SITE PLAN FOR:

ARVIN SANGO
NORTH AMERICAN TECHNICAL CENTER

NORTHFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN

PROJECT CONTACTS

OWNER

ARVIN SANGO
CONTACT: THOMAS CHRISTEN
1308 BEEMER CT.
OXFORD, MICHIGAN, 48371
PH: (248)318-3262

DEVELOPER

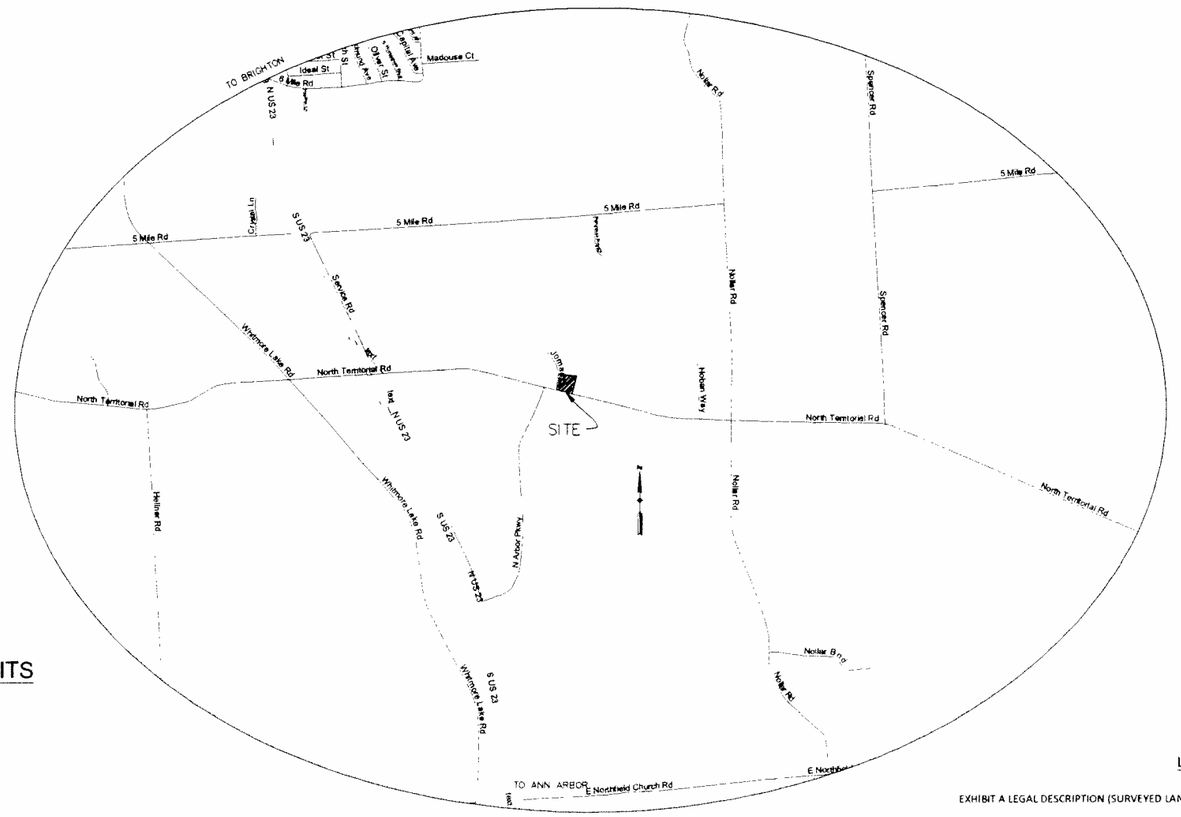
ACS
CONTACT: MATT NYSSE
3330 UNIVERSITY AVENUE
SUITE 200
MADISON WI, 53705-2167
PH: (608)663 1590

ENGINEER

CONTACT: TIM CURRIE PE
CIVIL ENGINEERING SOLUTIONS, INC
P.O. BOX 243
NEW HUDSON, MI 48165
PH: (248)264-6906
FAX: (810)448-5903
Tim.Currie@Civilengineeringsolutions.us

GOVERNMENT AGENCY PERMITS

- SOIL EROSION PERMIT
- WASHTENAW COUNTY HEALTH DEPT. (WELL TYPE 3)
- WASHTENAW COUNTY DRAIN COMMISSION
- NORTHFIELD TOWNSHIP
- MDEQ NPDES



OVERALL AREA MAP

NTS

SHEET INDEX

LEGAL DESCRIPTION

per title policy

EXHIBIT A LEGAL DESCRIPTION (SURVEYED LAND):

SITUATED IN THE TOWNSHIP OF NORTHFIELD, COUNTY OF WASHTENAW, STATE OF MICHIGAN

BEGINNING AT THE EAST QUARTER CORNER OF SECTION 20, TOWN 1 SOUTH, RANGE 6 EAST, NORTHFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN; THENCE S01°28'30"W, 665.26 FEET ALONG THE EAST LINE OF SAID SECTION 20; THENCE N71°11'05"W, 573.37 FEET ALONG THE CENTERLINE OF NORTH TERRITORIAL ROAD (120 FEET PROPOSED); THENCE N18°48'55"E, 179.85 FEET ALONG THE CENTERLINE OF JOMAR DRIVE; THENCE CONTINUING 221.03 FEET ALONG SAID CENTERLINE AND THE ARC OF A CIRCULAR CURVE TO THE LEFT, RADIUS 450.00 FEET, CHORD BEARING N04°44'38"E, 218.82 FEET; THENCE N79°15'15"E, 492.39 FEET TO THE PLACE OF BEGINNING; BEING PART OF THE SOUTHEAST QUARTER OF SAID SECTION 20.SUBJECT TO AND TOGETHER WITH A PRIVATE ROAD EASEMENT DESCRIBED AS COMMENCING AT THE EAST QUARTER CORNER OF SECTION 20, TOWN 1 SOUTH, RANGE 6 EAST, NORTHFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN; THENCE S01°28'30"W, 602.40 FEET ALONG THE EAST LINE OF SAID SECTION 20; THENCE N71°11'05"W, 504.64 FEET ALONG THE NORTH PROPOSED 60 FOOT RIGHT-OF-WAY LINE OF NORTH TERRITORIAL ROAD (120 FEET PROPOSED) FOR A PLACE OF BEGINNING; THENCE CONTINUING N71°11'05"W, 100.00 FEET; THENCE N18°48'55E, 73.34 FEET; THENCE N27°32'53"E, 94.53 FEET; THENCE 344.88 FEET ALONG THE ARC OF A NON-TANGENTIAL CURVE TO THE LEFT, RADIUS 417.00 FEET, CHORD BEARING N11°20'20"W, 335.14 FEET; THENCE N35°01'57"W, 83.63 FEET; THENCE 402.90 FEET ALONG THE ARC OF A NON-TANGENTIAL CURVE TO THE RIGHT, RADIUS 75.00 FEET, CHORD BEARING N54°58'03"E, 66.00 FEET; THENCE S35°01'57"E, 83.63 FEET; THENCE 405.13 FEET ALONG THE ARC OF A NON-TANGENTIAL CURVE TO THE RIGHT, RADIUS 483.00 FEET, CHORD BEARING S11°00'11"E, 393.36 FEET; THENCE S07°15'48"W, 97.19 FEET; THENCE S18°48'55"W, 73.34 FEET TO THE PLACE OF BEGINNING, BEING PART OF THE EAST HALF OF SAID SECTION 20,

PARCEL ID B-02-20-100-020

STREET ADDRESS 955 EAST TERRITORIAL ROAD, NORTHFIELD

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

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Rev	Issued For	Date
2	SITE PLAN SUBMITTAL	4-13-2016
1	OWNER REVIEW	2-22-2016

STATE OF MICHIGAN
TIM CURRIE
ENGINEER
No. 47077

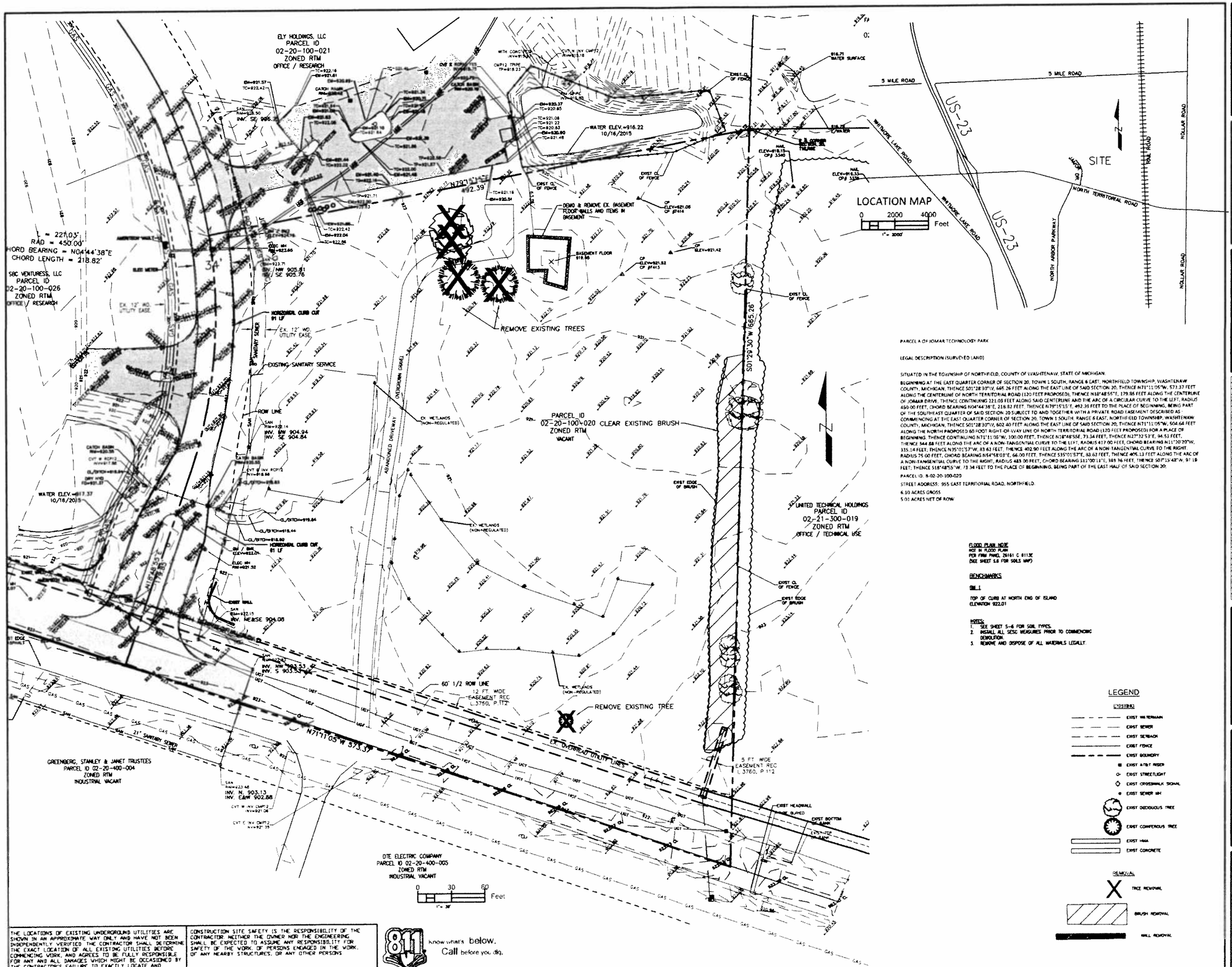
KEY PLAN — NORTH

DRAWN BY	SEP
SCALE	AS NOTED
DATE	1-11-2016

SHEET TITLE

COVER

CES JOB NUMBER	SHEET NUMBER
2015-0094	S.1



PARCEL A OF JOMAR TECHNOLOGY PARK

LEGAL DESCRIPTION (SURVEYED LAND)

