STAFF REPORT
PLANNING AND ZONING COMMISSION
For the April 30, 2015 meeting

TO: Planning and Zoning Commission Members

FROM: Sheena Danzer, Planning Director

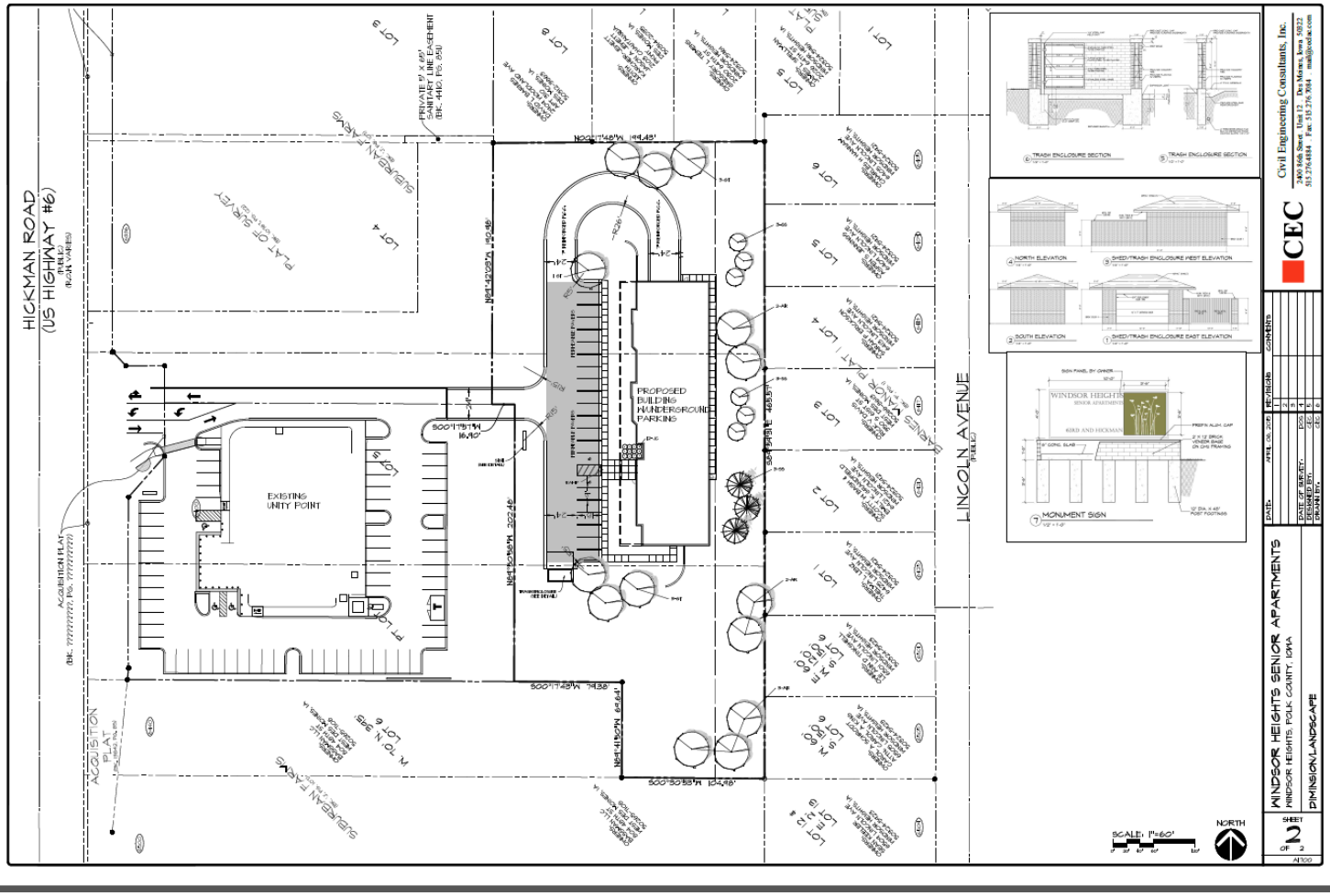
SUBJECT: Site Plan Review for Windsor Crossing Senior Living Facility

GENERAL INFORMATION

Applicant:	Windsor Crossing Senior Living Apartments 3512 Ingersoll Avenue Des Moines, IA 50312
Civil Engineer:	CEC, Inc.
Architect:	Wells and Associates, PC
Property Owner:	Hurd Windsor LLC & Knapp Windsor LLC
Application Date:	April 3, 2015
Location:	6400 Hickman Road
Zoning:	CC, Community Commercial- Hickman Overlay District
Proposed use:	3-story senior apartment with underground parking
Proposed building:	33,271 square feet
Requested Action:	Review site plan application and provide a recommendation to the City Council

Quick Summary:

On July 14, 2014 the Planning and Zoning Commission recommended approval to the Board of Adjustment for a Conditional Use Permit (CUP02-14) for a 31-unit senior living apartment complex at the 63rd and Hickman Road development. On July 28, 2014 the Board of Adjustment approved the conditional use permit with the condition that if the CDBG funds were not secured for the project, the permit becomes invalid. On January 9, 2015, the applicant contacted the City with the news that the application was awarded the funds for the project so action on the site plan is now the next step as the use has already been approved. The applicant's Architect was present at the March 25, 2015 Planning and Zoning meeting to give an overview of the site as they were not quite ready to submit a full site plan application. The applicant has been meeting with the Iowa Economic Development Authority (IEDA) on additional funding for stormwater management and has been working on best practices to implement in their project in which you will hear more on.



DEVELOPMENT COMMITTEE REVIEW

On April 9, 2015 the applicant met with the Development Committee to discuss their conceptual plan. The following comments were received from the Committee after the meeting. Overall feedback received, generated a positive recommendation for the project.

"This development is well thought out and fits into the community. Not only is the effort sustainable but it takes into consideration sensitivities of neighbors. Something we should always be concerned about."

"I am also wanting to add, if this project could be used as a template for all, and I stress all, future development Windsor Heights would be the envy of all of the metro."

"I think this is a very good project [maybe the best type of project] for the location.

I think the landscape connection at the rear of the property where it joins the residential area was an even better choice than previously presented.

I think the decision to add those sustainable elements [underground parking, permeable pavers, green roof, etc] are exactly what we should be pushing for and helping to create a greater identity/brand for WH.

I think we need to be sure to watch the landscaping plan and more specifically what is being planted as I think that will have a high degree of influence on the residential aspect of the adjacent neighborhood. Specifically, I think we need to have a good blend of deciduous and coniferous trees at the rear with the undulating berm and low shrubs that are also a mix of deciduous and coniferous plantings. The coniferous should be used to help randomly screen throughout and break up the massing while the deciduous will add texture and color along with screening when possible."

ENGINEER REVIEW

The City's Engineer reviewed the initial site plan with the following comments below. Staff is waiting for a full review of the site plan and specifically stormwater comments from the engineer, but should have a final comment from the engineer at the time of the meeting. The applicant has already worked to address most of the issues and is shown in the site plan that the Planning and Zoning Commission has been given, but staff wanted to give the Planning and Zoning Commission a copy of the initial comments in case there are questions related to them. A final building permit will not be issued until all issues are resolved.

- Need a copy of the storm water calculations.
- North arrows need correcting (sheets 2 and 3) as to not confuse PnZ or Council on orientation
- Need to see construction details for permeable pavers, parking lot and walks etc.
- Looks like a water service easement will be needed near Hickman Road.
- I believe the scale is incorrect on the two site plan drawings.
- The drive ramp may need to be widened to accommodate head to head traffic on the curve.
- There appears to be no outlet for the two retention areas south of the building.
- What materials will be used to construct the retaining walls?
- If the intake gets plugged at the bottom of the ramp, need to know the flooding will not enter the parking in the building.
- Flows along the NW property line used to sheet flow, now are swaled along the property line.
- East and west elevations do not show retaining walls.
- Will the west retaining wall have a rail near the building adjacent to the walk?
- The northeast intake in the parking north of the building has a grate of 948.5 but no 949 contour is shown between that and the 950 to the west
- What lighting is being proposed in the parking lot?

APPLICABLE SECTIONS

177.02 SITE PLAN REVIEW PROCEDURE.

1. Purpose. The Site Plan Review Procedure provides for special review in addition to plan review required by other sections of this Code of Ordinances of projects that have potentially significant effects on traffic circulation or a significant effect on land uses in adjacent neighborhoods. The procedure provides for review and evaluation of site development features and possible mitigation of unfavorable effects on surrounding property.

2. Administration. The Zoning Administrator shall review, evaluate, and act on all site plans submitted pursuant to this procedure. The Planning and Zoning Commission shall review site plans and shall transmit its recommendation to the City Council for approval.

Site Plan Review Procedure further states the following:

"The Zoning Administrator, or his/her designee, Planning and Zoning Commission, and City Council may require modification of a site plan as a prerequisite for approval. Required modifications may be more restrictive than base district regulations and may include, but not be limited to, additional landscaping or screening; installation of erosion control measures; improvement of access or circulation; rearrangement of structures on the site; or other modifications deemed necessary to protect the public health, safety, welfare, community character, property values, and/or aesthetics."

STAFF ANALYSIS

The following is the outline used in Chapter 177 to review site plans as well as the Hickman Overlay Standards.

