CHOICE ONE ENGINEERING

August 28, 2015

Victoria Proehl
Community Development Manager
City of Grove City
4035 Broadway
Grove City, OH 43123

Subject: Story Point Senior Living Development
Application 201508030054
FDP Submittal Disposition of Comments

Dear Ms. Proehl,

Below please find our Disposition of Comments regarding the FDP Submittal referenced above in response to your correspondence dated August 18, 2015.

1. The owner will deliver payment.
2. Dimensions have been added for the drives.
3. The table has been revised and dimensions have been added.
4. A bike path along Haughn Rd will be added to the final construction set.
5. Updated the total number of parking stalls to 178.
6. Added curb detail.
7. See attached.
8. Masonry has been added to the bases of directional signage.
9. Heights have been indicated. See attached. Max height is 49'-2".
10. See attached.
11. Carports have been deleted.
12. See attached.
13. Material sample board will be submitted under separate cover.
14. Dimensions have been added for the sidewalks.
15. Carports have been deleted.
16. Moved one stall to the north side of parking lot.
17. Will comply. Note shall be added.
18. Will comply by revising plans as noted.

RECEIVED
AUG 2 8 2015
GC PLANNING COMMISSION

West Central Ohio
440 E. Hoewisher Rd.
Sidney, OH 45365
937.497.0200 Phone

S. Ohio/N. Kentucky
203 W Loveland Ave
Loveland, OH 45140
513 239 8554 Phone

Eastern Indiana
607 N Meridian St.
Portland, IN 47371
260.766 2500 Phone

www.CHOICEONEENGINEERING.com

19. Note #10 will be deleted to clarify.
20. Will comply. Sea Green Junipers shall be specified at 36" Hgt.
21. No Comments Received.
22. StoryPoint has a number of similar sized facilities in operation and has been based on the number of parking spaces on data pulled from those locations.
23. Table has been updated.
24. There is at least 10' of separation between the utilities.
25. Note added.
26. Labeled ADA ramps.
27. Increased the handicap stalls to be 180 SF excluding the aisles.
28. Sanitary has been revised.
29. We are not breaking any drainage sheds due to the proposed development. The storm water runoff that the existing storm outlet receives now, due to the farm fields, will actually be less due to the runoff being detained for the proposed development. We feel that this situation will be improved due to the retention pond.
30. Percent slope has been added.
31. Fire Hydrant locations have been updated per Jackson Twp. Fire Department.
32. Added rock channel protection, labeled Headwalls.
33. Corporation line labeled.
34. Added water text.
35. Updated water for a single tap. Been in contact with the City of Columbus Division of Water and will have finalized in the final construction set.
36. Note added.
37. Do you want drainage arrows on the construction plans or just in the report? They have been added to the report exhibit.
38. Legend added showing Asphalt pavement. Composition will be in final construction set.
39. Reduced entry to 14' wide. Exit will have turn lane left and right.
40. The owner will dedicate 30' of right of way along Haughn Road.
41. Revised drainage exhibits have been provided.
42. A drainage exhibit has been created to show the offsite drainage shed boundary. Utilizing PondPack, the offsite area generates approximately 34 cubic feet per second of flow during a 100-year storm frequency. The swale is at a minimum of two feet wide, by at least two feet high, with 4:1 slopes, and at 0.55%. This swale would have adequate capacity to handle the 34 cfs of flow from the offsite drainage area.
43. The runoff values have been revised.
44. The time of concentrations have been revised.
45. The critical year storm design has been revised to utilize the 1-year runoff volumes.
46. The retention pond modeling has been revised to utilize the Bulletin 71 rainfall data.
47. This requirement has not been addressed. The requirement seems rather restrictive compared to basic storm design practices. We will need to coordinate with EMH&T on this issue.
48. All flood routing is directed away from the building. Also, all the catch basin grate elevations are above the calculated 100-year storm frequency ponding depth in the retention pond, so no ponding will occur above the grate elevations.
49. A detail of the outlet structure will be included in the final construction set.
50. A majority of these concerns have been addressed, but a few of these will still need to be worked out for the final plans. Some of this issues will need to be coordinated with EMH&T.

51. The slopes off the edge of the parking lot are 4:1s so no guardrail fence will be needed.
52. No comments received.
53. Water line has been revised to a single tap.
54. FDC will be within 75' of the hydrant along Orders Road as shown.
55. The fire hydrants have been modified per Jackson Township Fire Department.
56. Added two valves near the hot box.
57. Will comply by revising plans as noted.

Please review and call if you have any concerns. We look forward to meeting with you again next week at the Planning Board Meeting.

Thank you,

Jeff Puthoff, P.E.
Project Manager

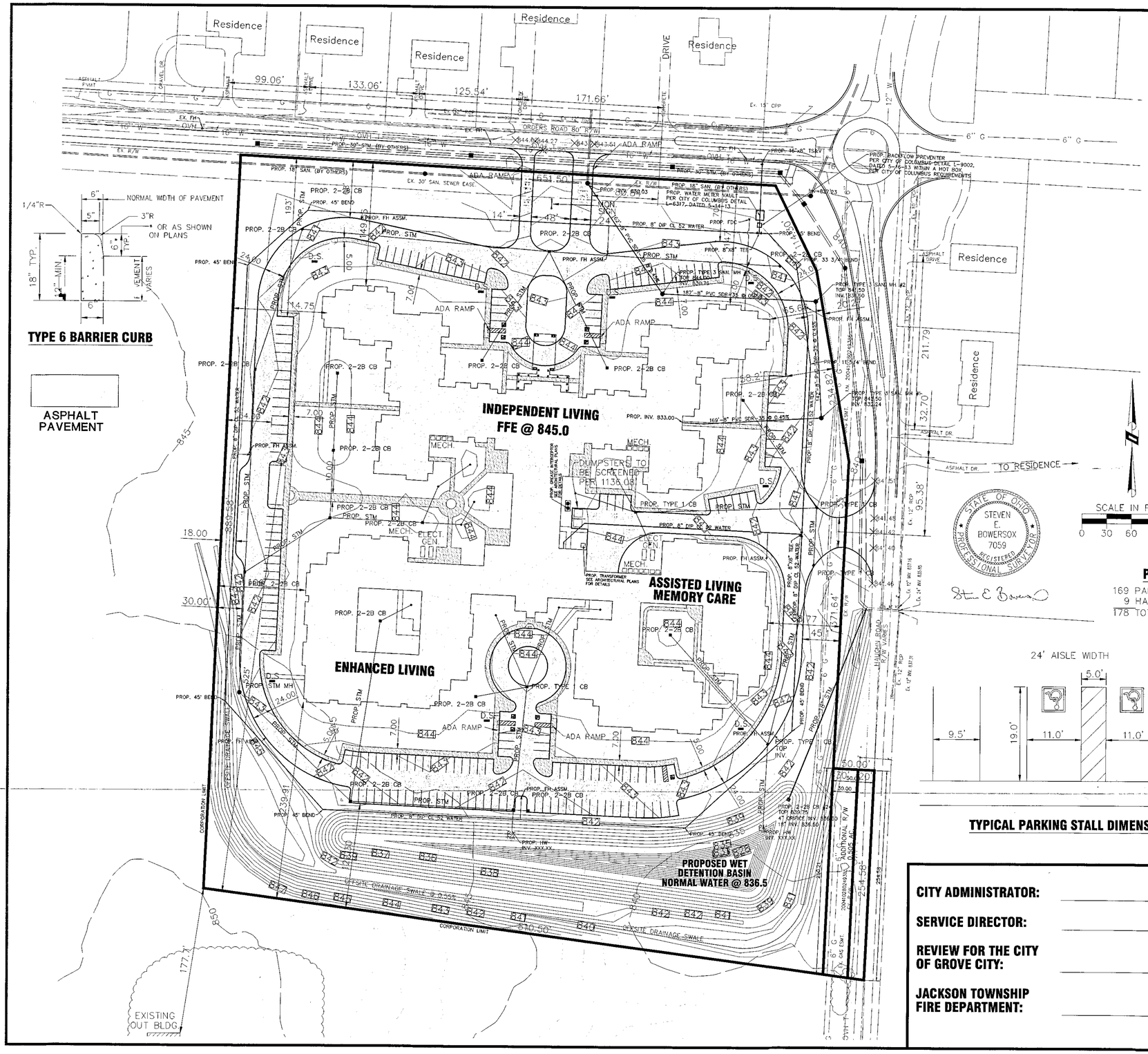
cc: Scott Deisler, pH7 Architects
Mark Murphy, Triple M Investments

Narrative for Story Point, Grove City, Ohio

Applicant proposes to construct an approximately 229,420 square foot, one-three story building with private roads. The purpose of this planned development is for the creation of senior housing and special care housing for those requiring more supervised living conditions. The senior housing will be delivered through a three-story (approx. 50'-0" tall) apartment building. 116 Independent Living apartments will be made up of seventy-eight (78) 685 SF one-bedroom units, thirty-eight (30) 965 SF two-bedroom units and eight (8) 1085 SF 2-bedroom deluxe units. Amenities will include a variety of dining venues, indoor and outdoor activity areas, shops, postal services, bank, salon/barber, library and computer classroom and multi-purpose rooms for larger gatherings, fitness or other group activities. The use of these amenities are limited to the residents and their guests and are not open to the public.

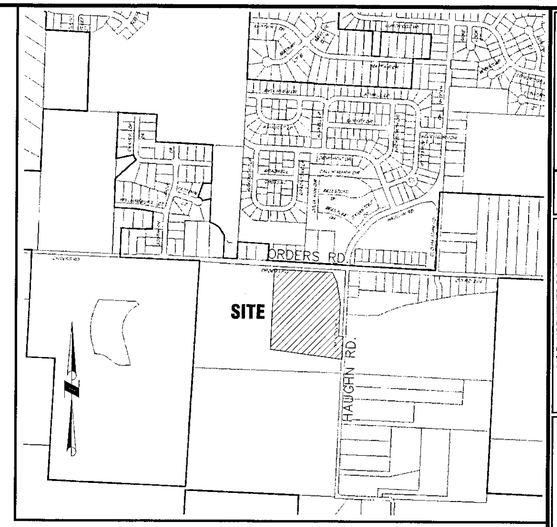
The housing programs for those requiring more services/assistance include Enhanced Living – an independent living program with 35 additional apartments offering "catered" services providing moderate assistance to those with slightly higher needs, but not the intensity required of an assisted or nursing care resident. Enhanced Living, located in the southwest quadrant, is a 1-story wing (Approx. 27'-0" tall) made up of thirty-three (33) 640 SF 1-bedroom units and two (2) 950 SF 2-bedroom units.