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PARCEL ID: 8-02-20-100-020

STREET ADDRESS: 955 EAST TERRITORIAL ROAD, NORTHFIELD

6.10 ACRES GROSS
5.01 ACRES NET OF ROW

FLOOD PLAIN NOTE
NOT IN FLOOD PLAIN
PER FIRM PANEL 26161 C 811E
(SEE SHEET S.0 FOR SOILS MAP)

BENCHMARKS

BM 1

TOP OF CURB AT NORTH END OF ISLAND
ELEVATION 922.01

NOTES:
1. SEE SHEET S-.6 FOR SOIL TYPES.
2. INSTALL ALL SESC MEASURES PRIOR TO COMMENCING DEMOLITION.
3. REMOVE AND DISPOSE OF ALL MATERIALS LEGALLY.

LEGEND

EXISTING

- EXIST WATERMAIN
- EXIST SEWER
- EXIST SETBACK
- EXIST FENCE
- EXIST BOUNDRY
- EXIST AT&T RISER
- EXIST STREETLIGHT
- EXIST CROSSWALK SIGNAL
- EXIST SEWER MH
- EXIST DECIDUOUS TREE
- EXIST COMPERNOUS TREE
- EXIST HMA
- EXIST CONCRETE

REMOVAL

- TREE REMOVAL
- BRUSH REMOVAL
- WALL REMOVAL

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Rev.	Description	Date
2	SITE PLAN SUBMITTAL	4-13-2016
1	OWNER REVIEW	2-22-2016

KEY PLAN NORTH

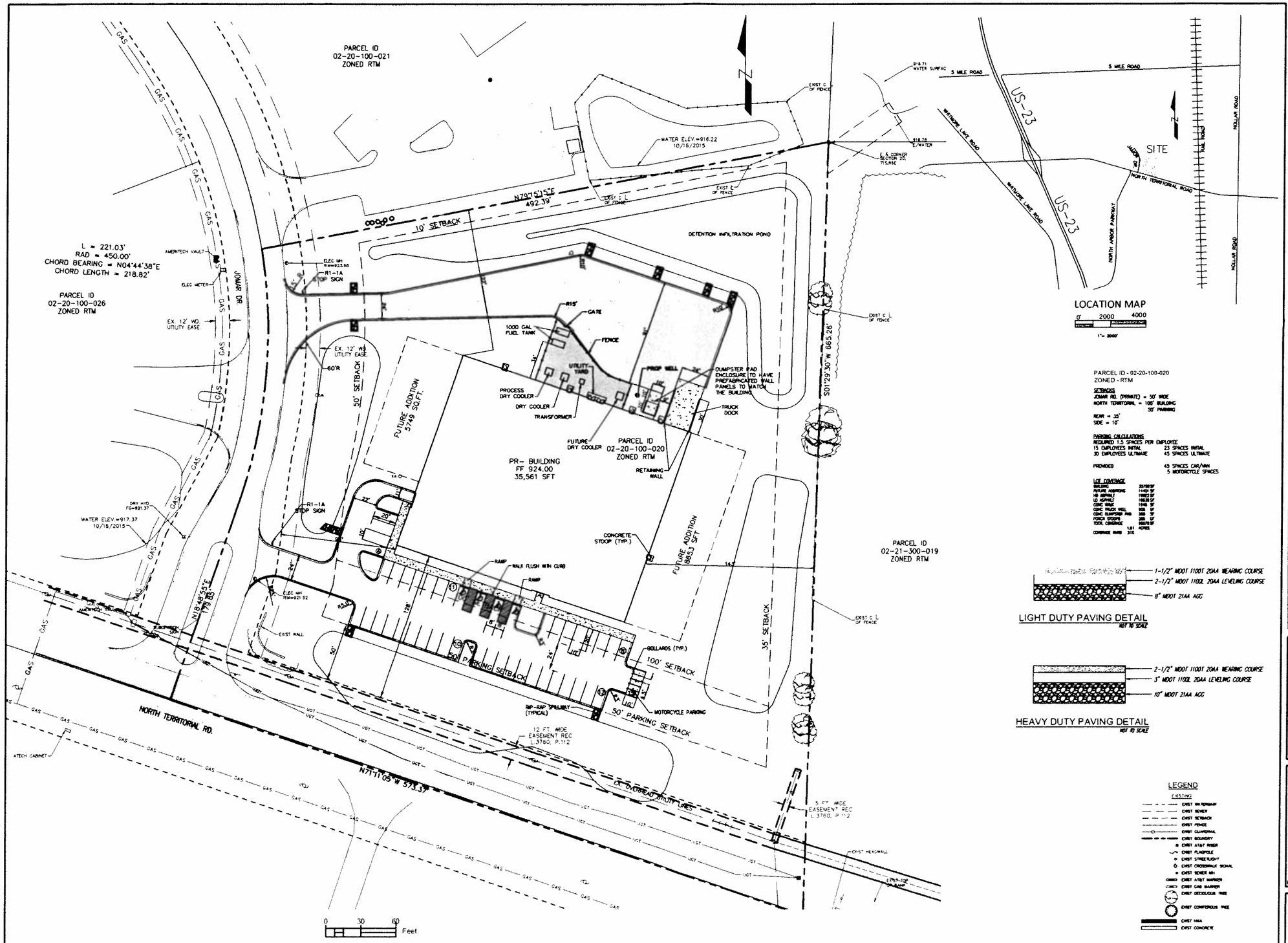
DRAWN BY:	SEP
SCALE:	AS NOTED
DATE:	1-11-2016

SHEET TITLE:

TOPOGRAPHIC/ DEMO PLAN

CES JOB NUMBER: 2015-0094

SHEET NUMBER: S.2



PARCEL ID - 02-20-100-020
ZONED - RTM

SETBACKS
JOMAR RD. (PRIVATE) = 50' WIDE
NORTH TERRITORIAL = 100' BUILDING
50' PARKING
REAR = 35'
SIDE = 10'

PARKING CALCULATIONS
REQUIRED 1.5 SPACES PER EMPLOYEE

15 EMPLOYEES INITIAL	23 SPACES INITIAL
30 EMPLOYEES ULTIMATE	45 SPACES ULTIMATE
PROVIDED	45 SPACES CAR/VAN
	5 MOTORCYCLE SPACES

LOT COVERAGE

BUILDING	35,561 SF
FUTURE ADDITIONS	14,402 SF
6" ASPHALT	118,822 SF
10" ASPHALT	118,822 SF
CONC WALK	1,746 SF
CONC TRUCK WELL	805 SF
CONC SUMP/CURB PAD	368 SF
PORCH STOOPS	285 SF
TOTAL COVERAGE	184,676 SF
	1.81 ACRES
COVERAGE RATIO	35%

1-1/2" MDOT 1100T 20AA WEARING COURSE
2-1/2" MDOT 1100L 20AA LEVELING COURSE
8" MDOT 21AA AGG

LIGHT DUTY PAVING DETAIL
NOT TO SCALE

2-1/2" MDOT 1100T 20AA WEARING COURSE
3" MDOT 1100L 20AA LEVELING COURSE
10" MDOT 21AA AGG

HEAVY DUTY PAVING DETAIL
NOT TO SCALE

LEGEND

EXISTING
- EXIST MN TERRAIN
- EXIST SEWER
- EXIST SETBACK
- EXIST FENCE
- EXIST GUARDRAIL
- EXIST BOUNDARY
- EXIST AT&T RISER
- EXIST FLAGPOLE
- EXIST STREETLIGHT
- EXIST CROSSWALK SIGNAL
- EXIST SEWER MH
- EXIST AT&T MARKER
- EXIST GAS MARKER
- EXIST DECIDUOUS TREE
- EXIST COMIFEROUS TREE
- EXIST MBA
- EXIST CONCRETE