Land Use Compatibility		Staff Comments
Height and Bulk	Development should minimize differences in height and building size from surrounding structures. Differences should be justified by urban design considerations.	No issues.
Setbacks	Development should respect pre-existing setbacks in surrounding area. Variations should be justified by site or operating characteristics.	Setback requirements have been met. Setback requirements are as follows: Front- 25 feet, Street side yard-25, and interior side yard- 0, rear yard- 10 feet. The proposed buildings are have exceeded all these setbacks as the

		proposed location is behind another development and not abutting a street. The senior living apartment parking lot is proposed to be approximately 150 feet from Unity Point's south parking lot.
Building Coverage	Building coverage should be similar to that of surrounding development if possible. Higher coverage should be mitigated by landscaping or site amenities.	No issues.
Frontage	Project frontage along a street should meet minimum frontage requirements and provide reasonable exposure for the development.	No issues. The development would sit behind Unity Point Clinic which abuts Hickman Road.
Parking and Internal Circulation	Parking should serve all structures with minimal conflicts between pedestrians and vehicles.	No issues.
Parking and Internal Circulation	All structures must be accessible to public safety vehicles.	No issues.
Parking and Internal Circulation	Development must have access to adjacent public streets and ways. Internal circulation should minimize conflicts and congestion at public access points.	No issues. Underground parking is proposed in addition to the 22 parking spaces at the front ground level entrance for a total of 57 parking spaces.
Landscaping	Landscaping should be integral to the development, providing street landscaping, breaks in uninterrupted paved areas, and buffering where required by surrounding land uses. Parts of site with sensitive environmental features or natural drainage ways should be preserved.	The Hickman Overlay standards require that landscaped parking islands shall be spaced no greater than 12 parking stalls apart within a single row of parking as well as no parking space, within a single row of parking, shall be greater than 6 stalls from a landscape island or pod. The applicant is proposing permeable pavers and would like the requirement to be eliminated as the islands would be difficult in permeable pavement. It is required that the development have at least a 30 foot buffer between the back of the building and the residential parcels to the south. This has been met. Please refer to the landscaping plan and cover sheet for the following landscaping schedule. **LANDSCAPING SCHEDULE** KEY QUAN BOTANICAL/COMMON NAME SIZE CONDITION GT 7 Gleditsia triacanthos Honeylocust 2 1/2"-3" cal. TS/B&B JC 12 Juniperus chinensis 'Mint Julep' MINT JULEP JUNIPER 24" HT CONT. (30" OC) SS 6 Amelanchier canadensis SHADBLOW SERVICEBERRY 6'-7' Ht. CONT./B&B AR 7 Acer rubrum Red Maple 3" Cal. TS/B&B The applicant is proposing open space throughout the development using a combination of trees and vegetation along with rain gardens. A rooftop garden is also being proposed which has exceeded the open space requirements. There is a 30 foot buffer requirement between the proposed senior living apartment and the residential dwellings to the south as they are different zoning districts. The senior living facility is the more intense zoning district. They are proposing approximately 60 feet in buffer space through the use of detention and trees which can be found in the landscape and grading plans. There is a buffer between the Unity Point development and the senior apartments which is made up of

		detention and which will have native plantings.
Building Design	Architectural design and building materials should be compatible with surrounding areas or highly visible locations	Elevations have been submitted for building elevation design. The Hickman Overlay standards state that buildings should have a unifying theme within a development. The proposed senior living apartments are using a different brick style that what has been approved for Unity Point; otherwise the theme between the two buildings is very similar.
Traffic Capacity	Project should not reduce the existing level of traffic service on adjacent streets. Compensating improvements will be required to mitigate impact on street system operations.	No issues addressed by city engineer.
External Traffic Effects	Project design should direct nonresidential traffic away from residential areas.	No issues. Only residential traffic will be entering the area.
Operating Hours	Projects with long operating hours must minimize effects on surrounding residential areas.	Not applicable.
Outside Storage	Outside storage areas must be screened from surrounding streets and less intensive land uses.	The outdoor trash enclosure is proposed to be screened.
Stormwater Management	Development should handle storm water adequately to prevent overloading of public storm water management system. Development should not inhibit development of other properties. Development should not increase probability of erosion, flooding, landslides, or other run-off related effects.	Stormwater management for the site is still being reviewed, but there should be a comment by the time of the meeting. The applicant is proposing several stormwater practices; rain gardens, green roof, permeable paved parking lot and detention.
Utilities	Project must be served by utilities.	All utilities are private.
Comprehensive Plan	Projects should be consistent with the City Comprehensive Development Plan	The Comprehensive Plan does not address a specific use for this property; it designates the area as a mixed use.

CONCLUSIONS

If there is a consensus of requested modifications to the site plan by the Planning and Zoning Commission, those can be recommended to the City Council. The Commission may recommend denial, defer the site plan for more information, approve, or approve with modifications.

MINUTES OF THE
WINDSOR HEIGHTS
PLANNING AND ZONING COMMISSION
Council Chambers- 1133 66th St.

April 30, 2015

1. **Call to Order.**

   Egger called the meeting to order at 5:03 p.m. Foss, Tillotson, Fife, Jones, Turner was in attendance, and Calhoun was absent. Planning Director, Sheena Danzer was also in attendance.

2. **Approval of the Agenda.**

   Tillotson made the motion to approve the agenda as presented; Fife seconded. Voice vote passed unanimously.

3. **Approval of the minutes from the April 16, 2015 meeting.**

   Foss made a motion to approve the minutes as presented; Jones seconded. Voice vote passed unanimously.

4. **Site Plan Review for Windsor Crossing Senior Living Apartments.**

   A motion was made by Tillotson and seconded by Fife to recommend approval of the site plan with the condition that additional landscaping materials (junipers and evergreens) be amended into the site. Voice vote passed unanimously.

5. **Discussion on Design and Development Guidelines.**

   The Commission discussed building orientation standards with the consensus that it be stated as a preference over a requirement. This will be updated in the guidelines for the next meeting date. The Commission requested that staff identify what cities are using dark sky lighting standards language and to report back at the next meeting. Other grammatical amendments were also pointed out in the meeting and will be updated.

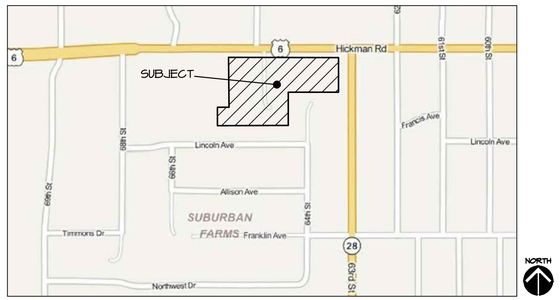
6. **Adjourn.**

   Tillotson moved to adjourn at 5:46 p.m.; Jones seconded. Voice vote passed unanimously.

SITE PLAN

WINDSOR HEIGHTS SENIOR APARTMENTS

WINDSOR HEIGHTS, IOWA



VICINITY SKETCH

NORTH

LEGAL DESCRIPTION

LOT 4, WINDSOR CROSSING PLAT 1, AN OFFICIAL PLAT, CITY OF WINDSOR HEIGHTS, POLK COUNTY, IOWA

ZONING

CC - COMMUNITY COMMERCIAL (WHICKMAN OVERLAY DISTRICT)

PARKING

PROVIDED: 57 SPACES

GRADING NOTES

1. FINISHED GRADE ON ALL NON-PAVED AREAS SHALL BE WITHIN 0.20 FOOT OF PLAN GRADE. PAVED AREAS SHALL BE WITHIN 0.10 FOOT.
2. THE CONTRACTOR SHALL VERIFY THE LOCATION AND PROTECT ALL EXISTING UTILITIES AND STRUCTURES. DAMAGE TO UTILITIES AND STRUCTURES SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE, TO THE SATISFACTION OF THE UTILITY OWNER.
3. TOPSOIL SHALL BE SPREAD TO A MINIMUM THICKNESS OF 6-INCHES ON ALL LANDSCAPED AREAS.
4. BACKFILL TO THE TOP OF ALL CURBS.
5. ALL ELEVATIONS ARE TO THE GUTTER GRADE UNLESS NOTED OTHERWISE.
6. COVER AND/OR FILTER SOCK AROUND ALL INTAKES PRIOR TO PAVING TO PREVENT SEDIMENTATION FROM ENTERING THE STORM SEWER.
7. ALL DEBRIS SPILLED ON CITY R.O.W. AND ADJOINING PROPERTY SHALL BE REMOVED BY CONTRACTOR IN A TIMELY FASHION.

UTILITY NOTES

1. ALL UTILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SUDAS 2014 "URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS".
2. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES OR STRUCTURES AT THE SITE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNERS OF UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK. THE CONTRACTOR SHALL NOTIFY THE PROPER UTILITY IMMEDIATELY UPON BREAKING OR DAMAGE TO ANY UTILITY LINE OR APPURTENANCE, OR THE INTERRUPTION OF THEIR SERVICE. IF EXISTING UTILITY LINES ARE ENCOUNTERED THAT CONFLICT IN LOCATION WITH NEW CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT MAY BE RESOLVED.
3. ALL SERVICES SHALL BE CONSTRUCTED TO WITHIN 5 FEET OF THE OUTSIDE OF THE BUILDING WALLS.
4. ALL EXISTING TILE LINES ENCOUNTERED SHALL BE RESTORED OR ROUTED TO A STORM SEWER WHETHER ACTIVE OR NOT.
5. COORDINATE ALL UTILITY SERVICE LOCATIONS & SIZES WITH BUILDING MECHANICAL DRAWINGS.

