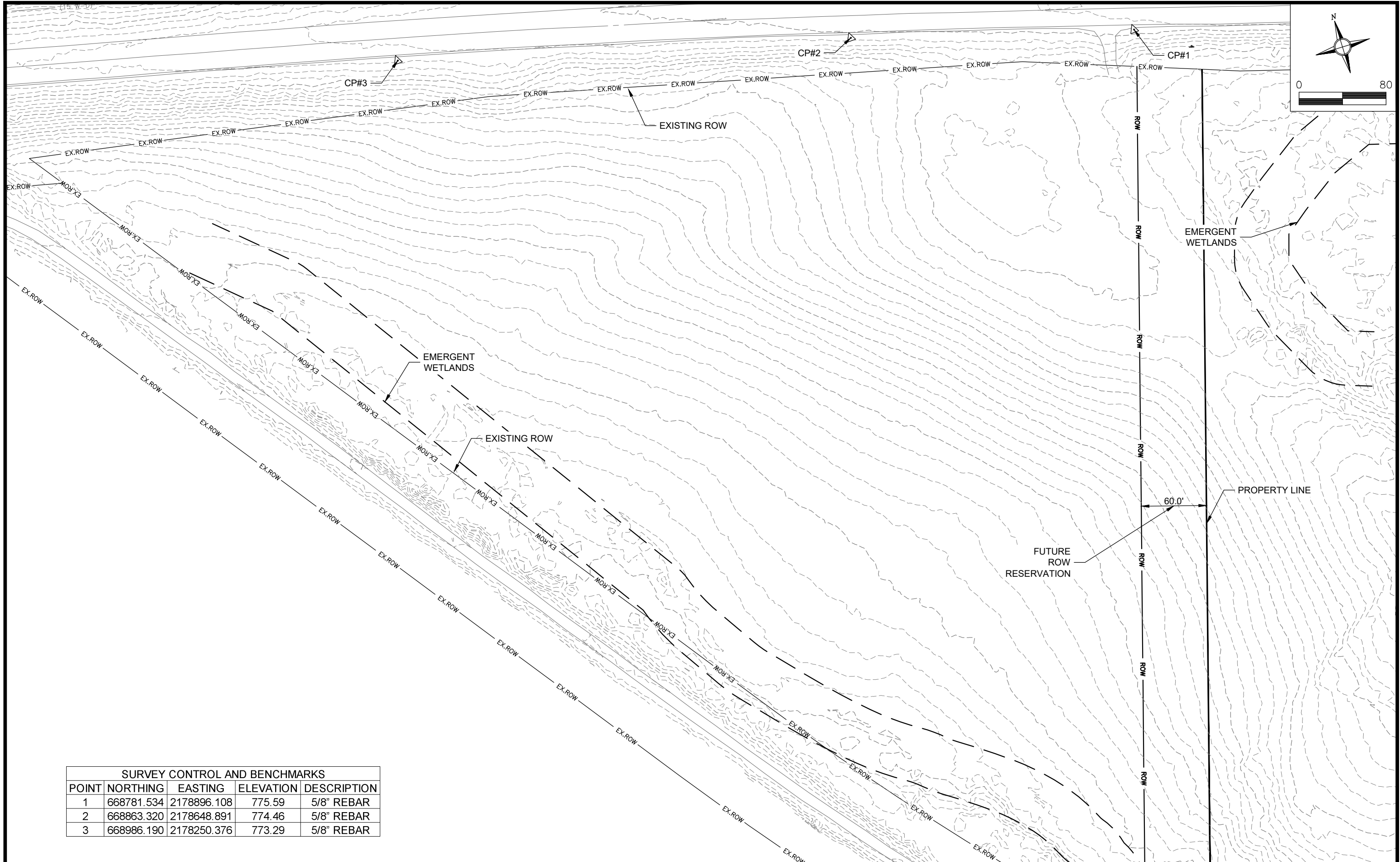
TITLEHOLDER	JORDAN CREEK CHURCH
TELEPHONE NUMBER	(847) 858-6551
EMAIL ADDRESS	paul@formfunctionstudio.com
MAILING ADDRESS	101 16TH AVENUE SW, SUITE A CEDAR RAPIDS, IA 52404

CONTACT PERSON	DREW J. DIGMAN, PE
TELEPHONE NUMBER	(319) 377-4629
FAX NUMBER	(319) 377-8498
EMAIL ADDRESS	ddigman@anderson-bogert.com
MAILING ADDRESS	4050 River Center Court NE Cedar Rapids, IA 52402
DATE SUBMITTED	8/28/2026
DATE REVISED	



PLANS PREPARED BY:
ANDERSON BOGERT
4050 RIVER CENTER CT NE, CEDAR RAPIDS, IA 52402
PHONE: 319-377-4629

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SURVEY CONTROL AND BENCHMARKS				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	668781.534	2178896.108	775.59	5/8" REBAR
2	668863.320	2178648.891	774.46	5/8" REBAR
3	668986.190	2178250.376	773.29	5/8" REBAR

NO.	REVISION DESCRIPTION	APPROVED	DATE

CLIENT: FORM FUNCTION STUDIO
1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551



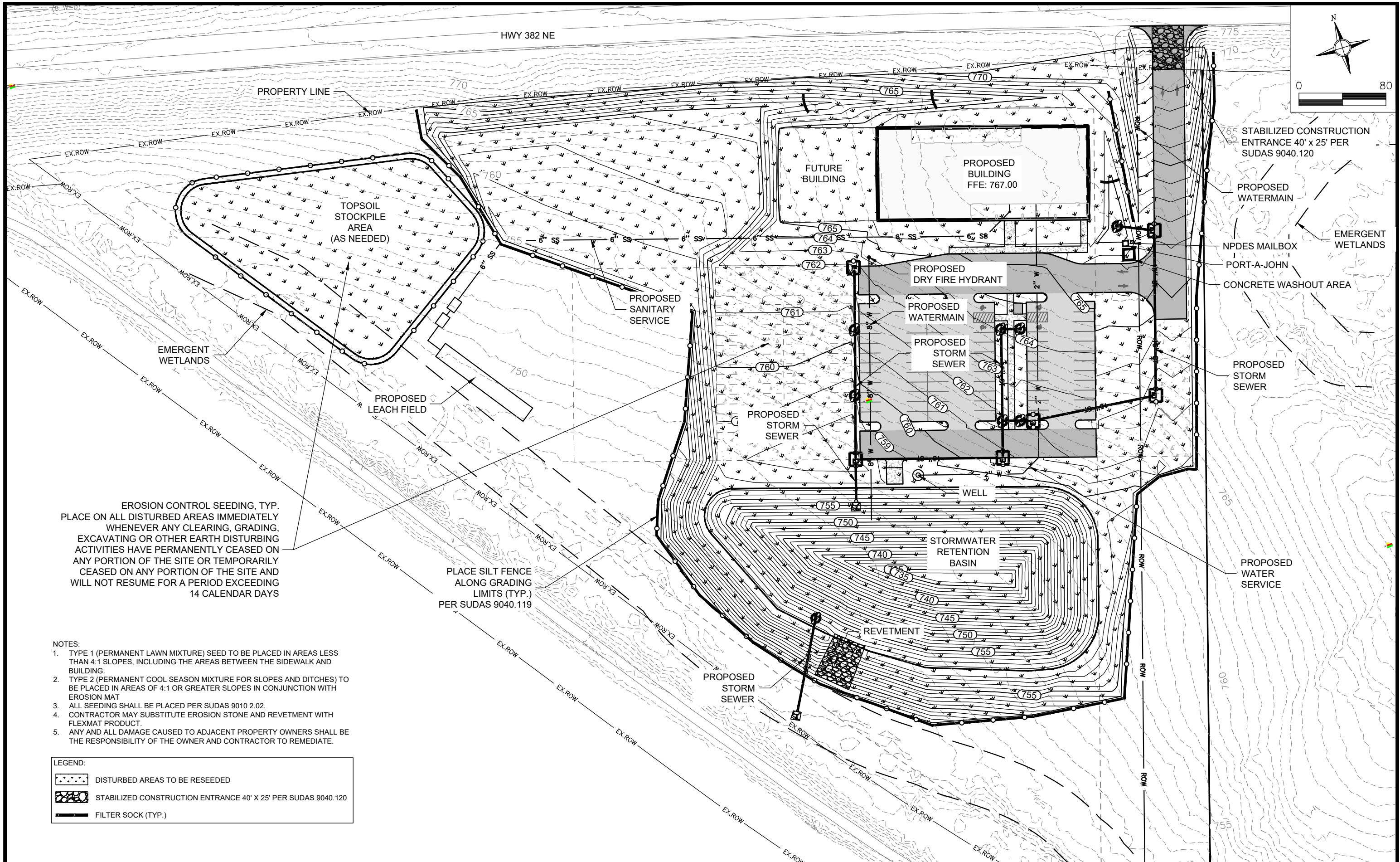
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PROJECT NO. 224074
APPROVED BY: DJD
SCALE: PLAN

JORDAN CREEK CHURCH
SOLON, IA

SITE TOPOGRAPHIC SURVEY,
CONTROL POINTS & DEMO
PLAN

SHEET NO.
C100
OF
C100

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EROSION CONTROL SEEDING, TYP.
PLACE ON ALL DISTURBED AREAS IMMEDIATELY
WHENEVER ANY CLEARING, GRADING,
EXCAVATING OR OTHER EARTH DISTURBING
ACTIVITIES HAVE PERMANENTLY CEASED ON
ANY PORTION OF THE SITE OR TEMPORARILY
CEASED ON ANY PORTION OF THE SITE AND
WILL NOT RESUME FOR A PERIOD EXCEEDING
14 CALENDAR DAYS

PLACE SILT FENCE
ALONG GRADING
LIMITS (TYP.)
PER SUDAS 9040.119

- NOTES:
1. TYPE 1 (PERMANENT LAWN MIXTURE) SEED TO BE PLACED IN AREAS LESS THAN 4:1 SLOPES, INCLUDING THE AREAS BETWEEN THE SIDEWALK AND BUILDING.
 2. TYPE 2 (PERMANENT COOL SEASON MIXTURE FOR SLOPES AND DITCHES) TO BE PLACED IN AREAS OF 4:1 OR GREATER SLOPES IN CONJUNCTION WITH EROSION MAT
 3. ALL SEEDING SHALL BE PLACED PER SUDAS 9010 2.02.
 4. CONTRACTOR MAY SUBSTITUTE EROSION STONE AND REVETMENT WITH FLEXMAT PRODUCT.
 5. ANY AND ALL DAMAGE CAUSED TO ADJACENT PROPERTY OWNERS SHALL BE THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR TO REMEDIATE.

LEGEND:			
	DISTURBED AREAS TO BE RESEED		
	STABILIZED CONSTRUCTION ENTRANCE 40' X 25' PER SUDAS 9040.120		
	FILTER SOCK (TYP.)		

NO.	REVISION DESCRIPTION	APPROVED	DATE

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1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551

ANDERSON BOGERT

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PROJECT NO. 224074

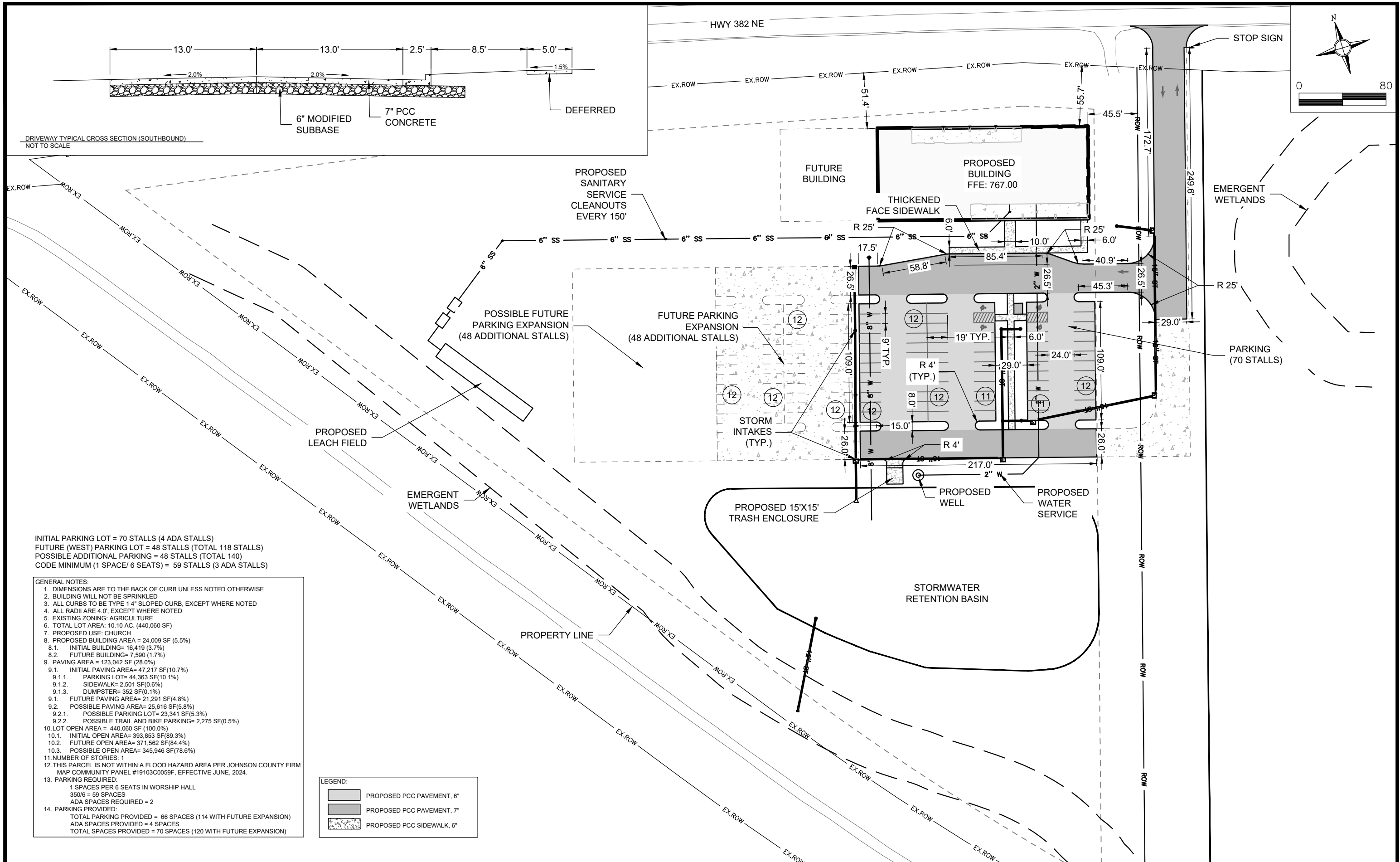
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SCALE: PLAN

JORDAN CREEK CHURCH
SOLON, IA

SITE EROSION
CONTROL PLAN

SHEET NO.
C200
OF
C200

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INITIAL PARKING LOT = 70 STALLS (4 ADA STALLS)
FUTURE (WEST) PARKING LOT = 48 STALLS (TOTAL 118 STALLS)
POSSIBLE ADDITIONAL PARKING = 48 STALLS (TOTAL 140)
CODE MINIMUM (1 SPACE/ 6 SEATS) = 59 STALLS (3 ADA STALLS)

- GENERAL NOTES:
1. DIMENSIONS ARE TO THE BACK OF CURB UNLESS NOTED OTHERWISE
 2. BUILDING WILL NOT BE SPRINKLED
 3. ALL CURBS TO BE TYPE 1 4" SLOPED CURB, EXCEPT WHERE NOTED
 4. ALL RADII ARE 4.0', EXCEPT WHERE NOTED
 5. EXISTING ZONING: AGRICULTURE
 6. TOTAL LOT AREA: 10.10 AC. (440,060 SF)
 7. PROPOSED USE: CHURCH
 8. PROPOSED BUILDING AREA = 24,009 SF (5.5%)
 - 8.1. INITIAL BUILDING= 16,419 (3.7%)
 - 8.2. FUTURE BUILDING= 7,590 (1.7%)
 9. PAVING AREA = 123,042 SF (28.0%)
 - 9.1. INITIAL PAVING AREA= 47,217 SF(10.7%)
 - 9.1.1. PARKING LOT= 44,363 SF(10.1%)
 - 9.1.2. SIDEWALK= 2,501 SF(0.6%)
 - 9.1.3. DUMPSTER= 352 SF(0.1%)
 - 9.1. FUTURE PAVING AREA= 21,291 SF(4.8%)
 - 9.2. POSSIBLE PAVING AREA= 25,616 SF(5.8%)
 - 9.2.1. POSSIBLE PARKING LOT= 23,341 SF(5.3%)
 - 9.2.2. POSSIBLE TRAIL AND BIKE PARKING= 2,275 SF(0.5%)
 10. LOT OPEN AREA = 440,060 SF (100.0%)
 - 10.1. INITIAL OPEN AREA= 393,853 SF(89.3%)
 - 10.2. FUTURE OPEN AREA= 371,562 SF(84.4%)
 - 10.3. POSSIBLE OPEN AREA= 345,946 SF(78.6%)
 11. NUMBER OF STORIES: 1
 12. THIS PARCEL IS NOT WITHIN A FLOOD HAZARD AREA PER JOHNSON COUNTY FIRM MAP COMMUNITY PANEL #19103C0059F, EFFECTIVE JUNE, 2024.
 13. PARKING REQUIRED:
 - 1 SPACES PER 6 SEATS IN WORSHIP HALL
 - 350/6 = 59 SPACES
 - ADA SPACES REQUIRED = 2
 14. PARKING PROVIDED:
 - TOTAL PARKING PROVIDED = 66 SPACES (114 WITH FUTURE EXPANSION)
 - ADA SPACES PROVIDED = 4 SPACES
 - TOTAL SPACES PROVIDED = 70 SPACES (120 WITH FUTURE EXPANSION)

- LEGEND:
- PROPOSED PCC PAVEMENT, 6"
 - PROPOSED PCC PAVEMENT, 7"
 - PROPOSED PCC SIDEWALK, 6"

NO.	REVISION DESCRIPTION	APPROVED	DATE

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CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551

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PROJECT NO. 224074

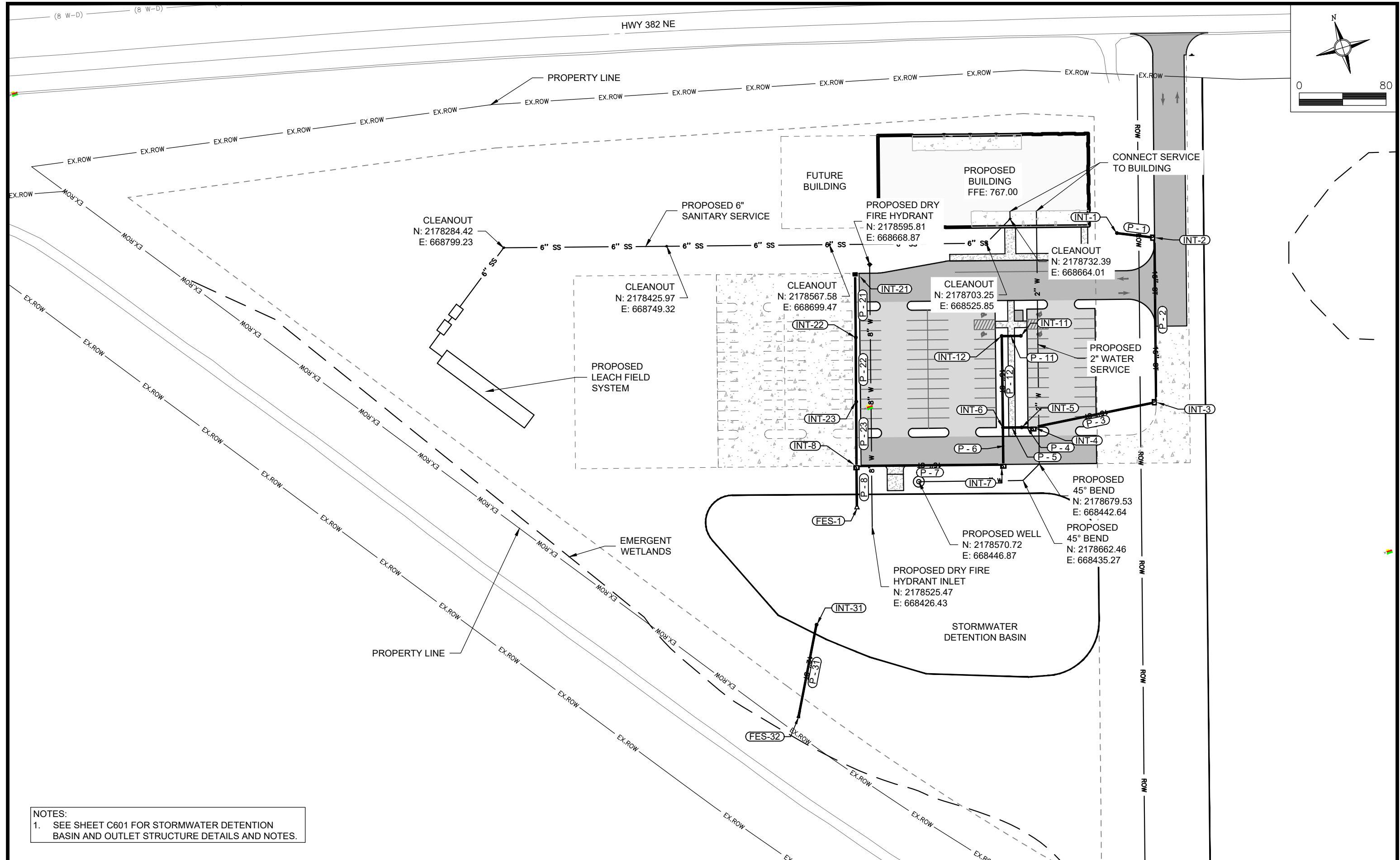
APPROVED BY: DJD
SCALE: PLAN

JORDAN CREEK CHURCH
SOLON, IA

SITE LAYOUT AND PAVING
PLAN

SHEET NO.
C300
OF
C300

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NOTES:
1. SEE SHEET C601 FOR STORMWATER DETENTION BASIN AND OUTLET STRUCTURE DETAILS AND NOTES.

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CLIENT: FORM FUNCTION STUDIO
1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551

ANDERSON **BOGERT**

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DATE: 9/04/26
PROJECT NO. 224074
APPROVED BY: DJD
SCALE: PLAN

JORDAN CREEK CHURCH
SOLON, IA

SITE UTILITY PLAN

SHEET NO.
C400
OF
C401

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STORM SEWER STRUCTURES						
NO.	TYPE	NORTHING	EASTING	FORM GRADE	FLOW LINE(S) IN	FLOW LINE OUT
FES-1	FES-18	668461.33	2178507.83	747.23	8: 746.00 (12") N	
FES-32	FES-12	668299.15	2178391.43	746.67	31: 745.00 (12") NE	
INT-1	SW-512 - 24"	668618.03	2178819.70	763.96		1: 760.80 (12") SE
INT-2	SW-507	668602.32	2178850.74	766.87	1: 760.10 (12") NW	2: 760.10 (12") S
INT-3	SW-507	668459.41	2178800.32	762.43	2: 757.07 (12") N	3: 757.07 (12") W
INT-4	SW-507	668476.35	2178686.16	762.61	3: 754.76 (12") E	4: 754.76 (12") W
INT-5	SW-512 - 24"	668479.93	2178676.02	762.20	4: 754.54 (12") E	5: 754.21 (12") W
INT-6	SW-512 - 30"	668485.65	2178659.80	762.22	12: 758.64 (12") N 5: 753.87 (12") E	6: 753.53 (12") S
INT-7	SW-507	668453.58	2178648.49	761.22	6: 752.85 (12") N	7: 752.52 (12") W
INT-8	SW-507	668498.59	2178520.97	757.62	23: 754.57 (12") N 7: 749.82 (12") E	8: 749.82 (12") S
INT-11	SW-512 - 24"	668559.46	2178704.07	764.20		11: 760.60 (12") W
INT-12	SW-512 - 24"	668565.28	2178687.57	764.05	11: 760.25 (12") E	12: 760.32 (12") S
INT-21	SW-501	668665.81	2178580.44	762.58		21: 759.74 (12") S
INT-22	SW-512 - 24"	668610.02	2178560.76	760.84	21: 758.56 (12") N	22: 758.49 (12") S
INT-23	SW-512 - 24"	668554.30	2178540.86	759.03	22: 756.27 (12") N	23: 755.75 (12") S
INT-31	OUTLET STRUCTURE	668373.84	2178436.35	747.00		31: 745.75 (12") SW

STORM SEWER PIPES								
NO.	TYPE	SIZE	LENGTH	SLOPE	FROM MH	FLOWLINE IN	FLOWLINE OUT	TO MH
P-1	RCP	12	31.6	2.00%	INT-2	760.10	760.80	INT-1
P-2	RCP	15	148.6	2.00%	INT-3	757.07	760.10	INT-2
P-3	RCP	15	112.4	2.00%	INT-4	754.76	757.07	INT-3
P-4	RCP	15	8.3	2.00%	INT-5	754.54	754.76	INT-4
P-5	RCP	15	15.2	2.00%	INT-6	753.87	754.21	INT-5
P-6	RCP	15	31.5	2.00%	INT-7	752.85	753.53	INT-6
P-7	RCP	15	132.3	2.00%	INT-8	749.82	752.52	INT-7
P-8	RCP	18	43.6	8.43%	FES-1	746.00	749.82	INT-8
P-11	RCP	12	15.5	2.00%	INT-12	760.25	760.60	INT-11
P-12	RCP	12	82.4	2.00%	INT-6	758.64	760.32	INT-12
P-21	RCP	12	57.2	2.00%	INT-22	758.56	759.74	INT-21
P-22	RCP	12	57.2	3.76%	INT-23	756.27	758.49	INT-22
P-23	RCP	12	56.7	2.00%	INT-8	754.57	755.75	INT-23
P-31	RCP	12	81.7	1.00%	FES-32	745.00	745.75	INT-31
P-41	RCP	12	27.7	1.00%	FES-42	741.14	741.54	FES-41

NO.	REVISION DESCRIPTION	APPROVED	DATE

CLIENT: FORM FUNCTION STUDIO
1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551



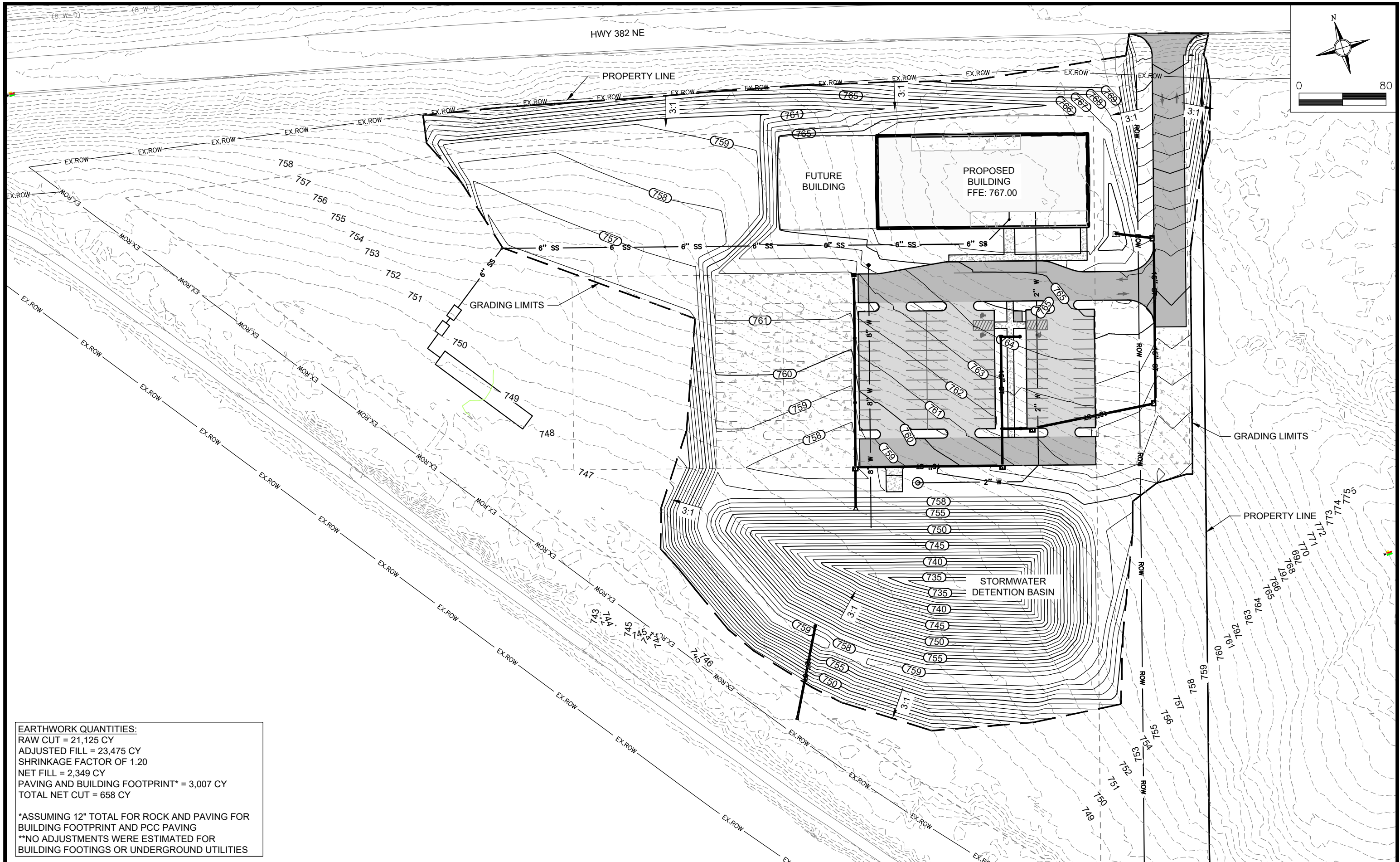
DRAWN BY: DJD
DATE: 9/04/26
PROJECT NO. 224074
APPROVED BY: DJD
SCALE: PLAN

JORDAN CREEK CHURCH
OLON, IA

SITE UTILITY PLAN

SHEET NO.
C401
OF
C401

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EARTHWORK QUANTITIES:

RAW CUT = 21,125 CY
ADJUSTED FILL = 23,475 CY
SHRINKAGE FACTOR OF 1.20
NET FILL = 2,349 CY
PAVING AND BUILDING FOOTPRINT* = 3,007 CY
TOTAL NET CUT = 658 CY

*ASSUMING 12" TOTAL FOR ROCK AND PAVING FOR
BUILDING FOOTPRINT AND PCC PAVING
**NO ADJUSTMENTS WERE ESTIMATED FOR
BUILDING FOOTINGS OR UNDERGROUND UTILITIES

CLIENT: FORM FUNCTION STUDIO
1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551

ANDERSON BOGERT

DRAWN BY: DJD
DATE: 9/04/26
PROJECT NO. 224074

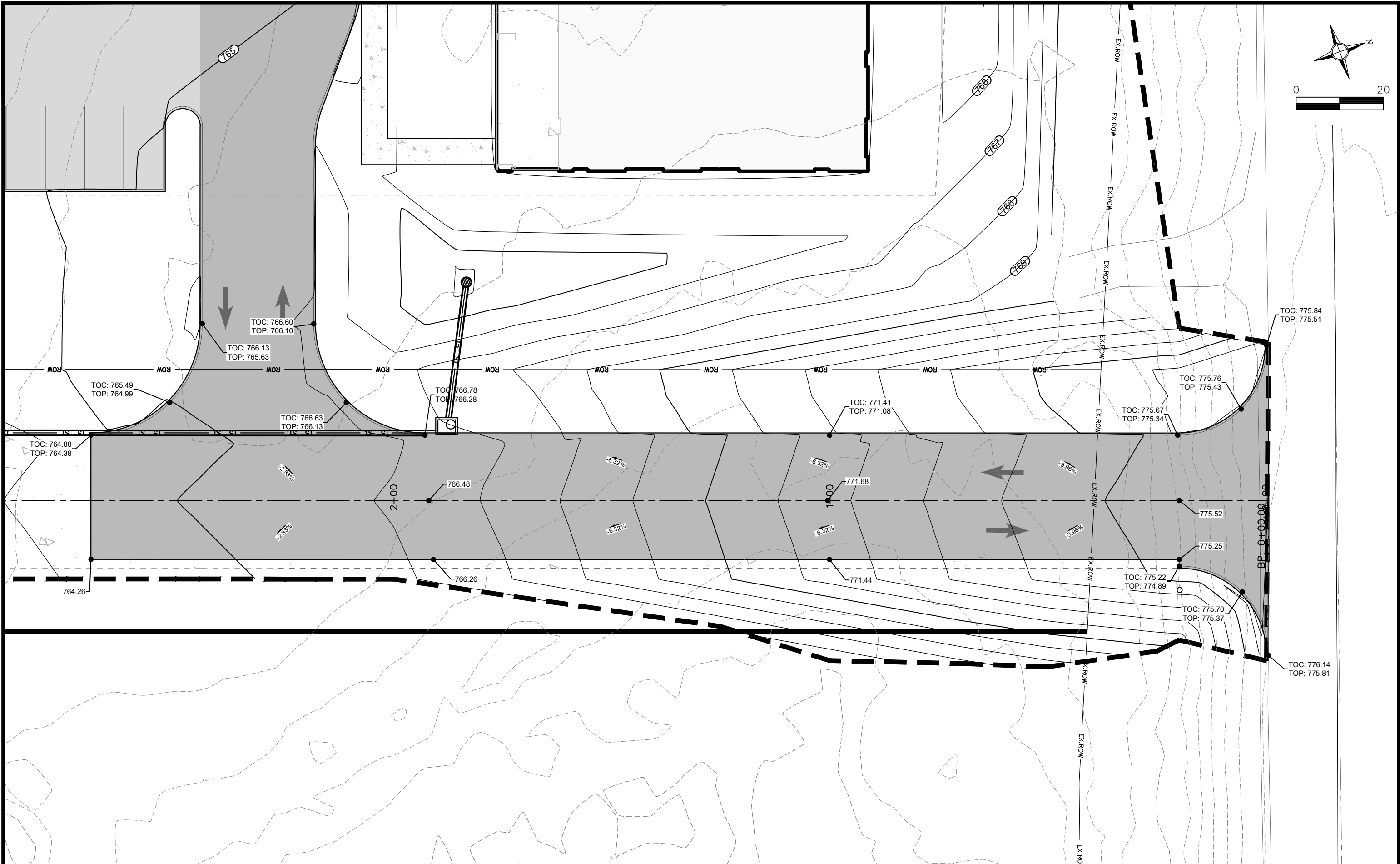
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SCALE: PLAN

JORDAN CREEK CHURCH
SOLON, IA

SPOT GRADING PLAN

SHEET NO.
C500
OF
C502

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NO.	REVISION DESCRIPTION	APPROVED	DATE

CLIENT: FORM FUNCTION STUDIO
1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551