Finally, a specialized 1-story environment for seniors with Alzheimer's or other associated dementias affecting memory and other cognitive skills is planned as a connected, yet stand-alone 48 unit, housing option for those unique seniors. The A.L. & Memory, located in the southeast quadrant, is a 1-story wing (Approx. 30'-0" tall) made up of forty-four (44) 295 SF 1-bed units and four (4) 450 SF 2-bed units.



TYPE 6 BARRIER CURB

ASPHALT PAVEMENT



SITE DATA

BUILDING COVERAGE:	3.1	AC. (19.4%)
PAVEMENT COVERAGE:	3.1	AC. (19.4%)
OPEN/GREEN SPACE:	9.774	AC. (61.2%)
TOTAL SITE:	15.974	AC.

CURRENT ZONING: RURAL RESIDENTIAL (RR)

PROPOSED ZONING: PLANNED UNIT DEVELOPMENT-RESIDENTIAL (PUD-R)

EMPLOYEES:

DAYS	62
AFTERNOON	40
MIDNIGHT	12
TOTAL	114

RESIDENTS:

INDEPENDENT LIVING:	
1 BEDROOM UNITS	78
2 BEDROOM UNITS	38
ENHANCED (PARTIALLY ASSISTED):	
1 BEDROOM UNITS	33
2 BEDROOM UNITS	2
ASSISTED LIVING & MEMORY CARE:	
1 BEDROOM UNITS	44
2 BEDROOM UNITS	4
TOTAL UNITS	199

PARKING

169 PARKING SPACES
9 HANDICAP SPACES
178 TOTAL

TYPICAL PARKING STALL DIMENSIONS

NOTES

1. ORDERS AND HAUGHN ROADS ARE SHOWN PER PRELIMINARY IMPROVEMENT PLANS DATED JANUARY 9, 2015.
2. PROPOSED LANDSCAPING SHOWN ON SEPARATE SHEETS, L1.01 AND L2.01
3. PHOTOMETRICS SHOWN ON SHEET ES01
4. CONCRETE CURB WILL BE USED THROUGHOUT THE SITE IN COMPLIANCE WITH THE ZONING TEXT.
5. DOWNSPOUTS ARE TO BE CONNECTED TO THE MAIN STORM SYSTEM.

CITY ADMINISTRATOR: _____

SERVICE DIRECTOR: _____

REVIEW FOR THE CITY OF GROVE CITY: _____

JACKSON TOWNSHIP FIRE DEPARTMENT: _____

DEVELOPMENT PLAN
STORY POINT

CITY PROJECT NO.: _____

OWNER: JOSEPH & MARCIA BROWN
2208 PINEVIEW DRIVE
MUNCIE, IN 47303

DEVELOPER: TRIPLE M INVESTMENTS
11640 SAN VINCNTE BLVD., SUITE 202
LOS ANGELES, CA 90049

DATE: AUGUST 3, 2015

CHOICE ONE ENGINEERING
440 E. HOEVISHER ROAD
SIDNEY, OHIO 45365
(937) 497-0200
www.choiceoneengineering.com
203 W. LOVELAND AVENUE
LOVELAND, OHIO 45140
(513) 239-8554

STORY POINT, A SENIOR LIVING FACILITY
CITY OF GROVE CITY, OHIO

DEVELOPMENT PLAN

REVISIONS:
08-28-2015
CITY COMMENTS

FILE NAME
FRAGCI1403_fdp

DRAWN BY
seb

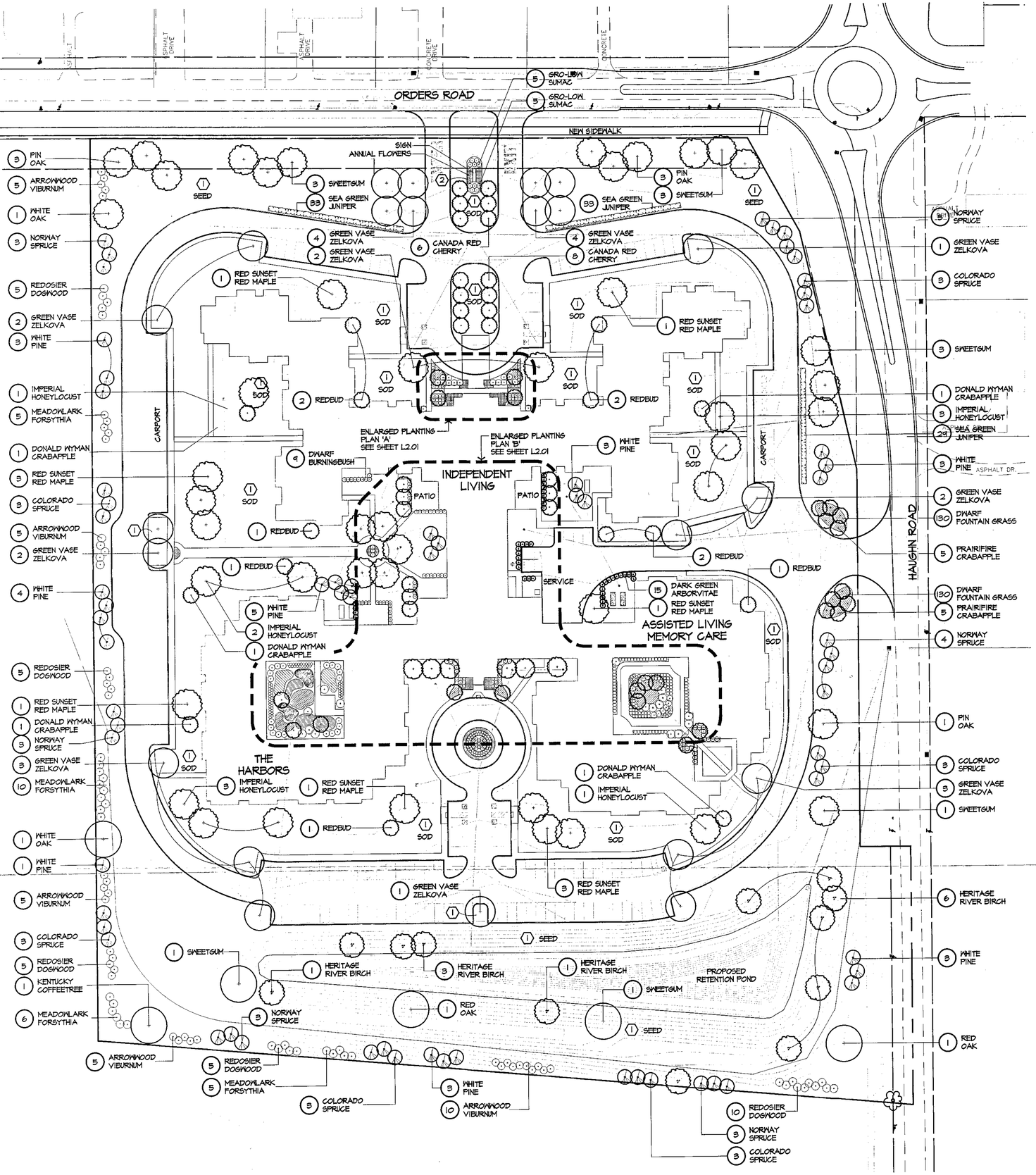
CHECKED BY
JSP

PROJECT No.
FRAGCI1403

DATE
08-03-2015

SHEET NUMBER
1 OF 1

RECEIVED
AUG 28 2015
GC PLANNING COMMISSION



GENERAL NOTES

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3. CONTRACTOR RESPONSIBLE FOR COST OF REPAIRS TO EXISTING SITE CONDITIONS WHEN DAMAGED BY CONTRACTOR. REPAIR TO THE SATISFACTION OF THE OWNER.
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5. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE IN LAWN AREAS.
6. FINE GRADE LAWN AREAS TO PROVIDE A SMOOTH AND CONTINUAL GRADE FREE OF IRREGULARITIES OR DEPRESSIONS.
7. CONTRACTOR SHALL SEED OR SOD ALL AREAS DISTURBED DURING CONSTRUCTION, SEE PLAN. ALL PARKING ISLANDS TO BE TURF.
8. ALL PLANTS SHALL MEET OR EXCEED STANDARDS SET IN THE U.S.A. STANDARD FOR NURSERY STOCK.
9. ALL PLANTING OPERATIONS SHALL ADHERE TO THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS.
10. ALL SERVICE STRUCTURES WILL BE SCREENED PER 1136.08 OF THE LANDSCAPING CODE.

CONSTRUCTION NOTES

1. LAWN AREA, FILL WITH TOPSOIL, MINIMUM DEPTH SHALL BE 6". MEET ADJACENT SURFACES FLUSH. PROVIDE POSITIVE DRAINAGE ACROSS ALL SURFACES.
2. LANDSCAPE AREA, FILL WITH TOPSOIL, MINIMUM DEPTH SHALL BE 24". MEET ADJACENT SURFACES FLUSH. PROVIDE POSITIVE DRAINAGE ACROSS ALL SURFACES.

NOTE:
PROVIDE COMPLETE IRRIGATION SYSTEM COVERING LAWNS / PLANT BEDS INSIDE PERIMETER DRIVE & ENTRY DRIVE AREA AND 20'-0" ALONG OUTSIDE EDGE OF PERIMETER DRIVE. SUBMIT SHOP DRAWINGS TO OWNER'S REPRESENTATIVE FOR REVIEW.

EDGE
PLANNING • LANDSCAPE ARCHITECTURE • URBAN DESIGN
330 WEST SPRING STREET, SUITE 350
COLUMBUS, OHIO 43215
614-486-3343

CONSULTANTS

SEAL

PRELIMINARY
NOT FOR CONSTRUCTION

PROJECT TITLE

StoryPoint
Grove City, OH

CLIENT

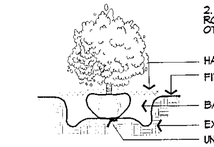
PROJECT NO.
Date 07/31/15
Revisions
Per Staff Comments

Sheet Title

OVERALL PLANTING PLAN

Sheet Number

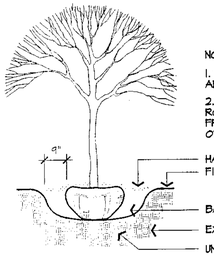
L1.01



NOTES:

1. TOP OF ROOT BALL TO BE 2"-3" ABOVE ADJACENT FINISH GRADE
2. REMOVE ROPE AND BURLAP FROM TOP 1/3 OF ROOT BALL. REMOVE ALL LABELS, TAGS OR OTHER FOREIGN MATERIALS FROM LIMBS.