DRAWING INDEX

SHEET NUMBER	SHEET TITLE
1	COVER
2	DIMENSION/LANDSCAPE
3	GRADING/UTILITY

PLANTING NOTES

1. ALL SITE WORK, SODDING AND LANDSCAPING SHALL MEET THE REQUIREMENTS OF THE STATEWIDE URBAN DESIGN AND SPECIFICATIONS (SUDAS) WITH CITY OF DES MOINES ADDENDUM FOR AND LANDSCAPE STANDARDS.
2. ALL PLANT MATERIAL SHALL AT LEAST MEET MINIMUM REQUIREMENTS SHOWN IN THE "AMERICAN STANDARD FOR NURSERY STOCK" (ANSI Z60.1-2004)
3. CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR A PERIOD OF ONE YEAR FROM DATE OF INSTALLATION.
4. THE CONTRACTOR SHALL REMOVE THE TREE STAKES ONE YEAR AFTER INSTALLATION.
5. NO PLANT MATERIAL SHALL BE SUBSTITUTED WITHOUT AUTHORIZATION OF THE LANDSCAPE ARCHITECT.
6. ALL TREES, SHRUBS, BEDS & GROUND COVERS SHALL BE MULCHED WITH AT LEAST 3" SHREDDED BARK MULCH.
7. THE CONTRACTOR SHALL VERIFY THE LOCATION AND PROTECT ALL UTILITIES AND STRUCTURES. DAMAGE TO UTILITIES AND STRUCTURES SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER OF THE UTILITY.
8. ONE WEEK PRIOR TO INSTALLATION, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT.
9. THE CONTRACTOR SHALL STAKE LOCATION OF PLANTS FOR LANDSCAPE ARCHITECT'S APPROVAL BEFORE DIGGING HOLES.
10. NO STAKING OF STREET TREES IS ALLOWED IN THE R.O.W.
11. REMOVE ALL WIRE, TWINE AND BURLAP FROM THE ROOTBALLS OF STREET TREES.
12. TOPSOIL SHALL BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY DPS. REGARDLESS, TOPSOIL SHALL NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS, AND SHALL CONTAIN LESS THAN 5 % BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1 1/2 " IN DIAMETER
13. ALL DISTURBED AREAS SHALL BE SEEDED OR SODDED.

LANDSCAPING SCHEDULE

KEY	QUAN	BOTANICAL/COMMON NAME	SIZE	CONDITION
GT	7	Gleditsia triacanthos Honeylocust	2 1/2"-3" cal.	TS/B&B
PP	6	Picea pungens Colorado Blue Spruce	6'-7' Ht.	CONT./B& B
PS	6	Pinus strobus White Pine	6'-7' Ht.	CONT./B& B
SS	6	Amelanchier canadensis SHADBLOW SERVICEBERRY	6'-7' Ht.	CONT./B& B
AR	7	Acer rubrum Red Maple	3" Cal.	TS/B&B
RD	8	Rhododendron x 'P.J.M.' P.J.M. Rhododendron	24" HT	CONT. (30" OC)
BG	8	Buxus x 'Green Mountain' Green Mountain Boxwood	24" HT	CONT. (30" OC)
HA	22	Hydrangea arborescens 'Annabelle' hydrangea	24" HT	CONT. (30" OC)
JY	38	Taxus cuspidata 'Nana' Japanese Dwarf Yew	24" HT	CONT. (30" OC)

GENERAL LEGEND

PROPOSED

- PLAT BOUNDARY
- SECTION LINE
- LOT LINE
- CENTERLINE
- EASEMENT LINE
- FLARED END SECTION
- DRAIN BASIN OR SEDIMENT RISER
- DRAIN BASIN WITH SOLID GRATE
- WATER VALVE
- FIRE HYDRANT ASSEMBLY
- BLOW-OFF HYDRANT
- SCOUR STOP MAT
- TURF REINFORCEMENT MAT
- STORM SEWER WITH SIZE
- WATER SEWER WITH SIZE
- WATER SERVICE
- PROPOSED CONTOUR
- SILT FENCE
- ADDRESS
- RIPRAP

EXISTING

- LOT LINE
- SANITARY/STORM MANHOLE
- WATER VALVE
- FIRE HYDRANT
- STORM SEWER SINGLE INTAKE
- STORM SEWER DOUBLE INTAKE
- STORM SEWER ROUND INTAKE
- FLARED END SECTION
- DECIDUOUS TREE
- CONIFEROUS TREE
- SHRUB
- POWER POLE
- STREET LIGHT
- GUY ANCHOR
- ELECTRIC TRANSFORMER
- GAS METER
- TELEPHONE RISER
- SIGN
- UNDERGROUND TELEVISION
- UNDERGROUND ELECTRIC
- UNDERGROUND GAS
- UNDERGROUND FIBER OPTIC
- UNDERGROUND TELEPHONE
- OVERHEAD ELECTRIC
- SANITARY SEWER WITH SIZE
- STORM SEWER WITH SIZE
- WATER MAIN WITH SIZE
- EXISTING CONTOUR
- TREELINE
- B.S.L. BUILDING SETBACK LINE
- P.U.E. PUBLIC UTILITY EASEMENT
- M.O.E. MINIMUM OPENING ELEVATION

BENCHMARK

63RD STREET
TRIANGLE CUT SE CORNER OF INTAKE
ELEVATION= 935.613

HICKMAN ROAD & 62ND STREET
TRIANGLE CU NW CORNER OF INTAKE
ELEVATION= 946.508

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com

CERTIFICATION

STATE OF IOWA
EDWARD H. ARP
LANDSCAPE ARCHITECT NO. 250
PROFESSIONAL LANDSCAPE ARCHITECT

I HEREBY CERTIFY THAT THE PORTION OF THIS TECHNICAL SUBMISSION DESCRIBED BELOW WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF IOWA.

BY:_____DATE:_____
EDWARD H. ARP, IOWA REG. NO. 250
PAGES OR SHEETS COVERED BY THIS SEAL:
SHEETS 1 THROUGH 9

CEC
Civil Engineering Consultants, Inc.
2400 86th Street, Unit 12 . Des Moines, Iowa 50322
515.276.4884 . Fax: 515.276.7084 . mail@ceeclac.com

REVISIONS		COMMENTS
1		
2		
3	DOS	
4	CEC	
5	CEC	
6	CEC	

DATE: APRIL 06, 2015
DATE OF SURVEY:
DESIGNED BY: DOS
DRAWN BY: CEC
CHECKED BY: CEC

WINDSOR HEIGHTS SENIOR APARTMENTS
WINDSOR HEIGHTS, IOWA

COVER

SHEET 1 OF 3

A1700

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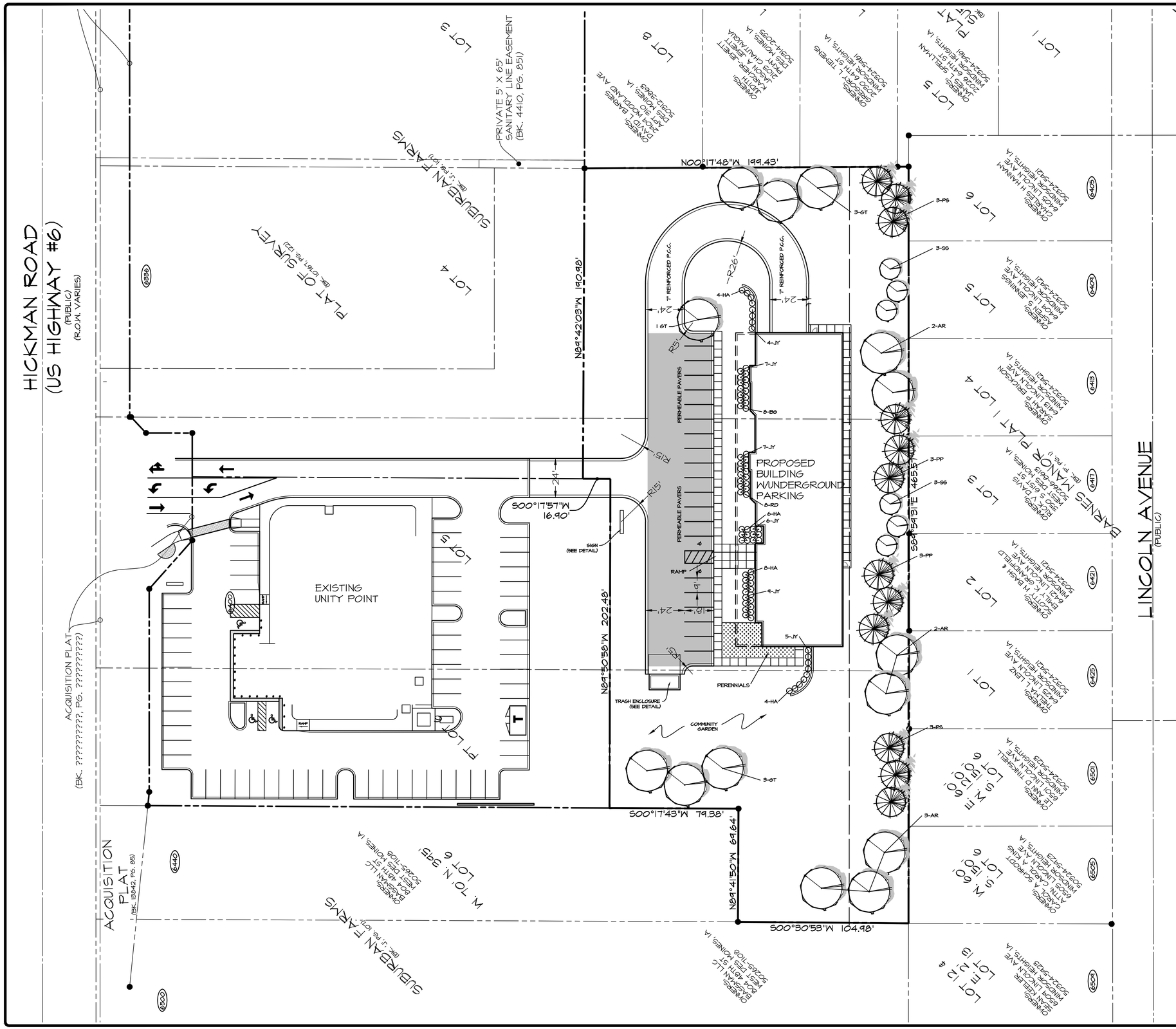
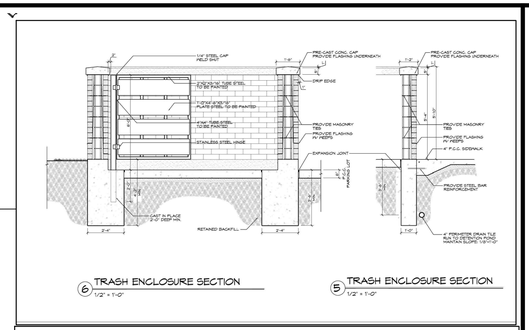
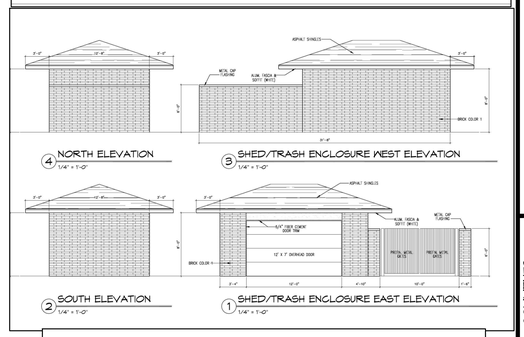
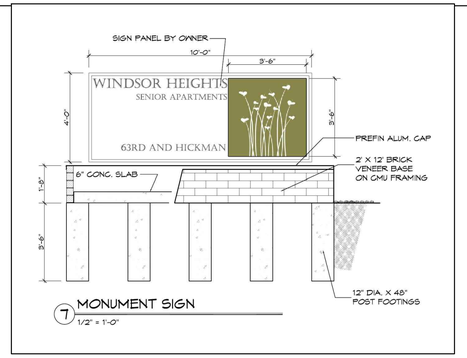
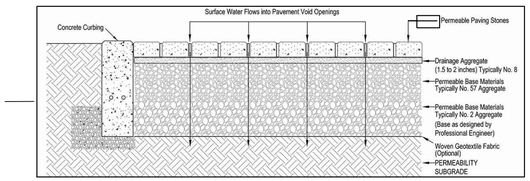