DRAWN BY: DJD
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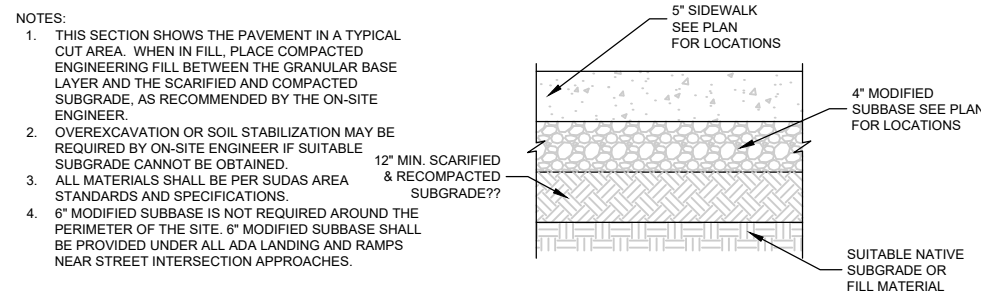
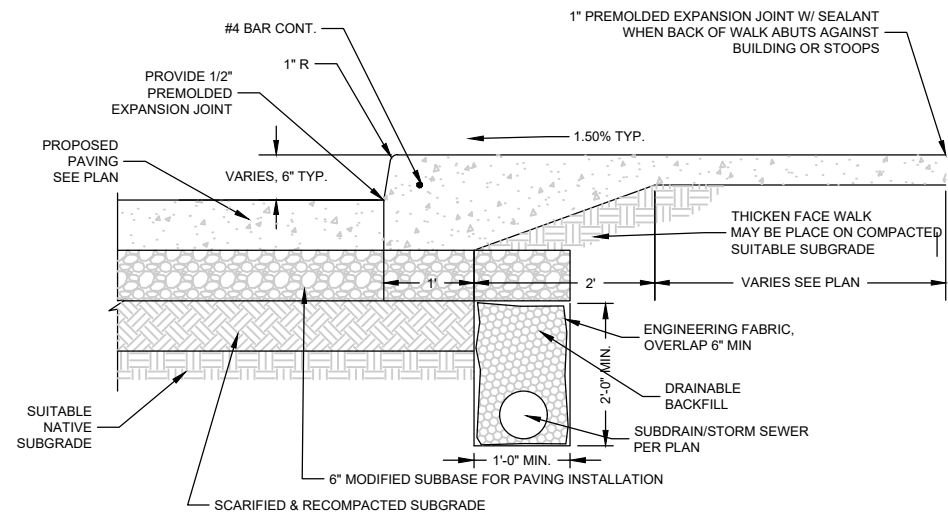
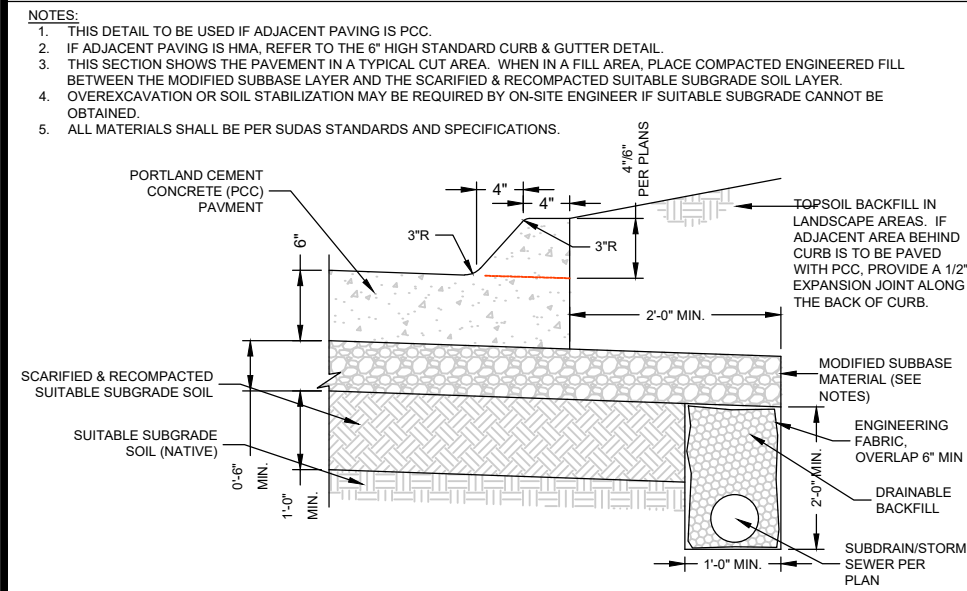
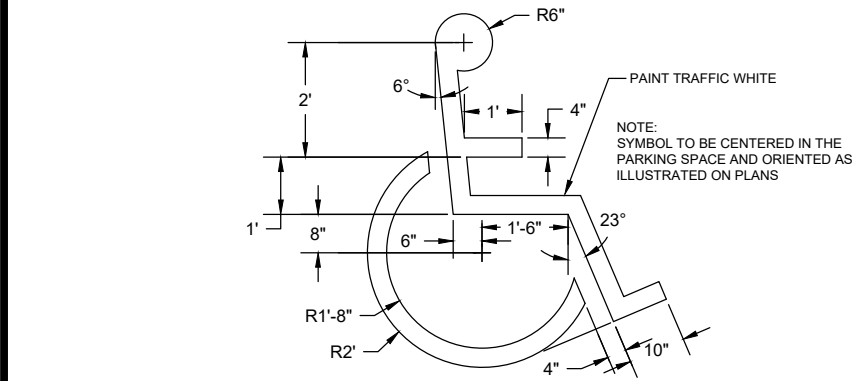
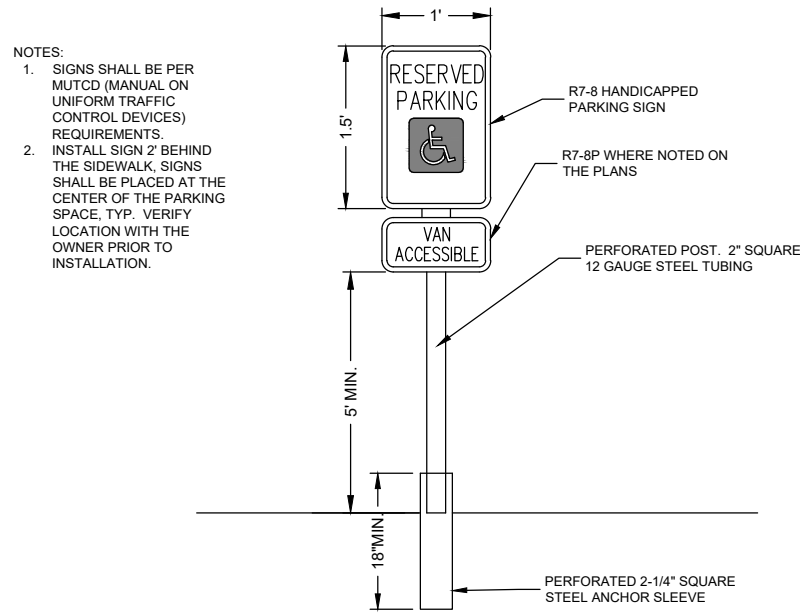
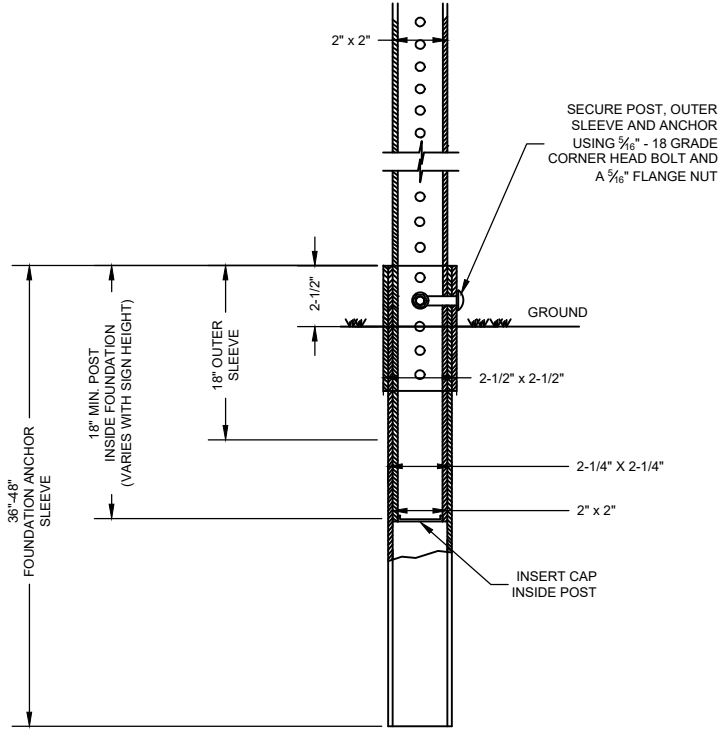
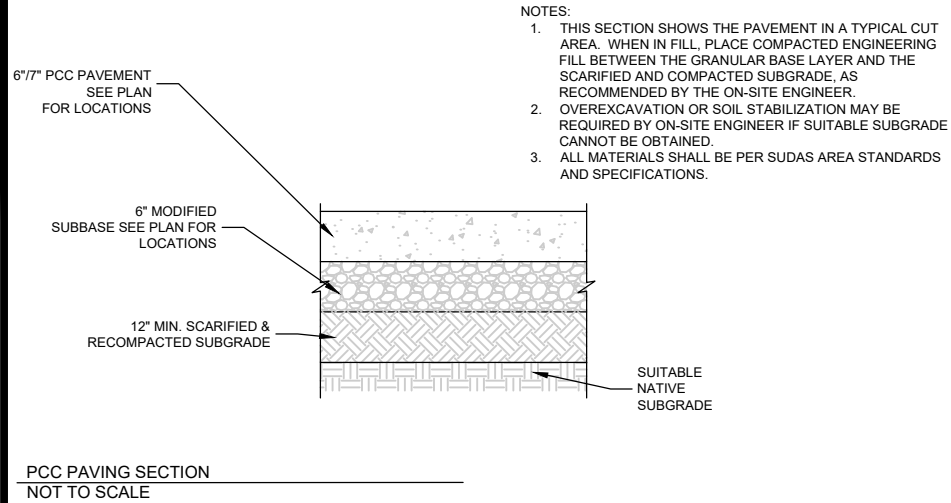
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JORDAN CREEK CHURCH
SOLON, IA

SPOT ELEVATION PLAN

SHEET NO.
C502
OF
C502

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1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
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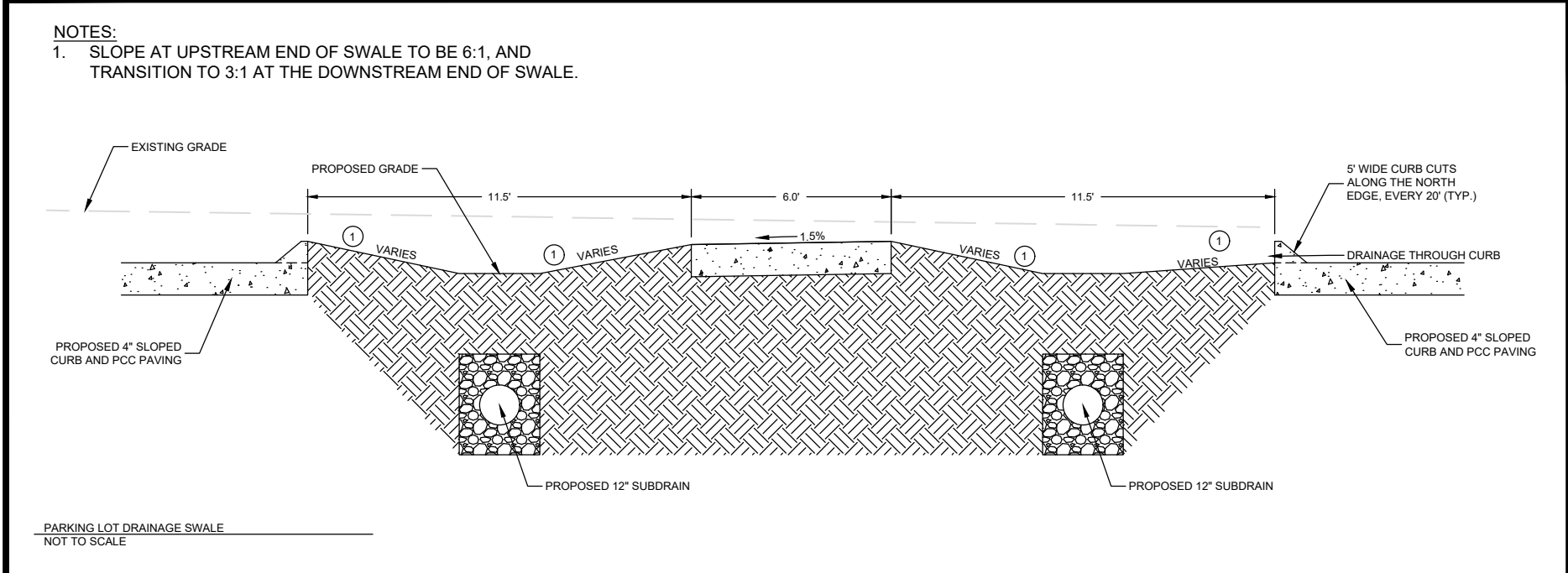
DRAWN BY: DJD
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PROJECT NO. 224074

APPROVED BY: DJD
SCALE: PLAN

JORDAN CREEK CHURCH
OLON, IA

SITE DETAILS AND NOTES

SHEET NO.
C600
OF
C602



ANDERSON  BOGERT

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GENERAL NOTES

- 1. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR CONSTRUCTION.
- 2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASCERTAINING THE LOCATION OF ALL EXISTING UTILITIES ON OR NEAR THE PROPOSED PROJECT SITE. CONTRACTORS SHALL NOTIFY ALL UTILITY COMPANIES FOR LOCATIONS PRIOR TO CONSTRUCTION AND MEET ALL REQUIREMENTS OF UTILITY COMPANIES.
- 3. ALL WASTE OR DEBRIS SHALL BE CLEANED-UP AND REMOVED BY THE CONTRACTOR.
- 4. NO TREES OR SHRUBS SHALL BE DISTURBED UNLESS NOTED ON THE PLANS OR APPROVED BY THE OWNER.

SITE NOTES

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH SUDAS STANDARDS. LATEST REVISION, UNLESS NOTED OTHERWISE.
- 2. NOTIFY THE UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN TO BE WITHIN THE CONSTRUCTION LIMITS.
- 3. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL UNCOVER EXISTING UTILITIES AT CRITICAL LOCATIONS TO DETERMINE EXACT HORIZONTAL AND VERTICAL LOCATION.
- 4. IOWA CODE 480. UNDERGROUND FACILITIES INFORMATION, REQUIRES VERBAL NOTICE TO IOWA ONE-ONE CALL 1-800-292-8989, NOT LESS THAN 48 HOURS BEFORE EXCAVATIONS, EXCLUDING HOLIDAYS AND WEEKENDS.
- 5. NOTIFY THE APPLICABLE GOVERNING AUTHORITY 48-72 HOURS PRIOR TO BEGINNING CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY.
- 6. NO WORK SHALL OCCUR OUTSIDE THE GRADING LIMITS UNLESS APPROVED BY THE OWNER'S REPRESENTATIVE.
- 7. ADJUST ALL VALVES, MANHOLES, CASTINGS, GAS VENTS, ETC. TO MATCH THE NEW SURFACE. ANY ADJUSTMENT SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
- 8. CONTRACTOR TO REFER TO BUILDING PLANS FOR DIMENSIONS, STOOP SIZES AND LOCATIONS, AND BUILDING UTILITY ENTRANCE LOCATIONS, SIZES AND ELEVATIONS.
- 9. ALL WASTE OR DEBRIS SHALL BE CLEANED UP AND REMOVED BY THE CONTRACTOR.
- 10. CONTRACTOR RESPONSIBLE FOR ALL TRENCH SHORING AND SITE SAFETY INCLUDING THE FENCING AND SIGNING OF THE SITE.
- 11. REPLACE PROPERTY MONUMENTS REMOVED OR DESTROYED BY CONSTRUCTION. MONUMENTS SHALL BE SET BY A LAND SURVEYOR REGISTERED IN THE STATE OF IOWA.

SOIL QUALITY PLAN:

- 1. BASED ON SOIL BORING LOGS AND FIELD OBSERVATIONS, LIMITED TOPSOIL IS ANTICIPATED TO BE ONSITE. TOPSOIL (IF ENCOUNTERED) FROM ALL DISTURBED AREAS SHALL BE STRIPPED AND STOCKPILED ONSITE DURING GRADING ACTIVITIES. STOCKPILED TOPSOIL SHALL HAVE APPROPRIATE EROSION AND SEDIMENT CONTROLS IN PLACE AS OUTLINED IN THE SITES EROSION CONTROL PLAN.
- 2. AFTER GRADING, PAVING, AND UTILITY CONSTRUCTION ACTIVITY IS SUBSTANTIALLY COMPLETE, SCARIFY OR TILL SUBGRADE TO DEPTH OF 6 INCHES (MIN.) WHERE TOPSOIL IS SCHEDULED.
- 3. IMPORT TOPSOIL AND SPREAD EVENLY THROUGHOUT THE SITE'S PROPOSED OPEN AREAS TO A FINAL DEPTH OF 6 INCHES (MIN.) AS OUTLINED IN METHOD #5 OF THE IOWA STORMWATER MANUAL CHAPTER 5.
- 4. DURING RESPREAD, REMOVE LARGE CLOUDS, ROOTS, LITTER, STONES LARGER THAN 1 INCH AND OTHER UNDESIRABLE MATERIAL. AFTER RESPREAD, AVOID PLACEMENT OF FOUNDATION SPOILS, FILL, OTHER MATERIALS OR HEAVY EQUIPMENT ON THE RESTORED AREA.
- 5. PERFORM TILLAGE AS NECESSARY TO ADDRESS EXCESSIVE COMPACTION. DO NOT TILL WET SOILS.

EROSION AND SEDIMENT CONTROL INSPECTION AND MAINTENANCE PRACTICES

- 1. CONTRACTOR SHALL PROVIDE TEMPORARY EROSION CONTROL, SEDIMENT, AND DUST CONTROL IN ACCORDANCE WITH THE PROJECT'S MINOR EROSION CONTROL PLAN AND SUDAS STANDARDS AND SPECIFICATIONS, LATEST EDITION. UNLESS NOTED OTHERWISE.
- 2. UNLESS NOTED OTHERWISE, CONTRACTOR SHALL INCORPORATE ALL EROSION CONTROL FEATURES INTO THE PROJECT PRIOR TO DISTURBING THE SOIL.
- 3. CONTRACTOR SHALL KEEP DISRUPTION OF AREAS TO A MINIMUM.
- 4. ALL CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EACH WEEK AND FOLLOWING ANY STORM EVENT OF 0.5 INCHES OR GREATER.
- 5. ALL MEASURES SHALL BE MAINTAINED IN GOOD WORKING ORDER; IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.
- 6. BUILT UP SEDIMENT WILL BE REMOVED FROM FILTER SOCK WHEN IT HAS REACHED ONE THIRD THE HEIGHT OF THE SOCK.
- 7. SILT FENCE & FILTER SOCK SHALL BE INSPECTED FOR DEPTH OF SEDIMENT, TEARS, TO SEE IF THE FABRIC IS SECURELY ATTACHED TO THE POSTS, AND SEE THAT THE POSTS ARE FIRMLY IN THE GROUND.
- 8. TEMPORARY AND PERMANENT SEEDING AND PLANTING SHALL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND HEALTHY GROWTH.
- 9. INSTALL SILT FENCE AROUND ALL STOCKPILED TOPSOIL.

SITE PREPARATION & DEMOLITION NOTES:

- 1. ALL WORK IN THE PUBLIC RIGHT OF WAY WILL REQUIRE EXCAVATION PERMITS, OBTAINED BY THE CONTRACTOR.
- 2. PROTECT ADJACENT PROPERTY DURING DEMOLITION. DEMOLITION LIMIT LINE IS THE EXISTING PROPERTY LINE UNLESS NOTED OTHERWISE.
- 3. MAINTAIN POSITIVE DRAINAGE ON THE SITE THROUGHOUT THE PROJECT DURATION.
- 4. PROVIDE WASTE AREAS OR DISPOSAL SITES FOR EXCESS MATERIAL (EXCAVATED MATERIAL OR BROKEN CONCRETE) WHICH IS NOT DESIRABLE TO BE INCORPORATED INTO THE WORK INVOLVED ON THIS PROJECT. NO MATERIAL SHALL BE PLACED WITHIN THE EASEMENTS. DISPOSAL SITES MUST BE APPROVED BY THE ENGINEER. CONTRACTOR SHALL APPLY NECESSARY MOISTURE TO THE CONSTRUCTION AREA AND TEMPORARY HAUL ROADS TO PREVENT THE SPREAD OF DUST. OFF-SITE DISPOSAL SHALL BE IN ACCORDANCE WITH THE APPLICABLE GOVERNMENTAL REGULATIONS.
- 5. ARRANGE AND PAY FOR AN OFF-SITE STORAGE AREA FOR MATERIALS AND EQUIPMENT, IF NECESSARY. ONLY STAGING AREAS WITHIN THE CONSTRUCTION LIMITS WILL BE AVAILABLE FOR CONTRACTOR USE.
- 6. KEEP ADJACENT PUBLIC STREETS FREE FROM SOIL AND DEBRIS GENERATED BY THE PROJECT. CLEAN SOIL AND DEBRIS FROM THE ADJACENT STREETS ON A DAILY BASIS.
- 7. DURING CONSTRUCTION, CONTROL DUST SPREADING FROM ALL WORK AND STAGING AREAS.
- 8. ANY EXISTING FACILITIES (CURBS, PAVEMENT, UTILITIES, ETC.) THAT THE CONTRACTOR'S OPERATIONS DAMAGE SHALL BE REPAIRED BY THAT CONTRACTOR AT HIS/HER COST.
- 9. REMOVE ALL DESIGNATED STREETS, DRIVEWAYS, ETC. IN THEIR ENTIRETY. BACKFILL ALL EXCAVATIONS WITH COHESIVE MATERIAL COMPACTED TO 98% STANDARD PROCTOR DRY DENSITY (ASTM D698).
- 10. WHERE A SECTION OF PAVEMENT, CURB AND GUTTER OR SIDEWALK IS CUT OR OTHERWISE DAMAGED BY THE CONTRACTOR, THE ENTIRE SECTION SHALL BE REMOVED AND REPLACED. PAVEMENT, CURBS, GUTTERS AND SIDEWALKS SHALL BE REMOVED A MINIMUM OF TWO FEET BEYOND THE EDGE OF THE TRENCH CUT OR TO THE NEAREST JOINT, AT THE COST OF THE CONTRACTOR
- 11. SAWCUT EDGES OF PAVEMENT FULL DEPTH PRIOR TO REMOVAL TO PREVENT DAMAGE TO ADJACENT SLABS AND FIXTURES.

SITE GRADING NOTES:

- 1. CLEAR EXISTING VEGETATION AND STRIP ANY TOPSOIL (IF ENCOUNTERED) WITHIN THE GRADING LIMITS. STOCKPILE ON-SITE FOR REUSE IF SUITABLE.
- 2. PROOFROLL ALL FILL AREAS TO IDENTIFY SOFT OR DISTURBED AREAS IN THE SUBGRADE IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING REPORT. CONSTRUCTION MANAGER (OR DESIGNATED REPRESENTATIVE) TO WITNESS PROOF ROLL.
- 3. SCARIFY EXISTING SUBGRADE AND RECOMPACT IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING REPORT PRIOR TO PLACEMENT OF FILL.
- 4. PLACE FILL MATERIAL IN LIFTS IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING REPORT. FILL MATERIAL OBTAINED FROM OFF-SITE SOURCES (IF APPLICABLE) SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING REPORT. FILL MATERIAL BROUGHT ONSITE SUBJECT TO CONSTRUCTION MANAGER'S APPROVAL.
- 5. SCARIFY AND RECOMPACT THE TOP 12" OF SUBGRADE IN ALL CUT AREAS AFTER ROUGH GRADING IS COMPLETED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING REPORT.
- 6. FILLS PLACED BELOW LAWN AREAS SHALL BE COMPACTED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING REPORT.
- 7. SCARIFY SUBGRADE TO DEPTH OF 4 INCHES WHERE TOPSOIL IS SCHEDULED. SCARIFY AREAS WHERE EQUIPMENT USED FOR HAULING AND SPREADING TOPSOIL HAS CAUSED COMPACTED SUBSOIL.
- 8. FINISH CONTOURS SHOWN ARE TO TOP OF PAVEMENT OR TO TOP OF SOD/TOPSOIL/MULCH.
- 9. SEE SOIL QUALITY PLAN FOR DEPTH A TOPSOIL/PLANTING SOIL IN NON HARD SURFACED AREAS. CONTRACTOR SHALL BE PREPARE SUBGRADE TO ACCOUNT FOR THE DEPTH OF TOPSOIL/SOD/MULCH AS TO NOT EXCEED THE ELEVATIONS SHOWN ON THE PLANS.

SEQUENCE OF EROSION CONTROL AND SEDIMENT CONTROL EVENTS:

- 1. INSTALL CONSTRUCTION ENTRANCE AND DOWN SLOPE SILT FENCE ALONG THE DOWNHILL EDGES OF THIS SITE. THESE ITEMS SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITY.
- 2. SITE DEMOLITION, CLEARING, GRUBBING, STRIPPING, AND STOCKPIILING OF TOPSOIL.
- 3. SITE GRADING AND STABILIZING SEEDING OF SLOPES 3:1 OR GREATER.
- 4. INSTALL AND MAINTAIN SILT FENCES ON SITE AS NEEDED.
- 5. INSTALLATION OF SANITARY SEWER SERVICE.
- 6. INSTALLATION OF WATER AND FIRE SERVICE.
- 7. INSTALLATION OF BUILDING FOUNDATION.
- 8. INSTALLATION OF STORM SEWER.
- 9. INSTALL UNDERGROUND UTILITIES SUCH AS ELECTRIC, GAS, TELEPHONE, AND CABLE TV LINES.
- 10. CONSTRUCTION OF CONCRETE OR HMA PAVING AND GRANULAR SUBBASE.
- 11. STABILIZATION SEEDING OF REMAINING DISTURBED AREAS.
- 12. COMPLETE FINAL LANDSCAPING/SODDING/SEEDING.
- 13. CONTACT ENGINEER FOR POST-CONSTRUCTION INSPECTION.
- 14. REMOVE TEMPORARY CONTROLS WHEN 70% STABILIZATION IS REACHED.
- 15. FILE NOTICE OF DISCONTINUATION TO IOWA DNR AND LINN COUNTY WITHIN 30 DAYS OF STABILIZATION.

NOTES:

- 1. WHENEVER POSSIBLE, EXISTING AREAS SHALL BE LEFT UNDISTURBED.
- 2. ALL DISTURBED AREAS SHALL BE STABILIZED IMMEDIATELY AFTER GRADING CEASES FOR AN ANTICIPATED PERIOD OF 14 CALENDAR DAYS OR LONGER.
- 3. CONTRACTOR WILL MAKE ARRANGEMENTS TO SEE THE EC AND SC PRACTICES ARE IN PLACE AND BEING PROPERLY MAINTAINED.

CONCRETE WASH OUT NOTES:

- 1. CONCRETE WASHOUT FACILITIES SHOULD BE INSPECTED DAILY AND AFTER HEAVY RAINS TO CHECK FOR LEAKS, IDENTIFY ANY PLASTIC LININGS AND SIDEWALLS HAVE BEEN DAMAGED BY CONSTRUCTION ACTIVITIES, AND DETERMINE WHETHER THEY HAVE BEEN FILLED TO OVER 75 PERCENT CAPACITY.
- 2. WHEN THE WASHOUT CONTAINER IS FILLED TO OVER 75 PERCENT OF ITS CAPACITY, THE WASHWATER SHOULD BE VACUUMED OFF OR ALLOWED TO EVAPORATE TO AVOID OVERFLOWS.
- 3. WHEN THE REMAINING CEMENTITIOUS SOLIDS HAVE HARDENED, THEY SHOULD BE REMOVED AND RECYCLED.
- 4. DAMAGES TO THE CONTAINER SHOULD BE REPAIRED PROMPTLY.
- 5. BEFORE HEAVY RAINS, THE WASHOUT CONTAINER'S LIQUID LEVEL SHOULD BE LOWERED OR THE CONTAINER SHOULD BE COVERED TO AVOID AN OVERFLOW DURING THE RAIN STORM.
- 6. FAILURE TO COMPLY WITH CONCRETE WASHOUT PROTOCOL IS SUBJECT TO AN IMMEDIATE MUNICIPAL INFRACTION AND SUBJECT TO FURTHER INFRACTION FROM THE US EPA, COUNTY, AND/OR IDNR.
- 7. CONFORM TO SILICA STANDARDS FOR WET-SAWING OF PCC PER NPDES AND OSHA REQUIREMENTS.

SITE UTILITY NOTES:

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH SUDAS SPECIFICATIONS FOR PUBLIC IMPROVEMENTS LATEST EDITION.
- 2. VERIFY THE LOCATION & ELEVATION OF EXISTING SERVICE STUBS AND POSSIBLE CONFLICTING UTILITIES PRIOR TO CONSTRUCTING PROPOSED WATER MAINS, SANITARY SEWERS, STORM SEWERS, ETC. ANY CONFLICTS MUST IMMEDIATELY BE BROUGHT TO THE ENGINEER'S ATTENTION.
- 3. SITE WORK UTILITY CONTRACTOR TO EXTEND ALL PIPING TO WITHIN 5' OF BUILDING AND CAPPED FOR CONNECTION BY BUILDING UTILITY CONTRACTOR UNLESS OTHERWISE INDICATED. COORDINATE ALL INVERT ELEVATIONS AND PIPING LOCATIONS WITH BUILDING PLANS.
- 4. ALL OPEN EXCAVATIONS SHALL BE PROTECTED WITH SAFETY FENCE, BARRIERS OR BARRICADES IN ACCORDANCE WITH OSHA. CONTRACTOR SHALL REFER TO BUILDING PLANS FOR UTILITY ENTRANCE LOCATIONS, SIZES, AND ELEVATIONS PRIOR TO BEGINNING UTILITY CONSTRUCTION.
- 5. THE CONTRACTOR WILL BE REQUIRED TO MAINTAIN A RECORD DRAWING SET SHOWING LOCATIONS OF ALL SERVICES AND OTHER PERTINENT INFORMATION REGARDING THE WATER MAIN, STORM SEWER, AND SANITARY SEWER CONSTRUCTION, WITNESS DIMENSIONS TO ENDS OF SERVICE LINES WILL BE REQUIRED. THE RECORD DRAWING SET WILL BE PROVIDED TO THE OWNER AND THE ENGINEER.

SITE STORM SEWER NOTES:

- 1. HDPE STORM SEWER PIPE & FITTINGS SHALL BE CORRUGATED WITH INTEGRALLY FORMED SMOOTH INTERIOR CONFORMING TO AASHTO M-294, TYPE S & ASTM F667. JOINTS SHALL BE INTEGRAL BELL AND SPIGOT JOINTS WITH ELASTOMERIC SEALS COMPLYING WITH ASTM F 477.
- 2. HDPE SUBDRAIN PIPE AND FITTINGS SHALL BE RIGID, TYPE S CORRUGATED WITH INTEGRALLY FORMED SMOOTH INTERIOR, WITH CLASS 2 PERFORATIONS CONFORMING TO AASHTO M-252 & ASTM F405.
- 3. STORM SEWER LINES SHALL BE A MINIMUM OF 10 FEET FROM WATER LINES RUNNING PARALLEL. AT CROSSINGS, A MINIMUM OF 18+" SEPARATION MUST BE MADE WITH A FULL 20' SECTION OF GASKETED PIPE CENTERED OVER OR UNDER THE LINE.

STAGING/TRAFFIC CONTROL NOTES:

- 1. USE IOWA DOT TC.202 (WORK WITHIN 15' OF CURB) WHEN WORKING ALONG ROADWAY.
- 2. NO ROAD CLOSURES ARE ANTICIPATED ON HIGHWAY 382.
- 3. IF TEMPORARY ONE LANE CLOSURE IS NECESSARY, THEN FLAGGERS SHALL BE EMPLOYED PER SUDAS 8030 1.06.
- 4. PROVIDE ADVANCE NOTICE OF LANE CLOSURES TO COUNTY AT LEAST 24 HOURS AHEAD OF SCHEDULED WORK.

SITE SANITARY SEWER NOTES(AS APPLICABLE):

- 1. SANITARY SEWER CONSTRUCTION SHALL MEET THE REQUIREMENTS OF THE SUDAS STANDARD SPECIFICATIONS.
- 2. SANITARY SEWER SERVICE PIPE AND FITTINGS SHALL BE 4", 6", AND 8" PVC PIPE THAT COMPLIES WITH SUDAS 4010 2.04 C.
- 3. WHERE WATER MAIN AND SANITARY SEWERS CROSS, ONE FULL (20 FOOT) LENGTH OF WATER MAIN SHOULD BE CENTERED OVER THE SANITARY SEWER, AND THE VERTICAL DISTANCE SHOULD BE MAINTAINED 18 INCHES OR GREATER. WHERE WATER LINES AND SEWERS CROSS AND THE MINIMUM CLEARANCE CANNOT BE MAINTAINED, THE SEWER MUST BE CONSTRUCTED OF WATER MAIN GRADE AWWA C-900 SDR-18 PVC OR DUCTILE IRON PIPE WITH COMPRESSION FITTINGS OR MECHANICAL JOINTS IF WITHIN 10 FEET OF THE WATER MAIN.