1 SHRUB PLANTING
NTS



NOTES:

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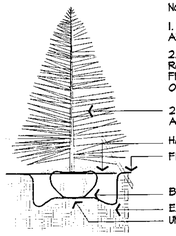
2. REMOVE ROPE AND BURLAP FROM TOP 1/2 OF ROOT BALL CUT TOP 1/2 OF WIRE BASKET FROM ROOT BALL. REMOVE ALL LABELS, TAGS OR OTHER FOREIGN MATERIALS FROM LIMBS.

2 TREE PLANTING
NTS



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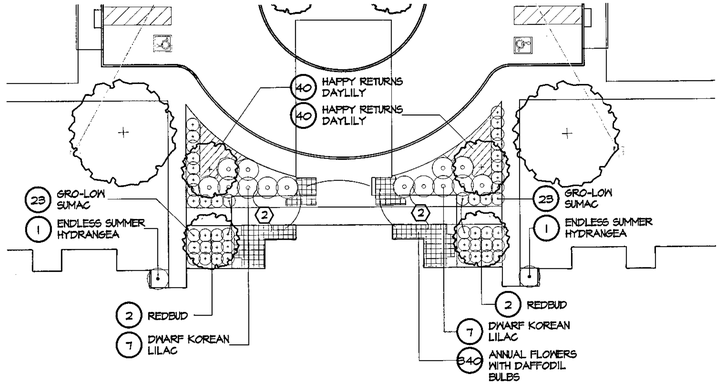
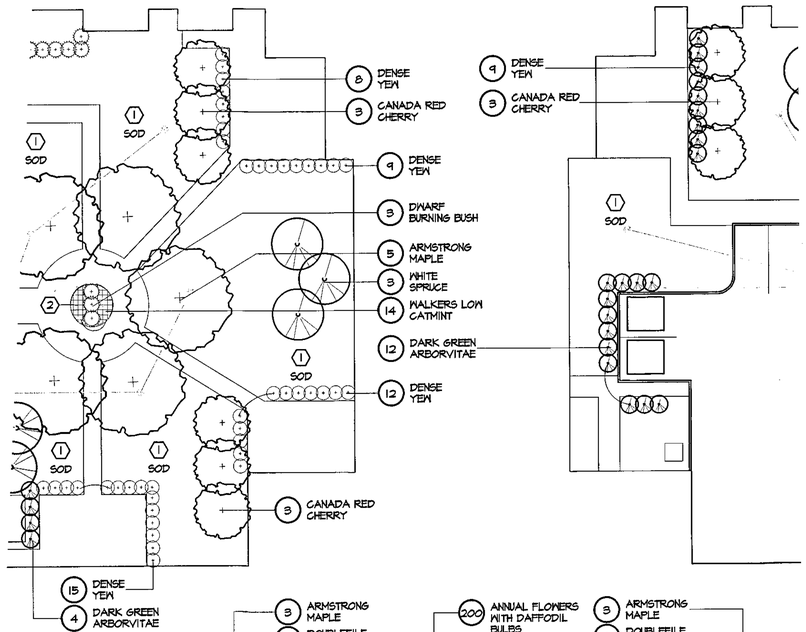
3 EVERGREEN TREE PLANTING
NTS



4 ENLARGED PLANTING PLAN 'A'
SCALE: 1" = 20'

NORTH

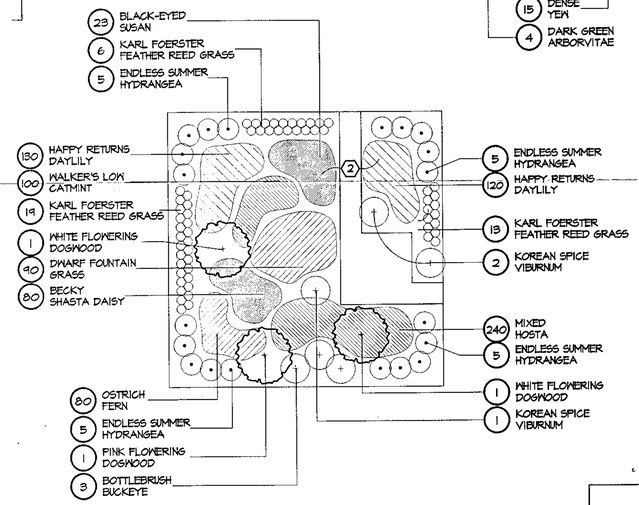


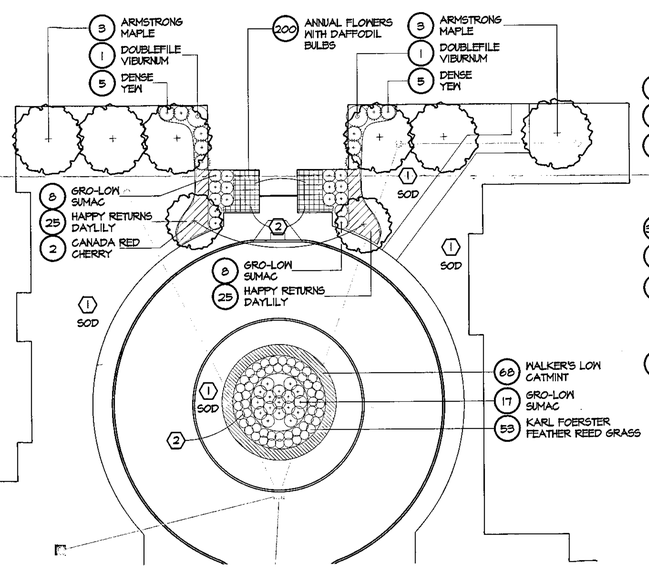
5 ENLARGED PLANTING PLAN 'B'
SCALE: 1" = 20'

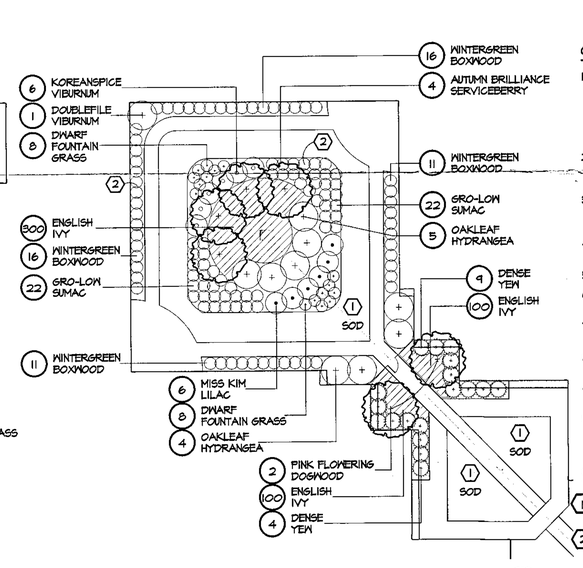
NORTH

PLANT MATERIALS LIST

QTY.	COMMON NAME	BOTANICAL NAME	SIZE	ROOT	REMARKS
	TREES				
11	RED SUNSET RED MAPLE	Acer rubrum 'Franksred'	3" Cal.	B&B	
4	AUTUMN BRILLIANCE SERVICEBERRY	Amelanchier x grandiflora 'Autumn Brilliance'	2" Cal.	B&B	
10	HERITAGE RIVER BIRCH	Betula nigra 'Heritage'	10'-12' Cal.	B&B	MULTI STEM
11	ARMSTRONG MAPLE	Acer Rubrum 'Armstrong'	2" Cal.	B&B	
14	REDBUD	Cercis canadensis	2" Cal.	B&B	SINGLE STEM
2	WHITE FLOWERING DOGWOOD	Cornus florida	2" Cal.	B&B	SINGLE STEM, WHITE
3	PINK FLOWERING DOGWOOD	Cornus florida 'Rubra'	2" Cal.	B&B	SINGLE STEM, PINK
10	IMPERIAL HONEYLOCUST	Gleditsia triacanthos var. inermis 'Imperial'	2" Cal.	B&B	
1	KENTUCKY COFFEETREE	Gymnocladus dioicus	3" Cal.	B&B	LARGE TREE
12	SWEETGUM	Liquidambar styraciflua	3" Cal.	B&B	
5	DONALD WYMAN CRABAPPLE	Malus 'Donald Wyman'	2" Cal.	B&B	
10	PRAIRIFIRE CRABAPPLE	Malus 'Prairifire'	2" Cal.	B&B	
18	COLORADO SPRUCE	Picea pungens	6' Hgt.	B&B	
25	WHITE PINE	Pinus strobus	6' Hgt.	B&B	
25	CANADA RED CHERRY	Prunus virginiana	2" Cal.	B&B	
2	WHITE OAK	Quercus alba	3" Cal.	B&B	LARGE TREE
7	PIN OAK	Quercus palustris	3" Cal.	B&B	LARGE TREE
2	RED OAK	Quercus rubra	3" Cal.	B&B	LARGE TREE
24	GREEN VASE ZELKOVA	Zelkova serrata 'Green Vase'	3" Cal.	B&B	
9	WHITE SPRUCE	Picea glauca	6' Hgt.	B&B	
21	NORWAY SPRUCE	Picea abies	6' Hgt.	B&B	
	SHRUBS				
3	BOTTLEBRUSH BUCKEYE	Aesculus parviflora	36" Hgt.	B&B	
54	WINTERGREEN BOXWOOD	Buxus sinica var. insularis 'Wintergreen'	18" Hgt.	Cont.	
30	REDOISIER DOGWOOD	Cornus sericea	24" Hgt.	Cont.	
22	ENDLESS SUMMER HYDRANGEA	Hydrangea macrophylla 'Endless Summer'	36" Hgt.	Cont.	
9	OAKLEAF HYDRANGEA	Hydrangea quercifolia	36" Hgt.	B&B	
95	SEA GREEN JUNIPER	Juniperus chinensis 'Sea Green'	36" Hgt.	B&B	
14	DWARF KOREAN LILAC	Syringa meyeri 'Palibin'	24" Hgt.	Cont.	
6	MISS KIM LILAC	Syringa patula 'Miss Kim'	24" Hgt.	Cont.	
81	DENSE YEW	Taxus x media 'Densiformis'	24" Hgt.	B&B	
31	DARK GREEN ARBORVITAE	Thuja occidentalis 'Nigra'	6' Hgt.	B&B	
139	GRO-LOW SUMAC	Rhus aromatica 'Gro-Low'	24" Spr.	Cont.	
9	KOREAN SPICE VIBURNUM	Viburnum carlesii	36" Hgt.	B&B	
30	ARROWWOOD VIBURNUM	Viburnum dentatum	36" Hgt.	B&B	
9	DOUBLEFILE VIBURNUM	Viburnum plicatum f. tomentosum	36" Hgt.	B&B	
12	DWARF BURNING BUSH	Euonymus alatus 'Compactus'	30" Hgt.	Cont.	
26	MEADOWLARK FORSYTHIA	Viburnum plicatum f. tomentosum	30" Hgt.	Cont.	
	PERENNIALS / GROUNDCOVER				
112	KARL FOERSTER FEATHER REED GRASS	Calamagrostis x acutiflora 'Karl Foerster'	2 Gal.	Cont.	
500	ENGLISH IVY	Hedera helix	2.25" P.P.	FLAT	SPACE 12" O.C.
380	HAPPY RETURNS DAYLILY	Hemerocallis 'Happy Returns'	1 Gal.	Cont.	
80	BECKY SHASTA DAISY	Leucanthemum x superbum 'Becky'	2 Gal.	Cont.	
182	WALKER'S LOW CATMINT	Nepeta x faassenii 'Walker's Low'	1 Gal.	Cont.	
106	DWARF FOUNTAIN GRASS	Pennisetum alopecuroides 'Hameln'	2 Gal.	Cont.	
23	BLACK-EYED SUSAN	Rudbeckia fulgida var. sullivantii 'Goldsturm'	2 Gal.	Cont.	
80	OSTRICH FERN	Matteuccia struthiopteris	2 Gal.	Cont.	
240	MIXED HOSTA	Hosta	2 Gal.	Cont.	(3) VARIETIES
540	DAFFODIL	Narcissus		Bulb	(3) PER PLANTING @ 12" O.C.