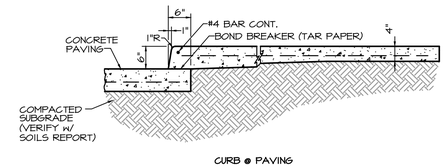






PERMEABLE PAVER DETAIL

NO SCALE



CURB DETAIL FOR CONCRETE PAVING

NO SCALE

SCALE: 1"=30'

NORTH

CEC
Civil Engineering Consultants, Inc.
2400 86th Street . Unit 12 . Des Moines, Iowa 50322
515.276.4884 . Fax: 515.276.7084 . mail@ceclac.com

DATE:	REVISIONS	COMMENTS
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APRIL 06, 2015

DATE OF SURVEY:
DESIGNED BY: DOS
DRAWN BY: CEC / CEC

WINDSOR HEIGHTS SENIOR APARTMENTS

WINDSOR HEIGHTS, POLK COUNTY, IOWA

DIMENSION/LANDSCAPE

SHEET 2 OF 2

A1700

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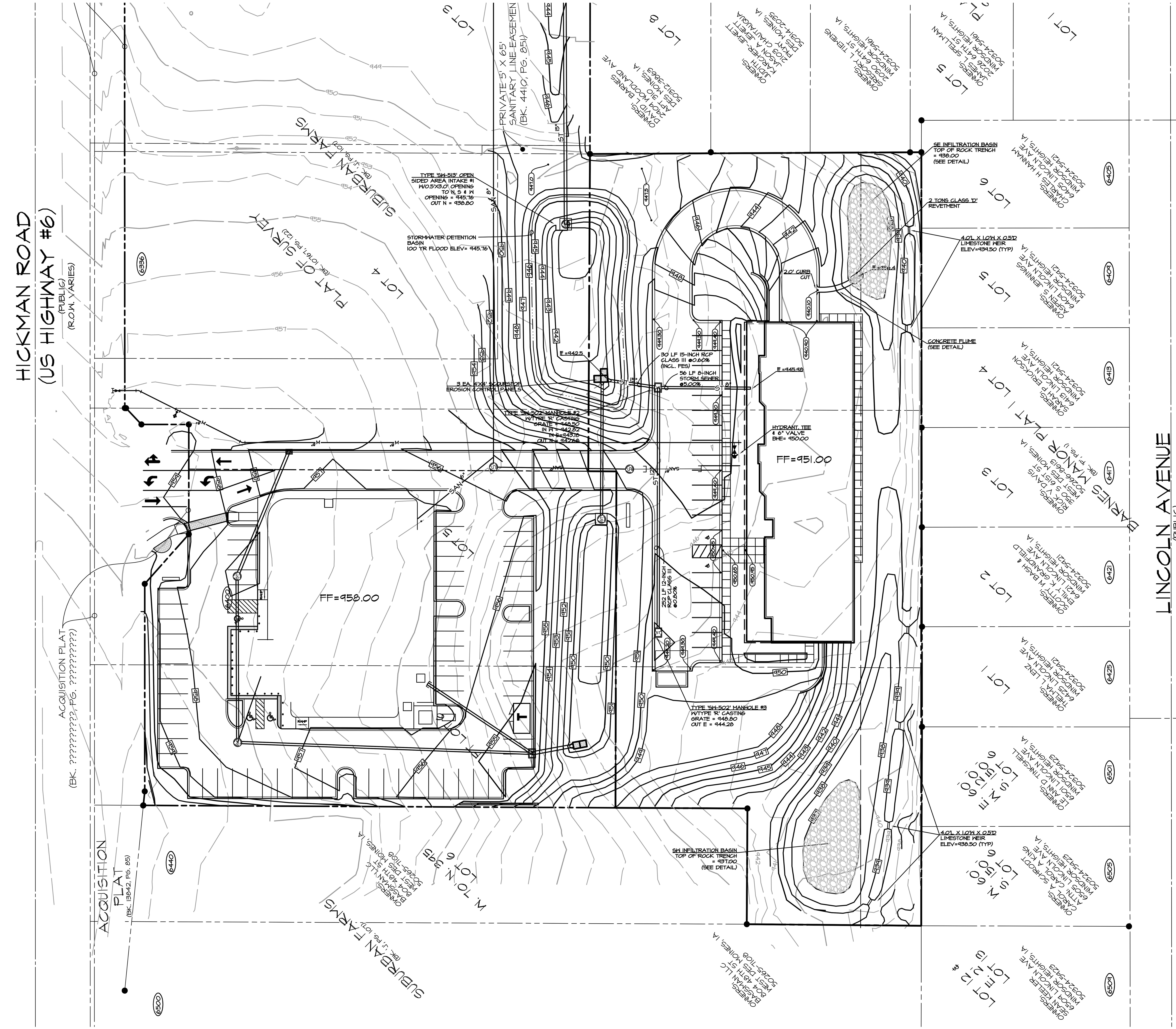
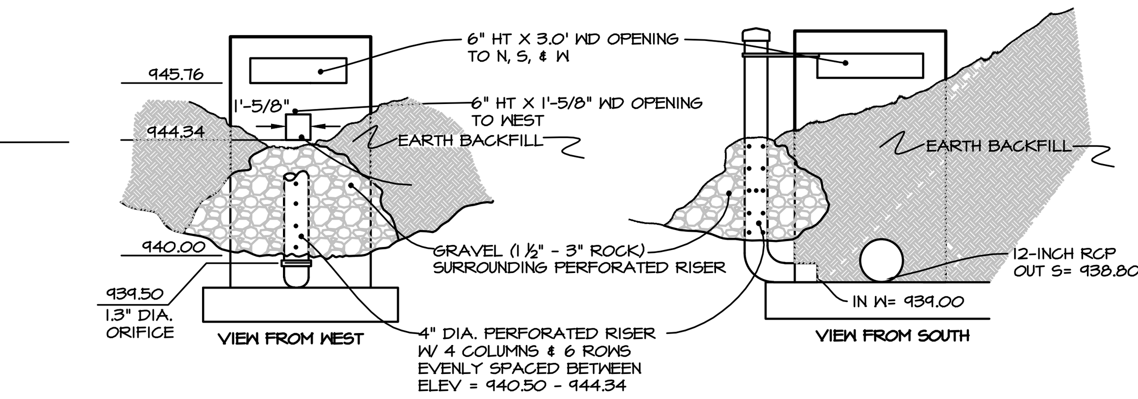
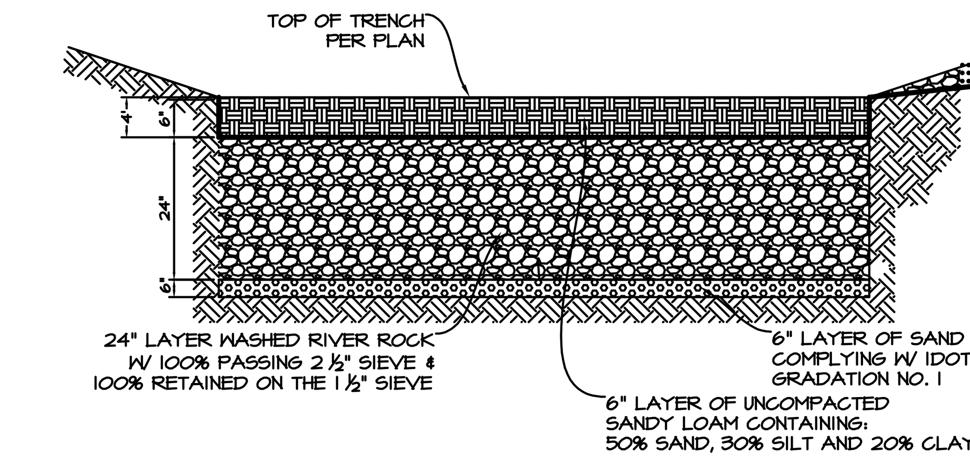