NO.	REVISION DESCRIPTION	APPROVED	DATE	

CLIENT: FORM FUNCTION STUDIO
1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551



DRAWN BY: DJD APPROVED BY: DJD
DATE: 9/04/26 SCALE: PLAN
PROJECT NO. 224074

JORDAN CREEK CHURCH
SOLOIN, IA

SITE DETAILS AND NOTES

SHEET NO.
C602
OF
C602

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WATER NOTES(AS APPLICABLE):

1. ALL PERMITS SHALL BE SECURED AND FEES SHALL BE PAID PRIOR TO START OF CONSTRUCTION.
2. CONTRACTOR SHALL CONTACT PUBLIC WORKS DEPARTMENT TO OBTAIN A 'START WORK' ORDER 24 HOURS PRIOR TO BEGINNING CONSTRUCTION OF WATER SYSTEM IMPROVEMENTS.
3. CONSTRUCTION OF PUBLIC AND PRIVATE WATER SYSTEM IMPROVEMENTS REQUIRES AN APPROVED PLAN SET ON FILE IN THE PUBLIC WORKS DEPARTMENT.
4. ON SITE INSPECTION OF WATER MAIN INSTALLATION WILL BE PROVIDED BY THE MUNICIPAL UTILITY.
5. THE CONTRACTOR IS RESPONSIBLE TO CONTACT IOWA ONE-CALL 1-800-292-8989 PRIOR TO EXCAVATION.
6. WATER MAIN MATERIALS, INSTALLATION AND TESTING MUST COMPLY WITH SUDAS DESIGN STANDARDS AND SPECIFICATIONS. THIS APPLIES TO BOTH PUBLIC AND PRIVATE WATER MAINS AND LARGE SERVICE LINES (3" OR LARGER) ON THE DISTRIBUTION SIDE OF THE METER. FOR PUBLICLY ACCEPTED IMPROVEMENTS CONSTRUCTED AS PART OF A SUBDIVISION, THE CONTRACTOR SHALL PURCHASE HYDRANTS FROM THE CITY PER CURRENT POLICY. EXCEPTIONS MUST BE PRE-APPROVED BY WATER ENGINEERING.
7. CONTRACTOR SHALL OBTAIN APPROVAL FROM THE PUBLIC WORKS OFFICE FOR ANY VARIANCE FROM THE APPROVED PLAN.
8. CONTRACTOR SHALL CONTACT PUBLIC WORKS DEPARTMENT FOR THE FOLLOWING SERVICES: WATER SHUT DOWN, TAP, FLUSH & FILL, SAMPLING AND OTHER SERVICES RELATED TO THE WATER SYSTEM. DISPOSAL OF HIGHLY CHLORINATED WATER SHALL BE IN COMPLIANCE WITH LOCAL, STATE & FEDERAL CODES.
9. WARRANTY: FOR THAT PORTION OF THE WATER SYSTEM IMPROVEMENTS THAT ARE TO BE ACCEPTED INTO THE PUBLIC WATER DISTRIBUTION SYSTEM, THE CONTRACTOR SHALL WARRANT THE WORKMANSHIP AND MATERIAL OF THE INSTALLED IMPROVEMENTS FOR A PERIOD OF TWO (2) YEARS FROM DATE OF ACCEPTANCE AND SHALL FURNISH THE MUNICIPALITY WITH A MAINTENANCE BOND COVERING THE COST OF THE WATER IMPROVEMENTS FOR THAT PERIOD. NO WATER SERVICE SHALL BE PROVIDED PRIOR TO RECEIPT OF THE REQUIRED MAINTENANCE BOND. FOR CITY FUNDED CAPITAL PROJECTS, PERFORMANCE BOND REQUIREMENTS IN THE CONTRACT DOCUMENTS GOVERN.
10. THE WATER UTILITY SHALL OPERATE ALL SYSTEM VALVES.
11. TRACER WIRE IS REQUIRED ON ALL PRIVATE AND PUBLIC WATER MAIN 3 INCHES IN DIAMETER OR LARGER. HOLES IN VALVE BOXES FOR TRACER WIRE MUST BE DRILLED.
12. WHERE WATER MAIN AND SANITARY OR STORM SEWERS CROSS, ONE FULL (20 FOOT) LENGTH OF WATER MAIN SHOULD BE CENTERED OVER THE SEWER, AND A VERTICAL DISTANCE SHOULD BE MAINTAINED OF18 INCHES OR GREATER . WHERE WATER LINES AND SEWERS CROSS AND THE MINIMUM CLEARANCE CANNOT BE MAINTAINED, AND THE WATER MAIN CROSSES UNDER THE SEWER, THE WATER MAIN MUST UTILIZE NITRILE GASKETS AND SANITARY SEWER MUST BE CONSTRUCTED OF WATER MAIN GRADE AWWA C-900 SDR-18 PVC OR DUCTILE IRON PIPE WITH COMPRESSION FITTINGS OR MECHANICAL JOINTS IF WITHIN 10 FEET OF THE WATER MAIN. RCP STORM SEWERS ARE TO HAVE 'O'-RING GASKETS.
13. UNLESS SPECIFICALLY APPROVED OTHERWISE, ALL LATERAL CONNECTIONS TO EXISTING MAINS THAT HAVE BEEN PREVIOUSLY TESTED AND TURNED INTO SERVICE, THAT ARE 4-INCH OR LARGER SHALL BE DONE BY 'LIVE' TAP USING AN APPROVED TAPPING SLEEVE OR SADDLE AND VALVE.
14. WATER MAINS AND LARGE SERVICES (3" OR LARGER) OVER 20 FEET IN LENGTH ARE REQUIRED TO BE DISINFECTED, FLUSHED, FILLED AND PRESSURE TESTED. PRESSURE / LEAKAGE TESTS ARE CONDUCTED AT 150 PSI UNDER THE DIRECTION OF THE MARION WATER UTILITY.
15. ALL WATER MAINS SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARD C 651. NO WATER MAIN SHALL BE PLACED INTO SERVICE UNTIL ALL SAMPLES HAVE PASSED BACTERIOLOGICAL TESTS.
16. HEAVILY CHLORINATED WATER MAY NOT REMAIN IN THE PIPELINE FOR MORE THAN 48 HOURS. HEAVILY CHLORINATED WATER SHALL BE FLUSHED THOROUGHLY FROM THE PIPELINE, UNTIL THE REPLACEMENT WATER THROUGHOUT ITS LENGTH WILL BE EQUAL IN QUALITY TO PERMANENT SOURCE OF SUPPLY. THE CHLORINATED WATER SHALL BE NEUTRALIZED BY TREATING WITH SODIUM BISULFITE, SODIUM SULFITE, SODIUM THIOSULFATE OR EQUAL APPROVED CHEMICAL BEFORE DISPOSAL IN ORDER TO PREVENT DAMAGE TO THE PIPE LINING AND VALVE COMPONENTS FROM DRY POWDER OR TABLET CHLORINE THE FOLLOWING PROCEDURE MUST BE USED. IN CASES WHERE THE CONTRACTOR IS UTILIZING POWDER OR TABLET CHLORINE DEPOSITED INTO THE WATER MAIN WHILE IT IS BEING INSTALLED, THE MAIN MUST BE FILLED WITHIN 48 HOURS. THE CONTRACTOR IS RESPONSIBLE FOR WATER MAIN FLUSHING OPERATIONS. THIS RESPONSIBILITY INCLUDES BUT IS NOT LIMITED TO VERIFYING PROCEDURES, PROVIDING ADEQUATE PERSONNEL AND EQUIPMENT, OBTAINING APPROVAL TO DISCHARGE INTO STORM OR SANITARY SEWERS, MONITORING SEWERS FOR BACK-UPS, MONITORING FLOW AND DE-CHLORINATION RESULTS. WATER DIVISION PERSONNEL WILL OPERATE VALVES AS REQUESTED.
17. IF INSTALLATION OF A CASING PIPE IS REQUIRED, IT SHALL INCLUDE CASING SPACERS AND WATERTIGHT MECHANICAL RUBBER END SEALS.

NO.	REVISION DESCRIPTION	APPROVED	DATE

CLIENT: FORM FUNCTION STUDIO
1203 3RD ST SE SUITE 7
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DRAWN BY: DJDAPPROVED BY: DJD

DATE: 9/04/26SCALE: PLAN

PROJECT NO. 224074

JORDAN CREEK CHURCH
SOLOIN, IA

SITE DETAILS AND NOTES

SHEET NO.
C603
OF
C602

Drainage Summary

For

Jordan Creek Church Site Plan
4237 HWY 382 NE
Solon, Iowa

Prepared by Anderson Bogert

August 28th, 2026

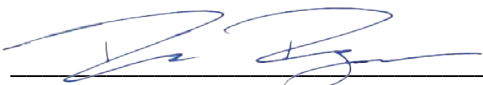
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.  <u>8-28-2026</u> Drew J. Digman, P.E. Date My license renewal date is December 31, 2027 Pages covered by this seal: <u>All</u>
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Executive Summary

This drainage report details information regarding the storm drainage design for the proposed “Jordan Creek Church Site Plan” development located at 4237 HWY 382 NE Solon, IA. The site is described as Auditor’s Parcel 2025023 Lying NE of RR in Sections 15 & 22, TWP 81 Range 6 as desc in Survey BK 68 PG 231, totaling 11.23 acres. The existing site contains row crops in the entire portion. The proposed development will contain a religious assembly facility with associated paved drives and parking. A retention basin with a single outlet structure will be installed to mitigate increased runoff from the impervious surfaces. Future evaluation/additional detention will be required for any future improvements.

The site will be divided into two sub areas. The main area compromises 4.36 acres of the total 11.23 acre property. The other 2.31 acres of the property will remain be regraded as a borrow source and drain off site as it does currently. See Appendix A for the post-developed watershed areas.

There was not a geotechnical report for this development but it is assumed that the soils generally include silty loam according to USGS Soil Maps. The soils were estimated to be classified within the “C” hydrologic soil group. The existing conditions is steep row crop for the entire site. Pre-developed runoff coefficient was 0.78 for that area. The 5-year pre-developed runoff is 27.23 cfs. The site has no significant contributing offsite flow.

The composite runoff curve number for the post developed site is 0.60. The 100-year post-developed peak runoff is 45.27 cfs before detention practices and 1.82 cfs after detention. The 1.25” Water Quality Volume (WQV) required for the detention pond is 10,511 cubic feet. The detention basin has 138,722 cubic feet of storage. There is an area in the surrounding the site that will bypass the detention basin and drain into the existing ditch to the south and west. The detention basin is over detaining to compensate for this un-detained area.

Table 1: Runoff Summary (Detention Basin Post Detention)

Runoff Recurrence Interval (yr)	Onsite		Contributing Offsite	
	Pre-Developed Peak Discharge (cfs)	Post-Developed Peak Discharge (cfs)	Existing Discharge (cfs)	Developed Discharge (cfs)
1 yr	17.39	0.26	0.00	0.00
5 yr	25.14	0.37	0.00	0.00
10 yr	29.34	0.49	0.00	0.00
25 yr	35.39	0.62	0.00	0.00
50 yr	40.26	0.87	0.00	0.00
100 yr	45.27	1.82	0.00	0.00

Table 2: Detention Basin Characteristics

Stage	Cumulative Storage (cf)	Outlet Discharge (cfs)	Overflow Discharge (CFS)
756.50	0	0.00	0.00
757.00	19,921	0.16	0.00
757.50	40,697	0.39	0.00
758.00	63,336	0.67	0.00
758.50*	87,775	3.52	0.00
759.00	112,901	4.76	24.41
759.50	138,722	5.73	72.67**

*Overflow Elevation = 758.50 @ Spillway

**Capacity of Emergency Overflow Spillway

Table 3: Allowable Release Rate

Allowable Release Rate		On Site Pre-Developed Peak Discharge Rate – 5 yr		Contributing Off Site Developed Peak Discharge – 100 yr
27.23	=	27.23	+	0.00

Table 4: Outlet Release Rate

Outlet Release Rate		Combined On Site Post-Developed Peak Discharge Rate – 100 yr		Contributing Off Site Developed Peak Discharge – 100 yr
1.82	=	1.82	+	0.00

Table 5: Detention Basin Summary

Runoff Recurrence Interval (yr)	Inflow (CFS)	Peak Discharge (CFS)	Peak Stage Elevation	Freeboard	Volume at Peak Stage Elevation
1 yr	1.09	0.26	757.18	2.32	27,140
5 yr	1.58	0.37	757.47	2.03	39,248
10 yr	1.87	0.49	757.63	1.87	46,449
25 yr	2.33	0.62	757.87	1.63	57,346
50 yr	2.71	0.87	758.07	1.43	66,257
100 yr	3.13	1.82	758.22	1.28	74,038

Site Characteristics

A. Pre-Developed Conditions

The existing soil types include:
Multiple Soil Associations
Existing use is all row crops.

B. Post-Developed Conditions

The property will be developed as a religious assembly facility with associated site paving and landscaping.

C. Contributing Off-Site Drainage

There is no significant offsite drainage.

D. Areas within Flood Way or Flood Plain Boundaries

None.

Pre-Developed Runoff Analysis**A. Watershed Area**

The total watershed analyzed is 4.36 acres of the 11.23 acre property. See Appendix A for the pre-developed watershed areas.

B. Time of Concentration

The existing site was divided into one distinct drainage subbasin. Using the Rational method within the HydroCAD software program, the time of concentration was calculated to be 7 minutes for the existing subbasin. See Appendix A for the pre-developed time of concentration flow path.

C. Precipitation Model

The precipitation model used in the stormwater calculations for this development was from the Johnson County IDF data from the NOAA 2026. The rainfall intensities listed in table 6 result from when the storm duration equals the time of concentration (7 min) resulting in the maximum peak runoff.

Table 6: Pre-Developed Routing Characteristics

Drainage Area (Acres)	Time of Concentration (Minutes)	Intensity (in/hr)					
		1yr	5yr	10yr	25yr	50yr	100yr
6.67	7.0	3.79	5.49	6.40	7.74	8.80	9.87

D. Runoff Factor

The runoff coefficient is 0.78.

E. Runoff Model

The Rational Method was used to determine peak flow rates and allowable release rate for the watershed.

F. Summary of Pre-Developed Runoff

Table 7: Pre-Developed Runoff Summary

Runoff Recurrence Interval (yr)	Total (cfs)
1	18.82
5	27.23
10	31.78
25	38.39
50	43.65
100	48.99

Post-Developed Runoff Analysis

A. Watershed Area

The total watershed analyzed is 6.67 ac. Of that watershed 4.36 ac will be detained and 2.31 ac will not be detained. The basin is designed for the total 6.67 ac of the watershed to compensate for the un-detained area as well. See Appendix A for the post-developed watershed areas.

B. Time of Concentration

The proposed site was divided into two subbasins. Using the Rational method within the HydroCAD software program, the time of concentration was assumed to be 5 minutes. See Appendix A for the locations and post-developed time of concentration flow path.

C. Precipitation Model

The precipitation model used in the stormwater calculations for this development is from the Johnson County IDF data from the NOAA 2026. The rainfall intensities listed in table 8 result from when the storm duration (471 min) equals the time of concentration (5 min) resulting in the maximum peak runoff.

The Modified Rational Method was used to route the post-developed conditions through the detention basin. This method requires calculations to determine the storm's critical duration, at which the largest storage volume is required, see calculations in Appendix B. The critical duration was determined to be 471 min for the detention pond. Table 8 illustrates the intensities occurring at these durations.

Table 8: Post-Developed Routing Characteristics

Frequency (yr)	Intensity (in/hr)	Runoff (cfs)
1	0.27	0.26
5	0.39	0.37
10	0.46	0.49
25	0.58	0.62
50	0.67	0.87
100	0.77	1.82

D. Runoff Factor

The composite runoff curve number is 0.60.

E. Runoff Model

The Rational Method was used to determine the peak runoff flow rates. The Modified Rational Method was used to develop a post-development hydrograph to route the post-developed conditions through the detention basin.

F. Summary of Post-Developed Runoff

**Table 9: Post-developed Runoff Summary
(Before Detention)**

Open Detention	
Runoff Recurrence Interval (yr)	Total (cfs)
1	17.39
5	25.14
10	29.34
25	35.39
50	40.26
100	45.27

Stormwater Conveyance Design

A. Stormwater Conveyance

All stormwater conveyances shall be designed according to the SUDAS Design Standards at a minimum.

B. Storm Sewer

Storm sewer was designed to convey the 100-yr storm to the detention basin.

C. Culverts

There are no culverts on site.

D. Open Channel Flow – Swales and Ditches

There are no significant swales or ditches on site.

E. Storm Drainage Outlets and Downstream Analysis

Existing drainage patterns will be maintained throughout the developed site. The projected peak flow from the 100 yr storm of 1.82 cfs is less than the allowable release rate of 27.23 cfs. The 12" outlet pipe for detention basin drains into an existing grassed farm field swale on the south side of the site.

F. Hydraulic Model

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Storm Water Management Design

A. Design Standards and References

SUDAS Design Standards & Iowa Stormwater Management Manual

B. Detention Basin Size and Location

The detention basin is located in the southeast corner of the site. There is an area (2.31 acres) surrounding the center of the site that will bypass the detention basin and outlet as the existing system does today to the south and west. The detention basin is designed to provide for the required water quality volume and the allowable release rates for the site and is over detaining to compensate for the area that is being bypassed. The water quality volume for the site was calculated using the formula on page 1 of Chapter 3 Section 6 Small Storm Hydrology of the Iowa Stormwater Management Manual. Refer to Appendix B for more detail.

C. Detention Basin Performance

Table 10 shows the detention basins performance during the 100 yr storm event. Tables 10 & 11 show the combined post-developed peak runoff from all sub-areas after the detention practices. Please note that the combined estimated post-developed peak discharge after the detention practice is lower than the pre-developed peak discharge depicted in Table 6.

Table 10: Detention Basin Characteristics

Stage	Cumulative Storage (cf)	Outlet Discharge (cfs)	Overflow Discharge (CFS)
756.50	0	0.00	0.00
757.00	19,921	0.16	0.00
757.50	40,697	0.39	0.00
758.00	63,336	0.67	0.00
758.50*	87,775	3.52	0.00
759.00	112,901	4.76	24.41
759.50	138,722	5.73	72.67**

*Overtop Elevation = 758.50 @ Overflow Spillway

**Capacity of Emergency Overflow Spillway

Table 11: Detention Basin Summary Post Development

Runoff Recurrence Interval (yr)	Inflow (CFS)	Peak Discharge (CFS)	Peak Stage Elevation	Freeboard	Volume at Peak Stage Elevation
1 yr	1.09	0.26	757.18	2.32	27,140
5 yr	1.58	0.37	757.47	2.03	39,248
10 yr	1.87	0.49	757.63	1.87	46,449
25 yr	2.33	0.62	757.87	1.63	57,346
50 yr	2.71	0.87	758.07	1.43	66,257
100 yr	3.13	1.82	758.22	1.28	74,038

D. Detention Basin Outlet

The outlet structure will consist of a 12" DIA perforated riser with a 12" outlet pipe at an elevation of 745.75. This pipe will outlet into an existing farm field drainage swale in the southeast corner of the site. The 12" Perforated Riser, with three rows of four 1.50" DIA holes drilled every 6" starting at an elevation of 765.50 and one 12" Dome grate at the top of the structure at an elevation of 758.00. Note: All elevations listed are to the bottom of the orifice or base of intake respectively.

Table 12: Water Quality Detention Time Calculation

Stage (ft)	Storage (cf)	Outflow (cfs)	Detention Time Between Stages (hr)
756.50	0	0	
			58.0
757.00	19,921	0.16	
			29.0
757.50	40,697	0.39	
			11.8
758.00*	63,336	0.67	
			3.24
758.50**	87,775	3.52	
Total Detention Time (hr)			102.04

*Elevation of top of Perforated Riser

**Elevation of Overflow Spillway

E. Spillway and Embankment Protection

The maximum elevation of the detention pond basin during the 100-year storm event is 758.22 ft. The top of the grade around the detention basin will be approximately 1.28 feet above the 100-year elevation, or 759.50 ft. A spillway is provided for larger storm events at 758.50 ft. (greater than the 100-year storm event) as any overtopping is expected to run over the southern corner of the basin and into the existing drainage way in the southeast corner of the site. This spillway is 20 feet wide with 12:1 slopes

for a total depth of 1.0 feet. This spillway is to be armored with revetment from the beginning of the overflow spillway to the toe of the slope on the backside of the berm. If the outlet structure is completely plugged the depth for a 100yr storm across the spillway will be 8" flowing at 3.80 FPS.

F. Channel Protection Volume

The proposed 1 yr storm will have a post development runoff of 0.26 cfs which is lower than the pre-developed 1 yr storm of 18.82 cfs (see Table 1). The 1 yr storm with a volume of 27,140 cf will be detained for 102.04 hrs in the proposed detention basin (see Table 12). This storm will have a peak elevation of 757.18 (see Table 11) and will have approximately 2.32 feet of freeboard to the top of basin at 759.50.

Permits

An NPDES Storm Water permit will be obtained for this development.

References

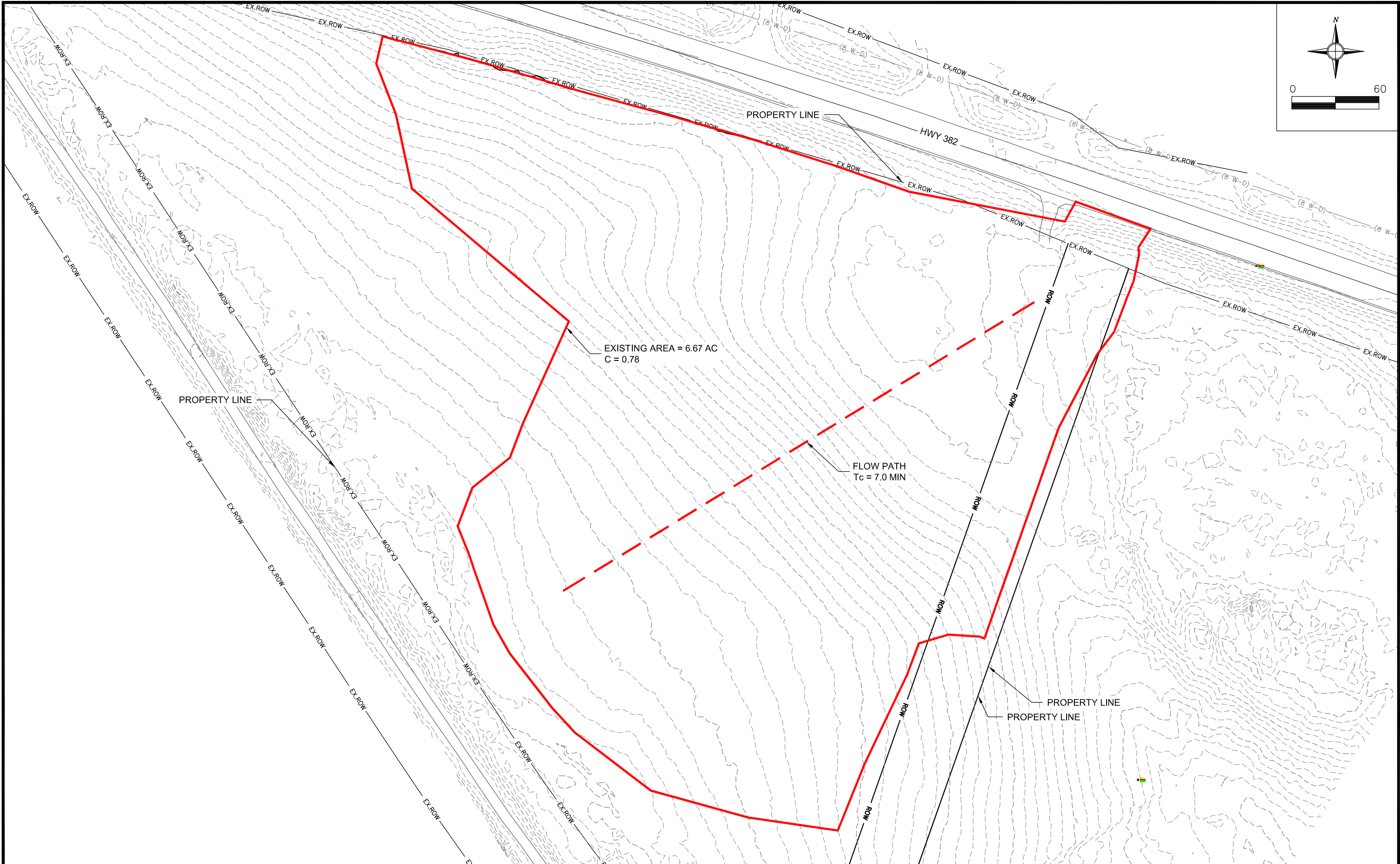
- Civil Engineering Reference Manual - Fifth Addition
- Handbook of Hydraulics - Fifth Addition
- Handbook of Concrete Culvert Pipe Hydraulics
- Hydrologic Soil Groups for Iowa Soils
- Iowa Stormwater Management Manual
- Iowa SUDAS

Appendix

Appendix A

Drainage Area Maps

D:\D360T\ACAD\224074\Drainage Maps.dwg 8-28-26 12:05:27 PM



NO.	REVISION DESCRIPTION	APPROVED	DATE

CLIENT: FORM FUNCTION STUDIO
1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551



DRAWN BY: DJD
DATE: 8/28/2026
PROJECT NO. 224074

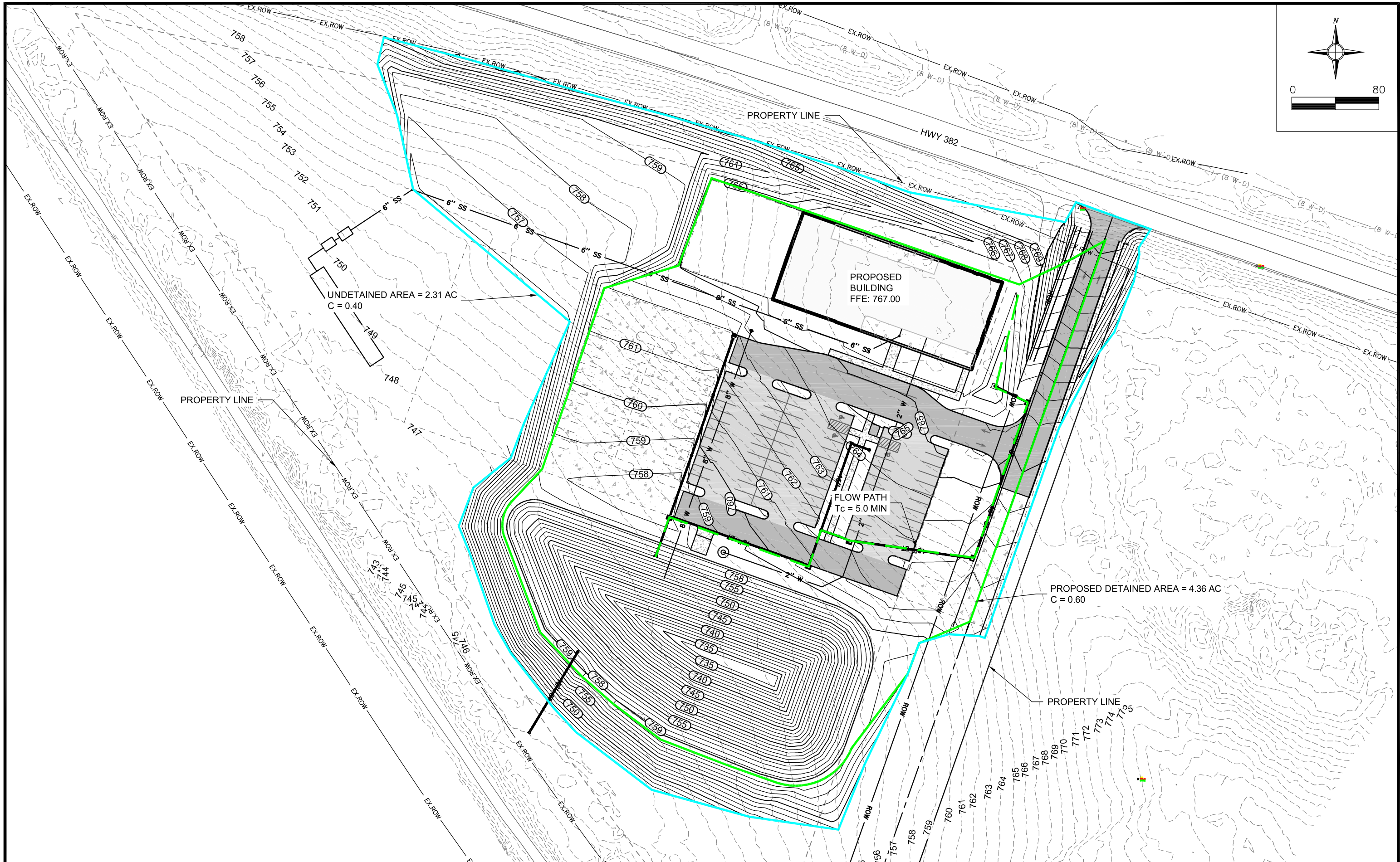
APPROVED BY: DJD
SCALE: PLAN

JORDAN CREEK CHURCH
SOLON, IA

PRE-DEVELOPED AREAS

SHEET NO.
1
OF
1

D:\360T\ACAD\224074\Drainage Maps.dwg 8-28-26 12:06:05 PM



NO.	REVISION DESCRIPTION	APPROVED	DATE

CLIENT: FORM FUNCTION STUDIO
1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551



DRAWN BY: DJD
DATE: 8/28/2026
PROJECT NO. 224074

APPROVED BY: DJD
SCALE: PLAN

JORDAN CREEK CHURCH
SOLON, IA

POST-DEVELOPED AREAS

SHEET NO.
1
OF
1

Appendix

Appendix B

Drainage Calculations



Job No. 224074
Subject JORDAN CREEK CHURCH
DRAINAGE CALCS
Sheet No. 1 of 1

Computed By DJD Date 8/28/24
Checked By _____ Date _____

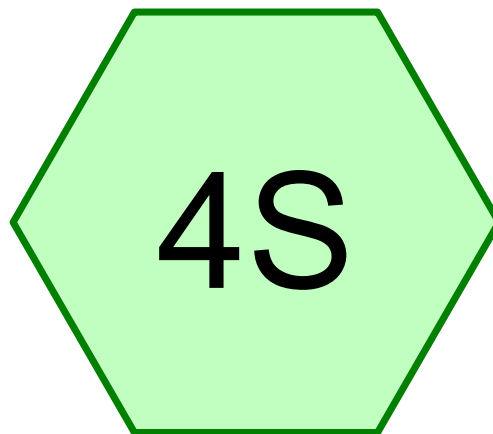
$$DA = 290785 \text{ SF} = 6.67 \text{ AC}$$
$$I_{\text{impervious}} = 98199 \text{ SF} = 2.25 \text{ AC}$$

$$R_v = 0.05 + (0.009 (33\% \text{ Impervious})) = 0.347$$

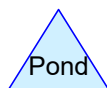
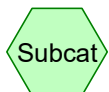
$$WQ_v = 0.347 \cdot 1.25 \cdot 290785 \cdot 1/12$$

$$WQ_v \text{ Required} = 10,511 \text{ CF Required}$$

$$WQ_v \text{ Provided} = 138,722 \text{ CF}$$



Existing



Routing Diagram for Existing

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Existing

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Page 2

Area Listing (all nodes)

Area (acres)	C	Description (subcatchment-numbers)
6.676	0.78	Open Area (4S)
6.676	0.78	TOTAL AREA

Existing*IA - Johnson County 2026 1-yr Duration=7 min, Inten=3.79 in/hr*

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Page 3

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Existing

Runoff Area=290,785 sf 0.00% Impervious Runoff Depth=0.50"

Flow Length=300' Slope=0.0660 '/' Tc=7.3 min C=0.78 Runoff=18.82 cfs 0.276 af

Total Runoff Area = 6.676 ac Runoff Volume = 0.276 af Average Runoff Depth = 0.50"**100.00% Pervious = 6.676 ac 0.00% Impervious = 0.000 ac**

Existing

IA - Johnson County 2026 1-yr Duration=7 min, Inten=3.79 in/hr

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Summary for Subcatchment 4S: Existing

Runoff = 18.82 cfs @ 0.12 hrs, Volume= 0.276 af, Depth= 0.50"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

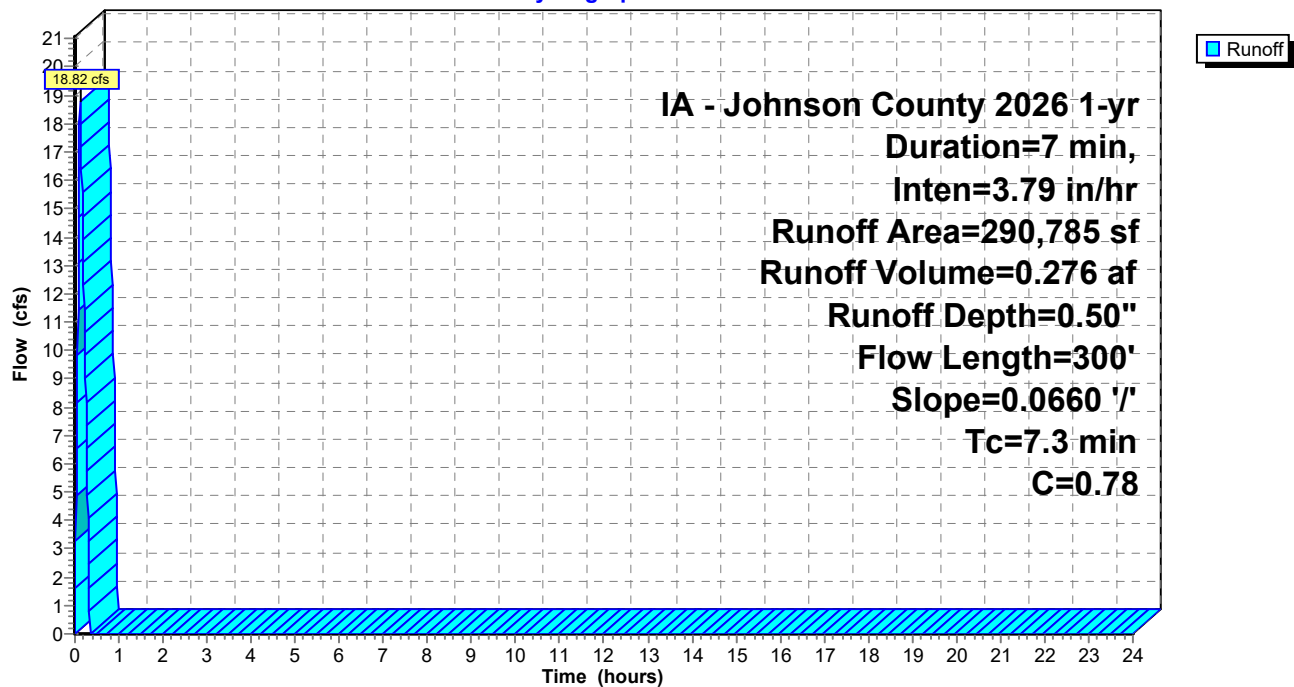
IA - Johnson County 2026 1-yr Duration=7 min, Inten=3.79 in/hr

Area (sf)	C	Description
290,785	0.78	Open Area
290,785		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	300	0.0660	0.69		Sheet Flow, Cultivated: Residue<=20% n= 0.060 P2= 3.01"

Subcatchment 4S: Existing

Hydrograph



Existing*IA - Johnson County 2026 2-yr Duration=7 min, Inten=4.42 in/hr*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Existing

Runoff Area=290,785 sf 0.00% Impervious Runoff Depth=0.58"

Flow Length=300' Slope=0.0660 '/' Tc=7.3 min C=0.78 Runoff=21.91 cfs 0.321 af

Total Runoff Area = 6.676 ac Runoff Volume = 0.321 af Average Runoff Depth = 0.58"**100.00% Pervious = 6.676 ac 0.00% Impervious = 0.000 ac**

Existing

IA - Johnson County 2026 2-yr Duration=7 min, Inten=4.42 in/hr

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Summary for Subcatchment 4S: Existing

Runoff = 21.91 cfs @ 0.12 hrs, Volume= 0.321 af, Depth= 0.58"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