PROPOSED
- PROP CONC WALK
- PROP GRAVEL
- PROP MBA WALKS
- PROP MBA CAR
- HANDICAP LOCATOR
- PROPOSED STORM

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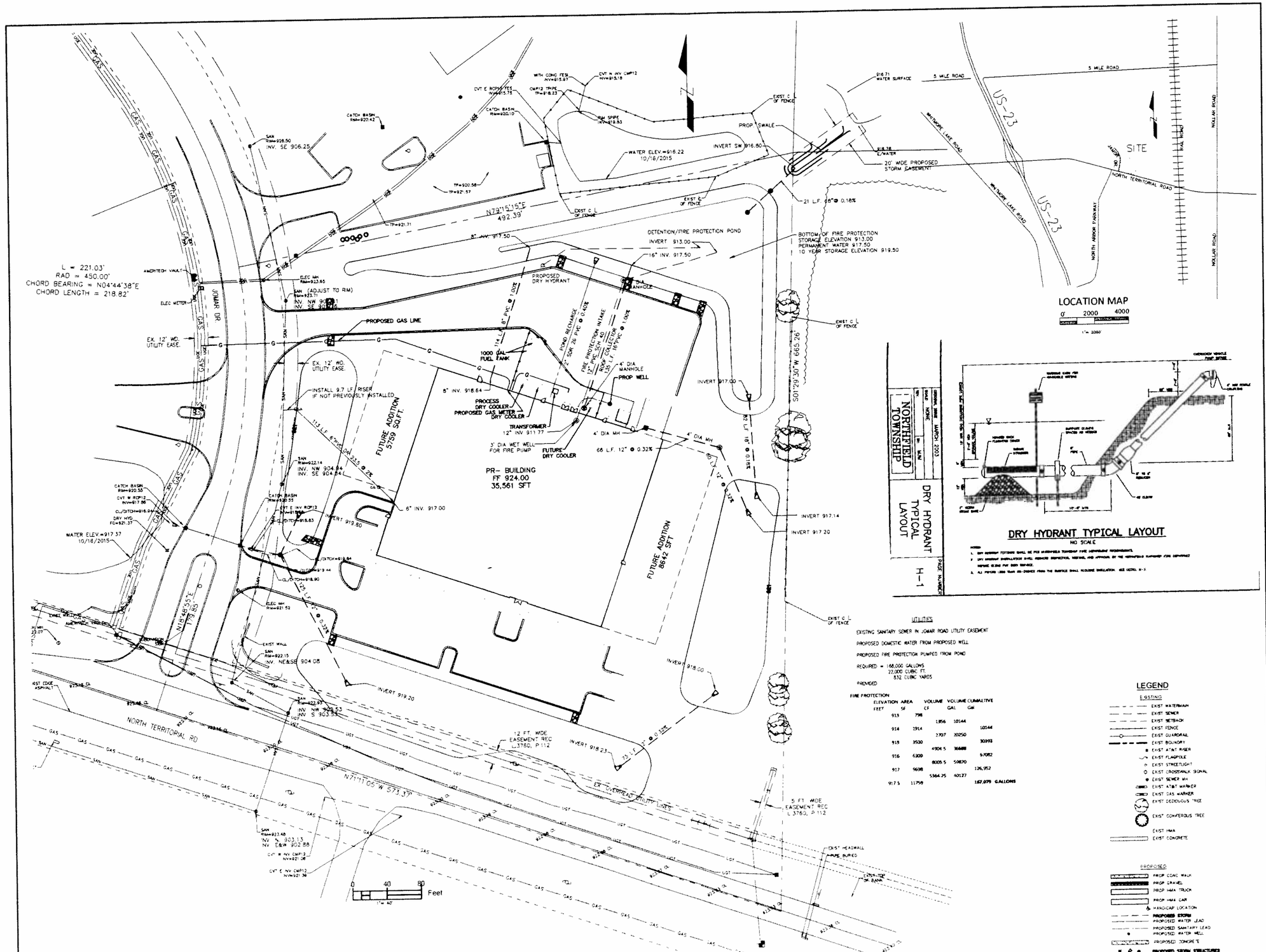
KEY PLAN — NORTH

DRAWN BY: SFP
SCALE: AS NOTED
DATE: 1-11-2016
SHEET TITLE:

SITE PLAN

CES JOB NUMBER: 2015-0094
SHEET NUMBER: S.3



NORTHFIELD TOWNSHIP

DRY HYDRANT TYPICAL LAYOUT

PAGE NUMBER H-1

UTILITIES

EXISTING SANITARY SEWER IN JOMAR ROAD UTILITY EASEMENT

PROPOSED DOMESTIC WATER FROM PROPOSED WELL

PROPOSED FIRE PROTECTION PUMPED FROM POND

REQUIRED = 168,000 GALLONS
22,000 CUBIC FT
832 CUBIC YARDS

PROVIDED

FIRE PROTECTION

ELEVATION FEET	AREA SF	VOLUME CF	VOLUME GAL	CUMULATIVE Gal
913	798			
		1856	10144	10144
914	1914			
		2707	20250	30393
915	3500			
		4904.5	36688	
916	6309			67082
		8005.5	59870	
917	9698			126,952
		5364.25	40127	
917.5	11759			167,079 GALLONS

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- EXIST FLAGPOLE
- EXIST STREETLIGHT
- EXIST CROSSWALK SIGNAL
- EXIST SEWER MH
- EXIST AT&T MARKER
- EXIST GAS MARKER
- EXIST DECIDUOUS TREE
- EXIST CONIFEROUS TREE
- EXIST HMA
- EXIST CONCRETE

PROPOSED

- PROP CONC WALK
- PROP GRAVEL
- PROP HMA TRUCK
- PROP HMA CAR
- HANDICAP LOCATION
- PROPOSED STORM
- PROPOSED WATER LEAD
- PROPOSED SANITARY LEAD
- PROPOSED WATER WELL
- PROPOSED CONCRETE
- PROPOSED STORM STRUCTURES

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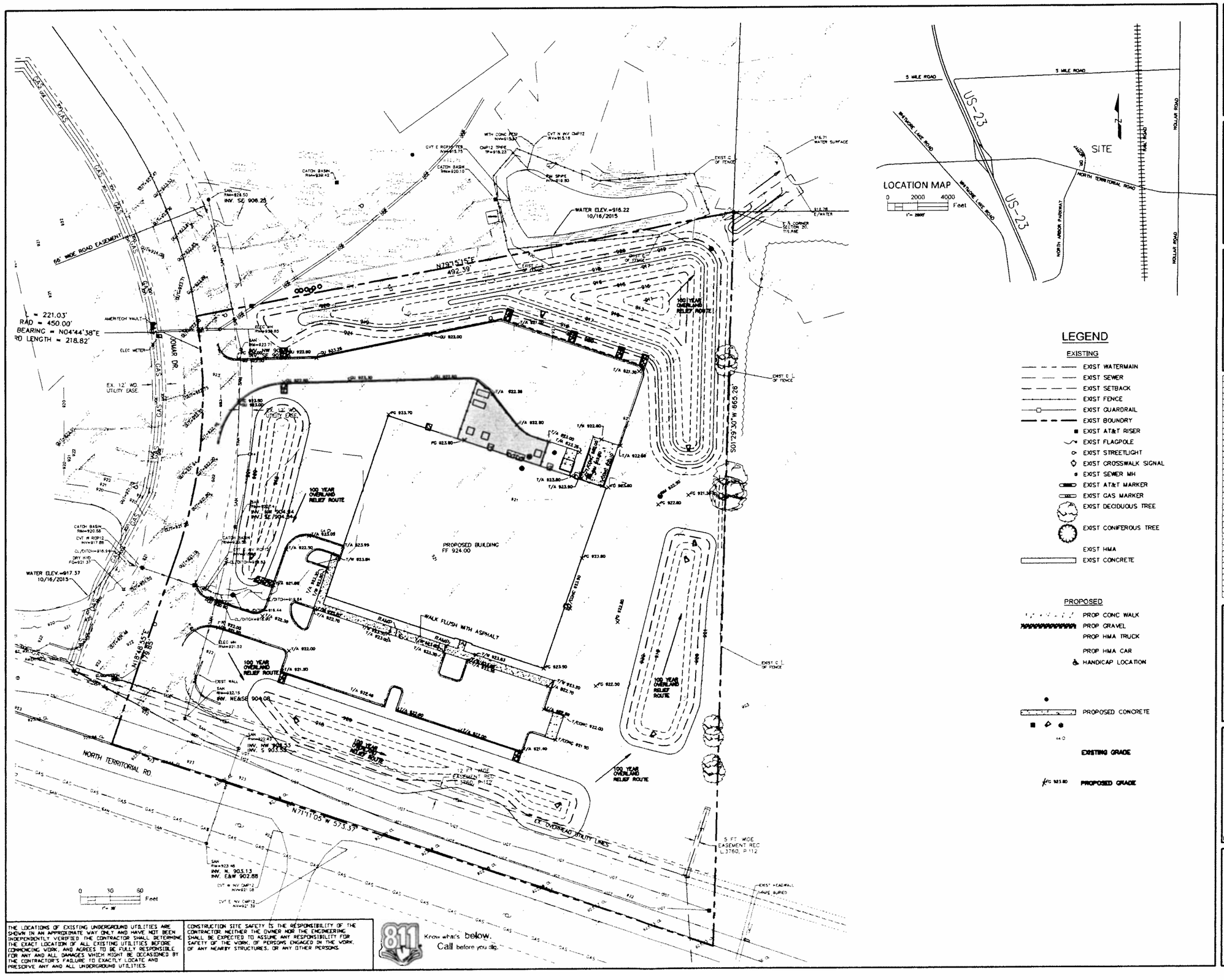
KEY PLAN NORTH

DRAWN BY	SEP
SCALE	AS NOTED
DATE	1-11-2016

SHEET TITLE

UTILITY PLAN

GES JOB NUMBER	SHEET NUMBER
2015-0094	S.4



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- EXIST SEWER MH
- EXIST AT&T MARKER
- EXIST GAS MARKER
- EXIST DECIDUOUS TREE
- EXIST CONIFEROUS TREE
- EXIST HMA
- EXIST CONCRETE

PROPOSED

- PROP CONC WALK
- PROP GRAVEL
- PROP HMA TRUCK
- PROP HMA CAR
- HANDICAP LOCATION
- PROPOSED CONCRETE
- EXISTING GRADE
- PROPOSED GRADE

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KEY PLAN — NORTH

DRAWN BY:	SEP
SCALE:	1" = 30'
DATE:	1-11-2016

SHEET TITLE:

GRADING PLAN

CES JOB NUMBER: 2015-0094

SHEET NUMBER: S. 5

Standard Method Runoff Volume work sheets

Total Site Area = 6 Acres
Total Site Area Excluding "Self crediting" BMPs = 6.02 Acres

Rational Method Variables

Cover type	Soil Type	Area (ft^2)	Area (Acre)	Run off coefficient (c.)	Factored area (CA)
Pavement	FoB (group A), MdA (group A)	44308	1.02	0.95	0.97
Building	FoB (group A), MdA (group A)	45076	1.03	0.95	0.98
Grass	FoB (group A), MdA (group A)	155647	3.57	0.25	0.89
Pond	FoB (group A), Sb (group B)	17200	0.39	1	0.39

Total = Σ (C.)(Area) = 3.24
Area total = Σ area = 6.02
Weighted C = Σ (C.)area / Σ area = 0.54

NRCS Impervious Variables

Impervious cover type	Soil Type	Area (ft^2)	Area (Acre)	Curve Number (CN)	Factored area (CN)(A)
Proposed Building	A	35176	0.81	98	79.14
Proposed Future Building	A	9900	0.23	98	22.27
Proposed Asphalt paving	A	38200	0.88	98	85.94
Proposed Sidewalk	A	3637	0.08	98	8.18
Proposed Aggregate Surface	A	1933	0.04	76	3.37
Proposed concrete truck dock	A	538	0.01	98	1.21
Pond Surface	A,B	17200	0.39	98	38.70

Total = Σ (CN.)(Area) = 200.12
Area total = Σ area = 2.05
Weighted CN = Σ (CN.)area / Σ area = 97.52

NRCS Pervious Variables

Pervious cover type	Soil Type	Area (ft^2)	Area (Acre)	Curve Number (CN)	Factored area (CN)(A)
Grass	A	95647	2.20	39	85.63
landscape	A	10000	0.23	68	15.61
Swales	A	30,000	0.69	39	26.86
Pond	A,B	20,000	0.46	39	17.91

Total = Σ (CN.)(Area) = 146.01
Area total = Σ area = 3.57
Weighted CN = Σ (CN.)area / Σ area = 40.86

First Flush Runoff Calculation W-2

Vw=(1")(1'/12")(43560ft^2/ac)(AC)=
Vw=(1")(1'/12")(43560ft^2/ac) (6.02) (.54) = 11752.22
Vw= 11752 Cubic Feet

A= Total Site area Excluding self crediting BMP's = 6.02
C= Weighted Runoff Coefficient from Worksheet 1 = 0.54

Pre Development Bank Full Run off Calculations: W 3

2 Year 24 Hour Storm Event p= 2.35 inches
Pre-develoment land cover will be Good Cover woods or Meadow.
Determine the associated soil hydrologic gorup for the entire site and choose the curve number.