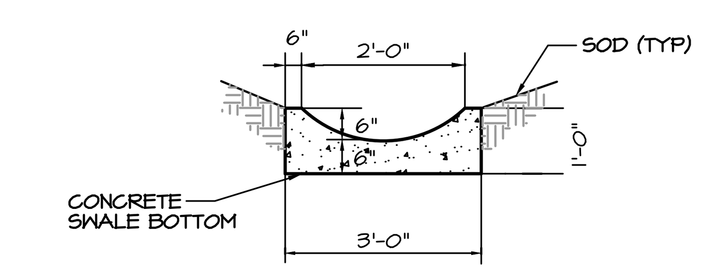
TYPE 'SW-513' OPEN SIDED INTAKE #1

NO SCALE



ROCK TRENCH DETAIL

NO SCALE



CONCRETE FLUME DETAIL

NO SCALE

CEC

Civil Engineering Consultants, Inc.

2400 86th Street . Unit 12 . Des Moines, Iowa 50322
515.276.4884 . Fax: 515.276.7084 . mail@ceclac.com

REVISIONS	COMMENTS
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DATE:	APRIL 06, 2015
DATE OF SURVEY:	DOS
DESIGNED BY:	CEC
DRAWN BY:	CEC

WINDSOR HEIGHTS SENIOR APARTMENTS

WINDSOR HEIGHTS, POLK COUNTY, IOWA

GRADING/UTILITY

SHEET 3 OF 3

A1700

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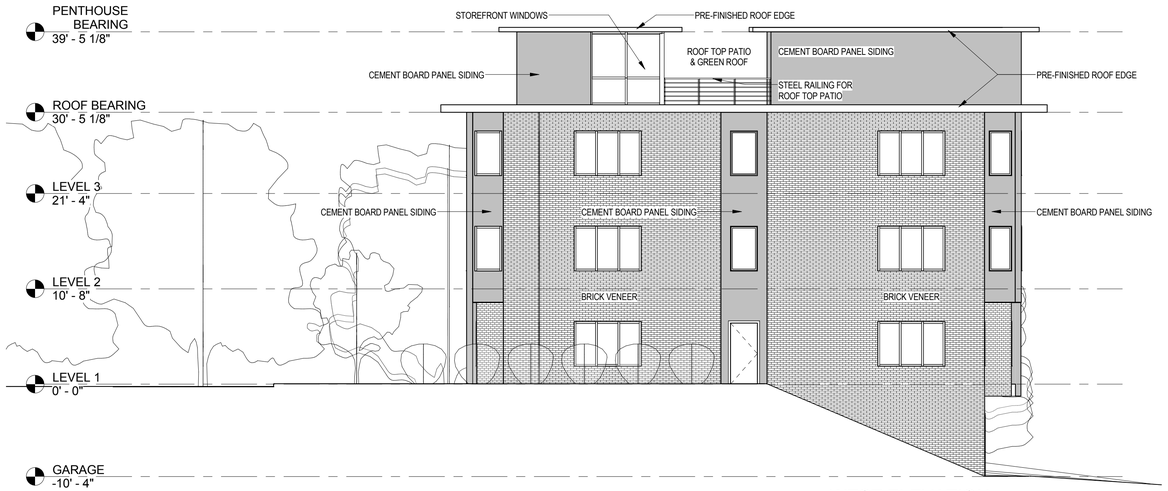
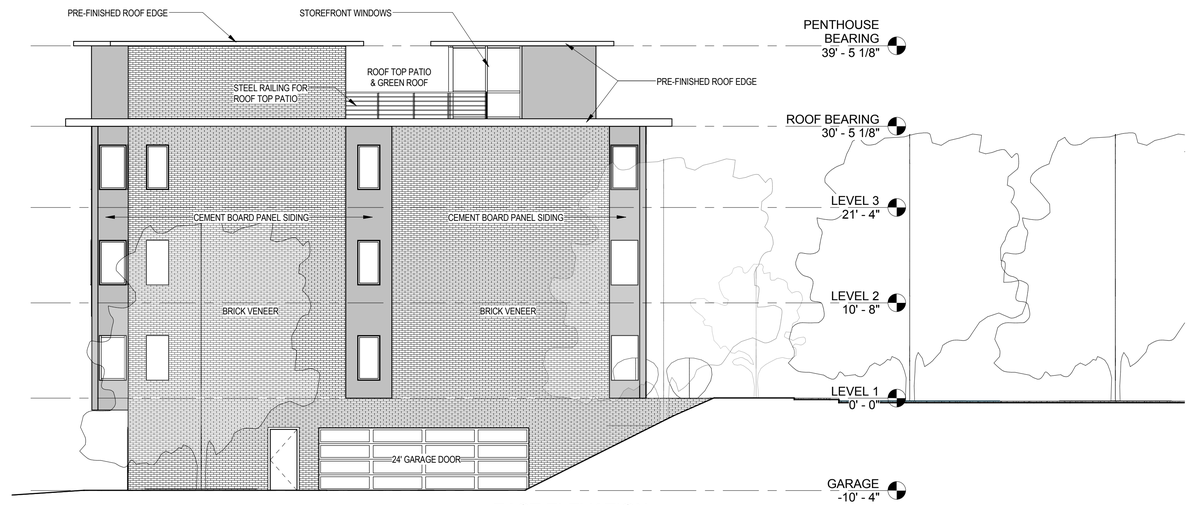
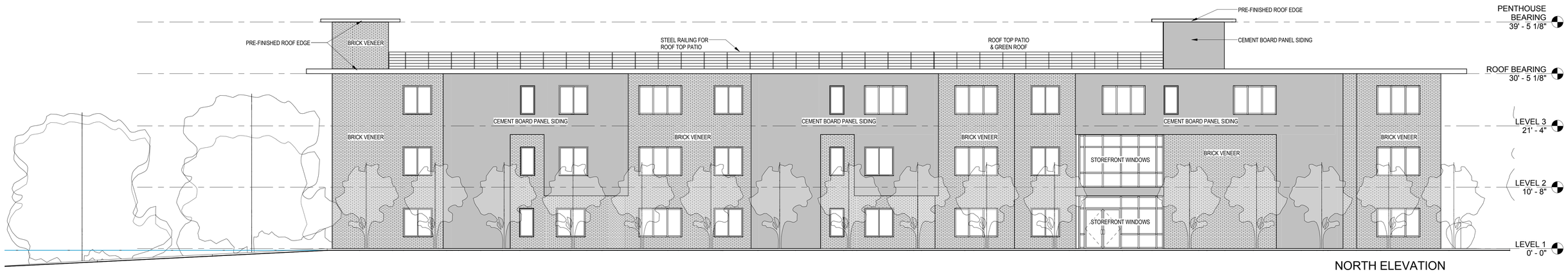