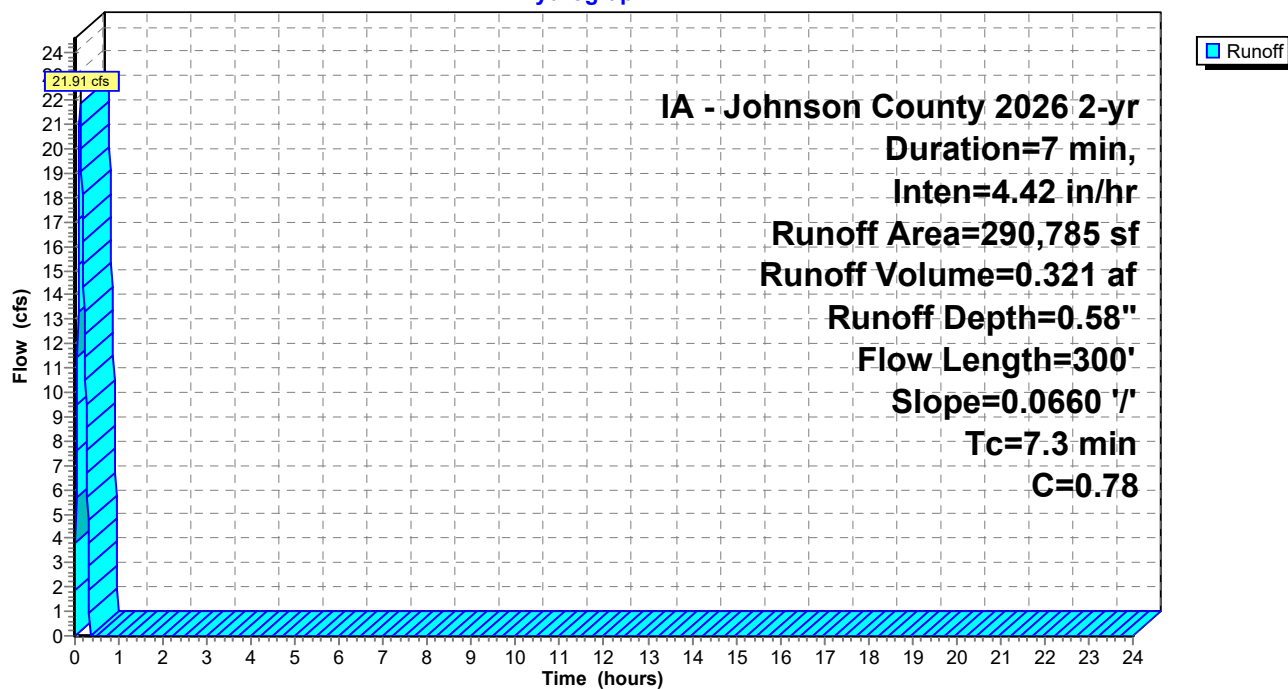
IA - Johnson County 2026 2-yr Duration=7 min, Inten=4.42 in/hr

Area (sf)	C	Description
290,785	0.78	Open Area
290,785		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	300	0.0660	0.69		Sheet Flow, Cultivated: Residue<=20% n= 0.060 P2= 3.01"

Subcatchment 4S: Existing

Hydrograph



Existing*IA - Johnson County 2026 5-yr Duration=7 min, Inten=5.49 in/hr*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Existing

Runoff Area=290,785 sf 0.00% Impervious Runoff Depth=0.72"

Flow Length=300' Slope=0.0660 '/' Tc=7.3 min C=0.78 Runoff=27.23 cfs 0.399 af

Total Runoff Area = 6.676 ac Runoff Volume = 0.399 af Average Runoff Depth = 0.72"**100.00% Pervious = 6.676 ac 0.00% Impervious = 0.000 ac**

Existing

IA - Johnson County 2026 5-yr Duration=7 min, Inten=5.49 in/hr

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Summary for Subcatchment 4S: Existing

Runoff = 27.23 cfs @ 0.12 hrs, Volume= 0.399 af, Depth= 0.72"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

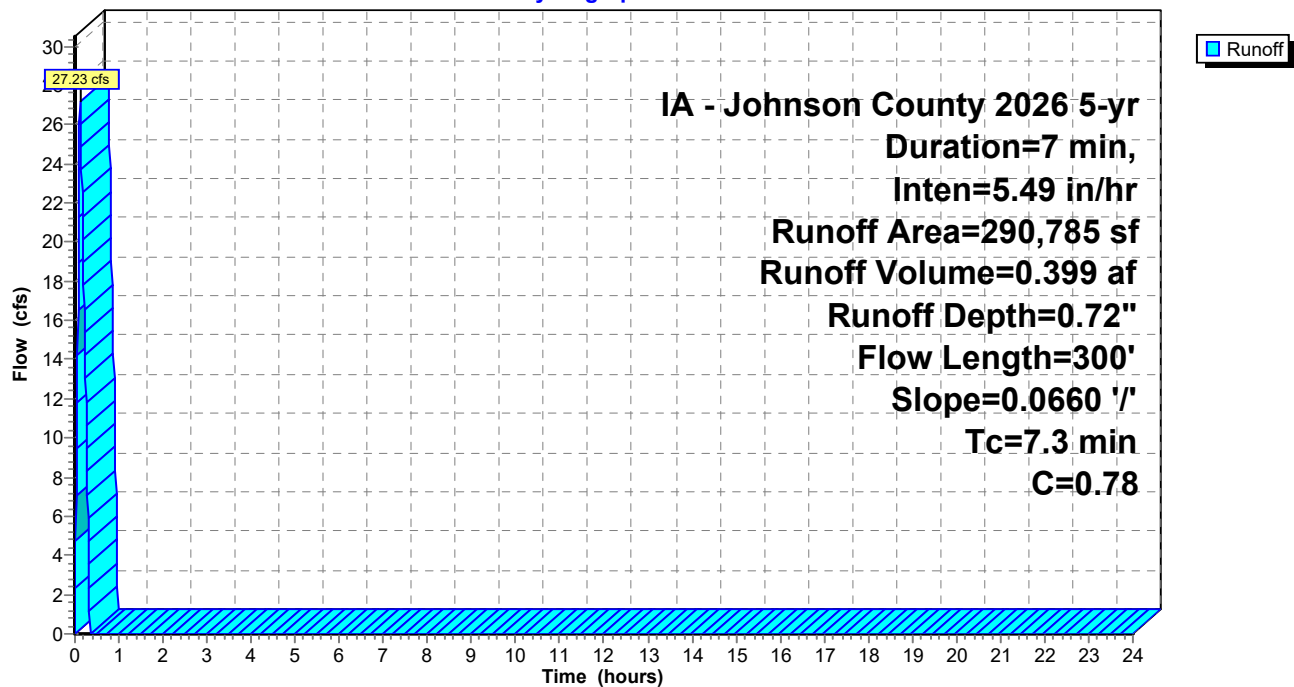
IA - Johnson County 2026 5-yr Duration=7 min, Inten=5.49 in/hr

Area (sf)	C	Description
290,785	0.78	Open Area
290,785		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	300	0.0660	0.69		Sheet Flow, Cultivated: Residue<=20% n= 0.060 P2= 3.01"

Subcatchment 4S: Existing

Hydrograph



Existing*IA - Johnson County 2026 10-yr Duration=7 min, Inten=6.40 in/hr*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Existing

Runoff Area=290,785 sf 0.00% Impervious Runoff Depth=0.84"

Flow Length=300' Slope=0.0660 '/' Tc=7.3 min C=0.78 Runoff=31.78 cfs 0.466 af

Total Runoff Area = 6.676 ac Runoff Volume = 0.466 af Average Runoff Depth = 0.84"**100.00% Pervious = 6.676 ac 0.00% Impervious = 0.000 ac**

Existing

IA - Johnson County 2026 10-yr Duration=7 min, Inten=6.40 in/hr

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Summary for Subcatchment 4S: Existing

Runoff = 31.78 cfs @ 0.12 hrs, Volume= 0.466 af, Depth= 0.84"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

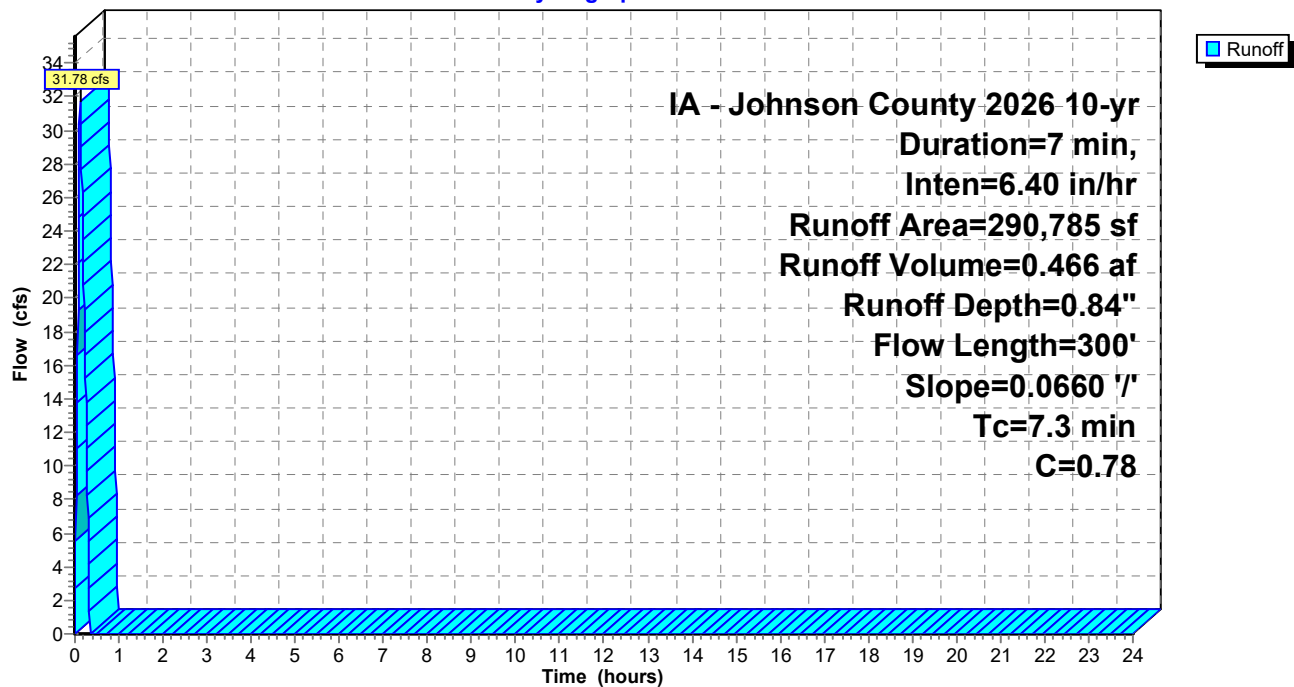
IA - Johnson County 2026 10-yr Duration=7 min, Inten=6.40 in/hr

Area (sf)	C	Description
290,785	0.78	Open Area
290,785		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	300	0.0660	0.69		Sheet Flow, Cultivated: Residue<=20% n= 0.060 P2= 3.01"

Subcatchment 4S: Existing

Hydrograph



Existing*IA - Johnson County 2026 25-yr Duration=7 min, Inten=7.74 in/hr*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Existing

Runoff Area=290,785 sf 0.00% Impervious Runoff Depth=1.01"

Flow Length=300' Slope=0.0660 '/' Tc=7.3 min C=0.78 Runoff=38.39 cfs 0.563 af

Total Runoff Area = 6.676 ac Runoff Volume = 0.563 af Average Runoff Depth = 1.01"**100.00% Pervious = 6.676 ac 0.00% Impervious = 0.000 ac**

Existing

IA - Johnson County 2026 25-yr Duration=7 min, Inten=7.74 in/hr

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Summary for Subcatchment 4S: Existing

Runoff = 38.39 cfs @ 0.12 hrs, Volume= 0.563 af, Depth= 1.01"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

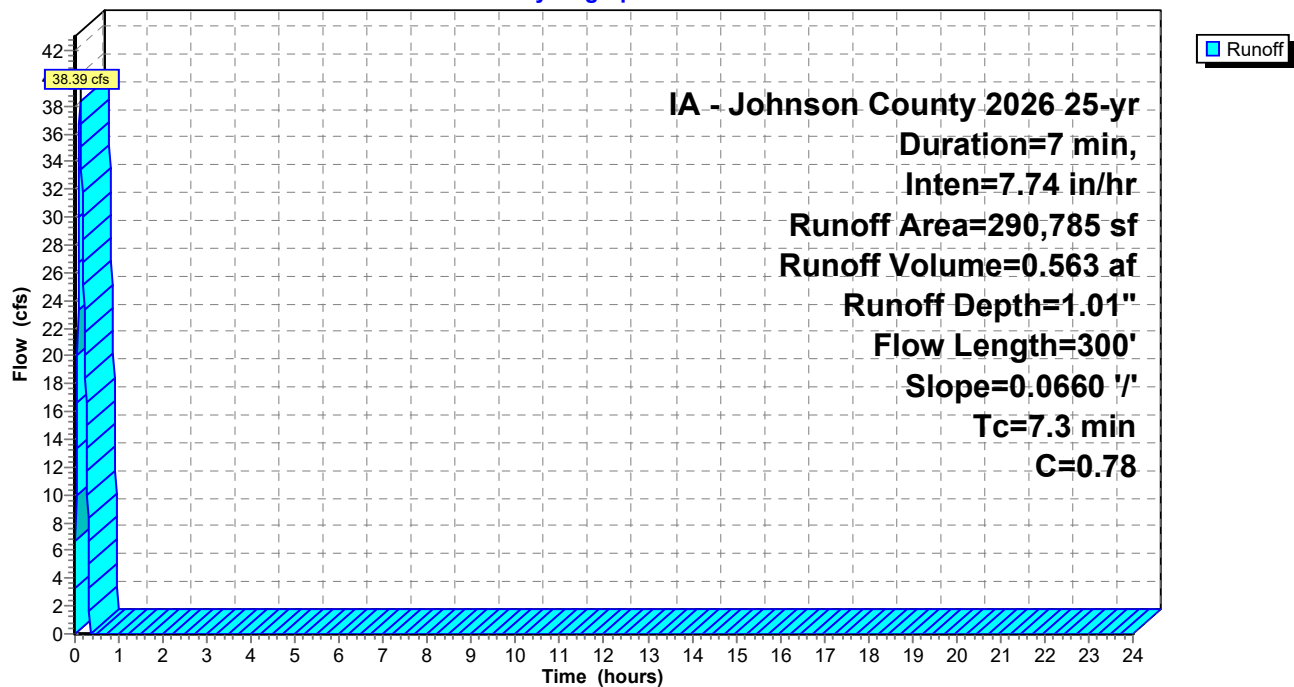
IA - Johnson County 2026 25-yr Duration=7 min, Inten=7.74 in/hr

Area (sf)	C	Description
290,785	0.78	Open Area
290,785		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	300	0.0660	0.69		Sheet Flow, Cultivated: Residue<=20% n= 0.060 P2= 3.01"

Subcatchment 4S: Existing

Hydrograph



Existing*IA - Johnson County 2026 50-yr Duration=7 min, Inten=8.80 in/hr*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Existing

Runoff Area=290,785 sf 0.00% Impervious Runoff Depth=1.15"

Flow Length=300' Slope=0.0660 '/' Tc=7.3 min C=0.78 Runoff=43.65 cfs 0.640 af

Total Runoff Area = 6.676 ac Runoff Volume = 0.640 af Average Runoff Depth = 1.15"**100.00% Pervious = 6.676 ac 0.00% Impervious = 0.000 ac**

Existing

IA - Johnson County 2026 50-yr Duration=7 min, Inten=8.80 in/hr

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Summary for Subcatchment 4S: Existing

Runoff = 43.65 cfs @ 0.12 hrs, Volume= 0.640 af, Depth= 1.15"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

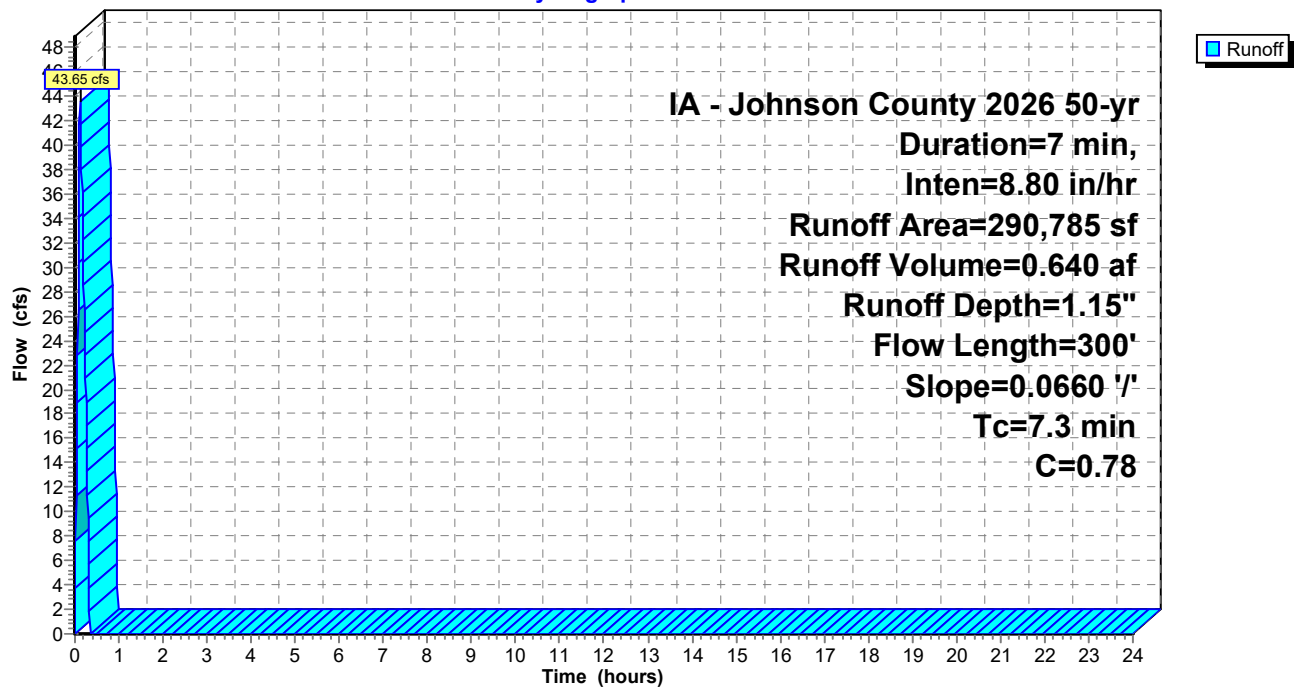
IA - Johnson County 2026 50-yr Duration=7 min, Inten=8.80 in/hr

Area (sf)	C	Description
290,785	0.78	Open Area
290,785		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	300	0.0660	0.69		Sheet Flow, Cultivated: Residue<=20% n= 0.060 P2= 3.01"

Subcatchment 4S: Existing

Hydrograph



Existing*IA - Johnson County 2026 100-yr Duration=7 min, Inten=9.87 in/hr*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Existing

Runoff Area=290,785 sf 0.00% Impervious Runoff Depth=1.29"

Flow Length=300' Slope=0.0660 '/' Tc=7.3 min C=0.78 Runoff=48.99 cfs 0.718 af

Total Runoff Area = 6.676 ac Runoff Volume = 0.718 af Average Runoff Depth = 1.29"**100.00% Pervious = 6.676 ac 0.00% Impervious = 0.000 ac**

Existing

IA - Johnson County 2026 100-yr Duration=7 min, Inten=9.87 in/hr

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Summary for Subcatchment 4S: Existing

Runoff = 48.99 cfs @ 0.12 hrs, Volume= 0.718 af, Depth= 1.29"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

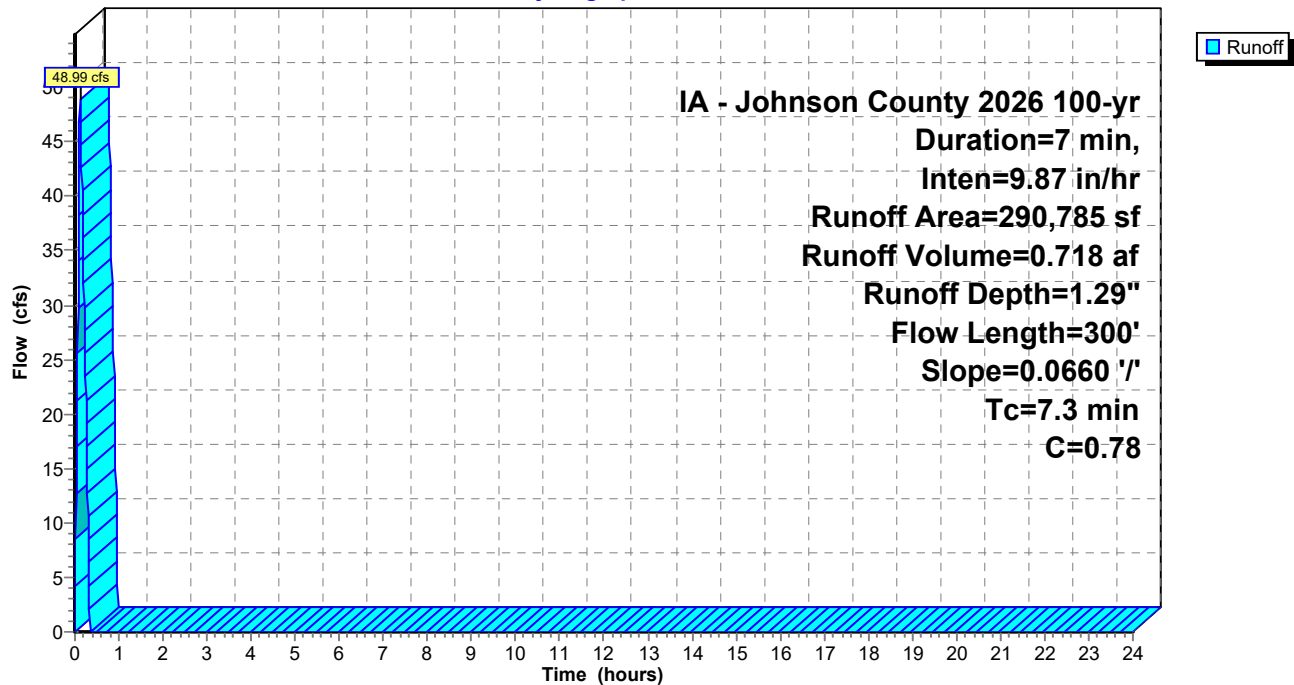
IA - Johnson County 2026 100-yr Duration=7 min, Inten=9.87 in/hr

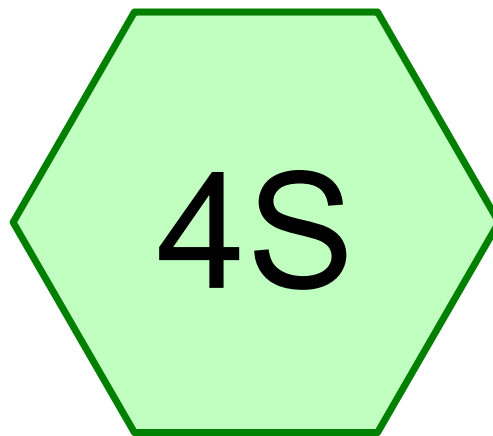
Area (sf)	C	Description
290,785	0.78	Open Area
290,785		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	300	0.0660	0.69		Sheet Flow, Cultivated: Residue<=20% n= 0.060 P2= 3.01"

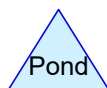
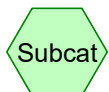
Subcatchment 4S: Existing

Hydrograph





Proposed



Routing Diagram for Proposed Pre Detention

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Proposed Pre Detention

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Area Listing (all nodes)

Area (acres)	C	Description (subcatchment-numbers)
4.421	0.40	Open Area (4S)
2.254	0.98	Paved/Building Areas (4S)
6.676	0.60	TOTAL AREA

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=1.30"

Tc=5.0 min C=0.60 Runoff=1.00 cfs 0.723 af

Total Runoff Area = 6.676 ac Runoff Volume = 0.723 af Average Runoff Depth = 1.30"

66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Summary for Subcatchment 4S: Proposed

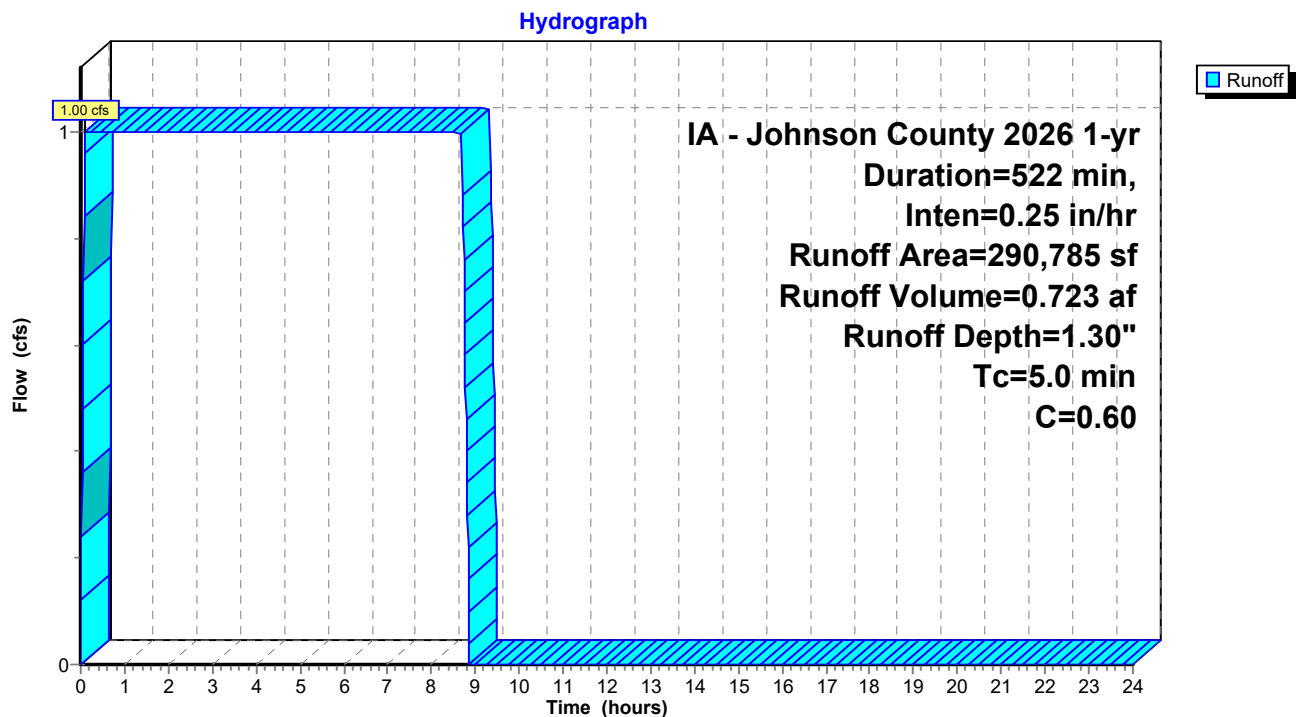
Runoff = 1.00 cfs @ 0.09 hrs, Volume= 0.723 af, Depth= 1.30"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 IA - Johnson County 2026 1-yr Duration=522 min, Inten=0.25 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed



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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=1.51"

Tc=5.0 min C=0.60 Runoff=1.16 cfs 0.839 af

Total Runoff Area = 6.676 ac Runoff Volume = 0.839 af Average Runoff Depth = 1.51"

66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Summary for Subcatchment 4S: Proposed

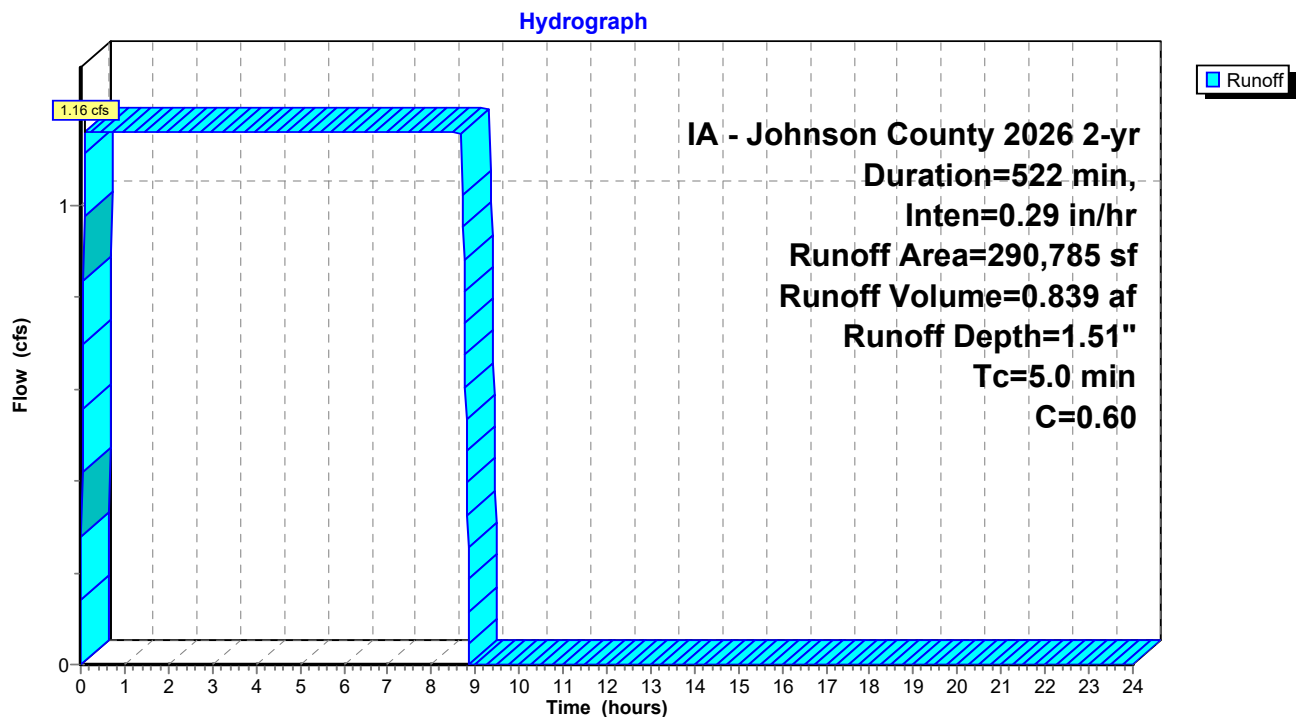
Runoff = 1.16 cfs @ 0.09 hrs, Volume= 0.839 af, Depth= 1.51"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 IA - Johnson County 2026 2-yr Duration=522 min, Inten=0.29 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed



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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=1.89"

Tc=5.0 min C=0.60 Runoff=1.45 cfs 1.051 af

Total Runoff Area = 6.676 ac Runoff Volume = 1.051 af Average Runoff Depth = 1.89"

66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Summary for Subcatchment 4S: Proposed

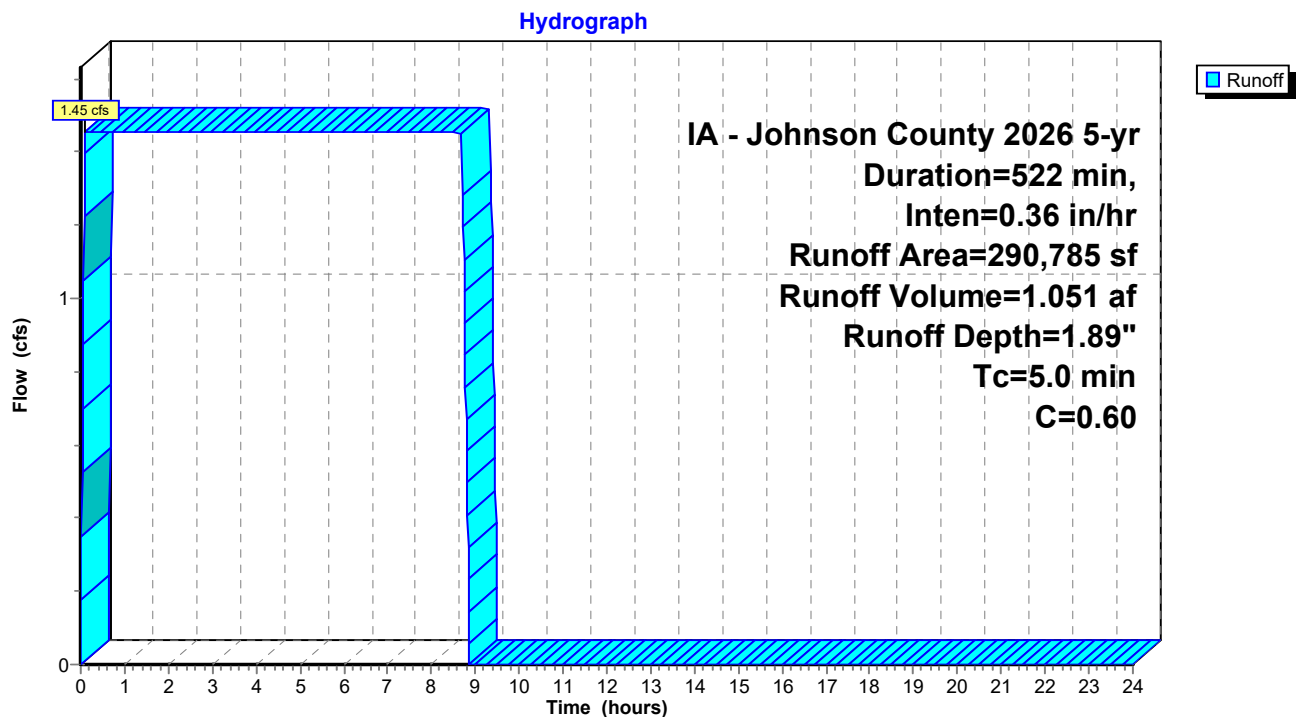
Runoff = 1.45 cfs @ 0.09 hrs, Volume= 1.051 af, Depth= 1.89"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 IA - Johnson County 2026 5-yr Duration=522 min, Inten=0.36 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed



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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=2.24"

Tc=5.0 min C=0.60 Runoff=1.72 cfs 1.246 af

Total Runoff Area = 6.676 ac Runoff Volume = 1.246 af Average Runoff Depth = 2.24"

66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Summary for Subcatchment 4S: Proposed