CN = 30

S= (1000/CN)-10 = 23.33

Q=((P-.2s)^2)/(P+.8s)= 0.255366 inches
A= Total Site area Excluding self crediting BMP's = 6.02 Acres

Vbf-pre= Q(1/12)A= 5580 Cubic feet

Standard Method Runoff Volume Calculations W - 4

Pervious Cover post development bankfull runoff calculations (Vbf per post)
2 Year 24 hour storm event p= 2.35 inches
Pervious cover CN From Worksheet 1 (W-1) CN= 40.86
S= 1000/CN-10= 1000 / 41 - 10 = 14.47
S = 14.47 inches

Q= ((P-.02S)^2)/((P+.08S)) = Q= ((2.35 - 2 * 14.47))^2 / (2.35 + 8 * 14.47)

= 0.02 inches
Pervious cover area from worksheet 1 Area = 155647 SF

Vbf per-post=Q(1/12)Area = 278 Cubic feet

Standard Method Runoff Volume Calculations W - 5

Impervious Cover post development bankfull runoff calculations (Vbf imp post)
2 Year 24 hour storm event p= 2.35 inches
Impervious cover CN From Worksheet 1 (W-1) CN= 97.52
S= 1000/CN-10= 1000 / 98 - 10 = 0.25
S = 0.25 inches

Q= ((P-.02S)^2)/((P+.08S)) = Q= ((2.35 - 2 * 0.25))^2 / (2.35 + 8 * 0.25)

= 2.07 inches
Impervious cover area from worksheet 1 Area = 89384 SF

Vbf imp-post=Q(1/12)Area = 15423 Cubic feet

Standard Method Runoff Volume Calculations W - 6

Pervious Cover post development 100 Year runoff calculations (V100 per post)
100 Year Storm event p= 5.11 inches
Pervious cover CN From Worksheet 1 (W-1) CN= 40.96
S= 1000/CN-10= 1000 / 41 - 10 = 14.41
S = 14.41 inches

Q= ((P-.02S)^2)/((P+.08S)) = Q= ((5.11 - 2 * 14.41))^2 / (5.11 + 8 * 14.41)

= 0.30 inches
Pervious cover area from worksheet 1 Area = 148035 SF

V100 per-post=Q(1/12)Area = 3677 Cubic feet

Standard Method Runoff Volume Calculations W - 7

Impervious Cover post development 100 year runoff calculations (V100 imp post)
100 Year hour storm event p= 5.11 inches
Impervious cover CN From Worksheet 1 (CN= 97.36
S= 1000/CN-10= 1000 / 97 - 10 = 0.27
S = 0.27 inches

Q= ((P-.02S)^2)/((P+.08S)) = Q= ((5.11 - 2 * 0.27))^2 / (5.11 + 8 * 0.27)

= 4.80 inches
Impervious cover area from worksheet 1 Area = 93471 SF

V100 per-post=Q(1/12)Area = 37373 Cubic feet

Determine time of concentration for applicable flow types W - 8

Flow Type	K	Change in Elevation	Length	Slope %	S^0.5	V=k*s^0.5	Tc=L/V*(3600)
Sheet Flow	0.48	2	150	2	1.414	0.679	0.061
Waterway	1.2	1	200	0.5	0.707	0.849	0.065
Waterway	1.2	2	800	0.25	0.500	0.600	0.370
Waterway	1.2						
Waterway	1.2						
Waterway	1.2						
Waterway	1.2						
Small Tributary	2.1						
Small Tributary	2.1						
Small Tributary	2.1						
Small Tributary	2.1						
Small Tributary	2.1						
Small Tributary	2.1						

Total time of Concentration Tc hrs= 0.4972 Hours

Runoff Summary and onsite Infiltration requirement W-9

Runoff Summary from Previous Worksheets

First Flush Volume (Vf)	12222 ft^3
Pre-development Bankfull Volume (Vbf-pre)	5580 ft^3
Pervious Cover Post Development bf Volume (Vbf-per)	252 ft^3
Impervious Cover Post Development BF Volume (Vbf imp post)	15990 ft^3
Total Bf Volume	16,243 ft^3
Pervious Cover Post Development 100YR Volume (V100-pre)	3677 ft^3
Impervious Cover Post Development 100YR Volume (V100-imp-post)	37373 ft^3
Total 100 Year Volume	41,050 ft^3

Determine the Onsite Infiltration requirements

Subtract the Pre-develment Bankfull from the Post devvlopment Bankfull volume

Total Post development bankfull Volume (Vbf-post)	16,243 ft^3
Pre-development bankful volume (Vbf-pre)	5580 ft^3
Bankfull Volume Difference	10,662 ft^3

Compare the Bankfull Volume difference with the First flush Volume.
The greater of the two is the onsite infiltration Requirement
Onsite Infiltration Requirement (Vinf) = 12222 ft^3

Detention Requirement W-10

Qp=238.6Tc^-0.82 = 238.6 * 0.4972 ^-0.82
Peak Unit of the Hydrograph = 423.1533 Cfs/in-mi^2

Total Site Area (ac) excluding "self crediting"bmp's Area = 6.02 acres

Q100 = Q100per+Q100imp = .3 + 4.8 = 5.10 inches

Peak Flow (PF)= Qp(cfs/in-mi)Q100Area / 640 = 423.15 * 5.1 * 6.02 / 640

pf= 20.28 cfs

Δ=PF(cfs)-0.15Area 20.28 - .15 * 6.02 = 19.38 cfs

Vdet= Required Detention ft^3
Vdet = Δ(cfs)/PF(cfs)*V100(ft^3)-Vinf= 19.38 / 20.28 * 41050 12222
V(det)= 28995.72

Determine Applicable BMP's and Associated volume credits W-11

Proposed BMP's	Area (ft^2)	Storage Volume (ft^3)	Average design infiltration rate (in/hr)	Infiltration volume during storm (ft^3)	Total Volume Reduction
Pourous Pavement w/ infiltration					
Infiltration Basin					
Subsurface infiltraiton Bed					
Infiltration Trench	8600	12084	5.3	5337	5337
Infiltration Trench	8635	10054	5.6	4692	10029
Infiltration Trench	4613	5328	11.3	5017	15046
Rain Garden / Bio Retention					
Dry Well					
Bio Swale					
Vegetated filter Strip					
Green Roof					

PROVIDED

DETENTION AND FIRE PROTECTION POND

FIRE PROTECTION

ELEVATION FEET	AREA SF	VOLUME CF	VOLUME GAL	CUMALTIVE
914	3963			
		4899.5	36650.81	
915	5836			36650.81
		7146.5	53459.53	
916	8457			90110.34
		10071.5	75340.05	
917	11686			165450.4 GALLONS

DETENTION

ELEVATION FEET	AREA SF	VOLUME CF	CUMALTIVE
917	11686		
		13598.5	
918	15511		13598.5
		17433	
919	19395		31031.5
		19252.8	
919.9	23429		50284.3 CUBIC FEET

INFILTRATION

EAST IB

ELEVATION FEET	AREA SF	VOLUME CF	CUMALTIVE
918	996		
		1911.5	
919	2827		
		3886.5	
920	4946		
		6119	
921	7292		

South IB

ELEVATION	AREA	VOLUME	CUMALTIVE
918	1637		
		3283	
919	4909		
		6771.5	
920	8634		
		12447	
921	16260		

Southwest IB

ELEVATION	AREA	VOLUME	CUMALTIVE
918	3636		
		4801	
919	5966		
		7283	
920	8600		
		10040.5	
921	11481		

West

ELEVATION	AREA	VOLUME	CUMALTIVE
918	843		
		1744.5	
919	2646		
		3816	
920	4986		
		5969	
921	6952		

Soil Map—Washtenaw County, Michigan
(ACS Northfield)

Map Scale: 1:1,220 if printed on A portrait (8.5" x 11") sheet.
Meters 0 15 30 60 90
Feet 0 50 100 200 300
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

USDA Natural Resources Conservation Service — Web Soil Survey, National Cooperative Soil Survey — 10/7/2015, Page 1 of 3
Soil Map—Washtenaw County, Michigan (ACS Northfield)

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
FoB	Fox sandy loam, 2 to 6 percent slopes	4.2	68.8%
MdA	Matherton sandy loam, 0 to 4 percent slopes	1.9	30.7%
Sb	Sebewa loam	0.0	0.5%
Totals for Area of Interest		6.1	100.0%

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 1:20,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: 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: Washtenaw County, Michigan
Survey Area Data: Version 13, Sep 17, 2014

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

Date(s) aerial images were photographed: Sep 18, 2011—Mar 21, 2012

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.

USDA Natural Resources Conservation Service — Web Soil Survey, National Cooperative Soil Survey — 10/7/2015, Page 2 of 3

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

CONSTRUCTION SITE SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEERING SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR ANY OTHER PERSONS.