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EDGE
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330 WEST SPRING STREET, SUITE 350
COLUMBUS, OHIO 43215
614-486-3343

CONSULTANTS

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PROJECT TITLE

StoryPoint
Grove City, OH

CLIENT

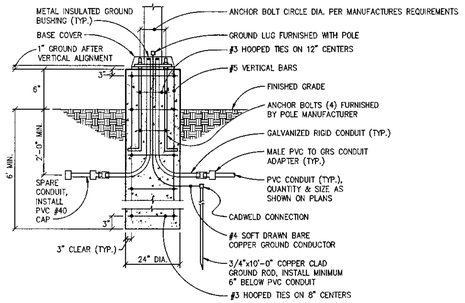
PROJECT NO.
Date 07/31/15
Revisions
Per Staff Comments

Sheet Title

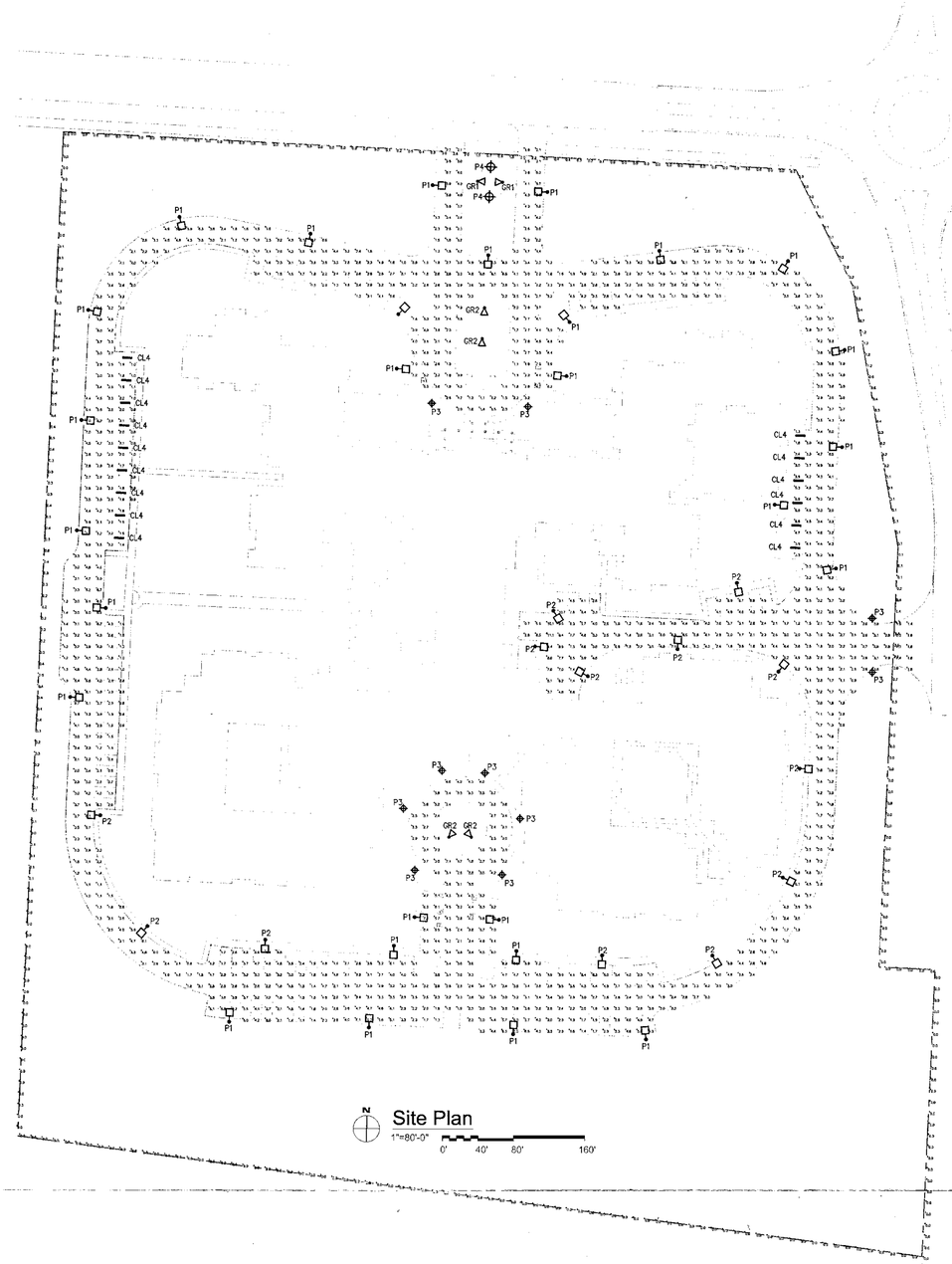
PLANTING DETAILS

Sheet Number

L2.01



A FIXTURE TYPE P1 BASE DETAIL
N.T.S.



N
Site Plan
1"=80'-0"
0' 40' 80' 160'

LIGHTING FIXTURE SCHEDULE

NOTE: FIXTURE NUMBER, LETTER PREFIX INDICATES TYPE OF MOUNTING AS FOLLOWS: CH-CHAIN HUNG; CL-CEILING MOUNTED; S-STEM SUSPENDED; W-WALL MOUNTED; R-CEILING RECESSED; WR-WALL RECESSED; CV-COVE MOUNTED; UC-UNDER CABINET; RF-ROOF MOUNTED; P-POST OR POLE; GR-GROUND MOUNTED; H-MOUNTED IN HOOD

FIXTURE TYPE	MANUFACTURER	CATALOG NO./MODEL NO.	QTY/LAMP/TYPE	FINISH	DESCRIPTION
CL4	ATG ELECTRONICS	#VP4FT4K	1/50/LED	BY ARCHITECT	4' SURFACE MOUNTED FIXTURE W/ WIREGUARD - 4300 LUMENS
GR1	LITHONIA	DSXF1 LED-2-A530/40K-HMF-MVOLT-THK	2/19/LED	BY ARCHITECT	LED FLOOR FIXTURE
GR2	LITHONIA	DSXF1 LED-2-A530/40K-NSP-MVOLT-THK	2/19/LED	BY ARCHITECT	LED FLOOR FIXTURE FOR FLAGPOLE
P1	LITHONIA	KAD LED-60C-1000-40K-R3-MVOLT	1/218/LED	BY ARCHITECT	20' LED POLE LIGHT
P2	LITHONIA	KAD LED-60C-1000-40K-R3-MVOLT	1/216/LED	BY ARCHITECT	20' LED POLE LIGHT W/ HOUSESIDE SHIELD
P3	LITHONIA	KAD LED-20C-1000-40K-R3-MVOLT-SPD04	1/73/LED	BY ARCHITECT	9' LED POLE LIGHT
P4	ANTIQUE STREET LAMPS	LTL30-X-32LED 525MA-4K-ACT-MVOLT-N5	1/32/LED	BY ARCHITECT	DECORATIVE POST TOP LIGHT
P5	LITHONIA	MRP-LED-1-630350/40K SR5 M VOLT	1/109/LED	BY ARCHITECT	8' LED POLE LIGHT FOR COURTYARDS

ARCHITECTURE
330 West Spring Street
Suite 265
Columbus, Ohio 43215
614.464.2455 PH
614.455.2455 FX
www.phTarchitects.com

NOT FOR CONSTRUCTION

X-CEL Engineering
Marconi Blvd., Suite 200
Columbus, Ohio 43215
(614) 764-5900 PH
(515) 474-3138 FX