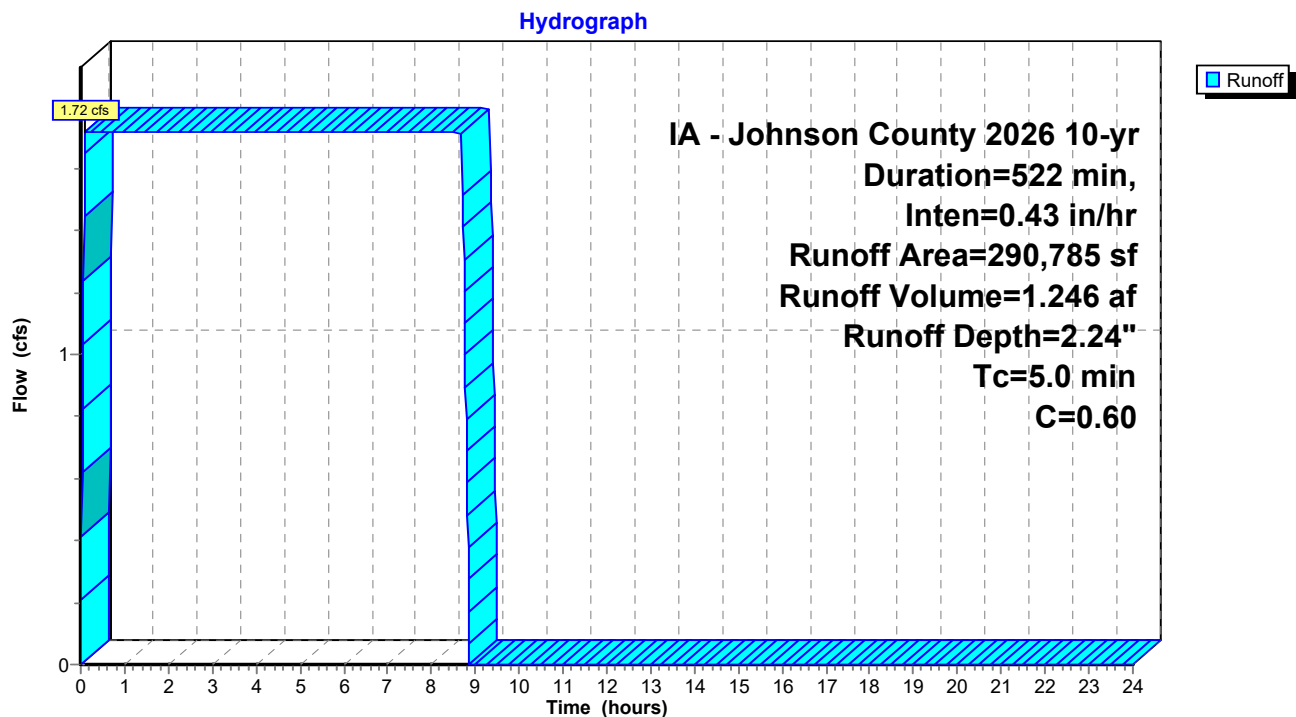
Runoff = 1.72 cfs @ 0.09 hrs, Volume= 1.246 af, Depth= 2.24"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 IA - Johnson County 2026 10-yr Duration=522 min, Inten=0.43 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed



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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=2.78"

Tc=5.0 min C=0.60 Runoff=2.14 cfs 1.547 af

Total Runoff Area = 6.676 ac Runoff Volume = 1.547 af Average Runoff Depth = 2.78"

66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Summary for Subcatchment 4S: Proposed

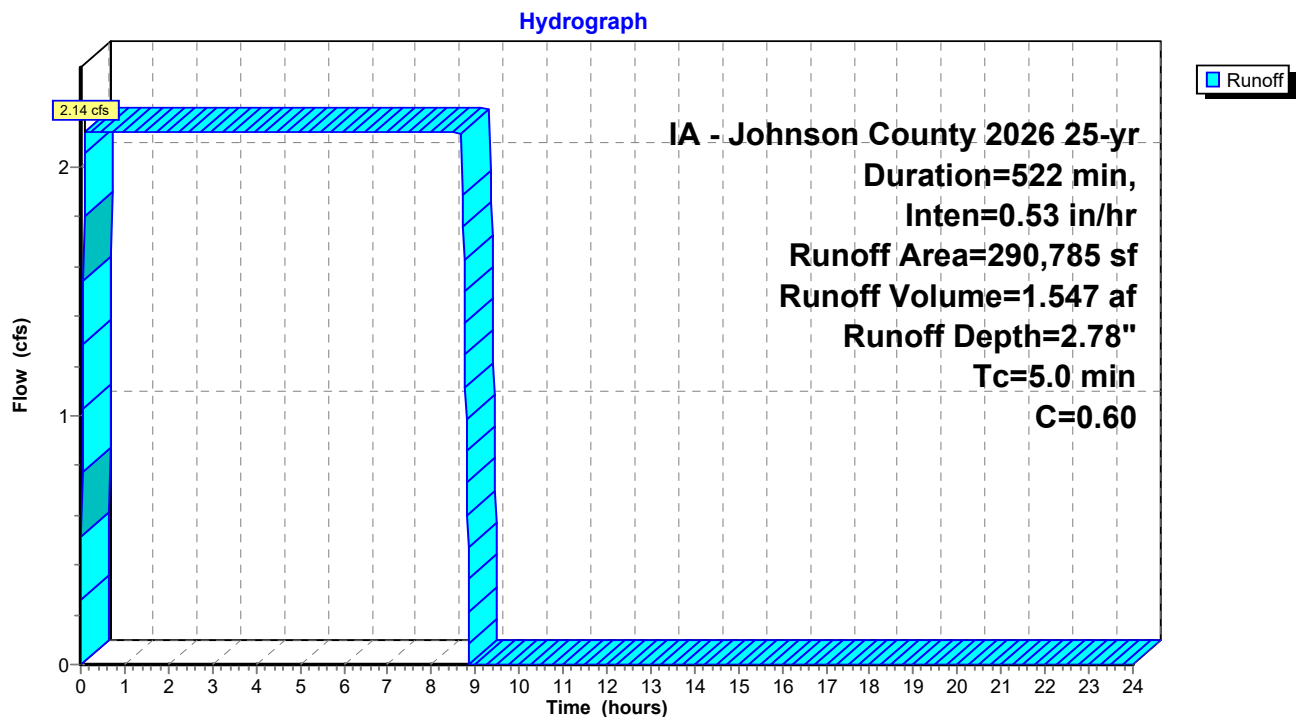
Runoff = 2.14 cfs @ 0.09 hrs, Volume= 1.547 af, Depth= 2.78"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 IA - Johnson County 2026 25-yr Duration=522 min, Inten=0.53 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed



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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=3.24"

Tc=5.0 min C=0.60 Runoff=2.49 cfs 1.802 af

Total Runoff Area = 6.676 ac Runoff Volume = 1.802 af Average Runoff Depth = 3.24"

66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Summary for Subcatchment 4S: Proposed

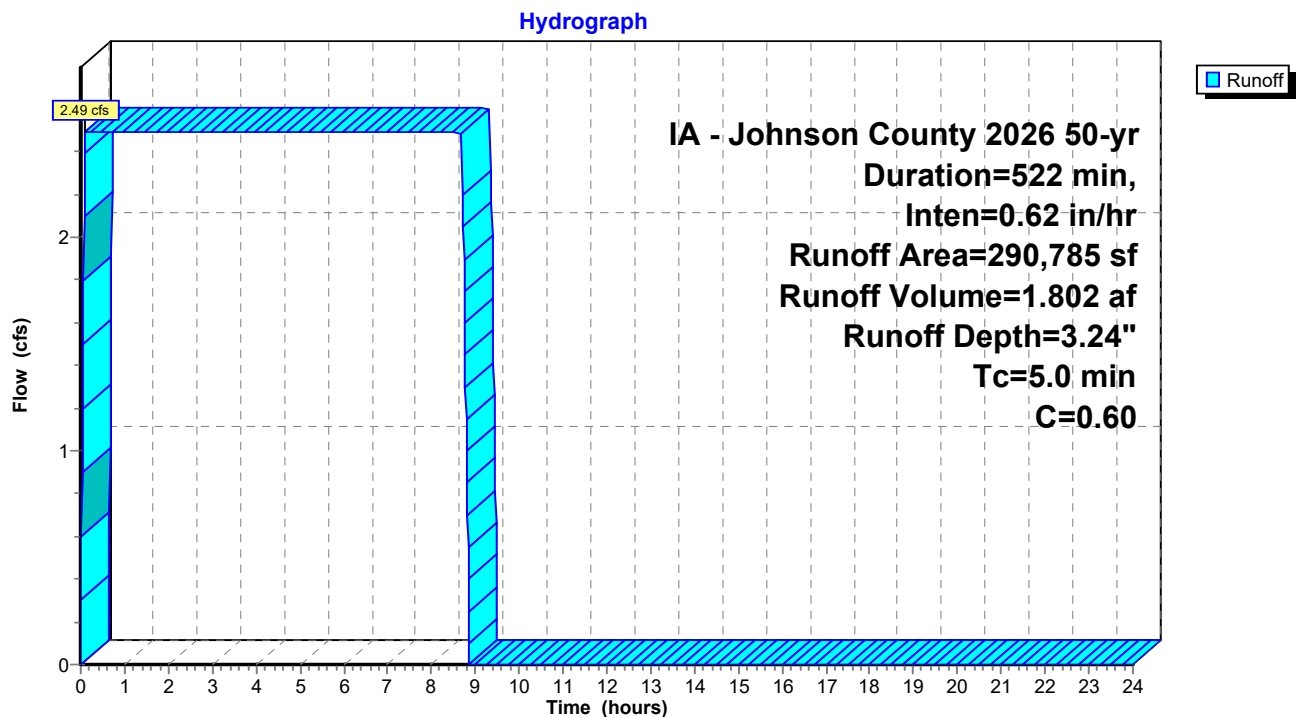
Runoff = 2.49 cfs @ 0.09 hrs, Volume= 1.802 af, Depth= 3.24"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 IA - Johnson County 2026 50-yr Duration=522 min, Inten=0.62 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by Rational method, Rise/Fall=1.0/2.0 xTc
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=3.74"
Tc=5.0 min C=0.60 Runoff=2.88 cfs 2.080 af

Total Runoff Area = 6.676 ac Runoff Volume = 2.080 af Average Runoff Depth = 3.74"
66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Summary for Subcatchment 4S: Proposed

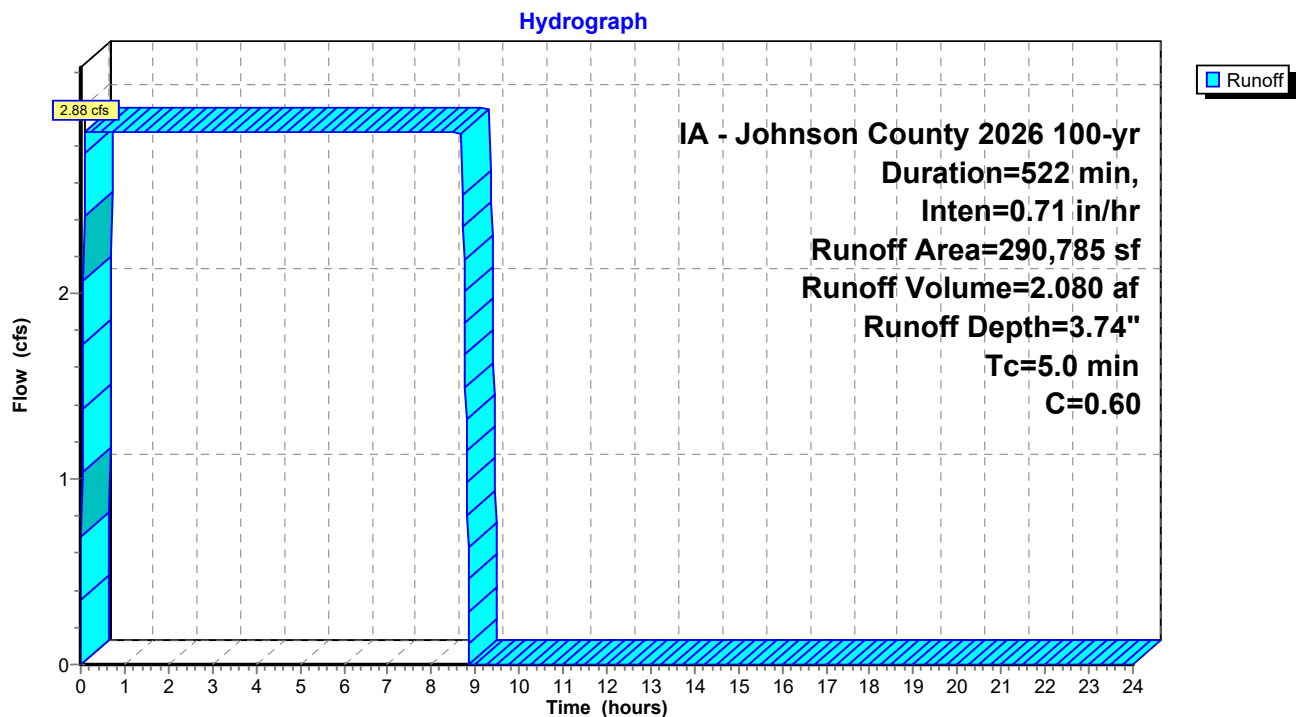
Runoff = 2.88 cfs @ 0.09 hrs, Volume= 2.080 af, Depth= 3.74"

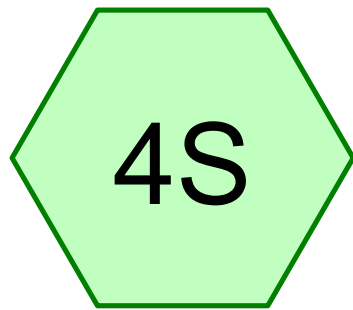
Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 IA - Johnson County 2026 100-yr Duration=522 min, Inten=0.71 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

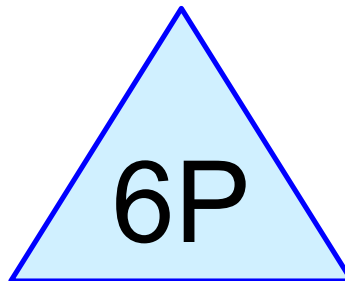
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 4S: Proposed

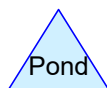
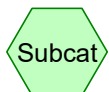




Proposed



Detention Basin



Routing Diagram for Proposed

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Proposed

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Area Listing (all nodes)

Area (acres)	C	Description (subcatchment-numbers)
4.421	0.40	Open Area (4S)
2.254	0.98	Paved/Building Areas (4S)
6.676	0.60	TOTAL AREA

Proposed

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	6P	745.75	745.00	87.2	0.0086	0.010	12.0	0.0	0.0

Proposed*IA - Johnson County 2026 1-yr Duration=522 min, Inten=0.25 in/hr*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=1.30"

Tc=5.0 min C=0.60 Runoff=1.00 cfs 0.723 af

Pond 6P: Detention Basin

Peak Elev=757.18' Storage=27,327 cf Inflow=1.00 cfs 0.723 af

Primary=0.27 cfs 0.329 af Secondary=0.00 cfs 0.000 af Outflow=0.27 cfs 0.329 af

Total Runoff Area = 6.676 ac Runoff Volume = 0.723 af Average Runoff Depth = 1.30"
66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Proposed

IA - Johnson County 2026 1-yr Duration=522 min, Inten=0.25 in/hr

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Summary for Subcatchment 4S: Proposed

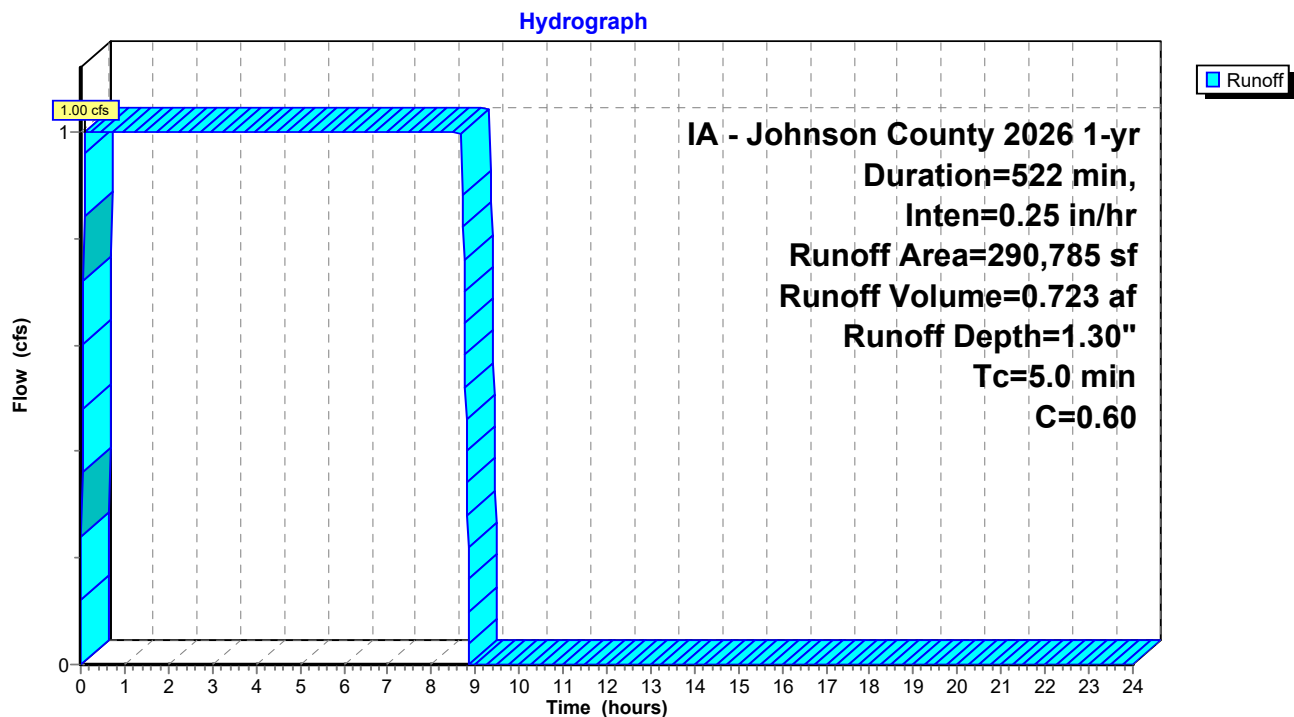
Runoff = 1.00 cfs @ 0.09 hrs, Volume= 0.723 af, Depth= 1.30"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

IA - Johnson County 2026 1-yr Duration=522 min, Inten=0.25 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed

Proposed

IA - Johnson County 2026 1-yr Duration=522 min, Inten=0.25 in/hr

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Summary for Pond 6P: Detention Basin

Inflow Area = 6.676 ac, 33.77% Impervious, Inflow Depth = 1.30" for 1-yr event
 Inflow = 1.00 cfs @ 0.09 hrs, Volume= 0.723 af
 Outflow = 0.27 cfs @ 8.82 hrs, Volume= 0.329 af, Atten= 73%, Lag= 523.9 min
 Primary = 0.27 cfs @ 8.82 hrs, Volume= 0.329 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 757.18' @ 8.82 hrs Surf.Area= 41,311 sf Storage= 27,327 cf

Plug-Flow detention time= 641.1 min calculated for 0.329 af (45% of inflow)
 Center-of-Mass det. time= 498.1 min (762.9 - 264.8)

Volume	Invert	Avail.Storage	Storage Description
#1	756.50'	138,722 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
756.50	39,000	842.0	0	0	39,000
757.50	42,418	867.0	40,697	40,697	42,506
758.00	48,198	906.0	22,639	63,336	48,026
759.00	50,946	925.0	49,566	112,901	50,942
759.50	52,341	835.0	25,821	138,722	63,555

Device	Routing	Invert	Outlet Devices
#1	Primary	745.75'	12.0" Round Culvert L= 87.2' Ke= 0.500 Inlet / Outlet Invert= 745.75' / 745.00' S= 0.0086 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	756.50'	1.5" Vert. Perf Riser X 4.00 columns X 3 rows with 6.0" cc spacing C= 0.600
#3	Device 1	758.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	758.50'	20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.27 cfs @ 8.82 hrs HW=757.18' (Free Discharge)

↑ **1=Culvert** (Passes 0.27 cfs of 11.93 cfs potential flow)

↑ **2=Perf Riser** (Orifice Controls 0.27 cfs @ 2.72 fps)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=756.50' (Free Discharge)

↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed

IA - Johnson County 2026 1-yr Duration=522 min, Inten=0.25 in/hr

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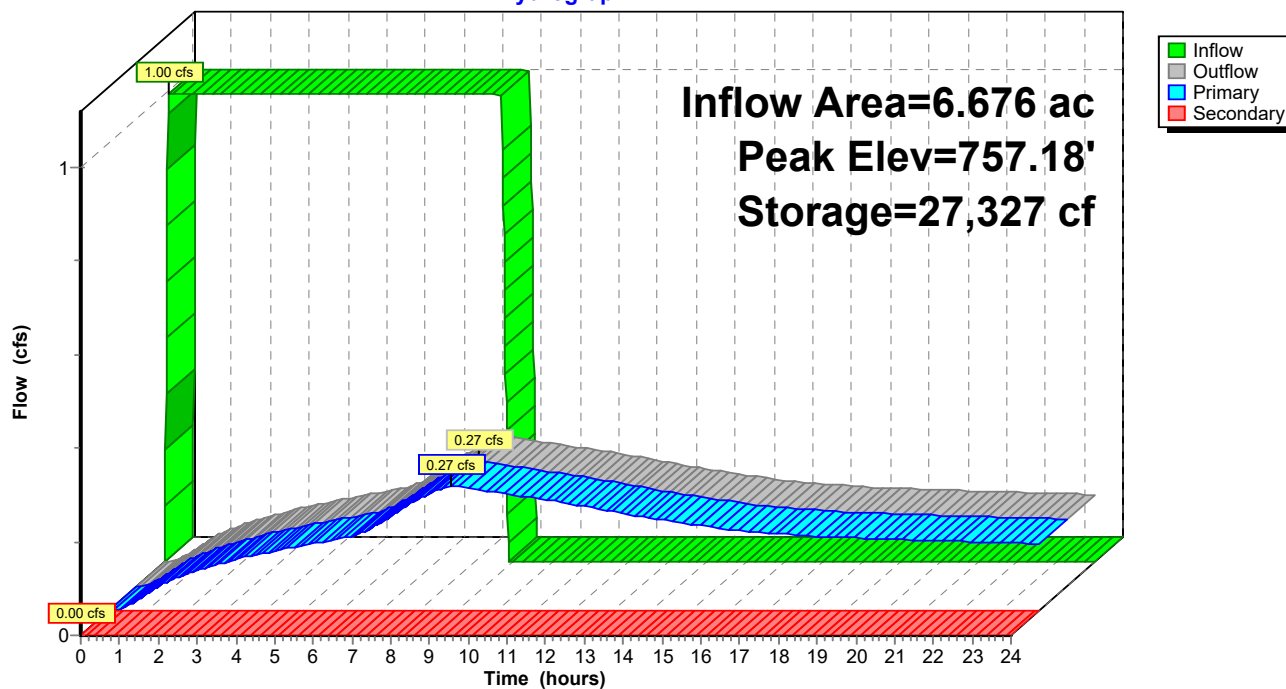
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Pond 6P: Detention Basin

Hydrograph



Proposed*IA - Johnson County 2026 2-yr Duration=522 min, Inten=0.29 in/hr*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=1.51"

Tc=5.0 min C=0.60 Runoff=1.16 cfs 0.839 af

Pond 6P: Detention Basin

Peak Elev=757.28' Storage=31,602 cf Inflow=1.16 cfs 0.839 af

Primary=0.31 cfs 0.394 af Secondary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.394 af

Total Runoff Area = 6.676 ac Runoff Volume = 0.839 af Average Runoff Depth = 1.51"
66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Proposed

IA - Johnson County 2026 2-yr Duration=522 min, Inten=0.29 in/hr

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Summary for Subcatchment 4S: Proposed

Runoff = 1.16 cfs @ 0.09 hrs, Volume= 0.839 af, Depth= 1.51"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

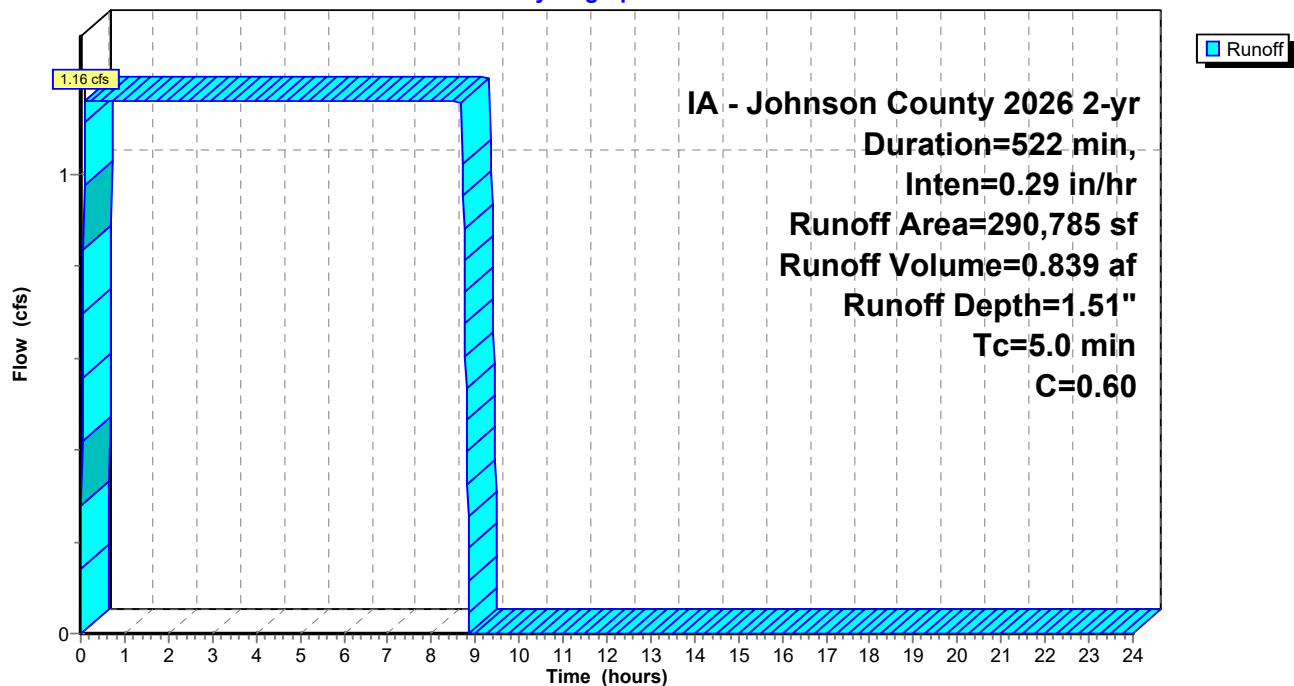
IA - Johnson County 2026 2-yr Duration=522 min, Inten=0.29 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed

Hydrograph



Proposed

IA - Johnson County 2026 2-yr Duration=522 min, Inten=0.29 in/hr

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Summary for Pond 6P: Detention Basin

Inflow Area = 6.676 ac, 33.77% Impervious, Inflow Depth = 1.51" for 2-yr event
 Inflow = 1.16 cfs @ 0.09 hrs, Volume= 0.839 af
 Outflow = 0.31 cfs @ 8.82 hrs, Volume= 0.394 af, Atten= 73%, Lag= 523.9 min
 Primary = 0.31 cfs @ 8.82 hrs, Volume= 0.394 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 757.28' @ 8.82 hrs Surf.Area= 41,666 sf Storage= 31,602 cf

Plug-Flow detention time= 634.8 min calculated for 0.394 af (47% of inflow)
 Center-of-Mass det. time= 495.8 min (760.6 - 264.8)

Volume	Invert	Avail.Storage	Storage Description
#1	756.50'	138,722 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
756.50	39,000	842.0	0	0	39,000
757.50	42,418	867.0	40,697	40,697	42,506
758.00	48,198	906.0	22,639	63,336	48,026
759.00	50,946	925.0	49,566	112,901	50,942
759.50	52,341	835.0	25,821	138,722	63,555

Device	Routing	Invert	Outlet Devices
#1	Primary	745.75'	12.0" Round Culvert L= 87.2' Ke= 0.500 Inlet / Outlet Invert= 745.75' / 745.00' S= 0.0086 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	756.50'	1.5" Vert. Perf Riser X 4.00 columns X 3 rows with 6.0" cc spacing C= 0.600
#3	Device 1	758.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	758.50'	20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.31 cfs @ 8.82 hrs HW=757.28' (Free Discharge)

↑ **1=Culvert** (Passes 0.31 cfs of 11.99 cfs potential flow)

↑ **2=Perf Riser** (Orifice Controls 0.31 cfs @ 3.18 fps)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=756.50' (Free Discharge)

↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed

IA - Johnson County 2026 2-yr Duration=522 min, Inten=0.29 in/hr

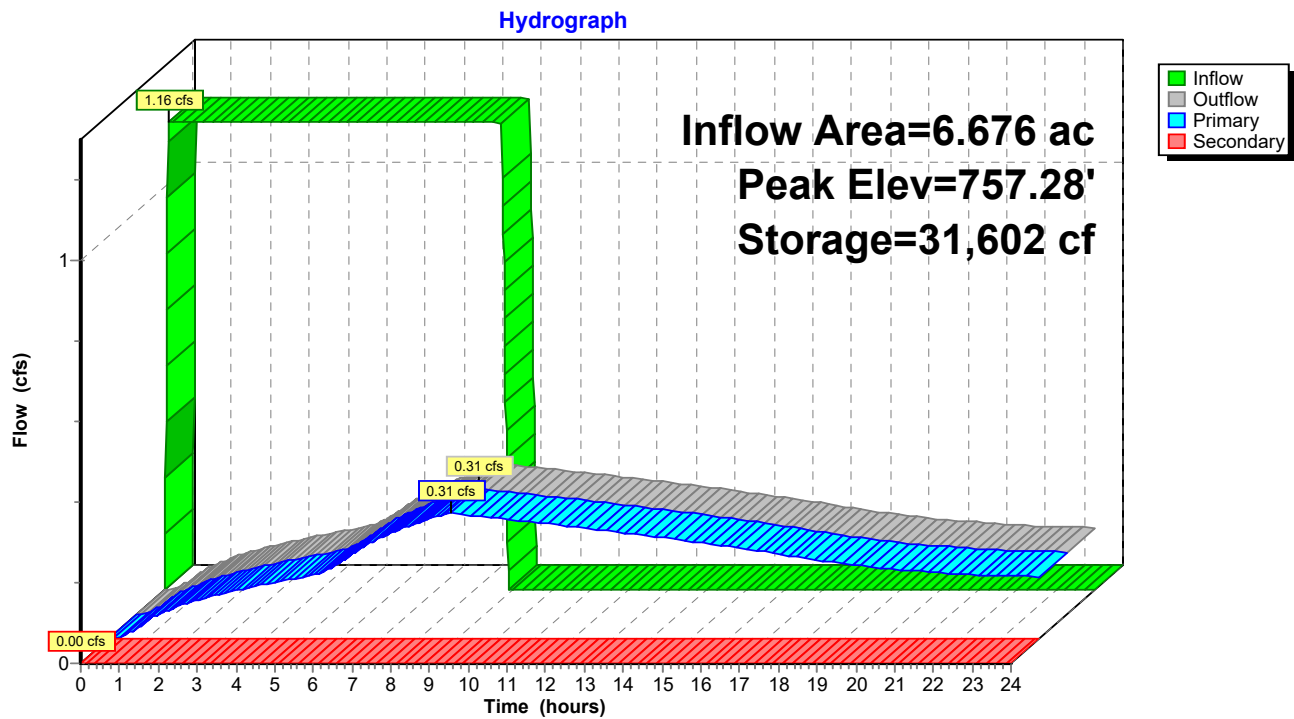
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Pond 6P: Detention Basin



Proposed*IA - Johnson County 2026 5-yr Duration=522 min, Inten=0.36 in/hr*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=1.89"

Tc=5.0 min C=0.60 Runoff=1.45 cfs 1.051 af

Pond 6P: Detention Basin

Peak Elev=757.47' Storage=39,489 cf Inflow=1.45 cfs 1.051 af

Primary=0.38 cfs 0.516 af Secondary=0.00 cfs 0.000 af Outflow=0.38 cfs 0.516 af

Total Runoff Area = 6.676 ac Runoff Volume = 1.051 af Average Runoff Depth = 1.89"
66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Proposed

IA - Johnson County 2026 5-yr Duration=522 min, Inten=0.36 in/hr

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Summary for Subcatchment 4S: Proposed

Runoff = 1.45 cfs @ 0.09 hrs, Volume= 1.051 af, Depth= 1.89"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

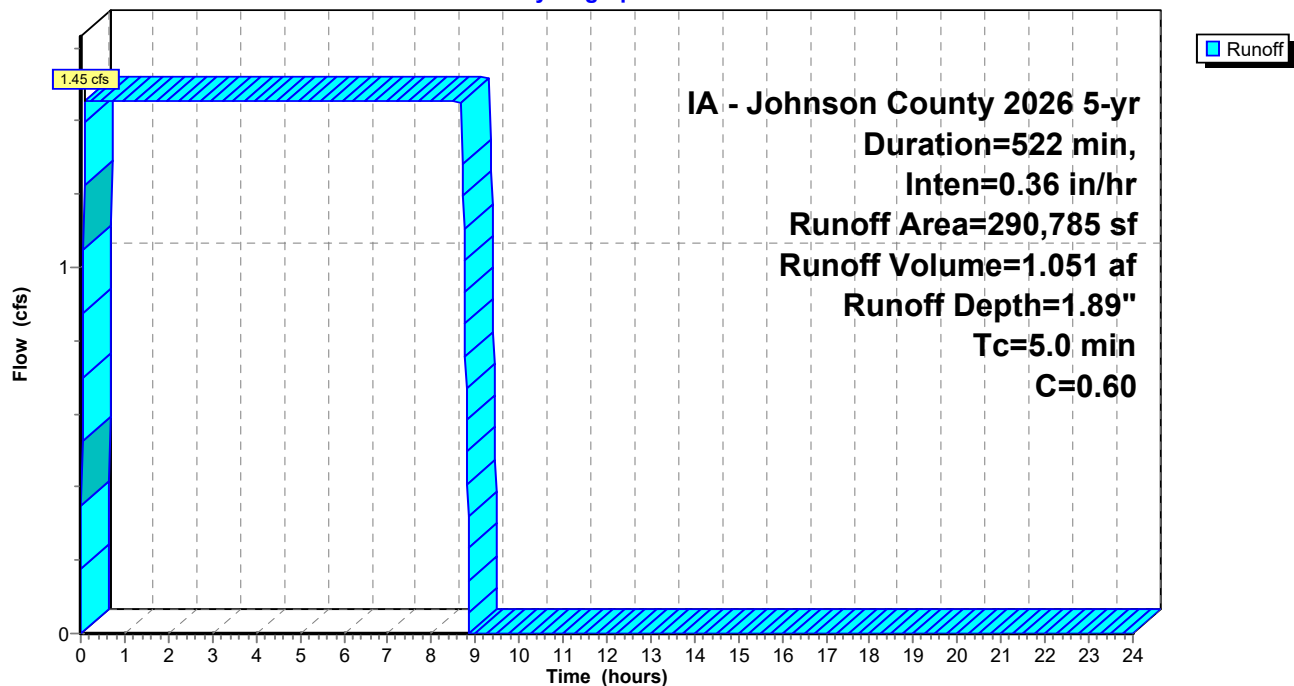
IA - Johnson County 2026 5-yr Duration=522 min, Inten=0.36 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed

Hydrograph



Proposed

IA - Johnson County 2026 5-yr Duration=522 min, Inten=0.36 in/hr

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Summary for Pond 6P: Detention Basin

Inflow Area = 6.676 ac, 33.77% Impervious, Inflow Depth = 1.89" for 5-yr event
 Inflow = 1.45 cfs @ 0.09 hrs, Volume= 1.051 af
 Outflow = 0.38 cfs @ 8.82 hrs, Volume= 0.516 af, Atten= 74%, Lag= 524.0 min
 Primary = 0.38 cfs @ 8.82 hrs, Volume= 0.516 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 757.47' @ 8.82 hrs Surf.Area= 42,319 sf Storage= 39,489 cf

Plug-Flow detention time= 646.0 min calculated for 0.515 af (49% of inflow)
 Center-of-Mass det. time= 512.7 min (777.5 - 264.8)

Volume	Invert	Avail.Storage	Storage Description
#1	756.50'	138,722 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
756.50	39,000	842.0	0	0	39,000
757.50	42,418	867.0	40,697	40,697	42,506
758.00	48,198	906.0	22,639	63,336	48,026
759.00	50,946	925.0	49,566	112,901	50,942
759.50	52,341	835.0	25,821	138,722	63,555

Device	Routing	Invert	Outlet Devices
#1	Primary	745.75'	12.0" Round Culvert L= 87.2' Ke= 0.500 Inlet / Outlet Invert= 745.75' / 745.00' S= 0.0086 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	756.50'	1.5" Vert. Perf Riser X 4.00 columns X 3 rows with 6.0" cc spacing C= 0.600
#3	Device 1	758.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	758.50'	20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.38 cfs @ 8.82 hrs HW=757.47' (Free Discharge)

↑ **1=Culvert** (Passes 0.38 cfs of 12.09 cfs potential flow)

↑ **2=Perf Riser** (Orifice Controls 0.38 cfs @ 3.83 fps)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=756.50' (Free Discharge)

↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed

IA - Johnson County 2026 5-yr Duration=522 min, Inten=0.36 in/hr

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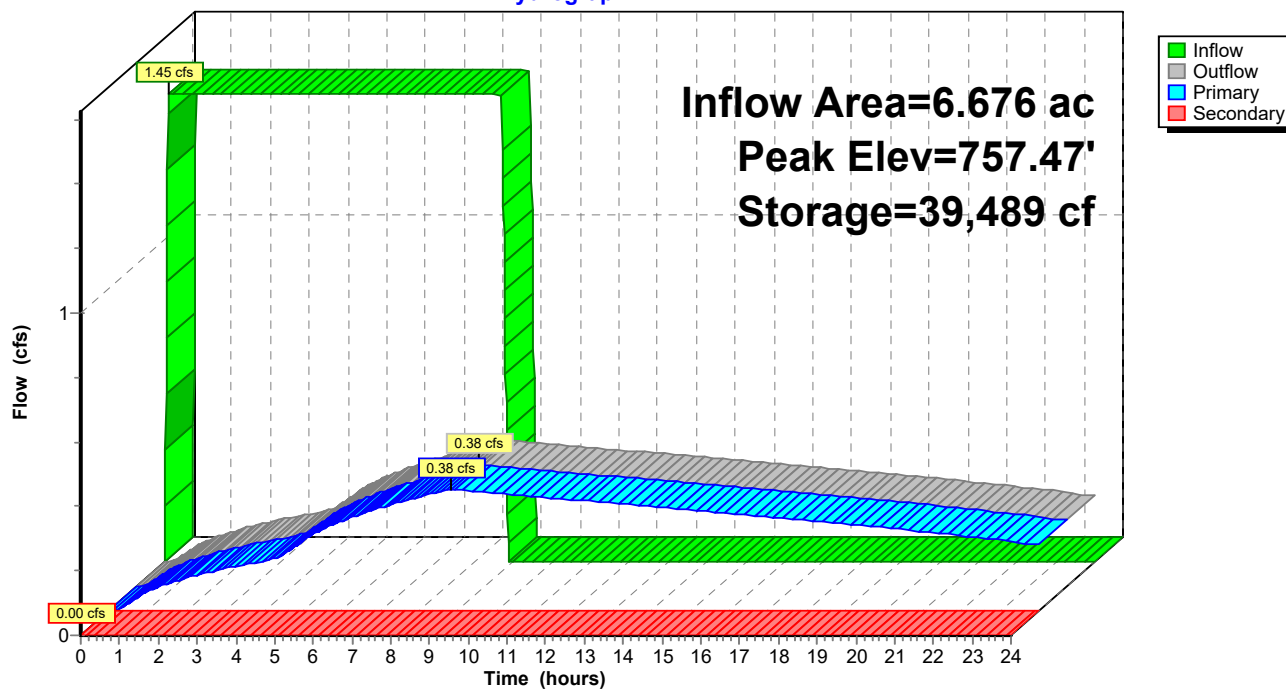
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Pond 6P: Detention Basin

Hydrograph



Proposed*IA - Johnson County 2026 10-yr Duration=522 min, Inten=0.43 in/hr*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=2.24"

Tc=5.0 min C=0.60 Runoff=1.72 cfs 1.246 af

Pond 6P: Detention Basin

Peak Elev=757.64' Storage=46,719 cf Inflow=1.72 cfs 1.246 af

Primary=0.49 cfs 0.617 af Secondary=0.00 cfs 0.000 af Outflow=0.49 cfs 0.617 af

Total Runoff Area = 6.676 ac Runoff Volume = 1.246 af Average Runoff Depth = 2.24"
66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Proposed

IA - Johnson County 2026 10-yr Duration=522 min, Inten=0.43 in/hr

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Summary for Subcatchment 4S: Proposed

Runoff = 1.72 cfs @ 0.09 hrs, Volume= 1.246 af, Depth= 2.24"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

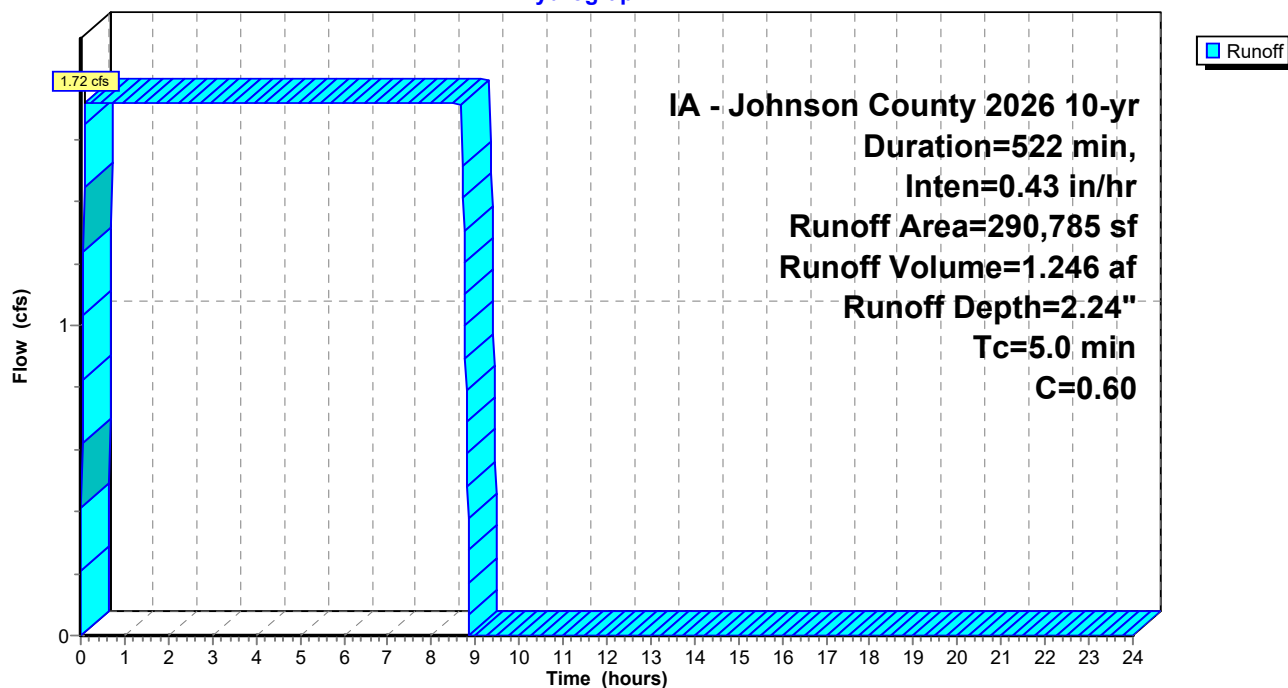
IA - Johnson County 2026 10-yr Duration=522 min, Inten=0.43 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed

Hydrograph



Proposed

IA - Johnson County 2026 10-yr Duration=522 min, Inten=0.43 in/hr

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Summary for Pond 6P: Detention Basin

Inflow Area = 6.676 ac, 33.77% Impervious, Inflow Depth = 2.24" for 10-yr event
 Inflow = 1.72 cfs @ 0.09 hrs, Volume= 1.246 af
 Outflow = 0.49 cfs @ 8.82 hrs, Volume= 0.617 af, Atten= 72%, Lag= 523.8 min
 Primary = 0.49 cfs @ 8.82 hrs, Volume= 0.617 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 757.64' @ 8.82 hrs Surf.Area= 43,992 sf Storage= 46,719 cf

Plug-Flow detention time= 646.3 min calculated for 0.617 af (50% of inflow)
 Center-of-Mass det. time= 513.9 min (778.7 - 264.8)

Volume	Invert	Avail.Storage	Storage Description
#1	756.50'	138,722 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
756.50	39,000	842.0	0	0	39,000
757.50	42,418	867.0	40,697	40,697	42,506
758.00	48,198	906.0	22,639	63,336	48,026
759.00	50,946	925.0	49,566	112,901	50,942
759.50	52,341	835.0	25,821	138,722	63,555

Device	Routing	Invert	Outlet Devices
#1	Primary	745.75'	12.0" Round Culvert L= 87.2' Ke= 0.500 Inlet / Outlet Invert= 745.75' / 745.00' S= 0.0086 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	756.50'	1.5" Vert. Perf Riser X 4.00 columns X 3 rows with 6.0" cc spacing C= 0.600
#3	Device 1	758.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	758.50'	20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.49 cfs @ 8.82 hrs HW=757.64' (Free Discharge)

↑ **1=Culvert** (Passes 0.49 cfs of 12.17 cfs potential flow)

↑ **2=Perf Riser** (Orifice Controls 0.49 cfs @ 3.33 fps)

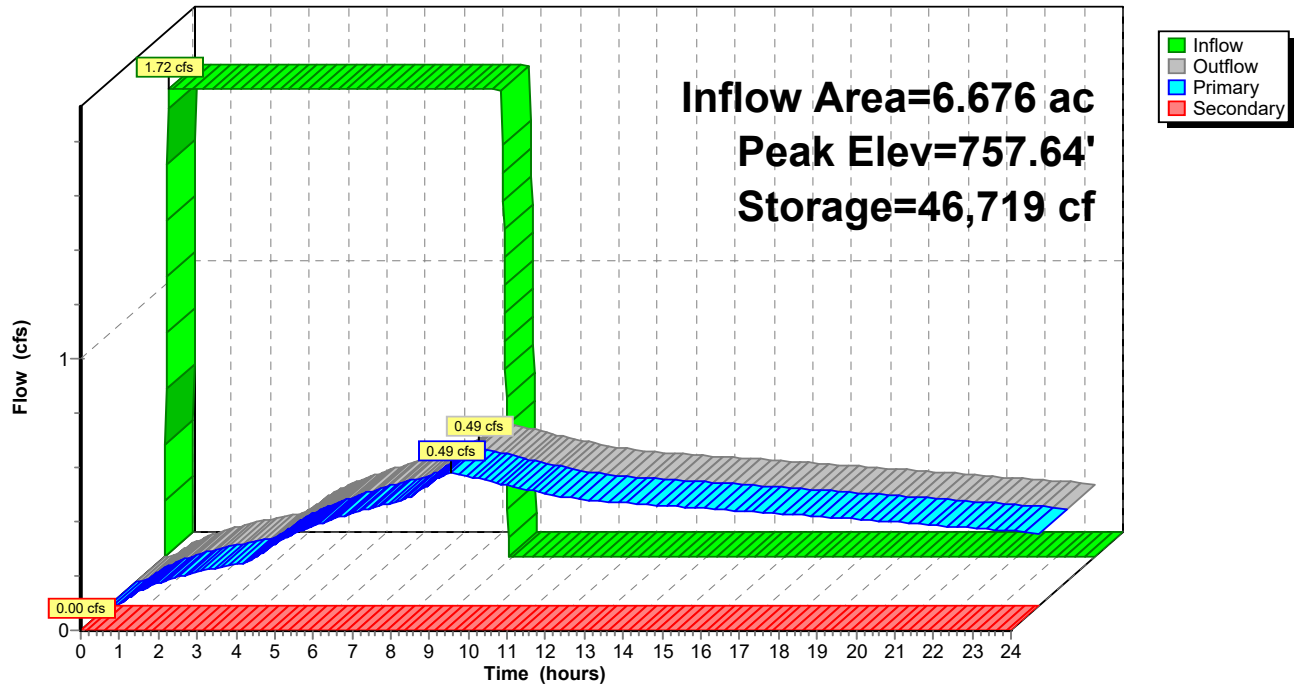
↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=756.50' (Free Discharge)

↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 6P: Detention Basin

Hydrograph



Proposed*IA - Johnson County 2026 25-yr Duration=522 min, Inten=0.53 in/hr*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=2.78"

Tc=5.0 min C=0.60 Runoff=2.14 cfs 1.547 af

Pond 6P: Detention Basin

Peak Elev=757.88' Storage=57,619 cf Inflow=2.14 cfs 1.547 af

Primary=0.62 cfs 0.784 af Secondary=0.00 cfs 0.000 af Outflow=0.62 cfs 0.784 af

Total Runoff Area = 6.676 ac Runoff Volume = 1.547 af Average Runoff Depth = 2.78"
66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Proposed

IA - Johnson County 2026 25-yr Duration=522 min, Inten=0.53 in/hr

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Summary for Subcatchment 4S: Proposed

Runoff = 2.14 cfs @ 0.09 hrs, Volume= 1.547 af, Depth= 2.78"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

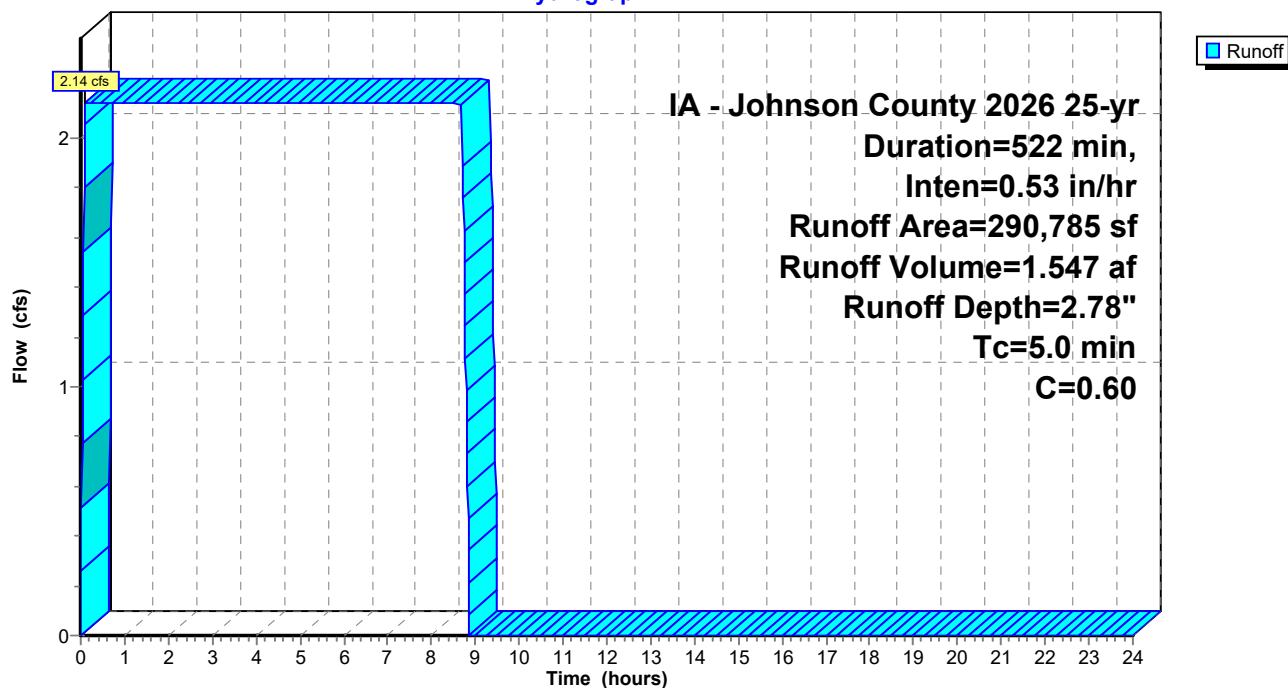
IA - Johnson County 2026 25-yr Duration=522 min, Inten=0.53 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed

Hydrograph



Proposed

IA - Johnson County 2026 25-yr Duration=522 min, Inten=0.53 in/hr

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Summary for Pond 6P: Detention Basin

Inflow Area = 6.676 ac, 33.77% Impervious, Inflow Depth = 2.78" for 25-yr event
 Inflow = 2.14 cfs @ 0.09 hrs, Volume= 1.547 af
 Outflow = 0.62 cfs @ 8.82 hrs, Volume= 0.784 af, Atten= 71%, Lag= 523.7 min
 Primary = 0.62 cfs @ 8.82 hrs, Volume= 0.784 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 757.88' @ 8.82 hrs Surf.Area= 46,773 sf Storage= 57,619 cf

Plug-Flow detention time= 632.3 min calculated for 0.784 af (51% of inflow)
 Center-of-Mass det. time= 503.3 min (768.1 - 264.8)

Volume	Invert	Avail.Storage	Storage Description
#1	756.50'	138,722 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
756.50	39,000	842.0	0	0	39,000
757.50	42,418	867.0	40,697	40,697	42,506
758.00	48,198	906.0	22,639	63,336	48,026
759.00	50,946	925.0	49,566	112,901	50,942
759.50	52,341	835.0	25,821	138,722	63,555

Device	Routing	Invert	Outlet Devices
#1	Primary	745.75'	12.0" Round Culvert L= 87.2' Ke= 0.500 Inlet / Outlet Invert= 745.75' / 745.00' S= 0.0086 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	756.50'	1.5" Vert. Perf Riser X 4.00 columns X 3 rows with 6.0" cc spacing C= 0.600
#3	Device 1	758.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	758.50'	20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.62 cfs @ 8.82 hrs HW=757.88' (Free Discharge)

↑ **1=Culvert** (Passes 0.62 cfs of 12.30 cfs potential flow)

↑ **2=Perf Riser** (Orifice Controls 0.62 cfs @ 4.20 fps)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=756.50' (Free Discharge)

↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed

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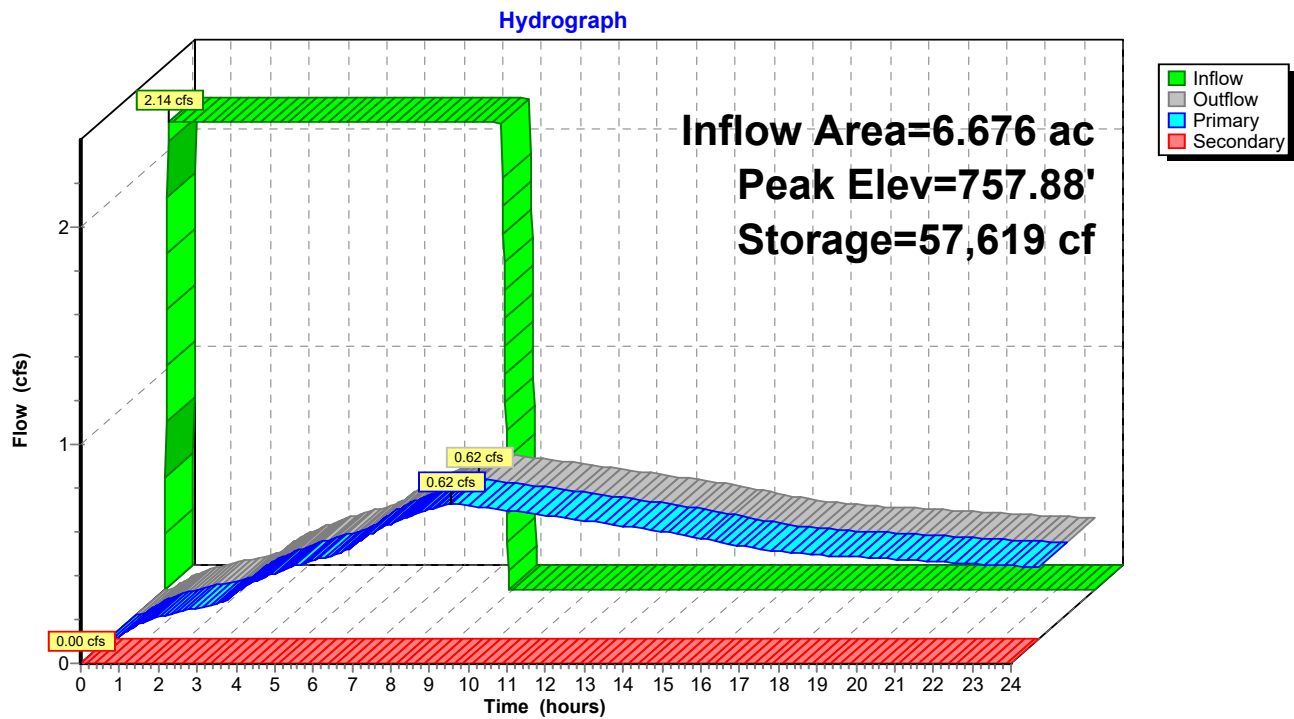
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Pond 6P: Detention Basin



Proposed*IA - Johnson County 2026 50-yr Duration=522 min, Inten=0.62 in/hr*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=3.24"

Tc=5.0 min C=0.60 Runoff=2.49 cfs 1.802 af

Pond 6P: Detention Basin

Peak Elev=758.07' Storage=66,783 cf Inflow=2.49 cfs 1.802 af

Primary=0.90 cfs 0.934 af Secondary=0.00 cfs 0.000 af Outflow=0.90 cfs 0.934 af

Total Runoff Area = 6.676 ac Runoff Volume = 1.802 af Average Runoff Depth = 3.24"
66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Proposed

IA - Johnson County 2026 50-yr Duration=522 min, Inten=0.62 in/hr

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Summary for Subcatchment 4S: Proposed

Runoff = 2.49 cfs @ 0.09 hrs, Volume= 1.802 af, Depth= 3.24"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

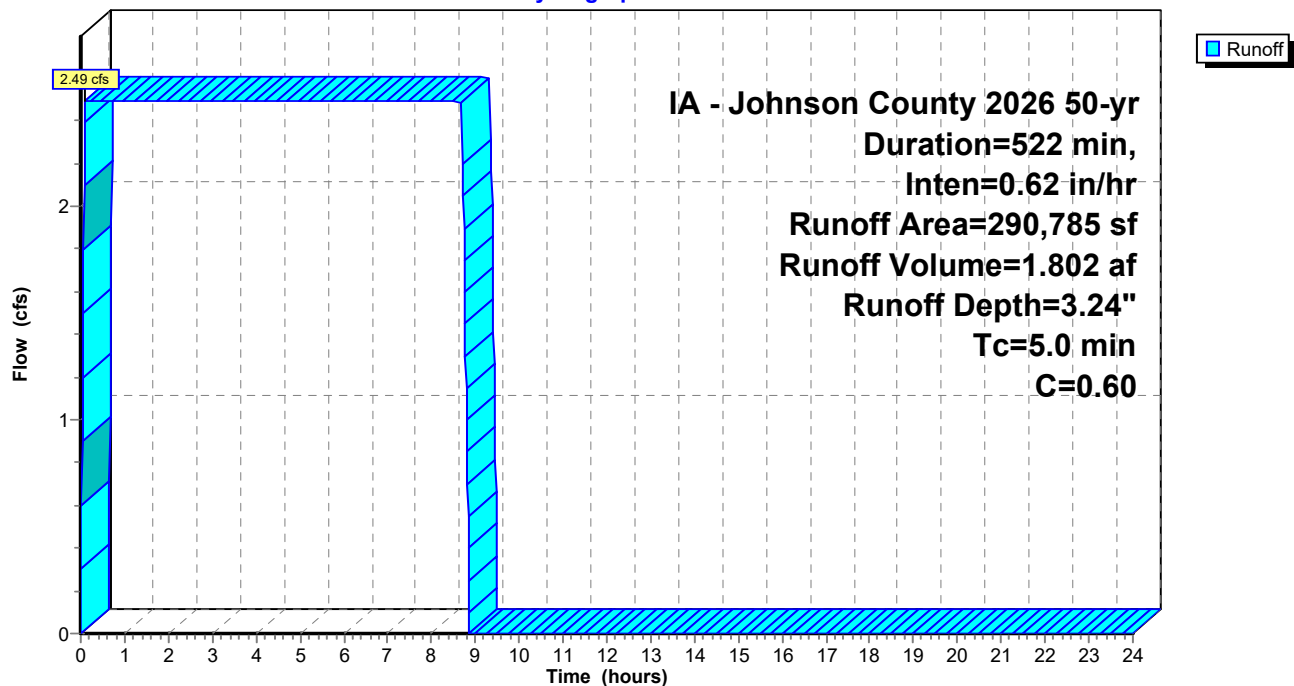
IA - Johnson County 2026 50-yr Duration=522 min, Inten=0.62 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed

Hydrograph



Proposed

IA - Johnson County 2026 50-yr Duration=522 min, Inten=0.62 in/hr

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Summary for Pond 6P: Detention Basin

Inflow Area = 6.676 ac, 33.77% Impervious, Inflow Depth = 3.24" for 50-yr event
 Inflow = 2.49 cfs @ 0.09 hrs, Volume= 1.802 af
 Outflow = 0.90 cfs @ 8.81 hrs, Volume= 0.934 af, Atten= 64%, Lag= 523.0 min
 Primary = 0.90 cfs @ 8.81 hrs, Volume= 0.934 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 758.07' @ 8.81 hrs Surf.Area= 48,392 sf Storage= 66,783 cf

Plug-Flow detention time= 625.6 min calculated for 0.933 af (52% of inflow)
 Center-of-Mass det. time= 499.5 min (764.2 - 264.8)

Volume	Invert	Avail.Storage	Storage Description
#1	756.50'	138,722 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
756.50	39,000	842.0	0	0	39,000
757.50	42,418	867.0	40,697	40,697	42,506
758.00	48,198	906.0	22,639	63,336	48,026
759.00	50,946	925.0	49,566	112,901	50,942
759.50	52,341	835.0	25,821	138,722	63,555

Device	Routing	Invert	Outlet Devices
#1	Primary	745.75'	12.0" Round Culvert L= 87.2' Ke= 0.500 Inlet / Outlet Invert= 745.75' / 745.00' S= 0.0086 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	756.50'	1.5" Vert. Perf Riser X 4.00 columns X 3 rows with 6.0" cc spacing C= 0.600
#3	Device 1	758.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	758.50'	20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.89 cfs @ 8.81 hrs HW=758.07' (Free Discharge)

↑ **1=Culvert** (Passes 0.89 cfs of 12.40 cfs potential flow)
 ↑ **2=Perf Riser** (Orifice Controls 0.70 cfs @ 4.73 fps)
 ↑ **3=Orifice/Grate** (Weir Controls 0.20 cfs @ 0.87 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=756.50' (Free Discharge)

↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed

Prepared by Information Technology Services

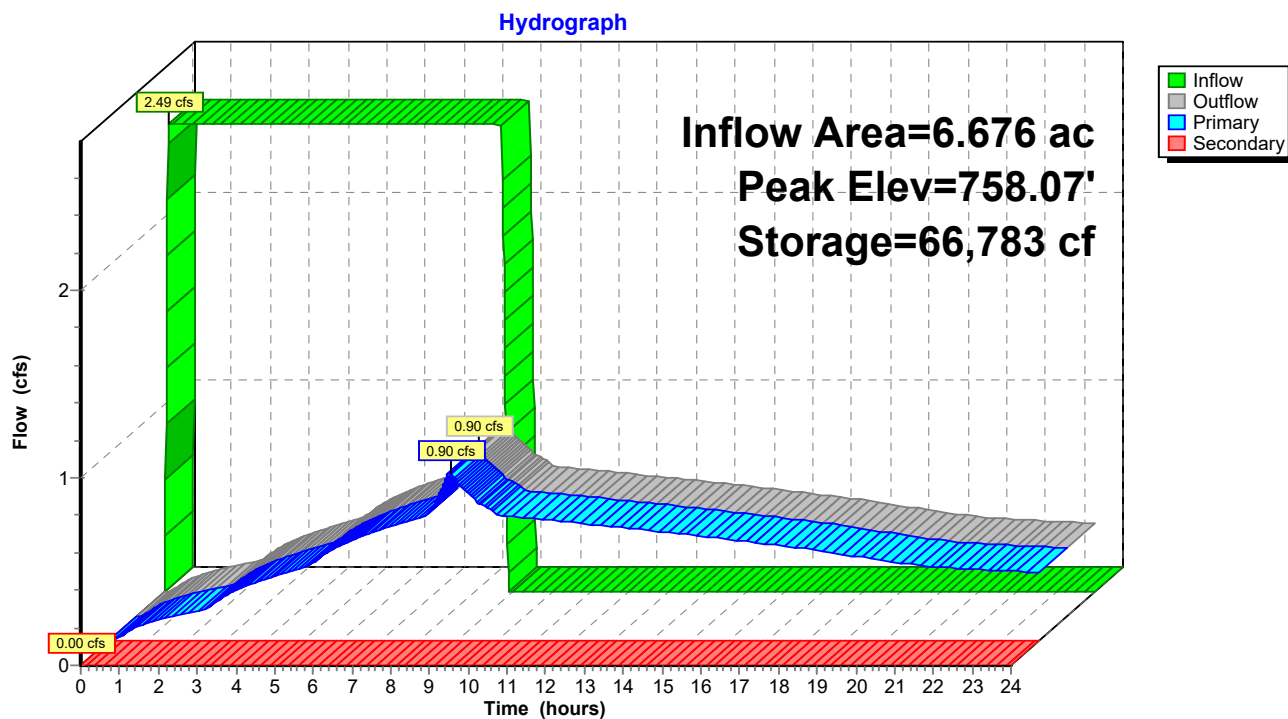
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IA - Johnson County 2026 50-yr Duration=522 min, Inten=0.62 in/hr

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Pond 6P: Detention Basin



Proposed*IA - Johnson County 2026 100-yr Duration=522 min, Inten=0.71 in/hr*

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Page 28

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment4S: Proposed

Runoff Area=290,785 sf 33.77% Impervious Runoff Depth=3.74"

Tc=5.0 min C=0.60 Runoff=2.88 cfs 2.080 af

Pond 6P: Detention Basin

Peak Elev=758.22' Storage=73,984 cf Inflow=2.88 cfs 2.080 af

Primary=1.81 cfs 1.163 af Secondary=0.00 cfs 0.000 af Outflow=1.81 cfs 1.163 af

Total Runoff Area = 6.676 ac Runoff Volume = 2.080 af Average Runoff Depth = 3.74"
66.23% Pervious = 4.421 ac 33.77% Impervious = 2.254 ac

Proposed

IA - Johnson County 2026 100-yr Duration=522 min, Inten=0.71 in/hr

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Summary for Subcatchment 4S: Proposed

Runoff = 2.88 cfs @ 0.09 hrs, Volume= 2.080 af, Depth= 3.74"

Runoff by Rational method, Rise/Fall=1.0/2.0 xTc, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

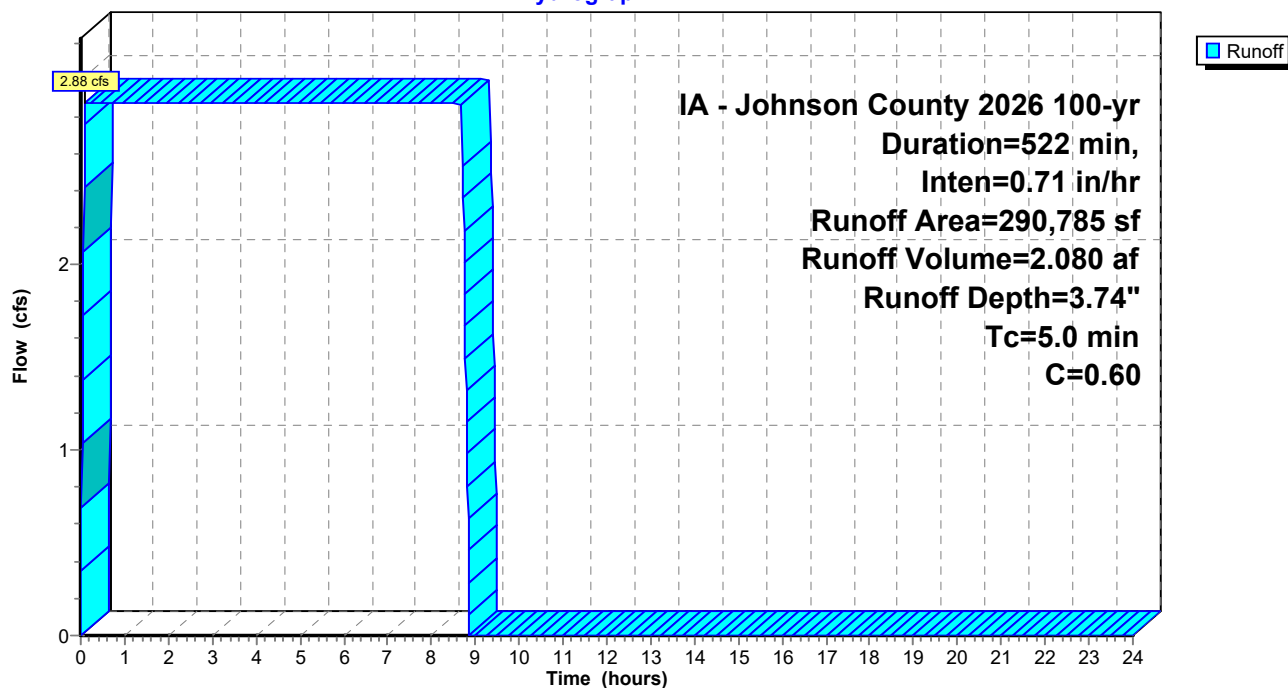
IA - Johnson County 2026 100-yr Duration=522 min, Inten=0.71 in/hr

Area (sf)	C	Description
192,586	0.40	Open Area
98,199	0.98	Paved/Building Areas
290,785	0.60	Weighted Average
192,586		66.23% Pervious Area
98,199		33.77% Impervious Area

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

Subcatchment 4S: Proposed

Hydrograph



Proposed

IA - Johnson County 2026 100-yr Duration=522 min, Inten=0.71 in/hr

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Summary for Pond 6P: Detention Basin