WEST ELEVATION



EAST ELEVATION



NORTH ELEVATION

SOUTH ELEVATION

WELLS + associates

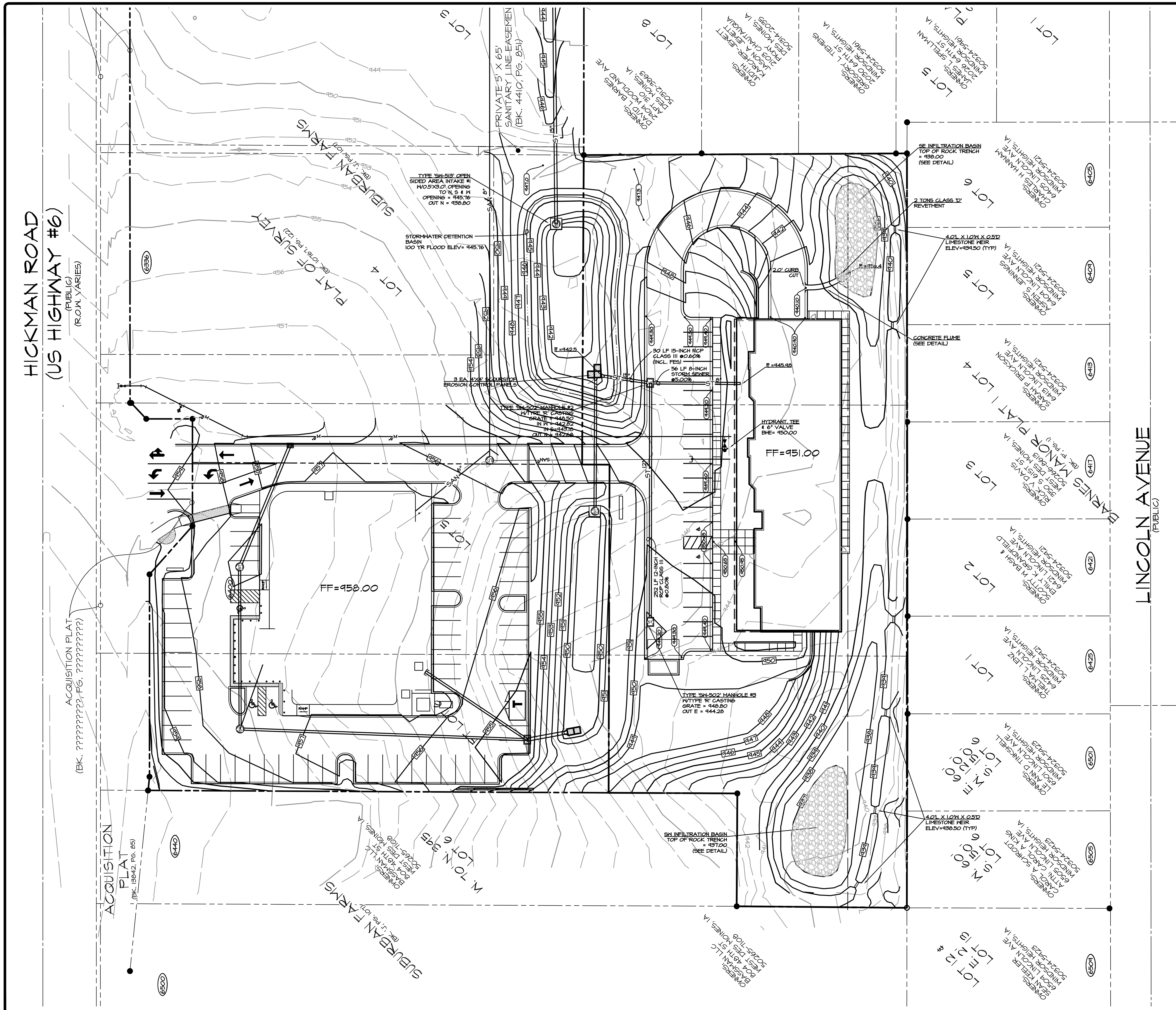
WEST ELEVATION

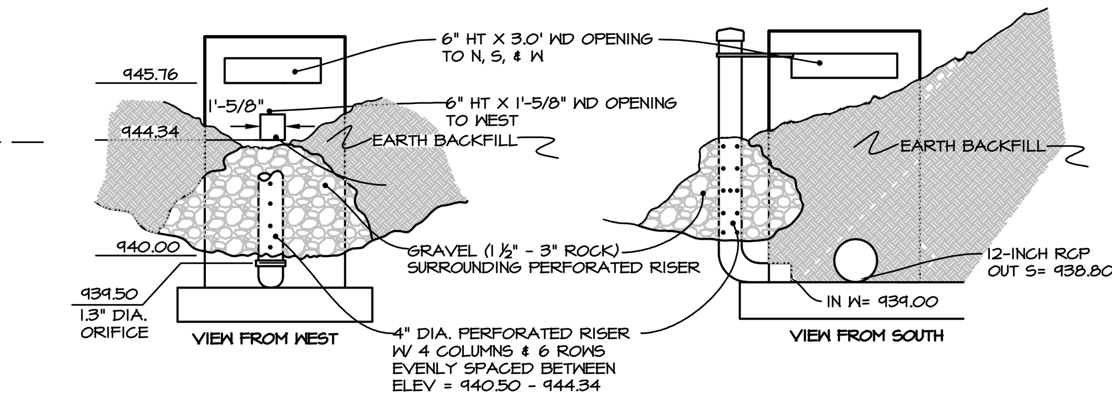
EAST ELEVATION

NORTH ELEVATION

SOUTH ELEVATION

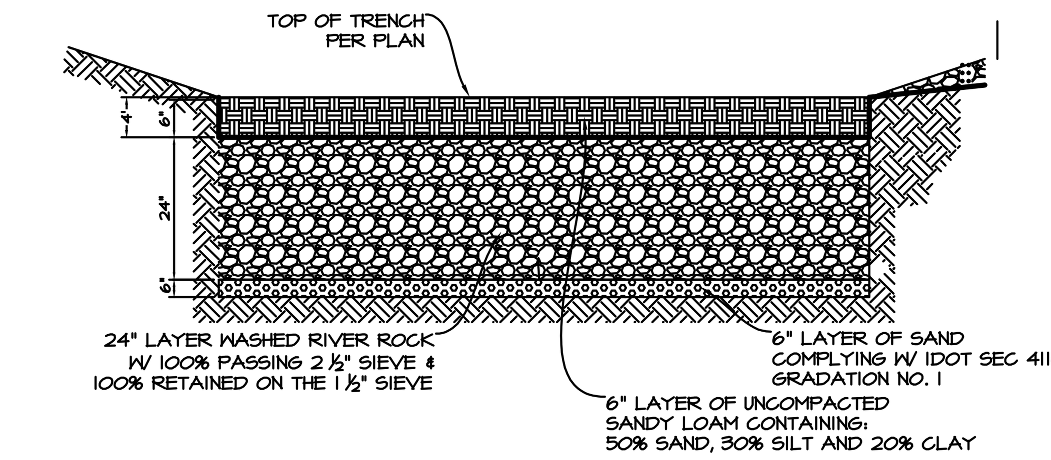
WELLS
+ associates





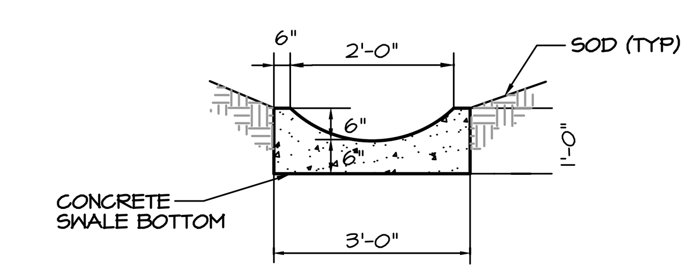
TYPE 'SW-513' OPEN SIDED INTAKE #1

NO SCALE



ROCK TRENCH DETAIL

NO SCALE



CONCRETE FLUME DETAIL

NO SCALE

Civil Engineering Consultants, Inc.
2400 86th Street . Unit 12 . Des Moines, Iowa 50322
515.276.4884 . Fax: 515.276.7084 . mail@ceclac.com

CEC

DATE:	APRIL 06, 2015	REVISIONS	COMMENTS
		1	
		2	
		3	
DATE OF SURVEY:	DOS	4	
DESIGNED BY:	CEC	5	
DRAWN BY:	CEC	6	

WINDSOR HEIGHTS SENIOR APARTMENTS

WINDSOR HEIGHTS, POLK COUNTY, IOWA

GRADING/UTILITY

SHEET 3 OF 3

A1700

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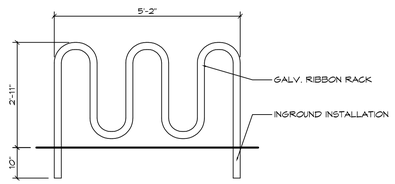
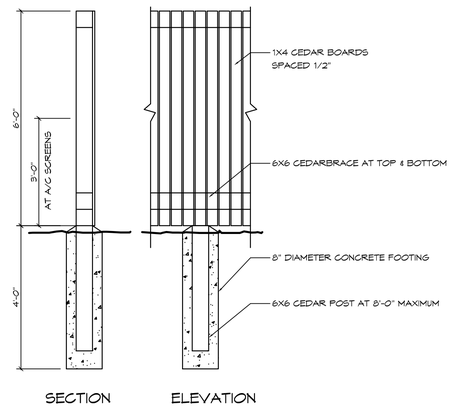
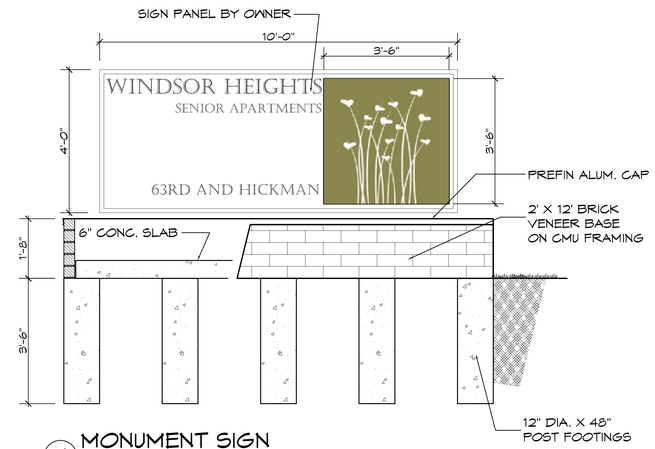