STORYPOINT OF GROVE CITY
Orders Road
Grove City, OH 43123

CSIG DEVELOPMENT COMPANY, LLC
2200 GENOA BUSINESS PARK DRIVE
BRIGHTON, MI 48114

NO.	DATE	REVISION

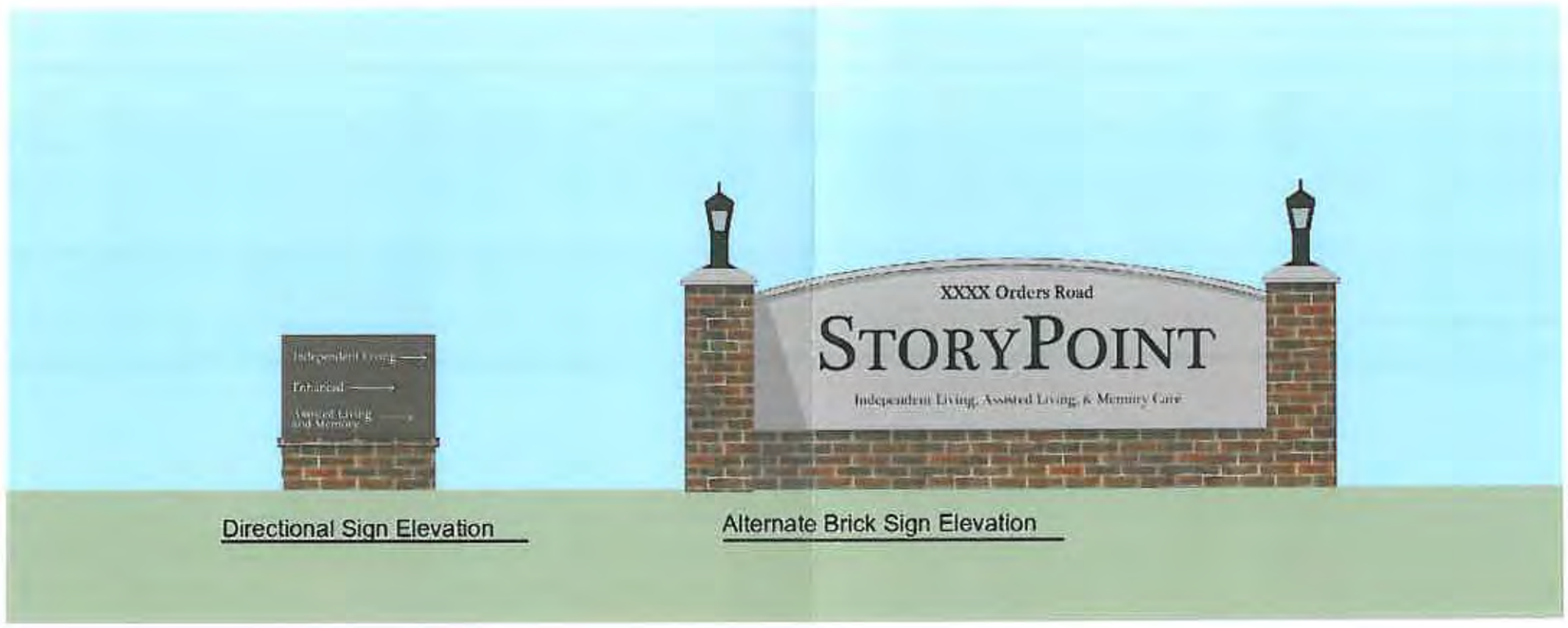
JOB NO. : 2015-12

DATE : 7-30-2015

ELECTRICAL SITE PLAN

ES01

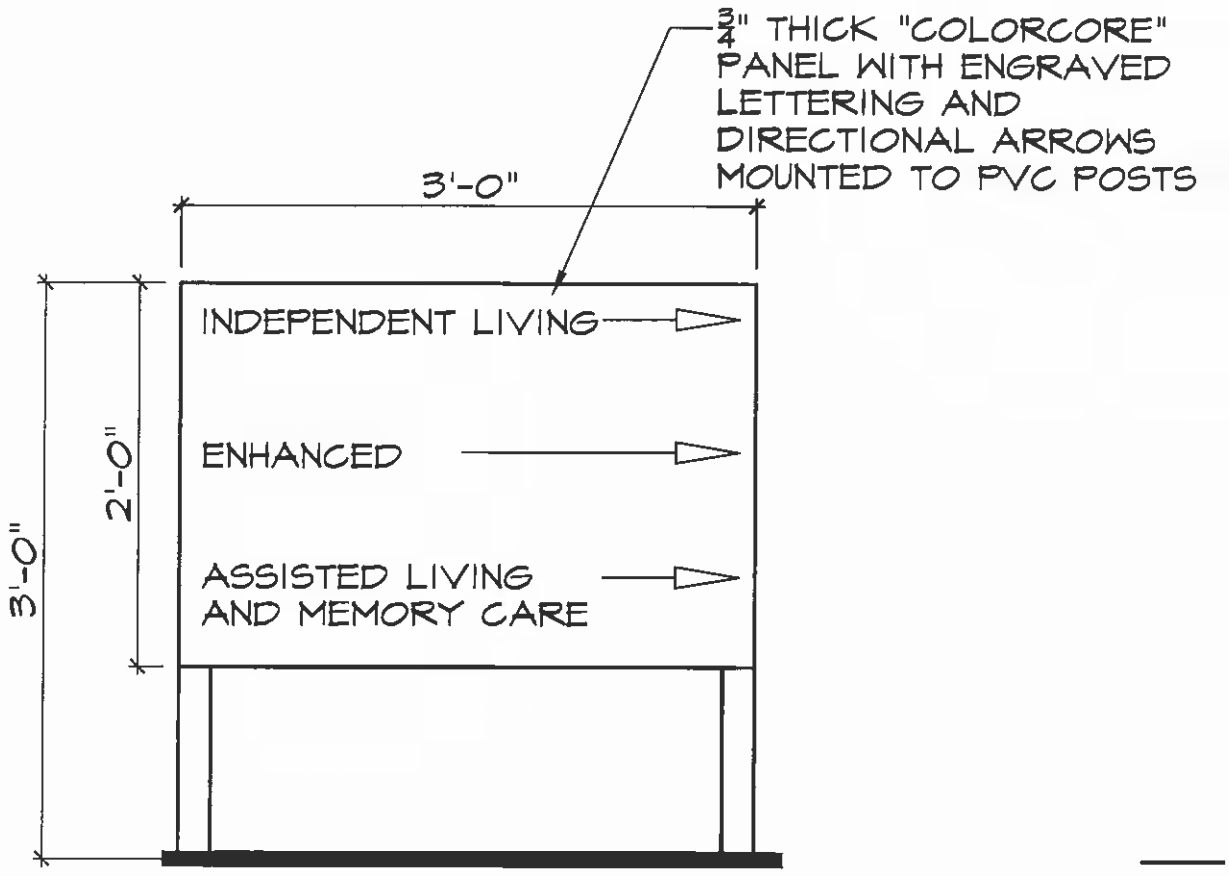
Story Point Proposed SetBacks			
	Main Building	Accessory Building (Carports)	Parking/Drive Aisle
North	147′	193′	68′
South	240′	525′	127′
East	89′	58′	20′
West	106′	54′	18′



Directional Sign Elevation

Alternate Brick Sign Elevation

StoryPoint - Ground Signage


3/4" THICK "COLORCORE" PANEL WITH ENGRAVED LETTERING AND DIRECTIONAL ARROWS MOUNTED TO PVC POSTS
3'-0"
2'-0"
3'-0"
INDEPENDENT LIVING
ENHANCED
ASSISTED LIVING AND MEMORY CARE

QUANITITY 8

pH7 ARCHITECTS

Every detail

Every possibility

330 W Spring St

Suite 265

Columbus, OH 43215

P 614.459.2955

F 614.455.2955

August 27, 2015

PROJECT: STORYPOINT OF GROVE CITY
ORDERS ROAD GROVE CITY, OHIO 43123

OWNER: CSIG DEVELOPMENT COMPANY
2200 GENOA BUSINESS PARK DRIVE BRIGHTON, MI 48114

ARCHITECT: pH7 Architects Inc.
330 West Spring Street
Suite 265
Columbus, Ohio 43215

EXTERIOR MATERIAL FINISH KEY		
MATERIAL	**MANUFACTURER**	**COLOR**
VINYL SIDING	Alside	Antique Parchment
VINYL TRIM	Alside	Glacier White
BRICK VENEER *	Glen-Gery	Wyandot Modular
ASPHALT SHINGLES	IKO - Cambridge	Dual Black
ALUMINUM TRIM, FASCIA,FREIZE	Alside Performance G8	White
EXTERIOR STOREFRONT	Tubelite	Bone White

*The Owner has elected to move forward with the Brick alternate for this project.

LEGAL DESCRIPTION
15.974 ACRES

Situated in the State of Ohio, County of Franklin, Township of Jackson, lying in Survey Number 1434 of the Virginia Military District, being a part of the 86.388 acre tract conveyed to Joseph D. Brown and Marcia L. Brown by of record in Instrument Number 200001120008580 and in Instrument Number 201209140136739 (all references are to the records of the Recorder's Office, Franklin County, Ohio) and being described as follows:

COMMENCING, FOR REFERENCE, at Franklin County Geodetic Survey monument number 2018 found at the intersection of the centerline of Orders Road (right of way width varies) and the centerline of Haughn Road (right of way width varies) being also the northeasterly corner of the 0.896 acre tract conveyed to the Franklin County Commissioners by deed of record in Instrument Number 200408170192072 and the northwesterly corner of the 0.727 acre tract conveyed to Dorothy A. Miller by deed of record in Instrument Number 201303220048045;

thence, South 02° 36' 56" West, 750.00 feet, along the centerline of Haughn Road, the easterly line of the 0.896 acre tract, the westerly line of the 0.727 acre tract, the westerly line of the 0.460 acre tract conveyed to Betty D. Gardner by deed of record in Official Record 5102 E09 and the westerly line of the 4.422 acre tract conveyed to Rebecca L. Absten and Michael J. Absten by deed of record in Instrument Number 200406090133243, to a Mag Nail set in the southeasterly corner of the 0.896 acre tract and being the **PRINCIPAL PLACE OF BEGINNING**;

thence, continuing South 02° 36' 56" West, 254.58 feet, along the centerline of Haughn Road, to a Mag Nail set;

thence, North 82° 23' 04" West, 810.50 feet, to an iron pin set, passing for reference an iron pin set at 20.08 feet in the westerly right of way line of Haughn Road;

thence, North 02° 36' 56" East, 889.58 feet, to an iron pin set in the southerly line of the 2.250 acre tract conveyed to the City of Grove City, Ohio by deed of record in Instrument 201410310144844;

thence, South 86° 59' 05" East, 651.50 feet, along the southerly line of the 2.250 acre tract and the northerly line of the Brown tract, to an iron pin found (13/16" ID. iron pipe with "EMHT" plug per survey by Joshua M. Meyer);

thence, South 26° 06' 28" East, 114.30 feet, along a southwesterly line of the 2.250 acre tract and a northeasterly line of the Brown tract, to an iron pin found (13/16" ID. iron pipe with "EMHT" plug per survey by Joshua M. Meyer);

thence, South 09° 55' 41" East, 234.82 feet, along a southwesterly line of the 2.250 acre tract and a northeasterly line of the Brown tract, to an iron pin found (13/16" ID. iron pipe with

"EMHT" plug per survey by Joshua M. Meyer) in the westerly line of the Franklin County Commissioners 0.896 acre tract;

thence, South 02° 36' 56" West, 371.64 feet, along the westerly line of the 0.896 acre tract and an easterly line of the Brown tract, to an iron pin set in the southwesterly corner of the 0.896 acre tract;

thence, South 87° 23' 04" East, 50.00 feet, along the southerly line of the 0.896 acre tract and a northerly line of the Brown tract, to the Principal Place of Beginning, passing for reference an iron pin set at 30.00 feet.

Containing 15.974 acres more or less of which 0.116 acres is within the present right of way occupied by Haughn Road. Subject, however, to all legal rights of way and/or easements, if any, of previous record.

Iron pins set, where indicated, are 5/8 inch diameter by 30 inches in length solid re-bars with yellow plastic caps bearing the inscription of Choice One Engineering and SEB LS-7059.