811 Know what's below. Call before you dig

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P.O. BOX 243
56711 GRAND RIVER AVE.
NEW HUDSON, MI 48165
PH: (248)264-6906
FAX: (810)448-5903
lzawada@civilengineeringsolutions.us

Rev	Issued For	Date
2	SITE PLAN SUBMITTAL	4-13-2016
1	OWNER REVIEW	2-22-2016

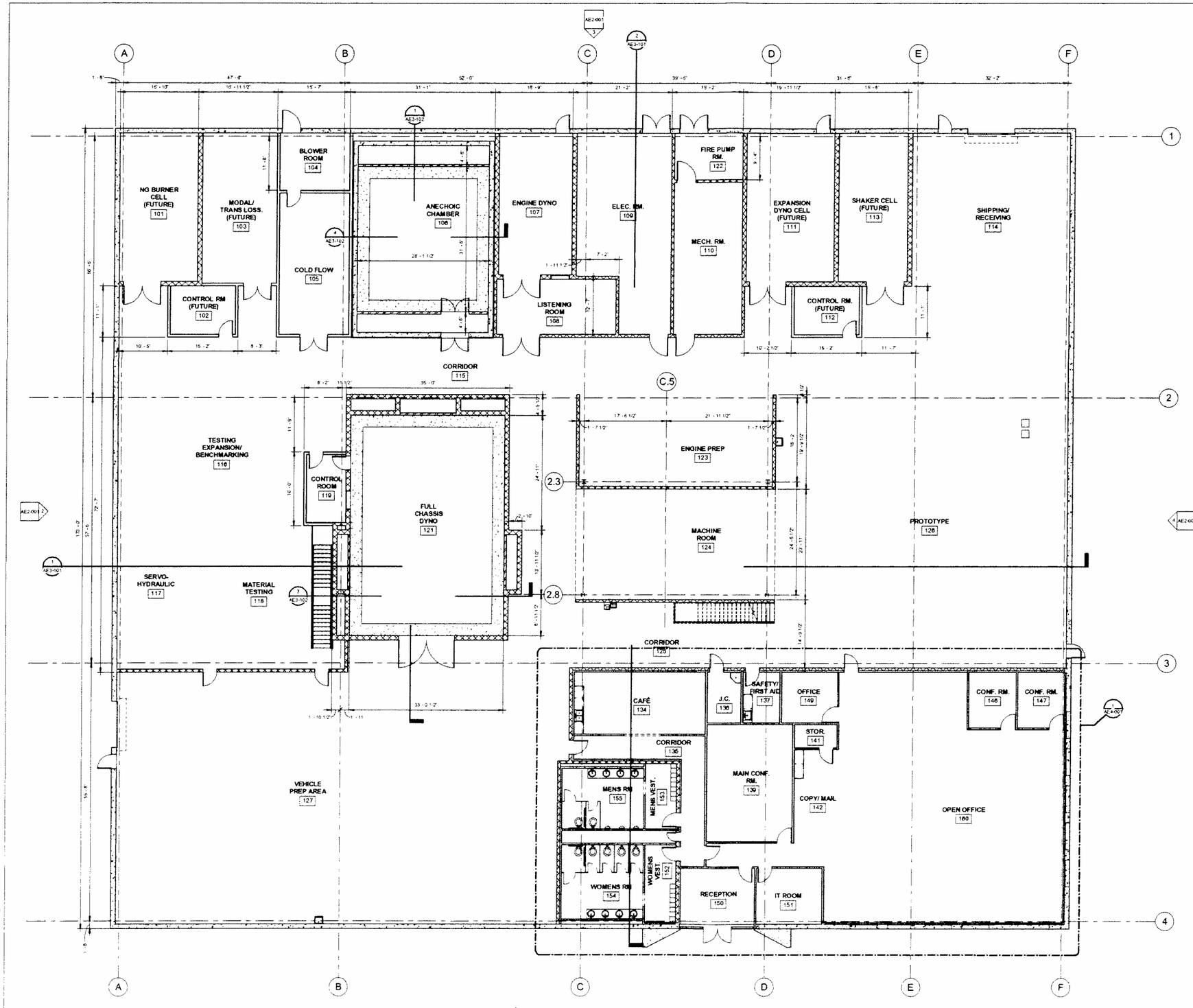
KEY PLAN
NORTH

DRAWN BY: SEP
SCALE: NTS
DATE: 1-11-2016

SHEET TITLE

DETENTION CALCULATIONS

CES JOB NUMBER: 2015-0094
SHEET NUMBER: S.6



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Rev.	Issued For	Date

KEY PLAN

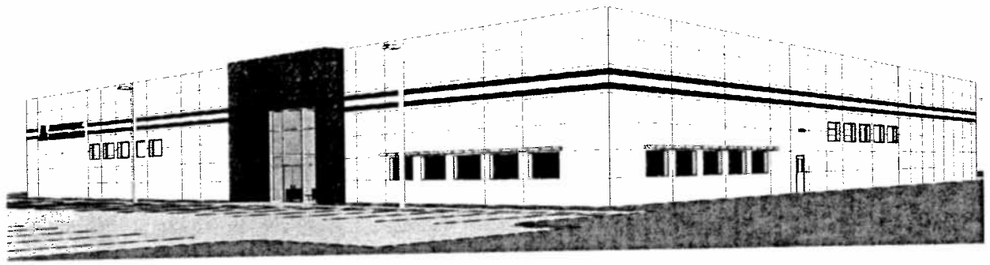
NORTH

DRAWN BY	Author
SCALE	1/8" = 1'-0"
DATE	12-24-15

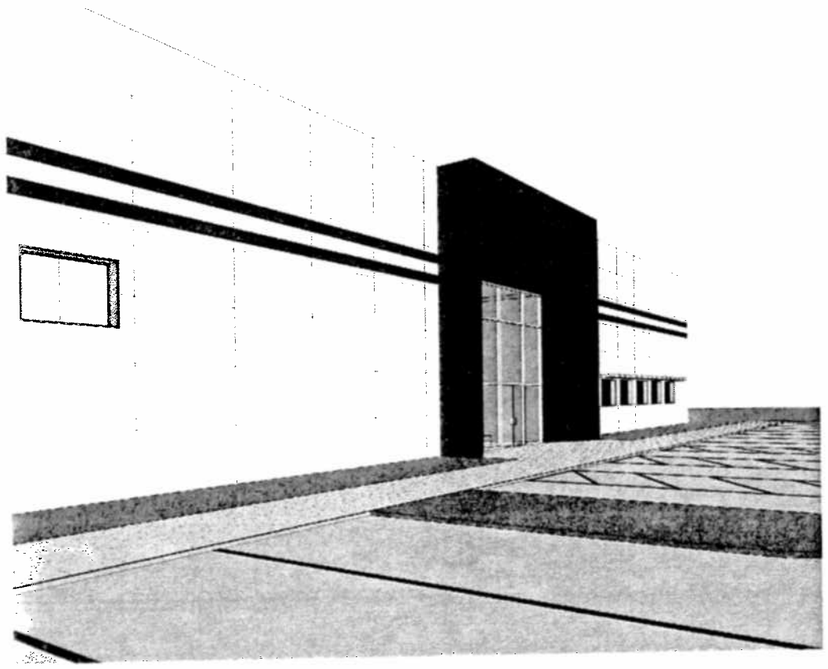
SHEET TITLE

FIRST FLOOR PLAN

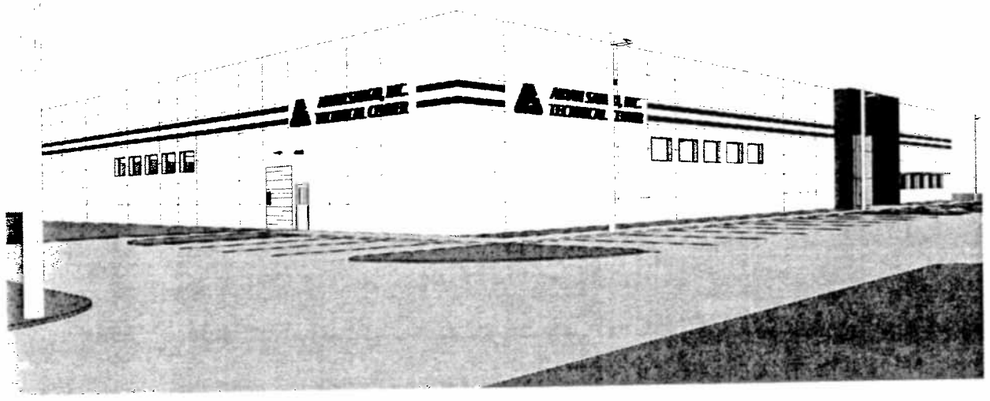
FES JOB NUMBER	SHEET NUMBER
15023-MI	AE1-100



2 Southeast Corner



3 Entrance



1 Southwest Corner

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Rev	Issued For	Date
1	SITE PLAN SUBMITTAL	04/13/16

KEY PLAN

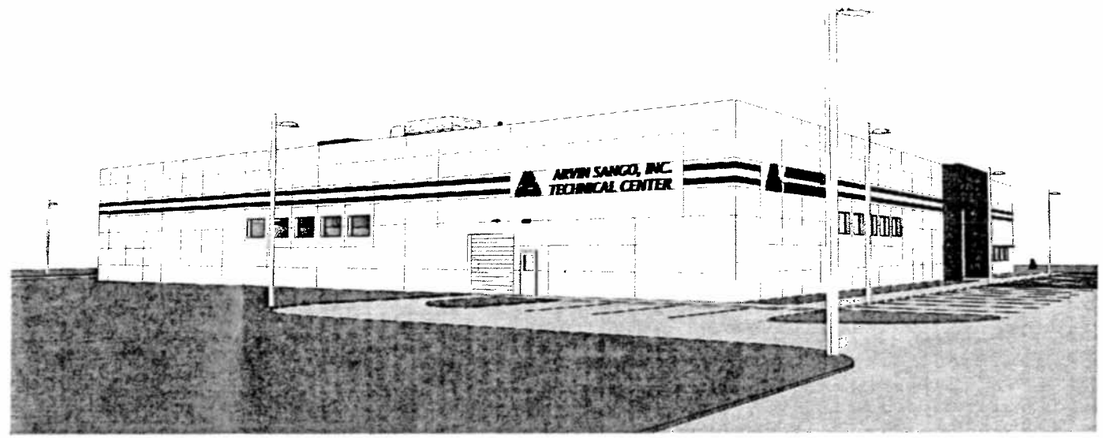
NORTH

DRAWN BY	Author
SCALE	
DATE	12-24-15

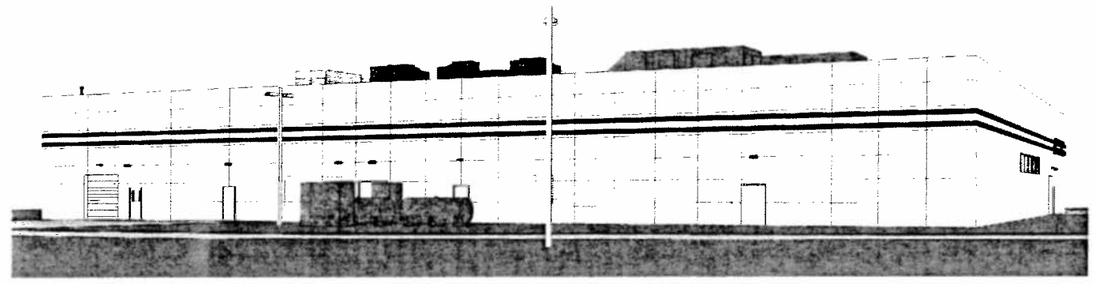
SHEET TITLE

EXTERIOR RENDERINGS

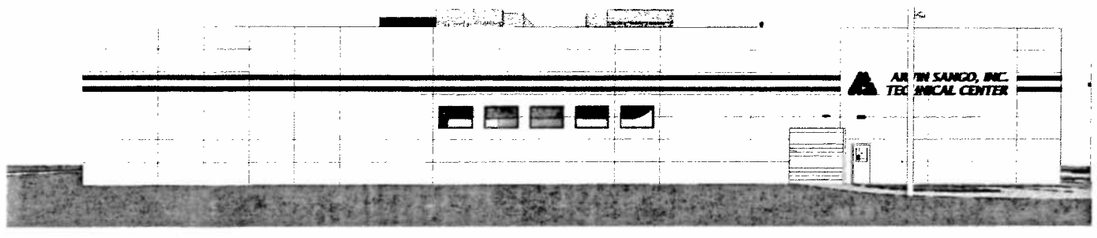
FES JOB NUMBER	SHEET NUMBER
15023-MI	AE1-801