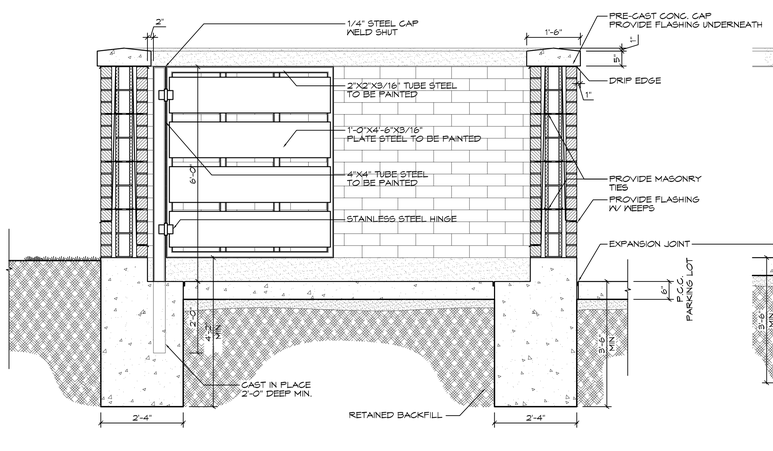
9 BIKE RACK
1/2" = 1'-0"



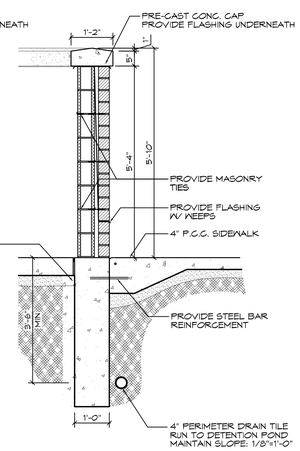
8 SCREEN FENCE
1/2" = 1'-0"



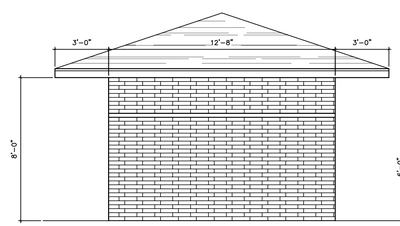
7 MONUMENT SIGN
1/2" = 1'-0"



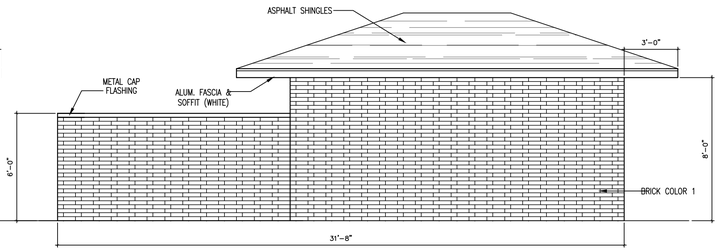
6 TRASH ENCLOSURE SECTION
1/2" = 1'-0"



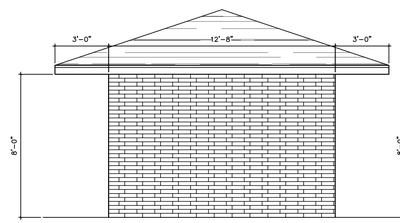
5 TRASH ENCLOSURE SECTION
1/2" = 1'-0"



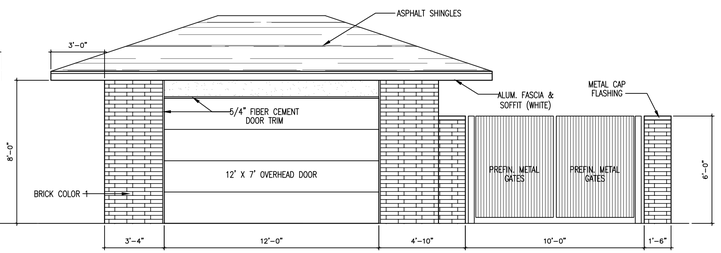
4 NORTH ELEVATION
1/4" = 1'-0"



3 SHED/TRASH ENCLOSURE WEST ELEVATION
1/4" = 1'-0"



2 SOUTH ELEVATION
1/4" = 1'-0"



1 SHED/TRASH ENCLOSURE EAST ELEVATION
1/4" = 1'-0"

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WINDSOR HEIGHTS MULTIFAMILY

63RD AND HICKMAN, WINDSOR HEIGHTS, IA 50324

PROJECT NO:
14125.00

DATE ISSUED
3 APRIL 2015
SCHEMATIC DESIGN

REVISIONS

TITLE
Unnamed

SHEET
SP-4

STORM WATER MANAGEMENT PLAN
FOR
WINDSOR APARTMENTS AT WINDSOR CROSSING

HICKMAN ROAD
WINDSOR HEIGHTS, IOWA

CEC
Civil Engineering Consultants, Inc.

Civil Engineering Consultants, Inc.
Prepared by: Bart A. Turk

Date:
April 21, 2015

CEC Job# A1700

CERTIFICATION

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.

PATRICK J. SHEPARD, IOWA LIC. NO. 12265 DATE
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2015

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Post Developed Drainage Contour Mapé é é é é é é é é ..é . (attached)

SITE CHARACTERISTICS

PRE DEVELOPMENT CONDITIONS

This site is a part of a larger development located at the SW quadrant of Hickman road and 63rd Street. This site is located at the SW corner of the development. The land use is currently vacant and is grassed with some overstory trees. This parcel basically drains from the south ROW line of Hickman Rd to the south property line.

POST DEVELOPMENT CONDITIONS

This site is planned to be developed as residential apartments, containing a building with drives and parking lots.
This site is divided into three drainage areas, each having a detention basin. The basins are labeled as follows:

NE Basin
SW Basin
SE Basin

The NE basin is the largest, sharing detention with 2.25 acres of future retail development located northeast of the site. This basin will also provide detention for a small portion of Unity Point medical clinic, located just northwest of the basin.

The SW and SE basins will be providing detention/water quality storage within rock infiltration trenches.

CONTRIBUTING OFFSITE DRAINAGE

The SW basin provides detention for Q100 undeveloped event of upstream offsite areas.

PRE DEVELOPMENT RUNOFF ANALYSIS

This site predominately drains from east to west at its upper portion and north to south within its lower portion with slopes ranging from 2 to 10 percent.

NE BASIN

Windsor Apartments	0.77
Unity Point	0.08
Future retail	+ 2.17
	3.02 acres

SW BASIN

Windsor Apartments	0.55
Unity Point	0.04
Offsite	+ 0.43
	1.02 acres

SE BASIN

0.42 acres

TIME OF CONCENTRATION

Manningôs Kinematic solution method shall be utilized to determine the siteôs pre-development time of concentration.
Refer to the attached map for configuration of the runoff path.

NE BASIN

Sheet Flow

$$Tt = \frac{0.007[(n)(L)]^{0.8}}{(P2^{0.5})(S^{0.4})}$$

n (manningôs ñnò) = 0.15 (short grass prairie)
L (flow length) = 100ô
S (slope ft/ft) = 0.026
Tt = 9.3 minutes

Shallow Concentrated Flow

Tt = L/(V)(60sec)

L (flow length) = 324ô
S (slope ft/ft) = 0.042
V = 2.0 ft/sec
Tt = 3.9 minutes

Total Time of Concentration = 9.3 + 3.9 = 13.2 minutes
Use a 15 minute Tc

SW BASIN

Sheet Flow

$$Tt = \frac{0.007[(n)(L)]^{0.8}}{(P2^{0.5})(S^{0.4})}$$

n (manningôs ñnò) = 0.15 (short grass prairie)
L (flow length) = 100ô
S (slope ft/ft) = 0.08
Tt = 5.9 minutes

Shallow Concentrated Flow

Tt = L/(V)(60sec)

L (flow length) = 230ô
S (slope ft/ft) = 0.052
V = 1.6 ft/sec
Tt = 2.4 minutes

Total Time of Concentration = 5.9 + 2.4 = 8.3 minutes
Use a 10 minute Tc

SE BASIN

Sheet Flow

$$Tt = \frac{0.007[(n)(L)]^{0.8}}{(P2^{0.5})(S^{0.4})}$$

n (manningôs ñnò) = 0.15 (short grass prairie)
L (flow length) = 100ô
S (slope ft/ft) = 0.04
Tt = 7.8 minutes

Shallow Concentrated Flow

Tt = L/(V)(60sec)

L (flow length) = 27ô
S (slope ft/ft) = 0.01
V = 0.7 ft/sec
Tt = 0.6 minutes

Total Time of Concentration 7.8 + 0.6 = 8.4 minutes
Use a 10 minute Tc

(Refer to existing drainage contour map for Tc path and existing topography.)

PRECIPITATION MODEL
Metro Design Standards ï Figure 3.5 Chapter II, Section 3

RUNOFF COEFFICIENT
Rational
Soil Group ñÇò
Undeveloped surface - average slope 2-10%
Runoff Coefficient = 0.25

SUMMARY OF PRE-DEVELOPMENT RUNOFF

NE BASIN
c = 0.25
Tc = 15 min
I = 3.92 in/hr
Acre = 3.02

Assume 5% of future retail will drain undetained.

Qrel (0.25)(3.92)(3.02) ï (0.25)(7.12)(0.11) = 3.87 cfs

SW BASIN
c = 0.25
Tc = 10 min
I5 = 4.56 in/hr
I100 = 8.34 in/hr
Acre = 1.02

SE BASIN
c = 0.25
Tc = 10 min
I5= 4.56 in/hr
I100 = 8.34 in/hr
Acre = 0.42

POST DEVELOPMENT RUNOFF ANALYSIS

WATERSHED AREA

The majority of the stormwater within the NE Basin will flow from the building, parking, drives and grassed areas, into storm intakes and then will be conveyed through the storm sewer and outlet into the detention basin. The detention basin shall detain for the 100 year developed storm event and release the 5 year undeveloped storm event. The basin shall also provide water quality release of the 1.25ò24hr event. For the SE Basin stormwater will flow from parking and grassed areas into an intake and then outlet from a storm sewer into the infiltration basin. The basin will be sized to accommodate the 100 yr.event. For the SW Basin stormwater will flow overland over grassed areas and collect into the infiltration that will be sized to store the 100 yr. event.