The bearings shown on this survey are based on NAD 83, GEOID 2003, Ohio South Zone, ODOT VRS CORS Network and verified by field traverse utilizing and referencing the Franklin County Engineering Department monuments FCGS 5623, FCGS 2018, FCGS 2017 and L21. The bearing of South 02° 36' 56" East between monuments FCGS 2018 and FCGS 2017 was utilized as the "basis of bearings" for this survey.

This survey was prepared using documents of record, prior plats of survey and observed evidence located by an actual field survey during the month of February 2015 performed under the direct supervision of Steven E. Bowersox, Ohio Professional Surveyor number 7059.

CHOICE ONE ENGINEERING

Steven E. Bowersox 3/2/2015
Steven E. Bowersox Date
Professional Surveyor No. 7059

0-33-E
Split
15.974 acres
0-tot
(160)
184

DESCRIPTION VERIFIED
DEAN C. RINGLE, P.E., P.S.
BY:
DATE 03 Mar 15

GROVE CITY SENIOR LIVING FACILITY
CITY OF GROVE CITY, FRANKLIN COUNTY
PRELIMINARY STORM WATER DETENTION CALCULATIONS

SITE DESCRIPTION:

The existing site is composed of agricultural runoff from field row crops, with some crop residue, in good condition. The proposed site will increase the impervious area on the site and require a means of storing the water runoff via a retention basin on site. Water Quality measures will be added to the proposed detention basin and the size of the basin will be sized to control the additional runoff produced by additional impervious area.

HYDROLOGIC METHODOLIGIES:

The hydrologic methodology used for this design was the Soil Conservation Service (SCS) TR-55 Method, which was computed via the Bentley PondPack program.

EXISTING HYDROLOGIC CONDITIONS:

The storm water on the existing site is drained via overland flow and ultimately outlets to an existing storm sewer on the east side of the site, under Haughn Road. This discharge outlet consists of a 24" concrete storm sewer.

DEVELOPED HYDROLIGIC CONDITIONS:

The proposed site will move the rain water across the site through the proposed storm sewer system. Once the storm water has entered the storm sewer it will then be carried to the proposed retention basin. The first ¾" of rain will be detained for the required 24 hours to treat that water for water quality. All release rates will not exceed either the critical release or the allowable release. There is some offsite drainage that was not factored as a part of this design due to the post developed site not including this drainage in the retention pond design. This drainage will drainage through a proposed swale around the site.

STORM WATER MANAGEMENT PLAN:

The proposed site will move the runoff through the site by having the proposed pavement sloped towards proposed catch basins. Once the water enters the catch basins it will then travel through proposed storm sewer to the retention basin.

APPLICABLE PERMITS:

The Ohio Environmental Protection Agency, Notice of Intent, will be required.
A Storm Water Pollution Prevention Plan (SWPPP) will be required.
Applicable City and State Permits.

CALCULATION SHEETS:

Below is a summary of the storm water detention calculations. Please see the attached computer printouts for additional details.

Hydrologic Soil Group C and D was used for these calculations based upon soil in the surrounding area. See attached soil map and classifications.

The proposed retention basin will be design to accommodate the additional water that will need to be retained based upon additional impervious area and water quality volume requirements.

EXISTING OFFSITE

- Time of Concentration (Tc)

  Pre-developed drainage area A = 69 minutes (1.148 hrs) See page 4 of 24 of computer calcs
- CN Number

  Pre-developed drainage area A = 85 – See page 10 of 23 of computer calcs
- Total Acreage Drainage Area A = 77.68 acres

PROPOSED RETENTION BASIN

- Time of Concentration (Tc)

  Pre-developed drainage area A1 = 31 minutes (0.520 hrs) - See page 8 of 24 of computer calcs

  Post-developed drainage area A1 = 21 minutes (0.348 hrs) - See page 6 of 24 of computer calcs
- CN Number

  Pre-developed = 78.28 – see page 11 of 24 of computer calculations

  Post-developed = 87.85 – see page 10 of 24 of computer calculations
- Total Acreage = 15.47 acres
- Undetained Acreage = 62.21 acres

Pre-developed Peak Flow		Post-developed Peak Flow	
Storm	Peak Flow	Storm	Peak Flow / Total Area
1 year	1.58 cfs	1 year	2.77 cfs
2 year	2.44 cfs	2 year	3.78 cfs
5 year	3.57 cfs	5 year	5.03 cfs
10 year	4.50 cfs	10 year	6.03 cfs
25 year	5.95 cfs	25 year	7.63 cfs
50 year	7.26 cfs	50 year	9.05 cfs
100 year	8.66 cfs	100 year	10.55 cfs

- Critical Storm Hydrograph Volume = (1.418 – 0.745) / 0.745 = 90% = 10 year storm

  See Catchment Summary Table on sheet 2 of 24.
- The site will be designed using the Peak Volume Critical Storm, so Critical Storm is 10 year.
- Storm Requirements = Control runoff from a 1, 2, 5, and 10 year storms on the post developed site to the runoff from a 1 year storm on the pre developed site. Then control runoff from the 25, 50, and 100 year storms on the post developed site to the runoff from these respective storms for the pre developed site.
- Retention Volume provided to an elevation of 841.00 = 4.048 acre-feet – see page 12 of 24
- Retention Outlet Structure consists of:

  A 2-2 catch basin with a 4" dia. Orifice at Inv. 836.50. This orifice will cover the WQ_v requirements. The top of the 2-2B catch basin at a grate elevation of 839.75. The emergency overflow will be a 10 foot wide weir at an elevation of 840.50. This allows water to overflow into it and then discharges through the existing storm sewer trunk line.

Proposed Retention Basin Summary:

STORM	PEAK INFLOW	PEAK OUTFLOW	ALLOWABLE FLOW	STORAGE	PEAK BASIN ELEVATION
1 YEAR	1.58 cfs	0.45 cfs	1.58 cfs	1.086 ac-ft	838.00
2 YEAR	2.44 cfs	0.55 cfs	1.58 cfs	1.568 ac-ft	838.57
5 YEAR	3.57 cfs	0.64 cfs	1.58 cfs	2.207 ac-ft	839.27
10 YEAR	4.50 cfs	0.92 cfs	1.58 cfs	2.699 ac-ft	839.77
25 YEAR	5.95 cfs	3.81 cfs	5.95 cfs	2.922 ac-ft	839.98
50 YEAR	7.26 cfs	5.36 cfs	7.26 cfs	3.080 ac-ft	840.13
100 YEAR	8.66 cfs	7.18 cfs	8.66 cfs	3.275 ac-ft	840.31

NOTE: The post developed release rates from the 1, 2, 5, and 10 year storms are all less than the 1 year pre developed release rate and the post developed release rates. The post developed release rates from the 25, 50 and 100 year storms are all less than the pre developed release rates for the respective storms.

WATER QUAULITY VOLUME CALCULATIONS

Below is a summary of the storm water runoff quality calculations that would be needed to fully contain the water quality runoff for the site.

- OEPA Requirements
- Detention Pond:
  - Release the runoff from a ¾" rain event on the drainage area over 24 hours or longer.
  - The first half of the total volume generated by the runoff from a ¾" rain event must be detained for greater than 8 hours.

Water Quality Calculations

Post-Construction storm water management water quality volume for development of both lots using 0.75 inches of rain:

WQ_v= 0.59*0.75*15.47/12=0.57 AC-FT

0.69 AC-FT Provided to elev. 837.50. Therefore 0.69>0.59 and water quality volume is detained.

Retention Basin

Retention Outlet Structure consists of:

- A 4" diameter hole at Inv. 836.50 would be required to hold back the water quality runoff from the site.
- Per the draw down calculation we satisfy the requirement of not releasing more than 50% before 8 hours and not more than 100% by 24 hours. Per the calculations the pond releases about 31.59% at 8 hours and about 94.77% at 24 hours. **(See attached WQv Calculations)**

Project:Grove City Senior Living Facility
Location: GROVE CITY, OH

Job No:
Date: 8/27/2015

OEPA REQUIREMENTS :
1) Release the runoff from a ¾" rain event on the drainage area over 24 hours or longer
2) The first half of the total volume generated by the runoff from a ¾" rain event must be detained for greater than 8 hours

WQv VOLUME CALCULATIONS USING 0.75" OF RAIN

WQv = 0.59*15.47*0.75/12 = 0.570 AC-FT = 24,830 CF
THE RETENTION BASIN HOLDS 26,409 CF AT ELEV. OF 837.50. 26,409 CF > 24,830 CF THEREFORE WQv SATISFIED. THEREFORE MUST RELEASE WQv THRU PROPERLY SIZED ORIFICE UNTIL 837.50 (1.0' HIGH) TO ENSURE WQv IS PROPERLY DETAINED AND RELEASED.

WQv DRAW DOWN CALCULATIONS

INSTALL 4.0" ORIFICE IN FACE OF CATCH BASIN AT INV 836.50 TO RELEASE WQv AT REQUIRED RATE
SET TOP OF CATCH BASIN GRATE ELEV. AT OR ABOVE 839.75.

Per the draw down calculation below we satisfy the requirement of not releasing more than 50% before 8 hours and not more than 100% by 24 hours. Per the calculations the 4.0" dia. orifice releases about 31.59% at 8 hours and about 94.77% at 24 hours.