Inflow Area = 6.676 ac, 33.77% Impervious, Inflow Depth = 3.74" for 100-yr event
 Inflow = 2.88 cfs @ 0.09 hrs, Volume= 2.080 af
 Outflow = 1.81 cfs @ 8.76 hrs, Volume= 1.163 af, Atten= 37%, Lag= 520.3 min
 Primary = 1.81 cfs @ 8.76 hrs, Volume= 1.163 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 758.22' @ 8.76 hrs Surf.Area= 48,795 sf Storage= 73,984 cf

Plug-Flow detention time= 579.8 min calculated for 1.163 af (56% of inflow)
 Center-of-Mass det. time= 464.2 min (728.9 - 264.8)

Volume	Invert	Avail.Storage	Storage Description
#1	756.50'	138,722 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
756.50	39,000	842.0	0	0	39,000
757.50	42,418	867.0	40,697	40,697	42,506
758.00	48,198	906.0	22,639	63,336	48,026
759.00	50,946	925.0	49,566	112,901	50,942
759.50	52,341	835.0	25,821	138,722	63,555

Device	Routing	Invert	Outlet Devices
#1	Primary	745.75'	12.0" Round Culvert L= 87.2' Ke= 0.500 Inlet / Outlet Invert= 745.75' / 745.00' S= 0.0086 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	756.50'	1.5" Vert. Perf Riser X 4.00 columns X 3 rows with 6.0" cc spacing C= 0.600
#3	Device 1	758.00'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	758.50'	20.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=1.81 cfs @ 8.76 hrs HW=758.22' (Free Discharge)

↑ **1=Culvert** (Passes 1.81 cfs of 12.47 cfs potential flow)
 ↑ **2=Perf Riser** (Orifice Controls 0.75 cfs @ 5.09 fps)
 ↑ **3=Orifice/Grate** (Weir Controls 1.06 cfs @ 1.53 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=756.50' (Free Discharge)

↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Proposed

IA - Johnson County 2026 100-yr Duration=522 min, Inten=0.71 in/hr

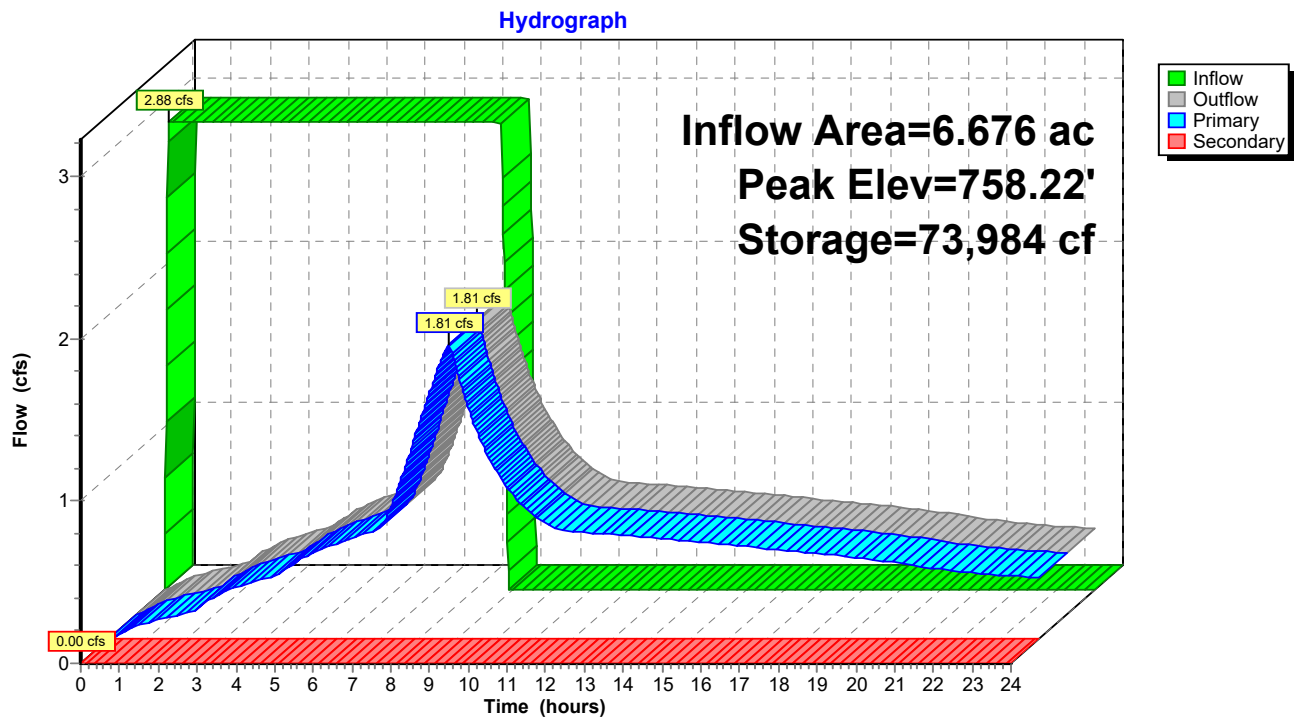
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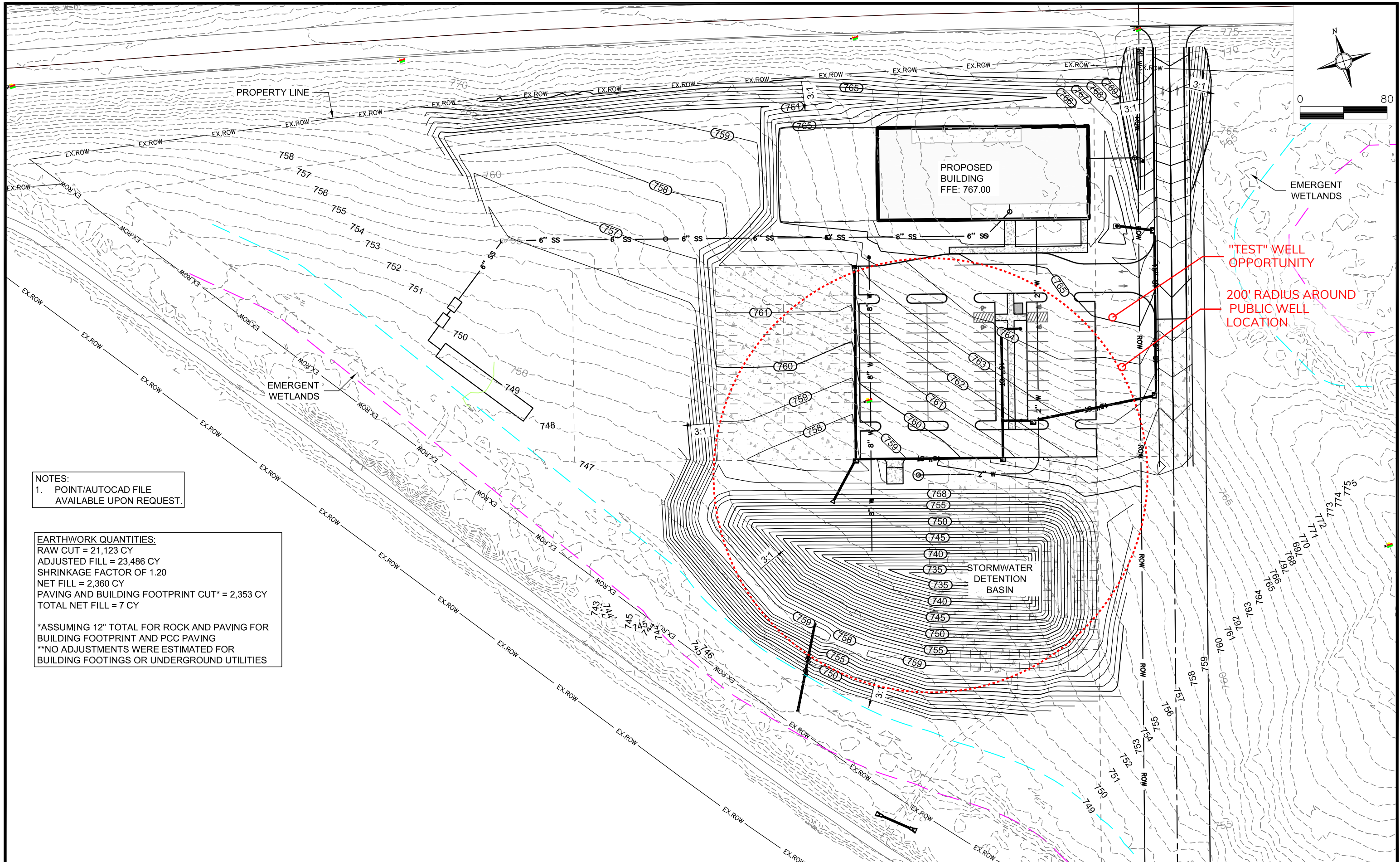
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Pond 6P: Detention Basin



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NOTES:
1. POINT/AUTOCAD FILE
AVAILABLE UPON REQUEST.

EARTHWORK QUANTITIES:
RAW CUT = 21,123 CY
ADJUSTED FILL = 23,486 CY
SHRINKAGE FACTOR OF 1.20
NET FILL = 2,360 CY
PAVING AND BUILDING FOOTPRINT CUT* = 2,353 CY
TOTAL NET FILL = 7 CY

*ASSUMING 12" TOTAL FOR ROCK AND PAVING FOR
BUILDING FOOTPRINT AND PCC PAVING
**NO ADJUSTMENTS WERE ESTIMATED FOR
BUILDING FOOTINGS OR UNDERGROUND UTILITIES

NO.	REVISION DESCRIPTION	APPROVED	DATE

CLIENT: FORM FUNCTION STUDIO
1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551



DRAWN BY: CIV
DATE: 6/24/26
PROJECT NO. 224074

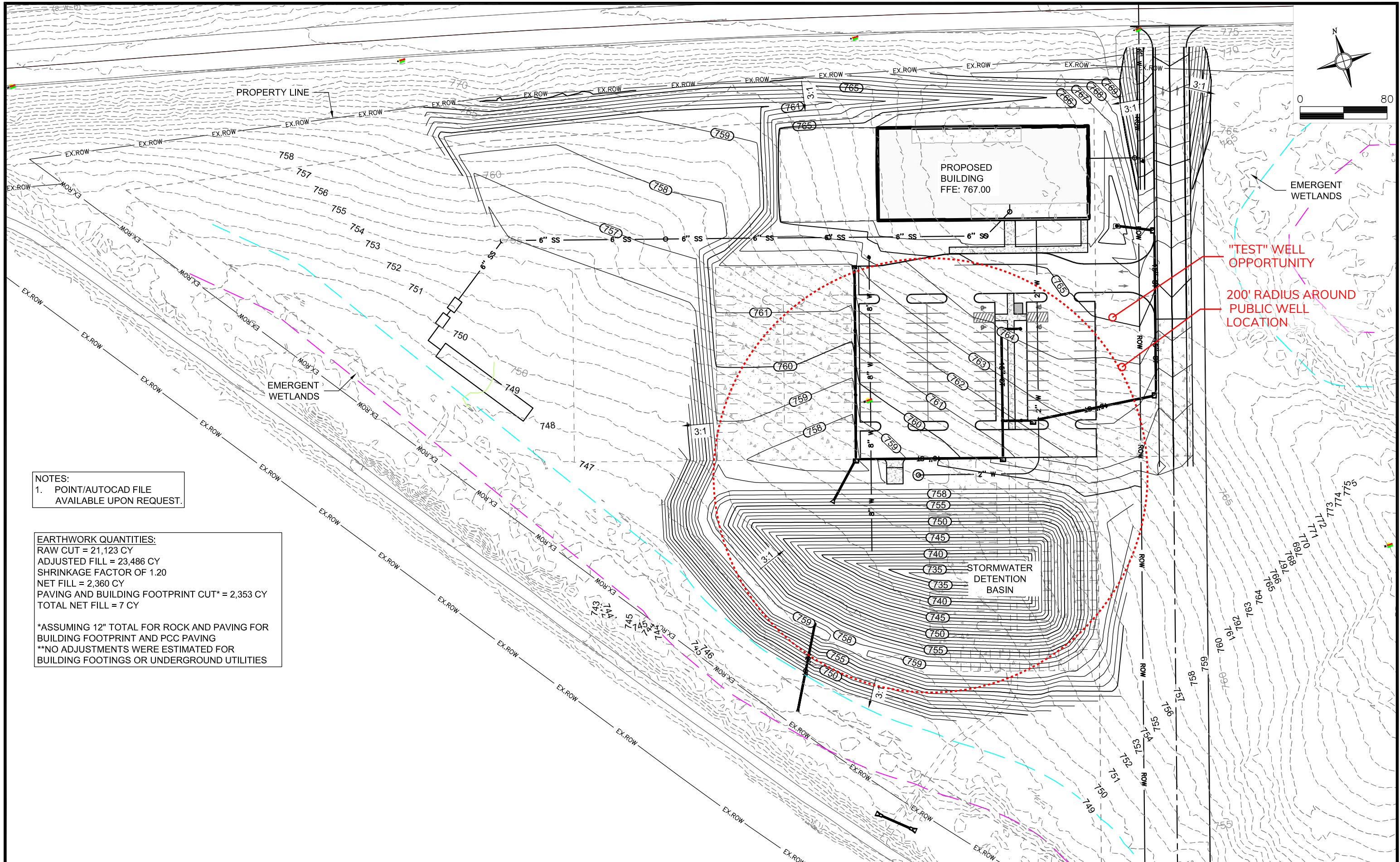
APPROVED BY: TJH
SCALE: PLAN

JORDAN CREEK CHURCH
SOLON, IA

SITE GRADING PLAN

SHEET NO.
C201
OF
C201

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NOTES:
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CLIENT: FORM FUNCTION STUDIO
1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551

ANDERSON **BOGERT**

DRAWN BY: CIV
DATE: 6/24/26
PROJECT NO. 224074

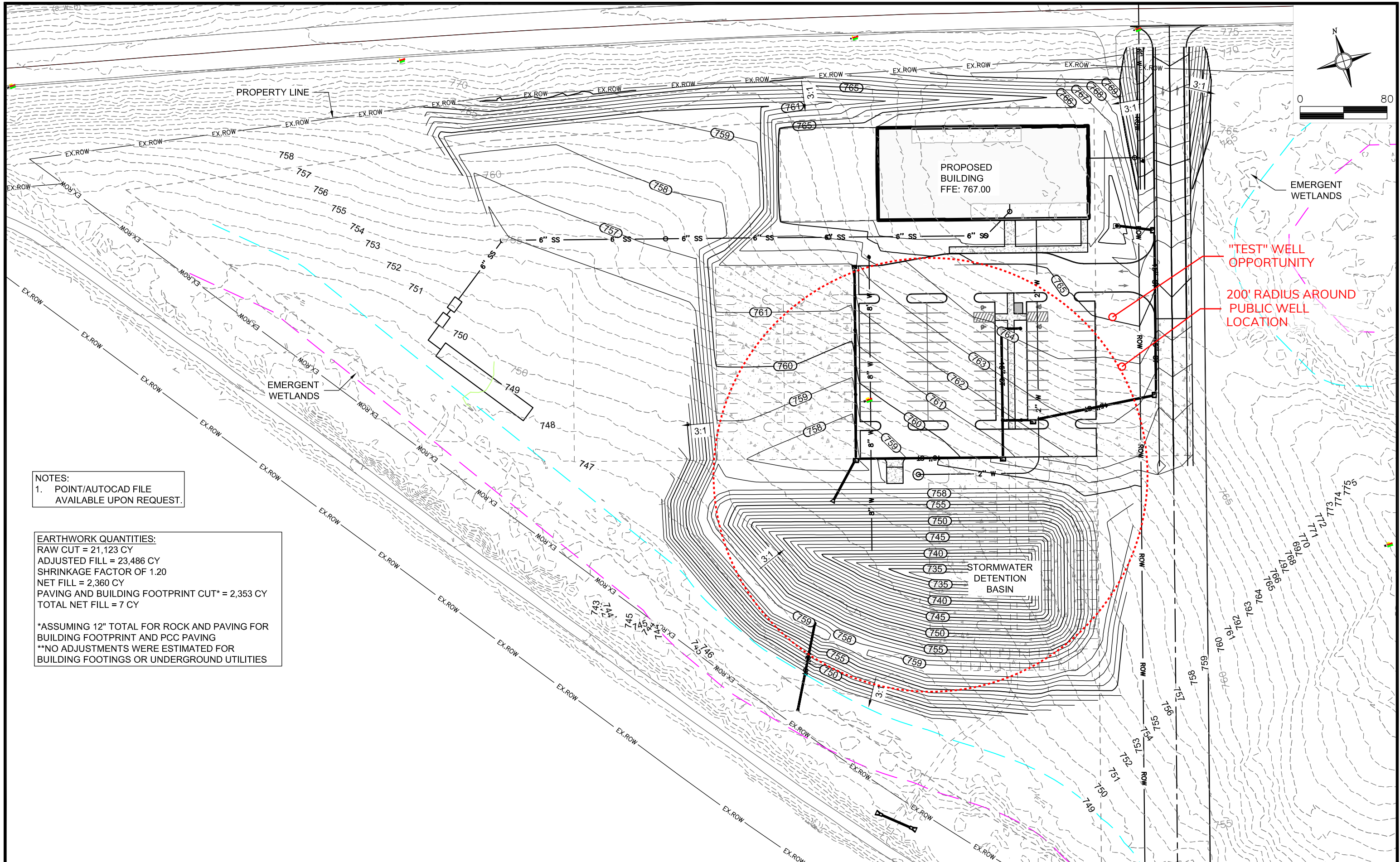
APPROVED BY: TJH
SCALE: PLAN

JORDAN CREEK CHURCH
SOLON, IA

SITE GRADING PLAN

SHEET NO.
C201
OF
C201

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NOTES:
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1203 3RD ST SE SUITE 7
CEDAR RAPIDS, IA 52401
PHONE: 847-858-6551

ANDERSON **BOGERT**

DRAWN BY: CIV
DATE: 6/24/26
PROJECT NO. 224074

APPROVED BY: TJH
SCALE: PLAN

JORDAN CREEK CHURCH
SOLON, IA

SITE GRADING PLAN

SHEET NO.
C201
OF
C201



4050 River Center Court NE
Cedar Rapids, IA 52402
Office: (319) 377-4629
Fax: (319) 377-8498

Jordan Creek Church Traffic Impact Study

Johnson County Parcel 0215451004

Route F16, 1,200 feet east of Polk Avenue

Prepared by: Jacob Sprengeler, PE
Anderson-Bogert Engineers and Surveyors, Inc.
Date: 7.6.26

I hereby certify that this Engineering document was prepared by me or under my direct personal supervision and that I am a duly Licensed Engineer under the laws of the State of Iowa.



7.6.2026



Jacob M Sprengeler
Iowa Registration No. 27485

Exp. Date: 12/31/2027

EXECUTIVE SUMMARY

This study was conducted on behalf of Form Function Studio (CLIENT) to discuss a potential new church development along County Route F16, north of Solon, in Johnson County, Iowa. The existing roadway is a 2-lane rural section with an estimated AADT of about 3,300 based on observations completed with the study.

The proposed driveway location has not experienced a pattern of overrepresented or correctable collisions and is actually performing better than the statewide statistical analysis would predict. Existing traffic was observed in May 2026. The peak hours were determined to start at 7:15am and 4:15pm on weekdays, and the Sunday analysis peak was selected to start at 10:15am. Based on historic AADT data, an background growth rate of 0.8% was assumed for the study area.

The proposed development will consist of a 13,500 square-foot building assumed for immediate construction. In the future, additional church facilities may be added on (about 7,500 square feet). This facility falls most nearly under ITE Land Use 560 – Church. Based on the current 12th Edition of the Trip Generation Manual, the development is expected to generate around 5 trips during the weekday AM peak, 8 trips during the weekday PM peak, and 151 trips during the Sunday peak. With full-build, the site would generate 8 AM weekday trips, 13 PM weekday trips, and 235 Sunday peak trips.

Under all analyzed scenarios, the site driveway movements operated with acceptable LOS B or better without any additional auxiliary lanes and 1 single exit lane. Therefore, there are no capacity or operational concerns with the proposed driveway.

Per DOT guidance, auxiliary warrants for left turns are based upon future (design year) volumes, while right turns are based upon current volumes. With this guidance in-mind, the EBR movement into the site does not currently plot above the warrant curve for a typical weekday. On Sunday, a full-day generation estimate is not provided by ITE. Assuming that the majority of trips are generated for the existing single Sunday service, the EBR movement plots nearly on the minor-right turn warrant. Neither future WBL volumes plot near the warranted curve.

Based on surrounding driveways and required driveway grade, the proposed entrance appears to be ideally located.

The report made several conclusions and recommendations which include:

1. We recommend the development proceed as currently indicated within the attached site plan. The site seems appropriately laid out, with an appropriate access location to County Highway F16. The driveway should stay at or above existing highway grade for at least 20-25' beyond the edge of traveled way. The ditch should be adjusted to limit the possibility of vegetation obscuring driveway sight triangles.
2. Per DOT auxiliary warrant criteria, the development does not plot above the minor right-turn warrant curve for a "typical day". Additionally, the development will likely plot well below the left-turn auxiliary lane criteria.
3. We recommend that adequate ROW be reserved along the property development in order to accommodate a potential future minor-right turning lane into the site. Upon full-occupancy, the site should continue to be monitored for appropriate operation, particularly on Sundays during church peaks.
4. Prior to any additional future expansion, we recommend that the development be revisited and reevaluated for the addition of an EBR minor-turn lane. A future evaluation could use actual site-generation data to verify the assumptions of this report. Furthermore, safety history of the new driveway could also be evaluated after several years of operation have occurred.

INTRODUCTION

This study is being conducted on behalf of Form Function Studio (CLIENT), in order to analyze and discuss potential traffic impacts relating from new development along Highway 382 (Co Route F16) about 1,400 feet east of Polk Avenue. The proposed development generally consists of a new Church worship space and associated parking lot.

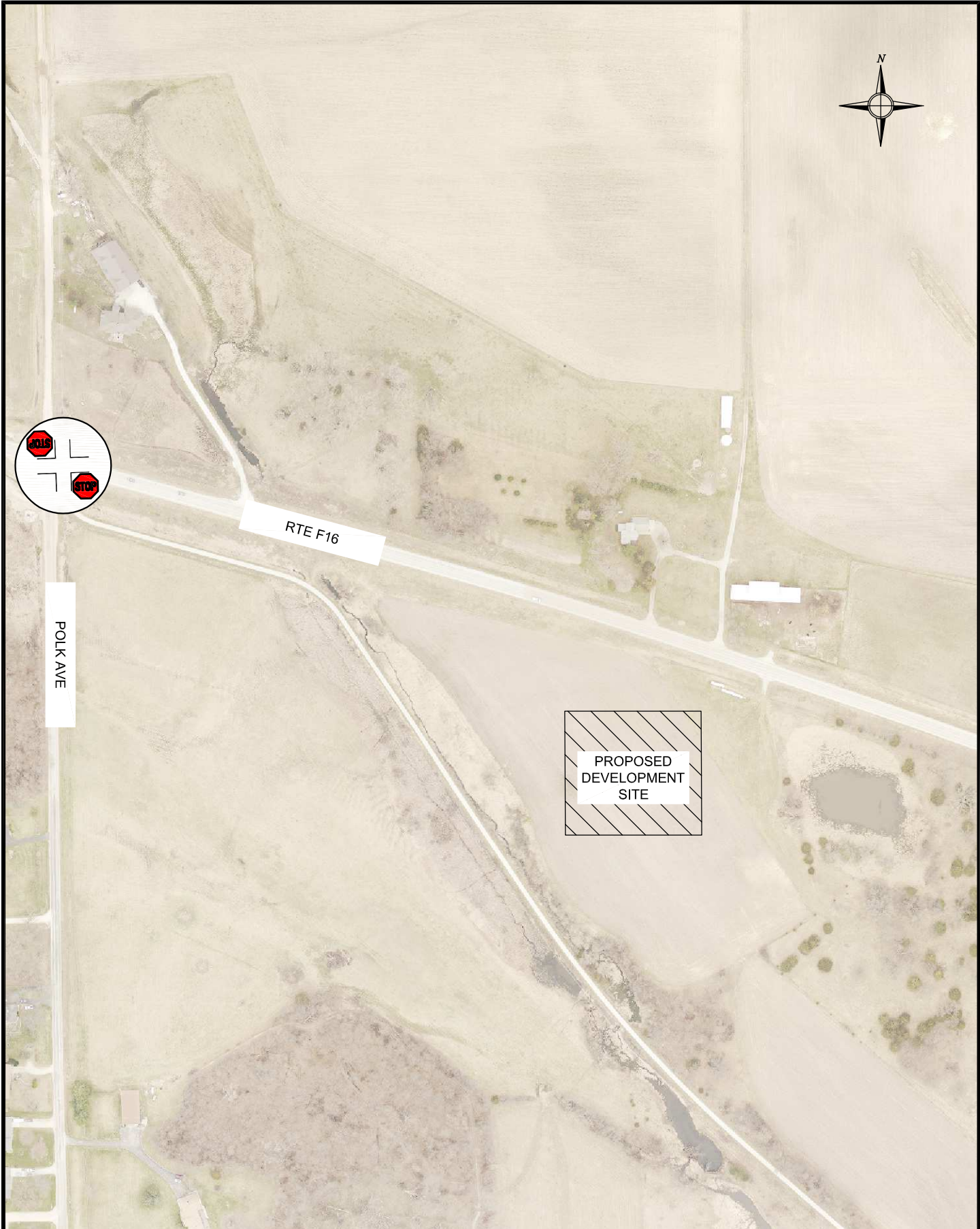
The CLIENT would like to construct improvements as soon as feasible. While the church may not start construction immediately, it is planned to begin within the next year or so. For analysis purposes, this analysis assumed the development was completed and occupied immediately.

The Study area is shown below in **Figure 1** and consists of the proposed site entrance to County Route F16.

This study generally includes discussion on the following:

- Analysis of existing roadway geometrics and study area, determination of background growth
- Analysis of existing safety history within the study area
- Analysis of the proposed development, trip generation, distribution, and assignment
- Capacity and Operational Analysis of no-build and partial-build scenarios on Opening Day (2026)
- Capacity and Operational Analysis of no-build and full-build scenarios on Opening Day+20 (2046)
- Uncontrolled Auxiliary Lane Warrant Analysis
- General Internal Site Considerations

This study will analyze a typical weekday AM and PM commuter peak and critical Sunday AM peak. For existing/opening day 2026, the initial-build (without future expansion) will be analyzed for all 3 peak hours. The Opening Day+20 will consider no-build and full-build (with future expansion) scenarios.



DRAWN BY:
APPROVED BY:
DATE:



FIGURE 1
STUDY AREA

ANALYSIS OF EXISTING NO-BUILD (2026)

EXISTING LAND USE

The existing parcel is undeveloped agricultural field.

ZONING

According to the online Johnson County Planning, Development, and Sustainability map, the parcel is zoned as A – Agricultural. According to the 2018 future land use map, the parcel is planned for future residential use. This is similar to the City of Solon future land use map.

According to Johnson County Code of Ordinances, a church is a “conditional” use for the current zoning. Therefore, the property will either require rezoning or a conditional use permit.

ADJACENT ROADWAY NETWORK

The existing highway characteristics are summarized in **Table 1**. The highway is currently a rural 2-lane section with pavement in fair condition. Classified as a major collector, counts observed with this study suggest the current AADT is likely about 3,300 vehicles per day.

Table 1 - Adjacent Road Network

Existing Roadway Network Characteristics							
Road	Federal Classification	AADT Estimate	Posted Speed MPH	Lane Configuration	Urban or Rural Section	Surfacing	Surface and Marking Condition
Co Route F16	Major Collector	3,300 (2026 Observed) 3,800 (2022 DOT)	55**	2-Lane	Rural - with paved shoulders	HMA	Fair

**Iowa legislatures recently passed a bill to raise the "default" speed limit from 55 mph to 60 mph which may impact the future speed posting on this roadway even in a "no-build" scenario.

Figure 2 - Adjacent Land Use

ADJACENT LAND USE

The area surrounding the proposed development is shown in **Figure 2**. Immediately surrounding the study site are undeveloped agricultural parcels. An existing paved trail runs along the creek which is along the southern property boundary.



CRASH HISTORY AND POTENTIAL FOR CRASH REDUCTION (PCR)

The Iowa DOT maintains several traffic resources online. Two of these databases are known as **The Iowa Crash Analysis Tool (ICAT)** and **Potential for Crash Reduction (PCR)**. The ICAT tool is a database of crash reports submitted by law enforcement agencies across the state. The PCR database compares and categorizes intersections across the state. It presents statistical analysis to help identify which intersections may operate less ideally, and which locations may benefit the most from improvement (i.e. where potential to reduce crashes is highest).

Within about 500 feet of the proposed site driveway, there have been 2 reported incidents since 2021. The first collision was a single-vehicle incident resulting in property damage only. The reported cause of the collision was an animal within the roadway.

The second incident was a 3-car accident that occurred while this study was being conducted. The primary cause of collision was listed as driving too fast for conditions. The report indicated that the collision was related to the existing highway access on the north side of the highway across from the proposed development site. The report suggests a large heavy truck was stopped in the westbound lane with a second car queued behind. A third vehicle was following too close and rear-ended the second vehicle into the large truck. This reported incident occurred during poor weather and visibility due to rain. This collision resulted in property damage only.

There is no current intersection along the proposed development. The segment is secondary route and not covered under the DOT PCR segment database. The nearby intersection on F16 at Polk Avenue has a negative PCR value for both severe and all crash types. Therefore, the statistical analysis shows that it actually operates better than predicted based off similar intersections across the state. Based on the data above, the study area does not exhibit an existing pattern of overrepresented or correctable collisions.

INTERSECTION SIGHT DISTANCE

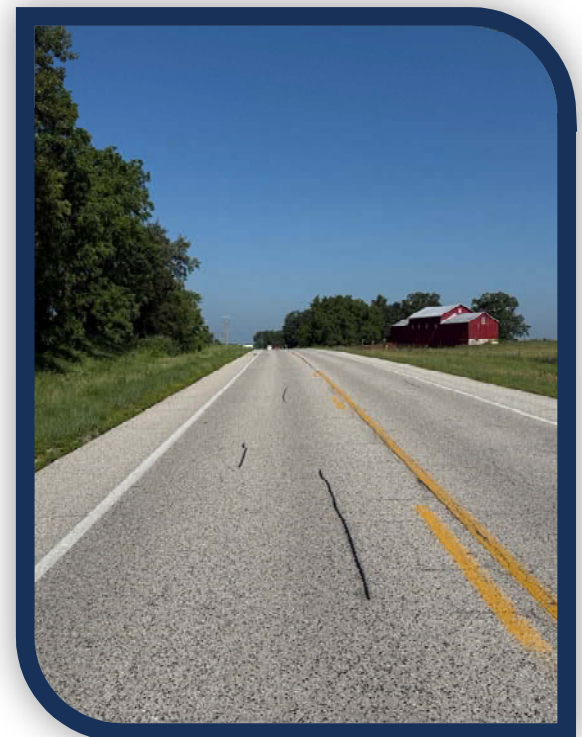
The proposed development entrance is located near a crest curve on Count Route F16 around 500' east of the proposed development entrance.

Based on the current DOT design manual, intersection sight distance for left turns from the driveway is around 700 feet assuming a 60 mph design speed.

Upon sight review, it was determined that the intersection sight distance (ISD) was not fully maintained for the crest curve. An object 14'-18' back from the highway 3.5' above the existing roadway was obscured by vegetation. The farthest distance the object was noted to be seen was at around 675'. This distance is over the required sight distance for a 55 mph design speed, but just shy of the required 705' for 60 mph. The field review indicated that highway vehicles do have adequate stopping sight distance. Therefore, if a car leaves the driveway onto the highway at an inappropriate time, traffic approach on the highway should have adequate distance to see the entering vehicle, and make the decision to either slow or full-stop prior to reaching the driveway location.

Additional safety measures to help improve the sight distance could be considered. One such improvement would be to raise the proposed driveway approach. The approach should be at or above the existing highway grade for at least 20-25 feet from the edge of traveled way. A second improvement would be to adjust the ditch grading/elevation near the driveway to maintain clear distances and limit the potential of vegetation obscuring sight triangles.

Figure 3 – Intersection Sight Triangle



EXISTING TRAFFIC PARAMETERS AND DATA

Continuous roadside radar was used to observe traffic data along the stretch of highway in May 2026. The following peak hour parameters were determined for the stretch of F16 within the study area:

AM Peak

7:15am – 8:15am
PHF: 0.80
Heavy Vehicles: 2%

PM Peak

4:15pm – 5:15pm
PHF: 0.93
Heavy Vehicles: 2%

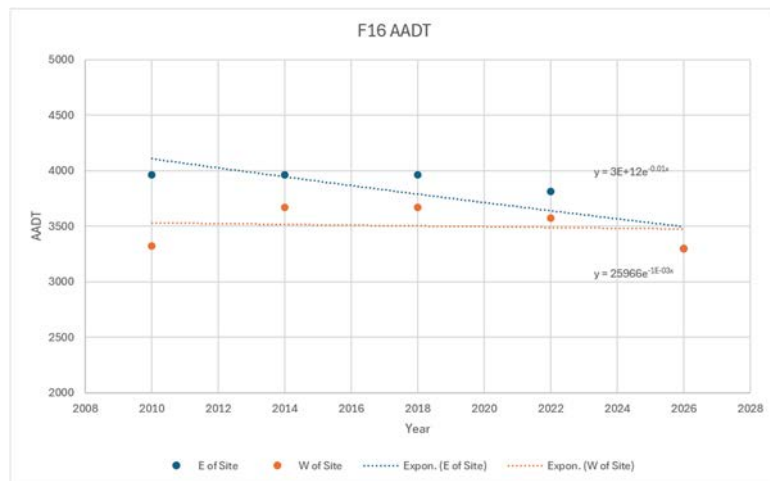
Sunday Critical Peak

Not well defined. 10:15am – 11:15am
PHF: 0.85
Heavy Vehicles: 2%

Background Growth Rate

This area has limited historic and future data relating to growth rates. The Iowa DOT publishes historic AADT data on the *Iowa Traffic Data* online database. **Figure 4** presents AADT data for F16 both west of the proposed site, and east of the proposed site on the DOT database. The data shows volumes have stayed steady or even reduced since 2014. The city of Solon is rapidly developing westward towards the proposed development site. Therefore, it seems more appropriate to assume a positive background growth rate for analysis rather than assuming no growth, or even a negative rate. For analysis purposes, **a moderate background growth rate of 0.8% was assumed.**

Figure 4 - Historic AADT Flows

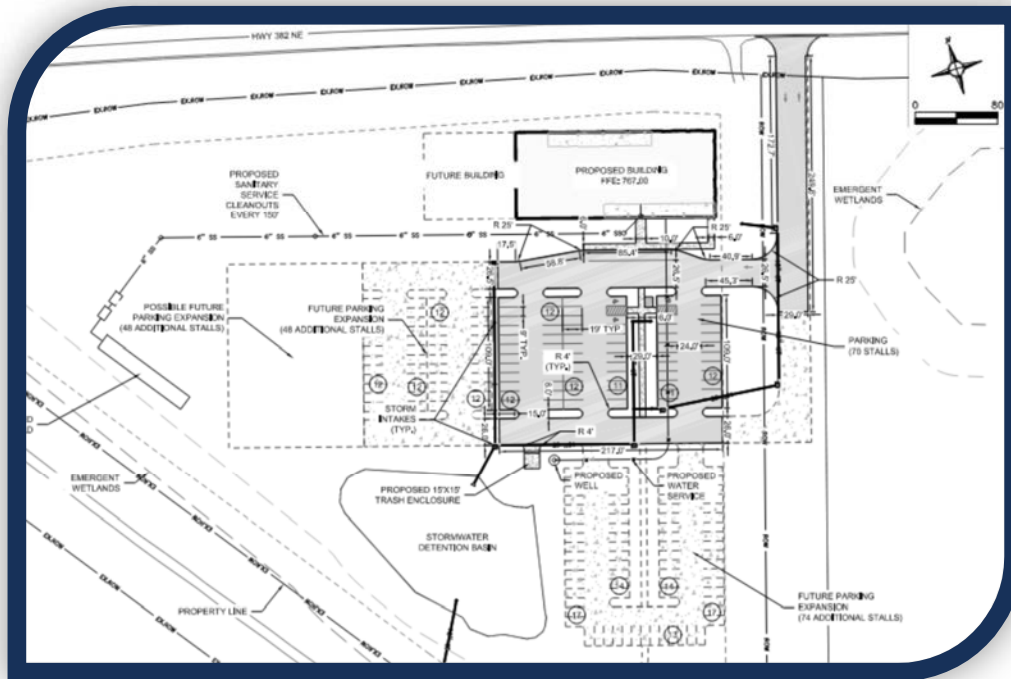


ANALYSIS OF OPENING DAY PARTIAL-BUILD (2026)

DESCRIPTION OF DEVELOPMENT

The proposed development consists of a church worship building of around 13,500 square-feet. Other improvements on the site will consist of parking lots, septic facilities, and detention areas. **Figure 5** shows the proposed site layout and is also attached in the **Appendices**.