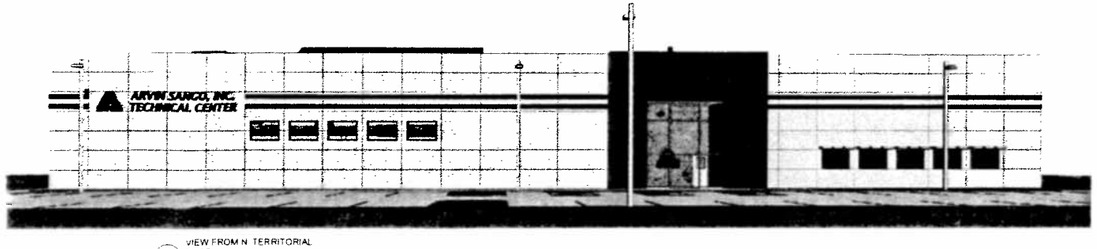
4 FROM SOUTHWEST BUILDING CORNER



3 VIEW FROM BACK OF BUILDING



2 VIEW FROM JOMAR DRIVE



1 VIEW FROM N. TERRITORIAL ROAD

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Rev	Issued For	Date
1	SITE PLAN SUBMITTAL	06/13/16

KEY PLAN

NORTH

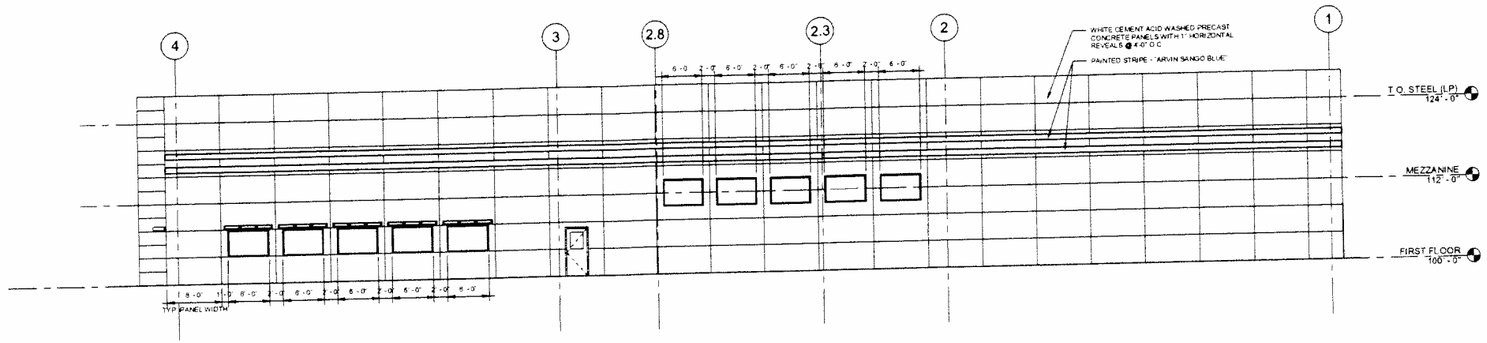
DRAWN BY Author
SCALE
DATE 12-24-15

SHEET TITLE

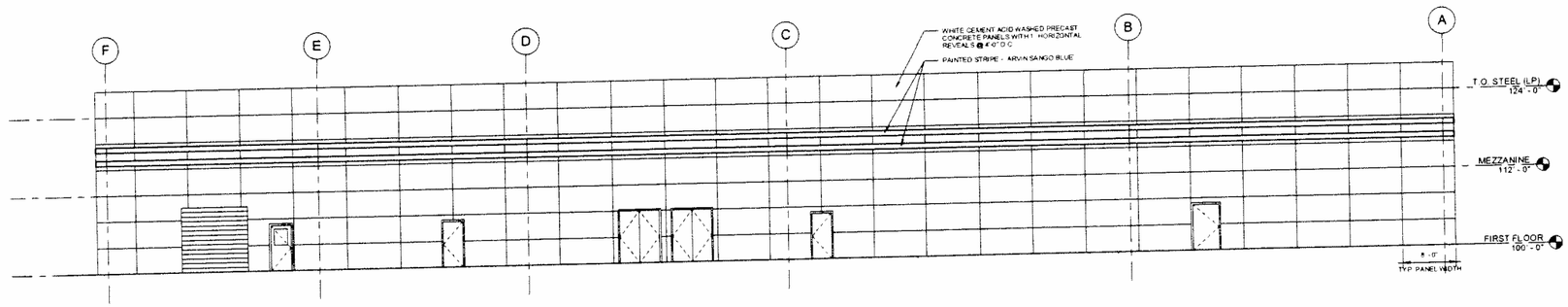
EXTERIOR RENDERINGS

FES JOB NUMBER 15023-MI

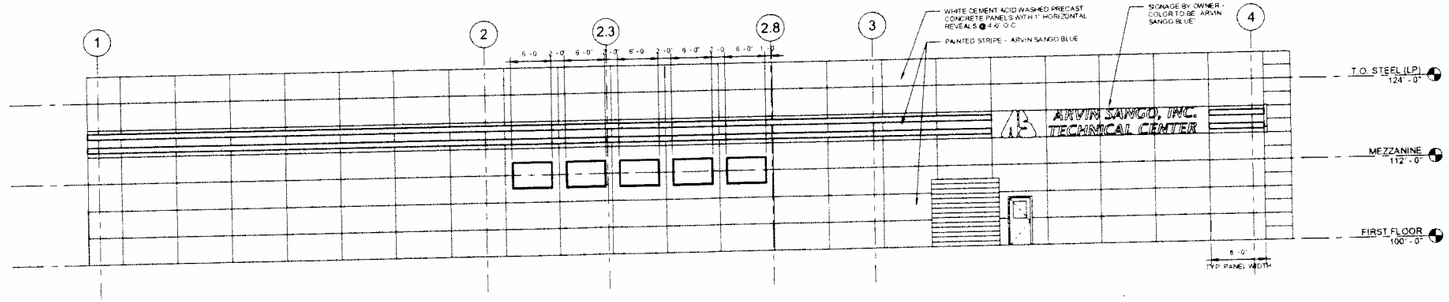
SHEET NUMBER AE1-802



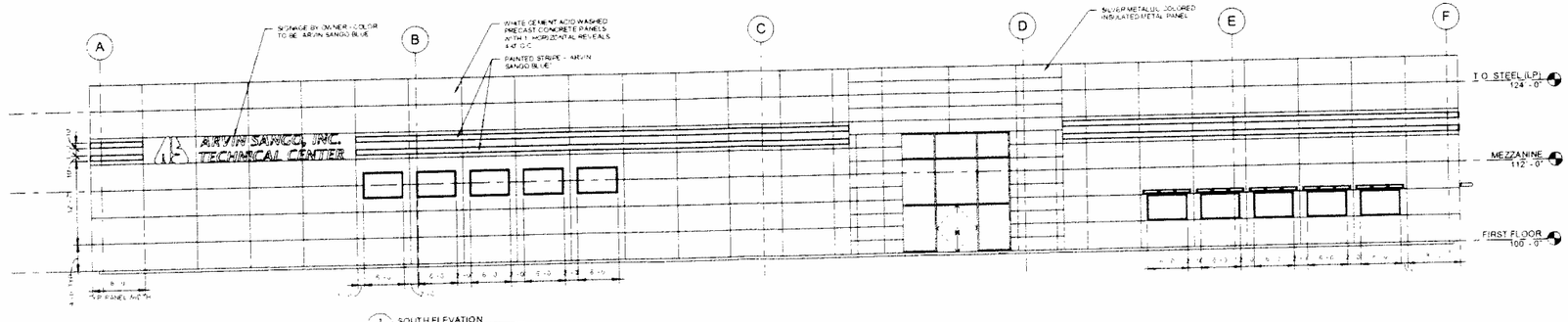
4 EAST ELEVATION
AE1-100 1/8" = 1'-0"



3 NORTH ELEVATION
AE1-100 1/8" = 1'-0"



2 WEST ELEVATION
AE1-100 1/8" = 1'-0"



1 SOUTH ELEVATION
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Rev.	Issued For	Date
1	SITE PLAN SUBMITTAL	04.13.16