SITE RETENTION BASIN

Basin Invert:.....	836.50	Ft
Orifice Opening.....	4.00	In.
Orifice Coefficient ..	0.55	
Average Head...	0.5	
Average Discharge	0.272	In.
Average Discharge Volume	490.23	cfs

Time (hour)	Time (min)	Starting Volume (CF)	Total Discharged Volume (CF)	Percentage Volume Discharged (%)
0.0	0	24,830.00	0	0.00%
0.5	30		490.23	1.97%
1.0	60		980.46	3.95%
1.5	90		1,470.68	5.92%
2.0	120		1,960.91	7.90%
2.5	150		2,451.14	9.87%
3.0	180		2,941.37	11.85%
3.5	210		3,431.59	13.82%
4.0	240		3,921.82	15.79%
4.5	270		4,412.05	17.77%
5.0	300		4,902.28	19.74%
5.5	330		5,392.50	21.72%
6.0	360		5,882.73	23.69%
6.5	390		6,372.96	25.67%
7.0	420		6,863.19	27.64%
7.5	450		7,353.41	29.62%
8.0	480		7,843.64	31.59%
8.5	510		8,333.87	33.56%
9.0	540		8,824.10	35.54%
9.5	570		9,314.32	37.51%
10.0	600		9,804.55	39.49%
10.5	630		10,294.78	41.46%
11.0	660		10,785.01	43.44%
11.5	690		11,275.23	45.41%
12.0	720		11,765.46	47.38%
12.5	750		12,255.69	49.36%
13.0	780		12,745.92	51.33%
13.5	810		13,236.14	53.31%
14.0	840		13,726.37	55.28%
14.5	870		14,216.60	57.26%
15.0	900		14,706.83	59.23%
15.5	930		15,197.05	61.20%
16.0	960		15,687.28	63.18%
16.5	990		16,177.51	65.15%
17.0	1020		16,667.74	67.13%
17.5	1050		17,157.96	69.10%
18.0	1080		17,648.19	71.08%
18.5	1110		18,138.42	73.05%
19.0	1140		18,628.65	75.02%
19.5	1170		19,118.87	77.00%
20.0	1200		19,609.10	78.97%
20.5	1230		20,099.33	80.95%
21.0	1260		20,589.56	82.92%
21.5	1290		21,079.78	84.90%
22.0	1320		21,570.01	86.87%
22.5	1350		22,060.24	88.85%
23.0	1380		22,550.47	90.82%
23.5	1410		23,040.69	92.79%
24.0	1440		23,530.92	94.77%
24.5	1470		24,021.15	96.74%
25.0	1500		24,511.38	98.72%
25.5	1530		25,001.60	100.69%

Map Scale: 1:1,870 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

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

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Franklin County, Ohio
Survey Area Data: Version 12, Sep 18, 2014

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

Date(s) aerial images were photographed: Feb 27, 2012—Aug 27, 2014

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

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Franklin County, Ohio (OH049)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CrB	Crosby silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	C/D	6.6	44.3%
Ko	Kokomo silty clay loam, 0 to 2 percent slopes	C/D	7.0	46.9%
LeB	Lewisburg-Crosby complex, 2 to 6 percent slopes	D	1.3	8.8%
Totals for Area of Interest			**14.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Map Scale: 1:1,790 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Franklin County, Ohio
Survey Area Data: Version 12, Sep 18, 2014

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

Date(s) aerial images were photographed: Feb 27, 2012—Aug 27, 2014

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

Map Unit Legend

Franklin County, Ohio (OH049)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CrB	Crosby silt loam, Southern Ohio Till Plain, 2 to 6 percent slopes	5.7	40.0%
Ko	Kokomo silty clay loam, 0 to 2 percent slopes	7.2	50.5%
LeB	Lewisburg-Crosby complex, 2 to 6 percent slopes	1.4	9.6%
Totals for Area of Interest		**14.2**	**100.0%**

GROVE CITY SENIOR LIVING FACILITY

Project Summary	
Title	Grove City Senior Living Facility
Engineer	RJL
Company	COEC
Date	8/28/2015

Notes

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
Pre Developed Site	Grove City - 1 yr	1	0.745	15.750	1.58
Pre Developed Site	Grove City - 2 yrs	2	1.179	15.700	2.44
Pre Developed Site	Grove City - 5 yrs	5	1.774	15.700	3.57
Pre Developed Site	Grove City - 10 yrs	10	2.276	15.650	4.50
Pre Developed Site	Grove City - 25 yrs	25	3.089	15.650	5.95
Pre Developed Site	Grove City - 50 yrs	50	3.840	15.650	7.26
Pre Developed Site	Grove City - 100 yrs	100	4.659	15.650	8.66
Post Developed Site	Grove City - 1 yr	1	1.418	15.650	2.77
Post Developed Site	Grove City - 2 yrs	2	1.997	15.600	3.78
Post Developed Site	Grove City - 5 yrs	5	2.740	15.600	5.03
Post Developed Site	Grove City - 10 yrs	10	3.341	14.450	6.03
Post Developed Site	Grove City - 25 yrs	25	4.278	14.450	7.63
Post Developed Site	Grove City - 50 yrs	50	5.121	14.450	9.05
Post Developed Site	Grove City - 100 yrs	100	6.021	14.450	10.55
OFFSITE DRAINAGE	Grove City - 1 yr	1	2.964	16.100	5.95
OFFSITE DRAINAGE	Grove City - 2 yrs	2	4.692	16.050	9.29
OFFSITE DRAINAGE	Grove City - 5 yrs	5	7.067	15.900	13.73
OFFSITE DRAINAGE	Grove City - 10 yrs	10	9.074	15.900	17.40
OFFSITE DRAINAGE	Grove City - 25 yrs	25	12.319	15.900	23.17
OFFSITE DRAINAGE	Grove City - 50 yrs	50	15.320	15.900	28.38
OFFSITE DRAINAGE	Grove City - 100 yrs	100	18.593	15.750	33.98

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
Pre Developed 24" Site Outlet	Grove City - 1 yr	1	0.745	15.750	1.58
Pre Developed 24" Site Outlet	Grove City - 2 yrs	2	1.179	15.700	2.44
Pre Developed 24" Site Outlet	Grove City - 5 yrs	5	1.774	15.700	3.57
Pre Developed 24" Site Outlet	Grove City - 10 yrs	10	2.276	15.650	4.50
Pre Developed 24" Site Outlet	Grove City - 25 yrs	25	3.089	15.650	5.95
Pre Developed 24" Site Outlet	Grove City - 50 yrs	50	3.840	15.650	7.26
Pre Developed 24" Site Outlet	Grove City - 100 yrs	100	4.659	15.650	8.66
Post Developed 24" Site Outlet	Grove City - 1 yr	1	0.348	22.900	0.45
Post Developed 24" Site Outlet	Grove City - 2 yrs	2	0.444	22.950	0.55
Post Developed 24" Site Outlet	Grove City - 5 yrs	5	0.547	23.000	0.64
Post Developed 24" Site Outlet	Grove City - 10 yrs	10	0.665	22.850	0.92
Post Developed 24" Site Outlet	Grove City - 25 yrs	25	1.588	18.200	3.81
Post Developed 24" Site Outlet	Grove City - 50 yrs	50	2.420	17.300	5.36

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)
Post Developed 24" Site Outlet	Grove City - 100 yrs	100	3.309	17.050	7.18
Offistle 24" Site Outlet	Grove City - 1 yr	1	2.964	16.100	5.95
Offistle 24" Site Outlet	Grove City - 2 yrs	2	4.692	16.050	9.29
Offistle 24" Site Outlet	Grove City - 5 yrs	5	7.067	15.900	13.73
Offistle 24" Site Outlet	Grove City - 10 yrs	10	9.074	15.900	17.40
Offistle 24" Site Outlet	Grove City - 25 yrs	25	12.319	15.900	23.17
Offistle 24" Site Outlet	Grove City - 50 yrs	50	15.320	15.900	28.38
Offistle 24" Site Outlet	Grove City - 100 yrs	100	18.593	15.750	33.98

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Post Developed Pond (IN)	Grove City - 1 yr	1	1.418	15.650	2.77	(N/A)	(N/A)
Post Developed Pond (OUT)	Grove City - 1 yr	1	0.348	22.900	0.45	838.00	1.086
Post Developed Pond (IN)	Grove City - 2 yrs	2	1.997	15.600	3.78	(N/A)	(N/A)
Post Developed Pond (OUT)	Grove City - 2 yrs	2	0.444	22.950	0.55	838.57	1.568
Post Developed Pond (IN)	Grove City - 5 yrs	5	2.740	15.600	5.03	(N/A)	(N/A)
Post Developed Pond (OUT)	Grove City - 5 yrs	5	0.547	23.000	0.64	839.27	2.207
Post Developed Pond (IN)	Grove City - 10 yrs	10	3.341	14.450	6.03	(N/A)	(N/A)
Post Developed Pond (OUT)	Grove City - 10 yrs	10	0.665	22.850	0.92	839.77	2.699
Post Developed Pond (IN)	Grove City - 25 yrs	25	4.278	14.450	7.63	(N/A)	(N/A)
Post Developed Pond (OUT)	Grove City - 25 yrs	25	1.588	18.200	3.81	839.98	2.922
Post Developed Pond (IN)	Grove City - 50 yrs	50	5.121	14.450	9.05	(N/A)	(N/A)
Post Developed Pond (OUT)	Grove City - 50 yrs	50	2.420	17.300	5.36	840.13	3.080

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft^3/s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Post Developed Pond (IN)	Grove City - 100 yrs	100	6.021	14.450	10.55	(N/A)	(N/A)
Post Developed Pond (OUT)	Grove City - 100 yrs	100	3.309	17.050	7.18	840.31	3.275

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.240
Slope	0.010 ft/ft
2 Year 24 Hour Depth	2.6 in
Average Velocity	0.08 ft/s
Segment Time of Concentration	0.348 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	4,643.00 ft
Is Paved?	False
Slope	0.010 ft/ft
Average Velocity	1.61 ft/s
Segment Time of Concentration	0.799 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	1.148 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.240
Slope	0.010 ft/ft
2 Year 24 Hour Depth	2.6 in
Average Velocity	0.08 ft/s
Segment Time of Concentration	0.348 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.348 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

Time of Concentration Results

Segment #1: TR-55 Sheet Flow	
Hydraulic Length	100.00 ft
Manning's n	0.240
Slope	0.010 ft/ft
2 Year 24 Hour Depth	2.6 in
Average Velocity	0.08 ft/s
Segment Time of Concentration	0.348 hours

Segment #2: TR-55 Shallow Concentrated Flow	
Hydraulic Length	922.00 ft
Is Paved?	False
Slope	0.009 ft/ft
Average Velocity	1.49 ft/s
Segment Time of Concentration	0.172 hours

Time of Concentration (Composite)	
Time of Concentration (Composite)	0.520 hours

==== SCS Channel Flow

Tc =

R = Qa / Wp
V = (1.49 * (R**(2/3)) * (Sf**-0.5)) / n

(Lf / V) / 3600

Where:

R= Hydraulic radius
Aq= Flow area, square feet
Wp= Wetted perimeter, feet
V= Velocity, ft/sec
Sf= Slope, ft/ft
n= Manning's n
Tc= Time of concentration, hours
Lf= Flow length, feet

==== SCS TR-55 Shallow Concentration Flow

Tc =

Unpaved surface:
V = 16.1345 * (Sf**0.5)

Paved Surface:
V = 20.3282 * (Sf**0.5)

(Lf / V) / 3600

Where:

V= Velocity, ft/sec
Sf= Slope, ft/ft
Tc= Time of concentration, hours
Lf= Flow length, feet

Subsection: Runoff CN-Area
Label: Post Developed Site

Return Event: 100 years
Storm Event: Bulletin 71 24hr (2.17 in)