Figure 5 - Proposed Site Plan



BUILD-OUT SCHEDULE

For analysis purposes, the development is planned for construction in the short-term, within the next year. The analysis assumes opening day in 2026.

PROPOSED LAND USE

The development falls most nearly into ITE Land Use Code 560 – Church. The proposed building is primarily a worship space with associated ancillary rooms typical of a church facility.

DEVELOPMENT TRIP GENERATION

Table 2 summarizes the ITE Trip Generation Estimate for the proposed development. The weekday traffic during peak hours is expected to be negligible. The weekday total traffic estimates from ITE are based upon a single data point provided in the manual. For Sunday, the average rate was used in place of the predictive curve. The predictive curve has an R² value of 0.52, which suggests the ITE curve model may not be the best at explaining and predicting variability in the trip distribution plotted against the floor area. The average studied church was over 46,000 square feet. 7 of 10 studies were larger than the proposed church building. At a small value, the fitted curve is dominated by the y-intercept term rather than the relative difference and size of the church itself. Therefore, it seems more appropriate to apply the average rate.

Table 2 - ITE Trip Generation

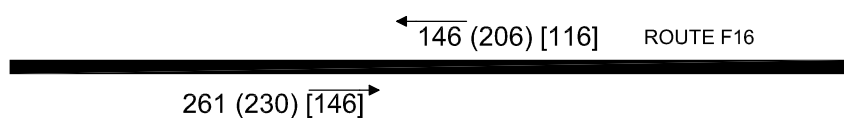
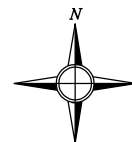
Estimated Site Trip Generation, ITE 12th Edition										
					AM Peak Hour		PM Peak Hour		Sunday Peak Hour	
					IN	OUT	IN	OUT	IN	OUT
Land Use Description	Code	Unit of Measure	Quantity	Total** Weekday	Peak of Adjacent Streets, 7 - 9		Peak of Adjacent Streets, 4 - 6		Peak of Generator***	
Church	560	ksf	13.5	92	3	2	3	5	71	80
Partial Build Total (Opening Day)				92	3	2	3	5	71	80
					5		8		151	
Church	560	ksf	7.5	51	2	1	2	3	39	45
Future Buildout (+20)				51	2	1	2	3	39	45
					3		5		84	
Total Full-Build Development				143	5	3	5	8	110	125
					8		13		235	
**Only a single study data point for weekday estimate in ITE manual.										
***Average Rates applied instead of "fitted curve"										

The generations presented in **Table 2** also seem to align with the site plan which provides about 70 paved parking lot spots for its opening day.

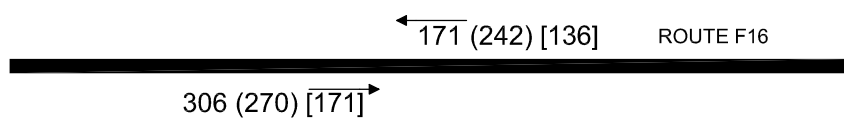
DEVELOPMENT TRIP DISTRIBUTION AND ASSIGNMENT

The current church is located within downtown Solon, at the community center. The patrons are likely comprised of local Solon residents, nearby surrounding communities such as Ely and Newport, as well as rural unincorporated residents.

The anticipated trip distribution was weighted in favor of arriving/departing from the east towards Solon. The existing traffic counts, Opening Day+20 No-Build, Trip distribution, trip assignment, Opening Day Partial-Build, and Opening Day+20 Full-Build scenario analysis volumes are shown in the following figures.



EXISTING/OPENING DAY NO-BUILD VOLUMES

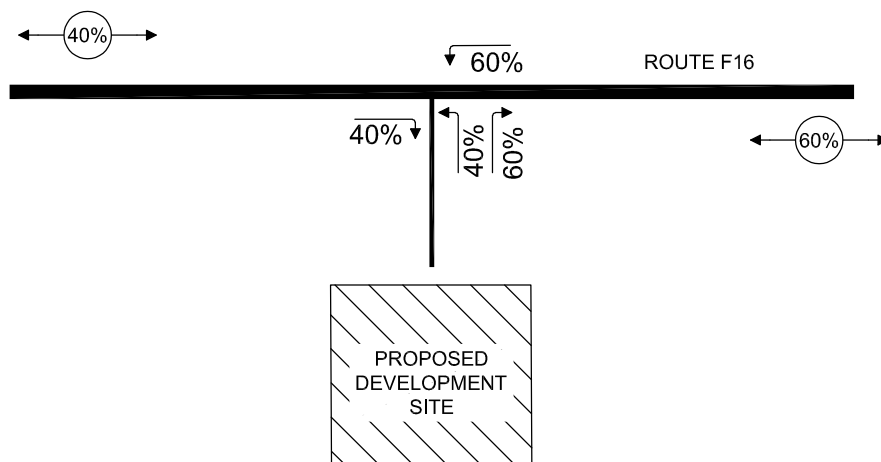
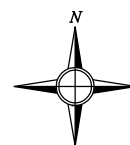


OPENING DAY+20 NO-BUILD VOLUMES

DRAWN BY:
APPROVED BY:
DATE:



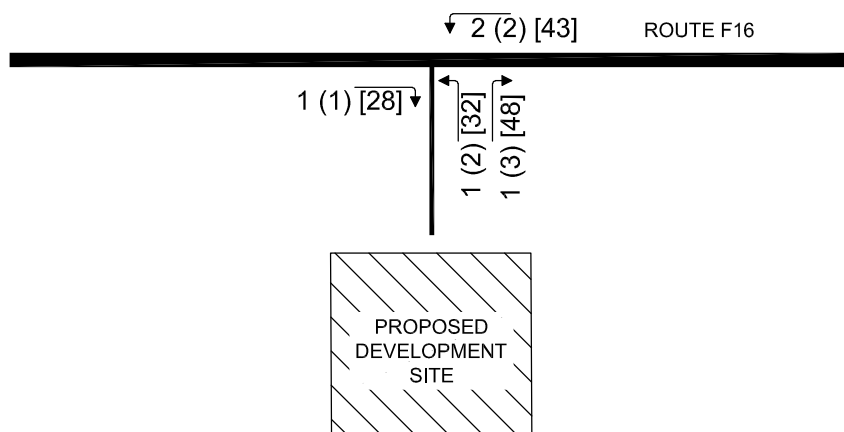
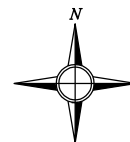
FIGURE 6
NO-BUILD PEAK HOUR ANALYSIS VOLUMES
AM (PM) [SUNDAY]



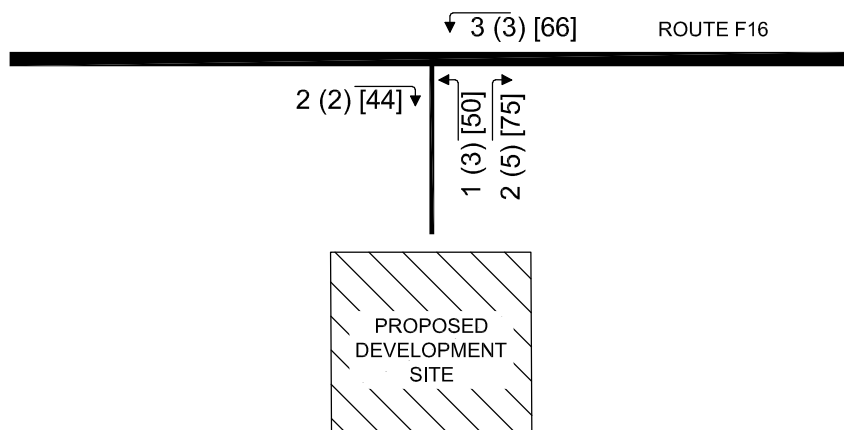
DRAWN BY:
APPROVED BY:
DATE:



FIGURE 7
TRIP DISTRIBUTION



EXISTING/OPENING DAY PARTIAL-BUILD ASSIGNMENT

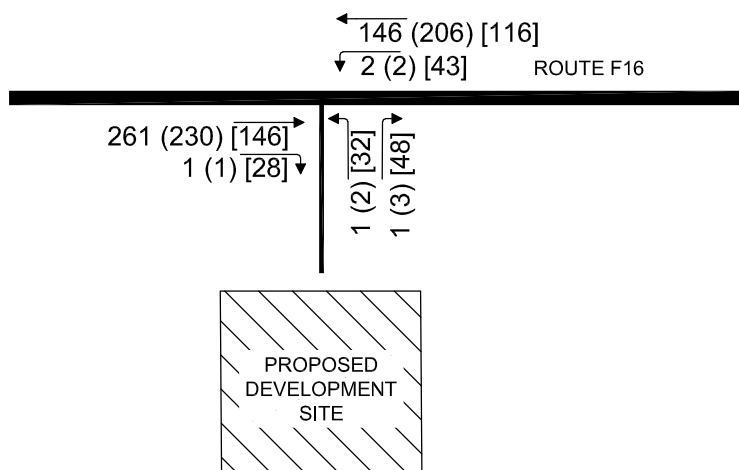
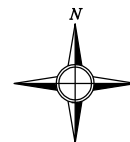


OPENING DAY+20 FULL-BUILD ASSIGNMENT

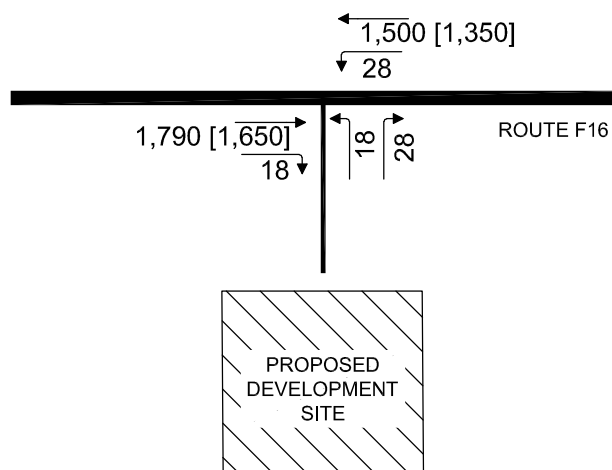
DRAWN BY:
APPROVED BY:
DATE:



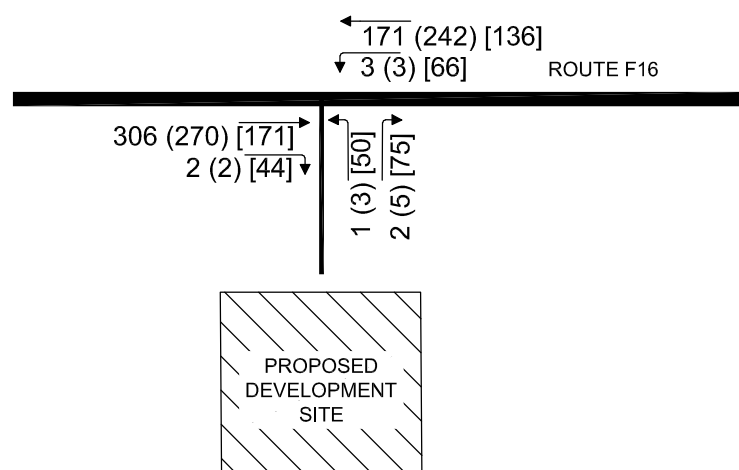
FIGURE 8
TRIP ASSIGNMENT
AM (PM) [SUNDAY]



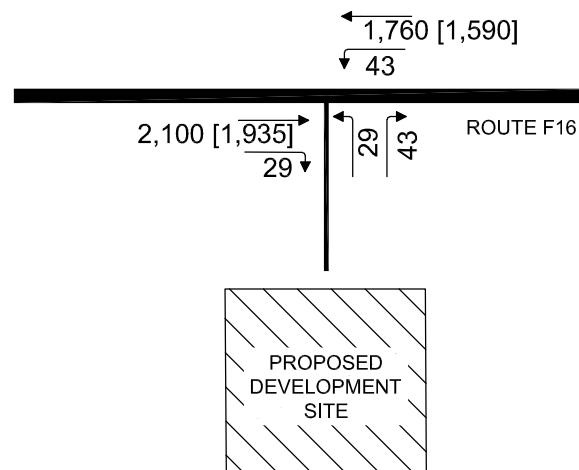
EXISTING/OPENING DAY PARTIAL-BUILD VOLUMES
PEAK HOUR ANALYSIS



EXISTING/OPENING DAY PARTIAL-BUILD VOLUMES
WEEKDAY ANALYSIS



OPENING DAY+20 FULL-BUILD VOLUMES
PEAK HOUR ANALYSIS



OPENING DAY+20 FULL-BUILD VOLUMES
WEEKDAY ANALYSIS

DRAWN BY:
APPROVED BY:
DATE:



FIGURE 9
PARTIAL AND FULL-BUILD ANALYSIS
VOLUMES AM (PM) [SUNDAY]

ANALYSIS OF FUTURE CONDITIONS (YEAR)

The church plans to pave/expand on the preliminary parking lot and add about 7,500 square feet onto the building for various uses between worship, fellowship, or potential athletic facilities. Such facilities would be used for the church, and not open to the “general public”. Therefore, the additional expansion was added to the opening day trip generations for the Opening Day+20 scenario. The estimated trip generation for full-build was presented earlier in **Table 2**. Aside of the parking lot and building expansion, no other driveway or facility expansions were assumed with this report. The trip distribution was assumed to remain the same for both Opening Day and Opening Day+20.

CAPACITY AND OPERATIONAL ANALYSIS

The current leading method to analyze intersection capacity and performance is published in the *Highway Capacity Manual, 7th Edition (HCM)*. The primary performance measure used in the capacity analysis is delay (seconds) per entering vehicle. The delay for each movement and vehicle is estimated and then categorized on a letter scale from A through F, with F being the worst. The scale is generally referred to as *Level-of-Service*. **Table 4** summarizes the current definitions for various LOS according to the HCM.

Table 4 - LOS Definitions

Highway Capacity Manual 7th Edition Unsignalized TWSC and AWSC Level-of-Service Criteria		
Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio	
	v/c ≤ 1.0	v/c > 1.0
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

Current design standards generally require LOS D or better on opening day, and LOS E or better in the design year. LOS F is typically considered unacceptable.

Based on observations for similar land uses in the region, traffic demand associated with church developments often exhibit severe peaks shortly before and after service times. For analysis purposes, the PHF for movements associated with the church (EBR, WBL, NB) was reduced from the background traffic to approximately 0.70 for the critical Sunday peak analysis. This provided a better model calibration to analyze how the intersection operates during the shorter 15-minute peaks before and after services are scheduled to occur. The resulting capacity analysis is summarized in **Table 3**.

The intersection will operate with acceptable LOS on all movements in all scenarios. The most critical peak for the development driveway is the Sunday peak. With the lowered PHF, the movements still operate with acceptable LOS. The on-site queuing is expected to be a couple vehicles or less during the critical peak. The analysis suggests that a single exit lane would also provide adequate capacity.

Table 3 - HCM Capacity Analysis

HCM 7th TWSC Analysis									
County Route F16 at Proposed Development Entrance									
Approach	Lanes	AM Opening Day Partial-Build				AM Opening+20 Full-Build			
		Volume (vph)	Delay (sec/veh)	95 th ile Queue, ft	LOS	Volume (vph)	Delay (sec/veh)	95 th ile Queue, ft	LOS
Eastbound									
Left									
Through	1	261	-	0	-	306	-	0	-
Right	-	1	-	0	-	1	-	0	-
Westbound									
Left	-	2	7.9	0	A	3	8.1	0	A
Through	1	146	0	0	A	171	0	0	A
Right									
Northbound									
Left	1	1	11	0	B	1	11.3	0	B
Through									
Right	-	1				2			
Intersection		0.1				0.1			

HCM 7th TWSC Analysis									
County Route F16 at Proposed Development Entrance									
Approach	Lanes	PM Opening Day Partial-Build				PM Opening+20 Full-Build			
		Volume (vph)	Delay (sec/veh)	95%ile Queue, ft	LOS	Volume (vph)	Delay (sec/veh)	95%ile Queue, ft	LOS
Eastbound									
Left									
Through	1	230	-	0	-	270	-	0	-
Right	-	1	-	0	-	2	-	0	-
Westbound									
Left	-	2	7.7	0	A	3	7.8	0	A
Through	1	206	0	0	A	242	0	0	A
Right									
Northbound									
Left	1	2	10.4	0	B	3	10.8	0	B
Through									
Right	-	3				5			
Intersection		0.2				0.2			

HCM 7th TWSC Analysis									
County Route F16 at Proposed Development Entrance									
		Sunday Opening Day Partial-Build				Sunday Opening+20 Full-Build			
Approach	Lanes	Volume (vph)	Delay (sec/veh)	95%ile Queue, ft	LOS	Volume (vph)	Delay (sec/veh)	95%ile Queue, ft	LOS
Eastbound									
Left									
Through	1	146	-	0	-	171	-	0	-
Right	-	28	-	0	-	44	-	0	-
Westbound									
Left	-	43	7.8	25	A	66	8	25	A
Through	1	116	0	0	A	136	0	0	A
Right									
Northbound									
Left	1	32	11.2	25	B	50	13.5	50	B
Through									
Right	-	48				75			
Intersection		3.4				4.5			

WARRANT ANALYSIS

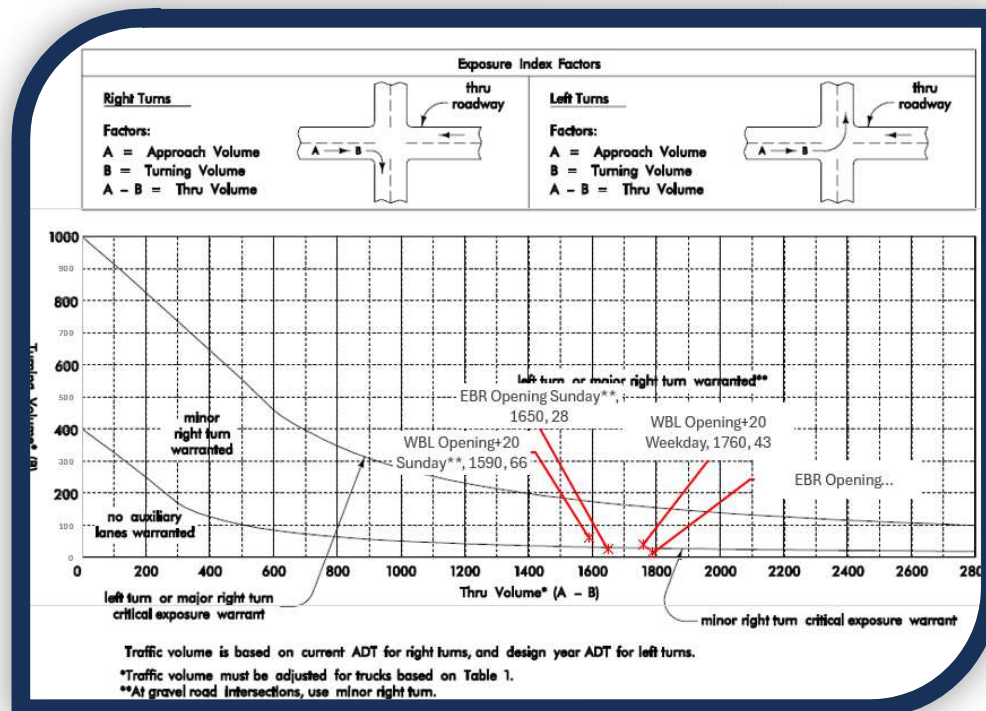
AUXILIARY LANES

The F16 roadway is currently in a rural area, and Johnson County has historically applied Iowa DOT design criteria. The Iowa DOT design manual provides guidance on the warrants for auxiliary turning lanes in Chapter 6, Figure 1. **Table 5** plots the weekday turning volumes against the Iowa DOT auxiliary lane warrant criteria. The plotted points show that the EBR weekday movement plots just below the minor right warrant curve, and the WBL movement plots well below the left turn warrant curve. The ITE trip generation manual does not currently provide a method of estimating total Sunday church trip generation. Local data was not available for this study and particular church land use. For this particular development, it seems reasonable to assume that the majority of Sunday traffic will be generated around the service time(s), rather than distributed across the day like the background highway traffic.

Table 5 also plots the Sunday critical peak hour against the background traffic ADT. The EBR movement plots just below the minor right turn threshold considering only the peak hour (where the warrant curve typically utilizes an average 24-hour volume). If the church plans for any other Sunday activities outside the worship service, the development will likely satisfy the DOT warrant criteria for the EBR movement. Even though the DOT table suggests using current volumes for the right-turn warrants, a future expansion would comfortably plot above the minor-right turn warrant for a given Sunday. With the future expansion, the proposed development, the EBR movement would plot right at the warrant curve even for a typical weekday. Thus, satisfying a minor right-turn warrant upon expansion for a typical weekday is possible and sensitive to the assumptions made in this report.

The peak hour volume is about 25% of the major warrant threshold. As of now, the church only has a single Sunday service. Therefore, Sunday attendance would likely need to increase 300% in order to satisfy the EBR major turn bay warrant during worship hours. The WBL movement would need to increase by about 200% in order to satisfy a WBL turning lane in the future scenario. Thus, satisfying warrants for WBL and a major EBR lane are not likely, and not sensitive to the assumptions of this report.

Table 5 - Iowa DOT Auxiliary Lane Warrant Analysis



While the development may potentially satisfy warrant criteria for a typical Sunday, this day of the week and entering volume is not representative of the “average day” that the DOT charts are based upon. Therefore, requiring additional improvements should be reevaluated at a later date if/when the church expands either its building or parking facilities. The need to expand would indicate that the church-generated traffic is likely greater in reality than was assumed with this report.

SIGNALIZED CONTROL

The intersection appears to operate with acceptable LOS for all scenarios. Therefore, signalization does not appear to be an appropriate or necessary form of control for the development access.

ANALYSIS OF SITE GEOMETRICS

ACCESS MANAGEMENT

The development has one proposed driveway. It will be located slightly eastward of the existing field access driveway. There is an existing residential driveway located offset to the west across the F16 county highway. There are no other existing driveways within a quarter-mile of the development.

This stretch of roadway is along a rural stretch of roadway that would be comparable to the Iowa DOT's *Rural 600* access management category for state routes. This category permits full access every 600 feet.

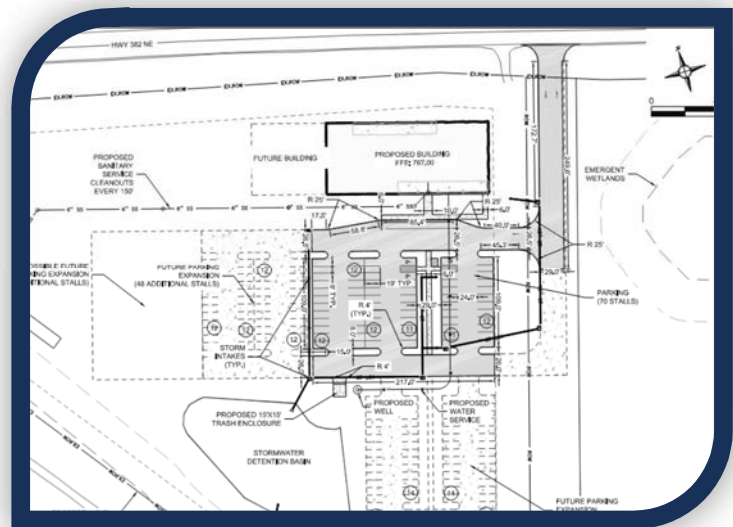
Ideally, the site driveway would be located directly across existing driveways. In this instance, the site has created a collector road that connects to the highway, rather than providing a direct connection. This would allow future access to the adjacent property without requiring a direct connection to the county highway. Additionally, the driveway is slightly offset from the existing farm residence access. This seems appropriate to allow a future potential roadway across to the north, should that area develop. The existing farm residence entrance is likely a Type C or D driveway with infrequent traffic. Therefore, a slight offset of the proposed road access and existing residence driveway is unlikely to inherently create operational or safety concerns for the highway.

Based on the existing site topography, it seems like a westward shift of the new access would create non-ideal grades which could potentially limit intersection sight distances. A shift would also likely eliminate the potential for a shared access with the adjacent property to the east of the development. Therefore, the driveway location appears to be appropriate as indicated on the attached site plan.

MULTI-MODAL ANALYSIS

There are currently no alternative transportation facilities for transit, bicycle, or pedestrian facilities along the highway. There is an existing multi-use trail that passes on the opposite side creek along the southern property boundary. This trail crosses Polk Avenue a short distance to the west of the site. The plan shows a potential future

Figure 10 - Proposed Site Plan



connection to the trail network. With a high posted speed, the presence of pedestrians and other vulnerable road users along the highway is not desirable at this time.

ADA ANALYSIS

It was assumed that the site will contain accessible features. The attached site plan shows several accessible parking stalls conveniently located near the church entrance. The site design may consider painting the accessible route crossing between the parking stalls and the church entrance. This brings extra attention to the space that vehicles and vulnerable road users will share.

SITE CIRCULATION AND LARGE VEHICLE ACCOMODATION

The site will likely serve primarily personal vehicles (cars and pickup trucks). As currently configured, the site geometry seems to be accommodating of these vehicles. The trash enclosure which would attract larger refuse collection vehicles is located in the far SW corner of the parking lot. Refuse schedules would likely not be more frequent than once per week. The loading area is currently separated from pedestrian areas and would likely occur outside of the typical church service hours. Therefore, the site seems to accommodate the likely vehicles anticipated to frequent the site.

CONCLUSIONS & RECOMMENDATIONS

1. We recommend the development proceed as currently indicated within the attached site plan. The site seems appropriately laid out, with an appropriate access location to County Highway F16. The existing grade falls away from the highway, but the proposed driveway should stay at or even above existing highway grade for at least 20-25' from the edge of traveled way. Ditch grading should also be adjusted to maintain both the clear zone and reduce vegetation impact on driveway sight triangles.
2. Per DOT auxiliary warrant criteria, the development does not plot above the minor right-turn warrant curve for a "typical day". Additionally, the development will likely plot well below the left-turn auxiliary lane criteria.
3. We recommend that adequate ROW be reserved along the property development in order to accommodate a potential future minor-right turning lane into the site. Upon full-occupancy, the site should continue to be monitored for appropriate operation, particularly on Sundays during church peaks.
4. Prior to any additional future expansion, we recommend that the development be revisited and reevaluated for the addition of an EBR minor-turn lane. A future evaluation could use actual site-generation data to verify the assumptions of this report. Furthermore, safety history of the new driveway could also be evaluated after several years of operation have occurred.

APPENDICES

5/19/2026 Time	Direction WB, Lane	Direction EB, Lane 2	5/19/2026 Time	Direction WB, Lane	Direction EB, Lane 2	5/20/2026 Time	Direction WB, Lane	Direction EB, Lane 2	5/20/2026 Time	Direction WB, Lane	Direction EB, Lane 2	5/21/2026 Time	Direction WB, Lane	Direction EB, Lane 2	5/21/2026 Time	Direction WB, Lane	Direction EB, Lane 2	5/31/2026 Time	Direction WB, Lane	Direction EB, Lane 2	5/31/2026 Time	Direction WB, Lane	Direction EB, Lane 2
12:00 AM	2	3	12:00 PM	18	27	12:00 AM	0	0	12:00 PM	23	26	12:00 AM	0	1	12:00 PM	29	29	12:00 AM	1	6	12:00 PM	22	36
12:15	2	0	12:15	13	28	12:15	0	1	12:15	28	26	12:15	0	1	12:15	19	33	12:15	2	2	12:15	22	36
12:30	4	0	12:30	35	22	12:30	1	1	12:30	29	30	12:30	0	0	12:30	23	27	12:30	2	2	12:30	30	27
12:45	1	1	12:45	16	22	12:45	0	0	12:45	22	24	12:45	1	0	12:45	23	34	12:45	2	2	12:45	18	26
1:00	0	0	1:00	24	39	1:00	1	0	1:00	18	21	1:00	0	3	1:00	22	29	1:00	1	2	1:00	19	34
1:15	1	1	1:15	29	19	1:15	0	0	1:15	22	27	1:15	1	0	1:15	16	39	1:15	1	1	1:15	23	36
1:30	0	0	1:30	19	34	1:30	0	1	1:30	25	14	1:30	1	0	1:30	44	39	1:30	1	1	1:30	32	30
1:45	0	0	1:45	17	31	1:45	0	0	1:45	27	21	1:45	0	0	1:45	69	35	1:45	0	2	1:45	22	31
2:00	0	0	2:00	26	22	2:00	0	0	2:00	19	34	2:00	0	0	2:00	36	24	2:00	0	2	2:00	23	33
2:15	0	0	2:15	20	29	2:15	0	0	2:15	17	15	2:15	0	1	2:15	28	24	2:15	0	2	2:15	22	27
2:30	0	1	2:30	22	24	2:30	0	0	2:30	15	33	2:30	1	0	2:30	26	41	2:30	0	0	2:30	24	29
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3:00	0	0	3:00	35	37	3:00	0	0	3:00	34	38	3:00	0	2	3:00	38	28	3:00	1	0	3:00	19	33
3:15	0	0	3:15	65	31	3:15	0	0	3:15	63	55	3:15	0	1	3:15	23	29	3:15	0	0	3:15	17	29
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4:00	0	1	4:00	44	45	4:00	0	0	4:00	33	34	4:00	1	1	4:00	50	49	4:00	1	1	4:00	24	34
4:15	1	1	4:15	37	43	4:15	0	2	4:15	45	47	4:15	1	2	4:15	42	58	4:15	1	0	4:15	24	30
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4:45	1	4	4:45	32	48	4:45	3	4	4:45	57	63	4:45	2	6	4:45	43	61	4:45	3	2	4:45	27	24
5:00	1	3	5:00	47	57	5:00	1	3	5:00	56	62	5:00	2	3	5:00	39	60	5:00	2	2	5:00	39	33
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5:30	3	5	5:30	28	56	5:30	6	4	5:30	52	37	5:30	4	6	5:30	38	37	5:30	1	3	5:30	30	33
5:45	5	9	5:45	31	34	5:45	6	9	5:45	24	26	5:45	7	15	5:45	32	31	5:45	1	4	5:45	36	29
6:00	10	7	6:00	27	38	6:00	14	11	6:00	21	30	6:00	15	15	6:00	30	37	6:00	2	3	6:00	23	25
6:15	6	14	6:15	21	32	6:15	8	19	6:15	27	24	6:15	8	13	6:15	26	24	6:15	3	5	6:15	25	32
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9:00	8	20	9:00	9	4	9:00	14	19	9:00	10	12	9:00	14	28	9:00	12	9	9:00	17	29	9:00	8	6
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10:45	18	24	10:45	2	1	10:45	25	26	10:45	2	6	10:45	14	29	10:45	6	4	10:45	39	38	10:45	1	2
11:00	10	32	11:00	5	0	11:00	15	16	11:00	3	0	11:00	25	32	11:00	1	0	11:00	27	34	11:00	2	5
11:15	30	23	11:15	0	0	11:15	35	17	11:15	2	2	11:15	20	28	11:15	1	3	11:15	28	32	11:15	1	3
11:30	18	21	11:30	1	1	11:30	24	24	11:30	1	2	11:30	18	21	11:30	0	4	11:30	44	30	11:30	0	0
11:45	22	24	11:45	1	0	11:45	28	40	11:45	0	0	11:45	30	26	11:45	0	2	11:45	30	39	11:45	0	2
Total	487	768	Total	1075	1134	Total	553	818	Total	1119	1177	Total	537	871	Total	1126	1219	Total	460	590	Total	886	1061
Percent	*	*	Percent	*	*	Percent	*	*	Percent	*	*	Percent	*	*	Percent	*	*	Percent	*	*	Percent	*	*
Peak	7:15	7:15	Peak	3:15	4:45	Peak	7:15	7:15	Peak	4:15	4:30	Peak	7:15	7:15	Peak	4:00	4:15	Peak	10:45	10:15	Peak	4:30	3:45
Volume	141	238	Volume	185	218	Volume	146	261	Volume	206	238	Volume	140	258	Volume	189	228	Volume	138	146	Volume	148	135
Peak Factor	0.629	0.783	Peak Factor	0.712	0.956	Peak Factor	0.702	0.694	Peak Factor	0.904	0.944	Peak Factor	0.761	0.701	Peak Factor	0.875	0.934	Peak Factor	0.784	0.793	Peak Factor	0.822	0.888

Day of Week	Est Max flow/day
Sunday	1500
Monday	180
Tuesday	180
Wednesday	530
Thursday	180
Friday	180
Saturday	180

Sources of Flow			
	People	GPD	Total
Church service Sunday	660	2	1320
Staff	10	18	180
Wednesday bible study	175	2	350

FLOW EQ (TREATING 1,000GPD)

Day of Week	Est Max flow/day	Treating	carry over
Sunday	1500	1000	500
Monday	680	1000	0
Tuesday	180	1000	0
Wednesday	530	1000	0
Thursday	180	1000	0
Friday	180	1000	0
Saturday	180	1000	0