KEY PLAN

NORTH

DRAWN BY	Author
SCALE	1/8" = 1'-0"
DATE	12-24-15

SHEET TITLE

BUILDING ELEVATIONS

FES JOB NUMBER 15023-MI

SHEET NUMBER AE2-001

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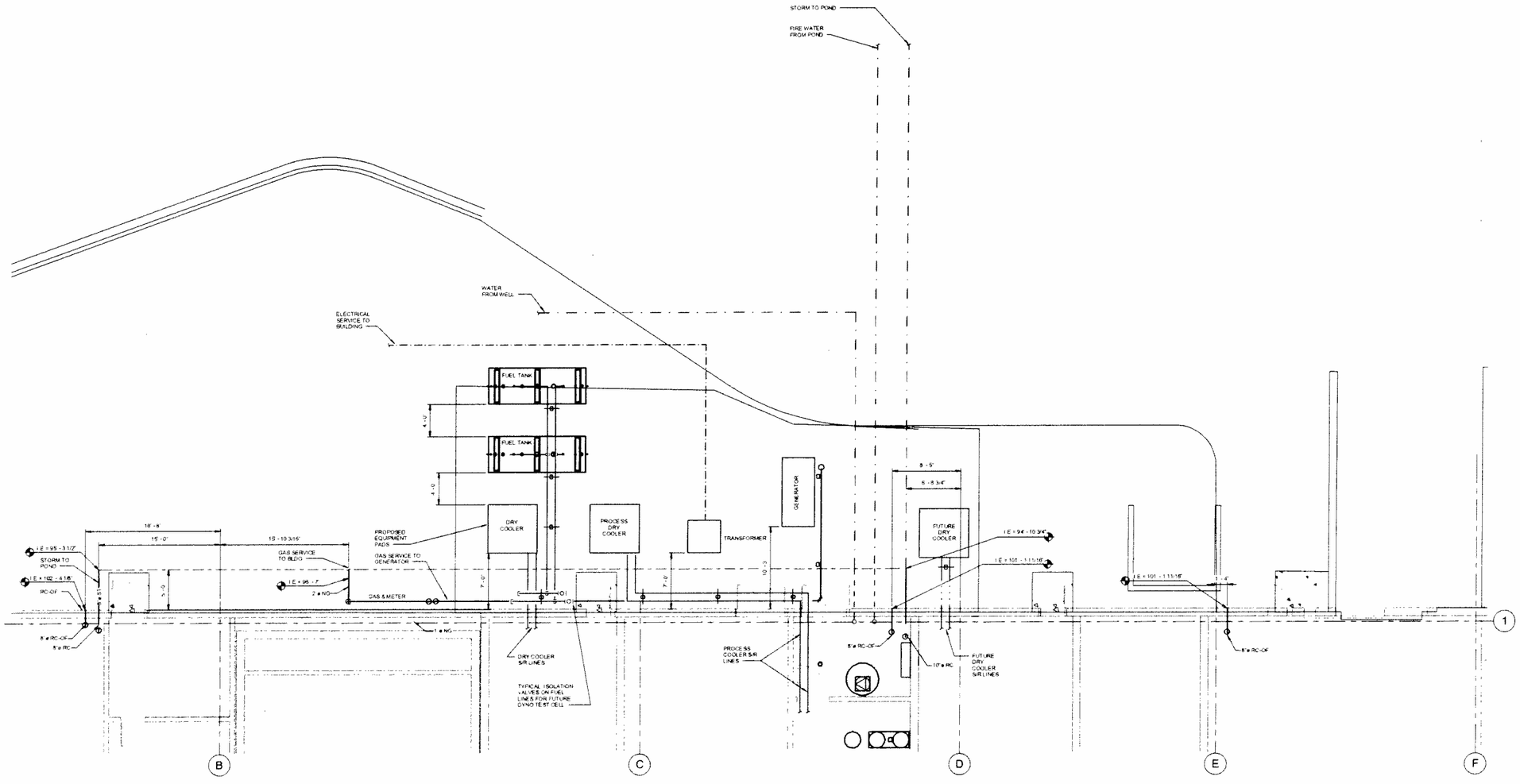

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Rev	Issued For	Date
	SITE PLAN SUBMITTAL	4/13/16

KEY PLAN

NORTH

DRAWN BY	Author
SCALE	3/16" = 1'-0"
DATE	Issue Date

SHEET TITLE

ENLARGED PLUMBING PLANS

FES JOB NUMBER:	SHEET NUMBER:
15023	MP4-102

Schedule

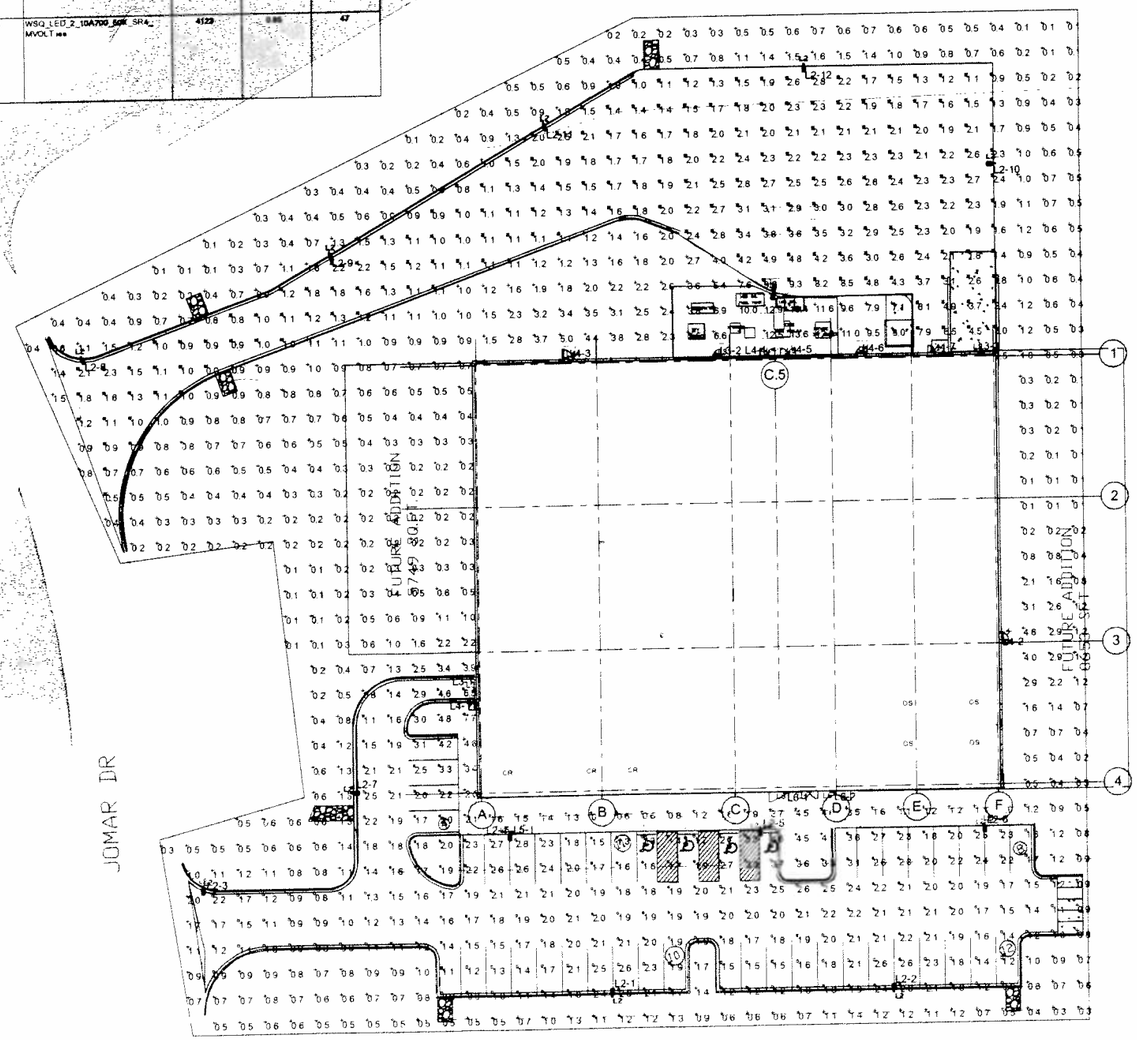
Symbol	Label	Image	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
	L1		1	Lithonia Lighting	DSX0 LED 40C 700 50K T4M MVOLT	DSX0 LED with 40 LEDs @700 mA, 5000K, Type 4 Medium Optics Roadway and Area Pole Light with Two Heads	LED	2	DSX0_LED_40C_700_50K_T4M_MVOLT.ies	11193	0.85	282
	L2		12	Lithonia Lighting	DSX0 LED 40C 700 50K T4M MVOLT	DSX0 LED with 40 LEDs @700 mA, 5000K, Type 4 Medium Optics Roadway and Area Pole Light with One Head	LED	1	DSX0_LED_40C_700_50K_T4M_MVOLT.ies	11193	0.85	91
	L3		3	Lithonia Lighting	DSXW1 LED 20C 350 50K T4M MVOLT	DSXW1 LED WITH (2) 10 LED LIGHT ENGINES, TYPE T4M OPTIC, 5000K, @ 350mA. Dock Area Wall Mounted Light	LED	1	DSXW1_LED_20C_350_50K_T4M_MVOLT.ies	2922	0.85	23.3
	L4		7	Lithonia Lighting	CSXW LED 30C 700 50K T4M	CONTOUR SERIES LED WALL-MOUNT WITH 30 5000K LEDS OPERATED AT 700mA AND PRECISION MOLDED ACRYLIC TYPE IV LENS Wall Pack above Exterior Door Light	LED	1	CSXW_LED_30C_700_50K_T4M.ies	7527	0.85	68
	L5		1	Lithonia Lighting	DSXF1 LED 2 A530/50K FL MVOLT	D-SERIES FLOOD SIZE 1 WITH 2 COB, 5000K, (FL) DISTRIBUTION, NEMA TYPE 5HX5V Sign Light Pole Mounted	LED	1	DSXF1_LED_2_A530_50K_FL_MVOLT.ies	4	0.85	40
	L6		2	Lithonia Lighting	WSQ LED 2 10A700/50K SR4 MVOLT	WSQ LED WITH 1 MODULE, 20 LED's, 700mA DRIVER, 5000K COLOR TEMPERATURE, TYPE 4 LENS Wall Sconce (Front Entrance)	LED	1	WSQ_LED_2_10A700_50K_SR4_MVOLT.ies	4123	0.85	47

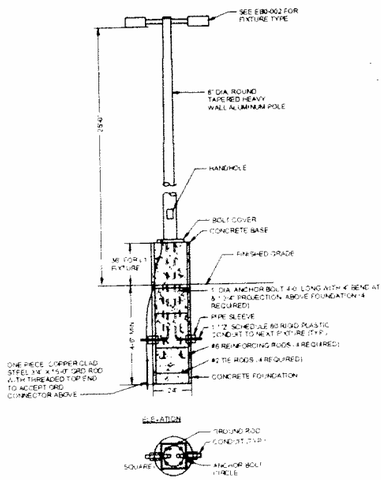
Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
North Drive	+	2.2 fc	9.6 fc	0.5 fc	19.2:1	4.4:1
Overall Site Lighting	+	1.7 fc	13.8 fc	0.1 fc	138.0:1	17.0:1
South Drive	+	1.9 fc	8.5 fc	0.6 fc	8.1:1	2.4:1