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft^2)	C (%)	UC (%)	Adjusted CN
Impervious (Building)	98.000	135,315.000	0.0	0.0	98.000
Impervious (Road/Walks)	98.000	168,568.000	0.0	0.0	98.000
Pervious (Grass Good Condition)	80.000	370,033.000	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	673,916.000	(N/A)	(N/A)	88.117

Runoff Curve Number Data

Soil/Surface Description	CN	Area (ft^2)	C (%)	UC (%)	Adjusted CN
Impervious (Field Row Crops SR + CR Good Condition) TYPE C	78.000	609,221.000	0.0	0.0	78.000
Impervious (Field Row Crops SR + CR Good Condition) TYPE D	81.000	64,695.000	0.0	0.0	81.000
COMPOSITE AREA & WEIGHTED CN --->	(N/A)	673,916.000	(N/A)	(N/A)	78.288

GROVE CITY SENIOR LIVING FACILITY

Subsection: Elevation-Area Volume Curve
Label: Post Developed Pond

Return Event: 100 years
Storm Event: Bulletin 71 24hr (2.17 in)

Elevation (ft)	Planimeter (ft^2)	Area (ft^2)	A1+A2+sqr(A1*A2) (ft^2)	Volume (ac-ft)	Volume (Total) (ac-ft)
836.50	0.0	27,768.000	0.000	0.000	0.000
837.00	0.0	30,244.000	86,991.569	0.333	0.333
837.50	0.0	32,746.000	94,460.145	0.361	0.694
838.00	0.0	35,272.000	102,003.540	0.390	1.085
838.50	0.0	37,824.000	109,621.719	0.419	1.504
839.00	0.0	40,400.000	117,314.787	0.449	1.953
839.50	0.0	43,002.000	125,082.701	0.479	2.431
840.00	0.0	45,629.000	132,927.030	0.509	2.940
840.50	0.0	48,282.000	140,847.759	0.539	3.479
841.00	0.0	50,959.000	148,843.444	0.569	4.048

Requested Pond Water Surface Elevations	
Minimum (Headwater)	836.50 ft
Increment (Headwater)	0.50 ft
Maximum (Headwater)	841.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Inlet Box	2-2B CB	Forward	18" Culvert	839.75	841.00
Orifice-Circular	WQV Orifice	Forward	18" Culvert	836.50	841.00
Culvert-Circular	18" Culvert	Forward	TW	836.50	841.00
Rectangular Weir	Emergency Overflow Weir	Forward	TW	840.50	841.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

Structure ID: WQV Orifice Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	836.50 ft
Orifice Diameter	4.0 in
Orifice Coefficient	0.600

Structure ID: 2-2B CB Structure Type: Inlet Box	
Number of Openings	1
Elevation	839.75 ft
Orifice Area	2.1 ft²
Orifice Coefficient	0.600
Weir Length	9.10 ft
Weir Coefficient	3.00 (ft^0.5)/s
K Reverse	1.000
Manning's n	0.000
Kev, Charged Riser	0.000
Weir Submergence	False
Orifice H to crest	False

Structure ID: 18" Culvert Structure Type: Culvert-Circular	
Number of Barrels	1
Diameter	18.0 in
Length	300.00 ft
Length (Computed Barrel)	300.00 ft
Slope (Computed)	0.002 ft/ft

Outlet Control Data	
Manning's n	0.013
Ke	0.200
Kb	0.018
Kr	0.000
Convergence Tolerance	0.00 ft

Inlet Control Data	
Equation Form	Form 1
K	0.0045
M	2.0000
C	0.0317
Y	0.6900
T1 ratio (HW/D)	1.094
T2 ratio (HW/D)	1.196
Slope Correction Factor	-0.500

Use unsubmerged inlet control 0 equation below T1 elevation.
Use submerged inlet control 0 equation above T2 elevation

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...

T1 Elevation	838.14 ft	T1 Flow	7.58 ft^3/s
T2 Elevation	838.29 ft	T2 Flow	8.66 ft^3/s

Structure ID: Emergency Overflow Weir Structure Type: Rectangular Weir	
Number of Openings	1
Elevation	840.50 ft
Weir Length	10.00 ft
Weir Coefficient	3.00 (ft^0.5)/s

Structure ID: TW Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	30
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.50 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.50 ft
Flow Tolerance (Minimum)	0.001 ft^3/s
Flow Tolerance (Maximum)	10.000 ft^3/s

GROVE CITY SENIOR LIVING FACILITY

Subsection: Composite Rating Curve
Label: Retention Pond Outlet Structure

Return Event: 100 years
Storm Event: Bulletin 71 24hr (2.17 in)

Composite Outflow Summary

Water Surface Elevation (ft)	Flow (ft^3/s)	Tailwater Elevation (ft)	Convergence Error (ft)
836.50	0.00	(N/A)	0.00
837.00	0.21	(N/A)	0.00
837.50	0.35	(N/A)	0.00
838.00	0.45	(N/A)	0.00
838.50	0.54	(N/A)	0.00
839.00	0.60	(N/A)	0.00
839.50	0.68	(N/A)	0.00
839.75	0.70	(N/A)	0.00
840.00	4.04	(N/A)	0.00
840.50	9.03	(N/A)	0.00
841.00	21.05	(N/A)	0.00

Contributing Structures
(no Q: 2-2B CB,WQV Orifice,18" Culvert,Emergency Overflow Weir)
WQV Orifice,18" Culvert (no Q: 2-2B CB,Emergency Overflow Weir)
WQV Orifice,18" Culvert (no Q: 2-2B CB,Emergency Overflow Weir)
WQV Orifice,18" Culvert (no Q: 2-2B CB,Emergency Overflow Weir)
WQV Orifice,18" Culvert (no Q: 2-2B CB,Emergency Overflow Weir)
WQV Orifice,18" Culvert (no Q: 2-2B CB,Emergency Overflow Weir)
WQV Orifice,18" Culvert (no Q: 2-2B CB,Emergency Overflow Weir)
WQV Orifice,18" Culvert (no Q: 2-2B CB,Emergency Overflow Weir)
2-2B CB,WQV Orifice,18" Culvert (no Q: Emergency Overflow Weir)
2-2B CB,WQV Orifice,18" Culvert (no Q: Emergency Overflow Weir)
2-2B CB,18" Culvert,Emergency Overflow Weir (no Q: WQV Orifice)

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	836.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	2.77 ft³/s	Time to Peak (Flow, In)	15.650 hours
Flow (Peak Outlet)	0.45 ft³/s	Time to Peak (Flow, Outlet)	22.900 hours

Elevation (Water Surface, Peak)	838.00 ft
Volume (Peak)	1.086 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	1.418 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	0.348 ac-ft
Volume (Retained)	1.067 ac-ft
Volume (Unrouted)	-0.002 ac-ft
Error (Mass Balance)	0.2 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	836.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	3.78 ft³/s	Time to Peak (Flow, In)	15.600 hours
Flow (Peak Outlet)	0.55 ft³/s	Time to Peak (Flow, Outlet)	22.950 hours

Elevation (Water Surface, Peak)	838.57 ft
Volume (Peak)	1.568 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	1.997 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	0.444 ac-ft
Volume (Retained)	1.549 ac-ft
Volume (Unrouted)	-0.004 ac-ft
Error (Mass Balance)	0.2 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	836.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	5.03 ft³/s	Time to Peak (Flow, In)	15.600 hours
Flow (Peak Outlet)	0.64 ft³/s	Time to Peak (Flow, Outlet)	23.000 hours

Elevation (Water Surface, Peak)	839.27 ft
Volume (Peak)	2.207 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	2.740 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	0.547 ac-ft
Volume (Retained)	2.187 ac-ft
Volume (Unrouted)	-0.006 ac-ft
Error (Mass Balance)	0.2 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	836.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	6.03 ft³/s	Time to Peak (Flow, In)	14.450 hours
Flow (Peak Outlet)	0.92 ft³/s	Time to Peak (Flow, Outlet)	22.850 hours

Elevation (Water Surface, Peak)	839.77 ft
Volume (Peak)	2.699 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	3.341 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	0.665 ac-ft
Volume (Retained)	2.673 ac-ft
Volume (Unrouted)	-0.003 ac-ft
Error (Mass Balance)	0.1 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	836.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	7.63 ft³/s	Time to Peak (Flow, In)	14.450 hours
Flow (Peak Outlet)	3.81 ft³/s	Time to Peak (Flow, Outlet)	18.200 hours

Elevation (Water Surface, Peak)	839.98 ft
Volume (Peak)	2.922 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	4.278 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	1.588 ac-ft
Volume (Retained)	2.687 ac-ft
Volume (Unrouted)	-0.003 ac-ft
Error (Mass Balance)	0.1 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	836.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	9.05 ft³/s	Time to Peak (Flow, In)	14.450 hours
Flow (Peak Outlet)	5.36 ft³/s	Time to Peak (Flow, Outlet)	17.300 hours

Elevation (Water Surface, Peak)	840.13 ft
Volume (Peak)	3.080 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	5.121 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	2.420 ac-ft
Volume (Retained)	2.697 ac-ft
Volume (Unrouted)	-0.004 ac-ft
Error (Mass Balance)	0.1 %

Infiltration	
Infiltration Method (Computed)	No Infiltration

Initial Conditions	
Elevation (Water Surface, Initial)	836.50 ft
Volume (Initial)	0.000 ac-ft
Flow (Initial Outlet)	0.00 ft³/s
Flow (Initial Infiltration)	0.00 ft³/s
Flow (Initial, Total)	0.00 ft³/s
Time Increment	0.050 hours

Inflow/Outflow Hydrograph Summary			
Flow (Peak In)	10.55 ft³/s	Time to Peak (Flow, In)	14.450 hours
Flow (Peak Outlet)	7.18 ft³/s	Time to Peak (Flow, Outlet)	17.050 hours

Elevation (Water Surface, Peak)	840.31 ft
Volume (Peak)	3.275 ac-ft

Mass Balance (ac-ft)	
Volume (Initial)	0.000 ac-ft
Volume (Total Inflow)	6.021 ac-ft
Volume (Total Infiltration)	0.000 ac-ft
Volume (Total Outlet Outflow)	3.309 ac-ft
Volume (Retained)	2.707 ac-ft
Volume (Unrouted)	-0.005 ac-ft
Error (Mass Balance)	0.1 %

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STORY POINT, A SENIOR LIVING FACILITY
CITY OF GROVE CITY, OHIO
DRAINAGE EXHIBIT

REVISIONS:

FILE NAME	FRAGCI1403_fdp_ut
DRAWN BY	RJL
CHECKED BY	JSP
PROJECT No.	FRAGCI1403
DATE	08-27-2015
SHEET NUMBER	1 OF 1

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