PRECIPITATION MODEL

Metro Design Standards ï Figure 3.5 Chapter II, Section 3

RAINFALL LOSS METHOD

Rational
Soil Group ñCò
Developed coefficient

NE BASIN

WINDSOR APARTMENTS

$$\tilde{C} = \frac{(0.25)(0.22 \text{ ac gr}) + (0.95)(0.55 \text{ ac hs})}{0.77 \text{ acres}}$$

= 0.75

FUTURE RETAIL
assume = 0.85

UNITY POINT

$$\tilde{C} = \frac{(0.25)(0.02 \text{ ac gr}) + (0.95)(0.06 \text{ ac hs})}{0.08 \text{ acres}}$$

= 0.78

SW BASIN

ñCò= 0.25

SE BASIN

$$\tilde{C} = \frac{(0.25)(0.31 \text{ ac gr}) + (0.95)(0.11 \text{ ac hs})}{0.42 \text{ acres}}$$

= 0.43

NE BASIN
STORAGE REQUIRED

DA = 2.17 (future retail) + 0.77(Windsor Apts) + 0.08(Unity Point) = 3.02 acres
Qrel = (0.25)(3.92)(3.02) ï (0.25)(7.12)(0.11) = 2.76 cfs
C x DA (0.85)(2.17-0.11)+(0.75)(0.77)+(0.78)(0.08) = 2.39

					Qrel =	
					2.76	
T(sec)	I(in/hr)	C x DA	Q(cfs)	RAIN(cf)	REL(cf)	STOR(cf)
900	7.12	2.39	17.02	15315	2484	12831
1200	6.38	2.39	15.25	18298	3312	14986
1500	5.64	2.39	13.48	20219	4140	16079
1800	4.90	2.39	11.71	21080	4968	16112
2100	4.60	2.39	10.99	23087	5796	17291
2400	4.30	2.39	10.28	24665	6624	18041
2700	4.01	2.39	9.58	25877	7452	18425
3600	3.11	2.39	7.43	26758	9936	16822
5400	2.52	2.39	6.02	32523	14904	17619
7200	1.92	2.39	4.59	33039	19872	13167
9000	1.67	2.39	3.99	35922	24840	11082
10800	1.41	2.39	3.37	36395	29808	6587

Storage required = 18,425 cf

STORAGE PROVIDED – NE BASIN

ELEV	DEPTH	AREA	VOLUME	TOTAL
940.40		0		
	0.60		123	123
941.00		616		
	1.00		1453	1576
942.00		2290		
	1.00		2879	4455
943.00		3467		
	1.00		3987	8442
944.00		4507		
	1.00		5117	13559
945.00		5727		
	1.00		6386	19944
946.00		7044		

100 YR FLOOD ELEVATION = [(18425-13559)/(19944-13559)](1.0) + 945.00
= 945.76

SIZE ORIFICE – NE BASIN

Orifice shall be a rectangular weir in west side of open sided intake

Where $B = Q / (D)(K)((64.4)(H-D/2)))^{0.5}$

Q = 2.76 cfs
D = 0.50ô
K = 0.60
H 945.76 ï 944.34 = 1.42ô
B= 1.06ô

WATER QUALITY VOLUME – NE BASIN

Provide treatment for 1.25òrainfall event
WQv = (Rv)(A)(P)/12

Rv = 0.05 + 0.009(i)
I = 80% (impervious area of the site) 2.33/2.91 = 0.80
Rv = 0.77 (volumetric runoff coefficient)
A = 3.02 acres
P = 1.25ò

WQv = [(0.77)(2.91)(1.25)]/12
= 0.2334 ac/ft or (0.2337)(43560) = 10,167 cf

STORAGE PROVIDED

ELEV	DEPTH	AREA	VOLUME	TOTAL
940.40		0		
	0.60		123	123
941.00		616		
	1.00		1453	1576
942.00		2290		
	1.00		2879	4455
943.00		3467		
	1.00		3987	8442
944.00		4507		
	1.00		5117	13559
945.00		5727		
	1.00		6386	19944
946.00		7044		

WQv ELEVATION = [(10,167-8442)/(13559-8442)](1.0) + 944.00 = 944.34

SIZE PERFORATED RISER – NE BASIN

WQ detention volume = 10,167 cf
(60 sec)(60 min)(24 hrs) = 86,400 sec
3,611/86,400 = 0.12 cfs

<u>Size orifice in bottom of riser pipe</u>

Where: A =Q / (0.6)(c)(sq rt 64.4(H))

Q = 0.12 cfs
C = 0.60

Set elevation of orifice at elevation = 940.00
H 944.34 ï 940.00 = 4.34 feet

A = 0.020 sq ft or 1.91 inch diameter opening

Provide a 1-7/8òdiameter opening.

<u>Size perforated riser</u>

Perforations in riser shall convey more flow than the orifice plate as not to control flow.

Where: $Q = C_s(2A_s/3h_s)(2gh^{3/2})^{0.5}$

C_s = 0.611
A = (area of ½òhole)(4 columns)(6 rows)
= (0.196 sq. in.)(4)(6)
= .0327 sf
h_s = 944.34 ï 940.0 = 4.34ô
h = 2.17ô

Q = [(0.611)(0.0050)(14.35)
= 0.0438 cfs

The orifice in the bottom of the riser shall control.

SW BASIN
SIZE INFILTRATION BASIN

STORAGE REQUIRED

DA = 1.02 acres
Tc = 10 min
I100 = 8.34 in/hr

Q100 (0.25)(8.34)(1.02) = 2.13 cfs
Storage required (2.13)(10 min)(60sec) = 1,278 cf

1278/0.35 = 3,651 cf rock storage

DETERMINE DMAX OF TRENCH

Where: dmax = (f)(T)/n/12
F = 0.17 in/hr (infiltration rate ï ñÇòsoil sandy clay loam)
T = 72 hours
n = 0.35

dmax = 2.91ô

use 3.0ômax depth of trench.

DETERMINE AREA OF ROCK TRENCH

Where: A = Vw/[(n)(dt)+(f)(T)/12]

A = 1,764 sf

SIZE BASIN OVERFLOW WEIRS

This basin shall contain 4 overflow weirs along top of dam

Q100 = 2.13 cfs
2.13 / 4 = 0.53 cfs

Weir shall be a 3.0ôL x 1.0ôW x 0.50ôD of limestone aligned with adjacent downstream property line located between existing single family residential lots.

Q100 = 0.53ô
W = 3.0ô
H = 0.14ô

SW BASIN
SIZE INFILTRATION BASIN

STORAGE REQUIRED

DA = 0.42 acres
Tc = 10 min
I100 = 8.34 in/hr

Q100 (0.43)(8.34)(0.42) = 1.51 cfs
Storage required (1.51)(10 min)(60sec) = 906 cf

906/0.35 = 2589 cf rock storage

DETERMINE DMAX OF TRENCH

Where: dmax = (f)(T)/n/12
F = 0.17 in/hr (infiltration rate ï ñÇòsoil sandy clay loam)
T = 72 hours
n = 0.35
dmax = 2.91ô

use 3.0ômax depth of trench.

DETERMINE AREA OF ROCK TRENCH

Where: A = Vw/[(n)(dt)+(f)(T)/12]

A = 1251 sf

Provide a 3ôrock trench having an area of 1,251 sf

SIZE BASIN OVERFLOW WEIRS

This basin shall contain 2 overflow weirs along top of dam

Q100 = 1.51 cfs
1.51 / 2 = 0.76 cfs

Weir shall be a 3.0ôL x 1.0ôW x 0.50ôD of limestone aligned with adjacent downstream property line located between existing single family residential lots.

Q100 = 0.76ô
W = 3.0ô
H = 0.18ô

SIZE PIPE

(Use 5 minute time of concentration)

INTAKE #3
ACRE = 0.15
Q100 = (0.62)(9.48)(0.15) = 0.88 cfs

PIPE FROM INTAKE #3 TO FES
Use an 12-inch storm sewer @ 1.00%
Capacity = 3.57 cfs

ROOF DRAIN
ACRE = 0.25 (green roof)
Q100 = (0.60)(9.48)(0.25) = 1.42 cfs

PIPE FROM ROOF DRAIN TO INTAKE #2
Use an 8-inch storm sewer @ 2.00%
Capacity = 1.71 cfs

INTAKE #2
ACRE = 0.35
Q100 = (0.80)(9.48)(0.35) = 2.65 cfs

PIPE FROM INTAKE #2 TO FES
Q100 total 0.88(#3) + 1.42(RD) + 2.65 = 4.95 cfs
Use an 15-inch storm sewer @ 0.60%
Capacity = 5.01 cfs
Q5 total (0.62)(5.28)(0.15) + (0.60)(5.28)(0.25) + (0.80)(5.28)(0.25) = 2.34 cfs
Q5 outlet velocity = 3.9 ft/sec

INTAKE #1
(detention outlet)
Qrel = 2.76 cfs
This basin accepts 1.38 cfs from Unity Point basin from the west
Q 2.76 + 1.38 = 4.14 cfs
Use a 15-inch RCP @ 2.00%
Capacity = 9.106 cfs