Luminaire Locations

		Location						Aim		
No	Label	X	Y	Z	MH	Orientation	Tilt	X	Y	Z
1	L1	1150.58	364.14	25.00	25.00	10.18	0.00			
1	L2	1084.38	86.94	25.00	25.00	0.00	0.00	1084.38	88.30	0.00
2	L2	1194.56	86.94	25.00	25.00	0.00	0.00	1194.56	88.30	0.00
3	L2	923.34	133.55	25.00	25.00	179.90	0.00	923.34	132.19	0.00
4	L2	1044.80	152.29	25.00	25.00	179.94	0.00	1044.80	150.93	0.00
5	L2	1142.87	152.29	25.00	25.00	179.94	0.00	1142.88	150.93	0.00
6	L2	1230.70	152.29	25.00	25.00	179.94	0.00	1230.70	150.93	0.00
7	L2	981.97	168.94	25.00	25.00	90.18	0.00	983.33	168.93	0.00
8	L2	878.20	343.73	25.00	25.00	156.87	0.00	878.69	342.46	0.00
9	L2	975.79	383.29	25.00	25.00	158.44	0.00	978.29	382.03	0.00
1	L3	1031.52	209.15	20.00	20.00	269.90	0.00	1031.52	209.15	0.00
2	L3	1128.13	339.46	20.00	20.00	179.90	0.00	1128.13	339.46	0.00
3	L3	1229.22	339.47	20.00	20.00	359.66	0.00	1229.22	338.47	0.00
1	L4	1031.97	202.35	12.00	12.00	270.00	0.00	1031.97	202.35	0.00
2	L4	1238.07	226.49	12.00	12.00	90.00	0.00	1238.07	226.49	0.00
3	L4	1069.61	339.37	12.00	12.00	0.00	0.00	1069.61	339.37	0.00
4	L4	1147.99	339.37	12.00	12.00	0.00	0.00	1147.99	339.37	0.00
5	L4	1155.95	339.37	12.00	12.00	0.00	0.00	1155.95	339.37	0.00
6	L4	1184.10	339.37	12.00	12.00	0.00	0.00	1184.10	339.37	0.00
7	L4	1212.12	339.37	12.00	12.00	0.00	0.00	1212.12	339.37	0.00
1	L5	1045.40	152.75	18.69	12.00	0.00	90.00	1045.40	184.75	19.19
1	L6	1153.20	186.30	12.00	12.00	180.00	0.00	1153.20	186.30	0.00
2	L6	1171.54	186.30	12.00	12.00	180.00	0.00	1171.54	186.30	0.00
10	L2	1237.87	413.98	25.00	25.00	269.94	0.00	1236.51	413.98	0.00
11	L2	1061.53	432.81	25.00	25.00	158.40	0.00	1062.03	431.54	0.00
12	L2	1163.43	454.38	25.00	25.00	180.07	0.00	1163.43	453.02	0.00





DUAL (SINGLE) HEAD PARKING LOT LIGHTING FIXTURE

NOTE: (2) FIXTURE S (SINGLE HEAD) AND HAS A 24" DIA CONCRETE BASE

ARVIN SANGO, INC.

ACS
Design · Construction · Integration
3330 University Avenue, Suite 200
Madison, WI 53705
Tel: (608) 663-1590 Fax: (608) 663-1591
www.acscm.com

FES GROUP
Facility Engineering Services
28036 Oakland Oaks Ct.
Wixom, MI 48393
Phone: 248-344-2800
Fax: 248-344-1650
www.fesgroupllc.com

Rev	Issued For	Date
	SITE PLAN SUBMITTAL	04/13/16

KEY PLAN

NORTH

DRAWN BY	FES
SCALE	As indicated
DATE	Issue Date

SHEET TITLE

SITE LIGHTING CALCUATIONS

FES JOB NUMBER 15023-MI

SHEET NUMBER ES1-001

PLOTTED: 4/12/2016 2:14:08 PM

C:\Users\yanhou\Documents\15023_Elec_Central_yanhou.rvt

ARVIN SANGO, INC.

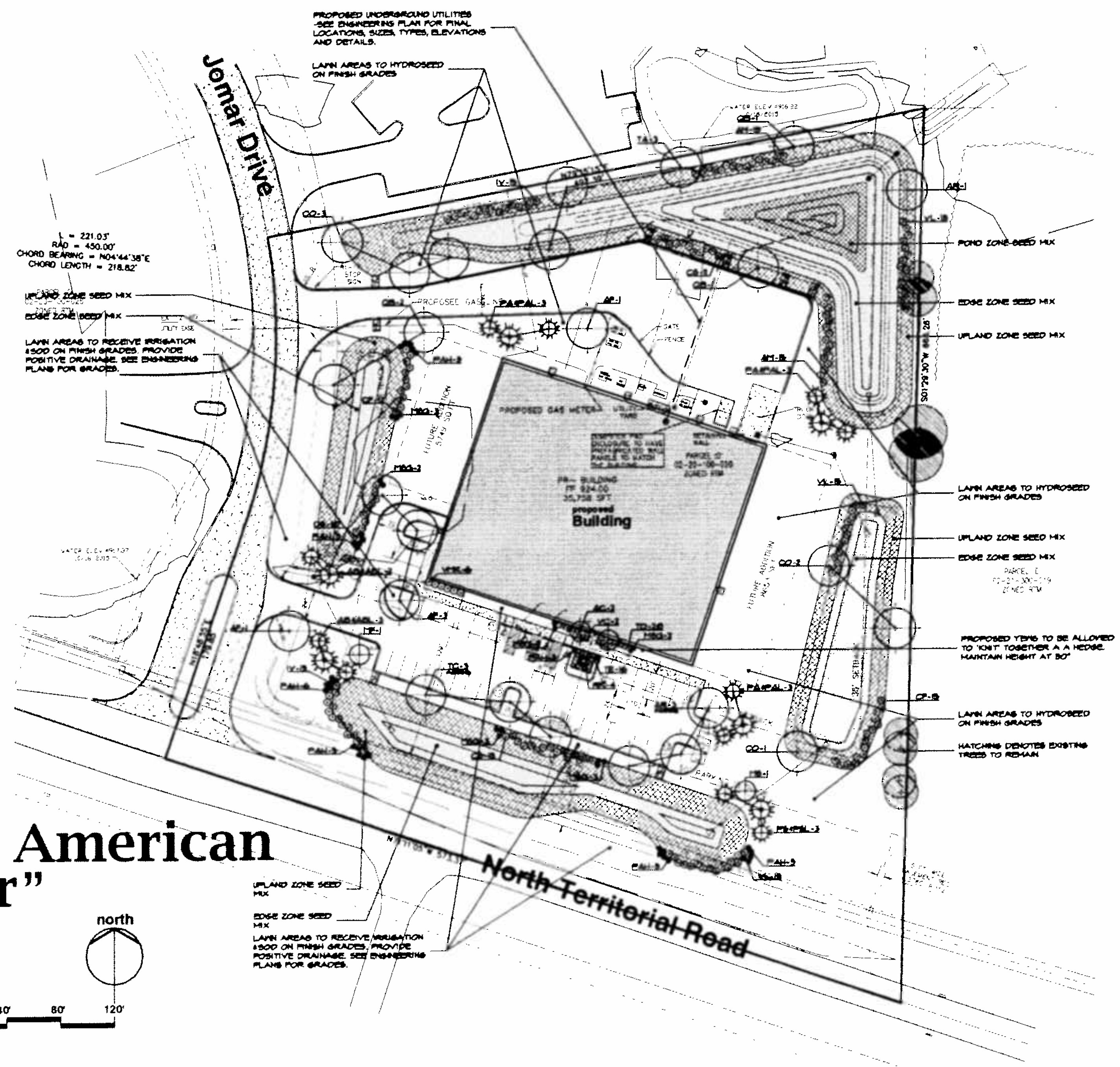
ACS
Design · Construction · Integration
3330 University Avenue, Suite 200
Madison, WI 53705
Tel: (608) 663-1590 Fax: (608) 663-1591
www.acscm.com

FPA
FELINO A. PASCUAL and ASSOCIATES
Community Land Planner and registered Landscape Architect
24333 Orchard Lake Rd. Suite G
Farmington Hills, MI 48336
ph (248) 557-5588
fax (248) 557-5416

rev. ref. no.	issue	date
LS16.035.02	REVIEW	2-24-2016
LS16.035.04	REVIEW	4-24-2016
	TWP	4-13-2016

general landscape notes:

1. LANDSCAPE CONTRACTOR SHALL VISIT THE SITE, INSPECT EXISTING CONDITIONS, REVIEW PROPOSED PLANTINGS AND RELATED WORK. CONTACT THE OWNER AND/OR LANDSCAPE ARCHITECT WITH ANY CONCERNS OR DISCREPANCY BETWEEN THE PLAN, PLANT MATERIAL LIST, AND/OR SITE CONDITIONS.
2. PRIOR TO BEGINING OF CONSTRUCTION ON ANY WORK, CONTRACTORS SHALL VERIFY LOCATIONS OF ALL ON SITE UTILITIES, GAS, ELECTRIC, TELEPHONE, CABLE TO BE LOCATED BY CONTACTING MISS DIG 1-800-482-7171. ANY DAMAGE OR INTERRUPTION OF SERVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COORDINATE ALL RELATED WORK ACTIVITIES WITH OTHER TRADES AND REPORT ANY UNACCEPTABLE JOB CONDITIONS TO OWNER PRIOR TO COMMENCING.
3. NUMERICAL VALUE ON THE LANDSCAPE QUANTITIES SPECIFIED ON THE PLAN TAKE PRECEDENCE OVER GRAPHIC REPRESENTATION. VERIFY ANY CONCERN-DISCREPANCY WITH LANDSCAPE ARCHITECT.
4. ALL CONSTRUCTION AND PLANT MATERIAL LOCATION TO BE ADJUSTED ON SITE IF NECESSARY.
5. ALL SUBSTITUTIONS OR DEVIATIONS FROM THE LANDSCAPE PLAN MUST BE APPROVED BY NORTHFIELD TOWNSHIP AND LANDSCAPE ARCHITECT.
6. ALL LARGE TREES AND EVERGREENS TO BE STAKED, GUYED AND WRAPPED AS DETAIL SHOWN ON PLAN.
7. PLANT BEDS TO BE DRESSED WITH MIN. 3" OF FINELY DOUBLE SHREDDED HARDBARK MULCH.
8. DIG SHRUB PITS 1' LARGER THAN SHRUB ROOT BALLS AND TREE PITS 2' LARGER THAN ROOT BALL. BACK FILL WITH ONE PART TOP SOIL AND ONE PART SOIL FROM EXCAVATED PLANTING HOLE.
9. REMOVE ALL TWINE, WIRE AND ALL NON-BIODEGRADABLE MATERIALS FROM THE ROOTBALL. CUT DOWN WIRE BASKET AND FOLD DOWN ALL BURLAP FROM TREE, SHRUB EARTHBALLS AND FROM TREE TRUNKS.
10. NATURAL COLOR, FINELY SHREDDED HARDWOOD BARK MULCH REQUIRED FOR ALL PLANTINGS. 4" THICK BARK MULCH FOR TREES IN 4' DIA. CIRCLE WITH 3" PULLED AWAY FROM TRUNK, 3" THICK BARK MULCH FOR SHRUBS AND 2" THICK BARK MULCH FOR PERENNIALS.
11. PLANT MATERIAL QUALITY & INSTALLATION SHALL BE IN ACCORDANCE WITH THE CURRENT AMERICAN ASSOCIATION OF NURSERYMEN LANDSCAPE STANDARDS.
12. PROVIDE PEAT SOD FOR ALL NEW AND DISTURBED LAWN AREAS UNLESS NOTED OTHERWISE.
13. ALL PLANTING AREAS TO BE PREPARED WITH APPROPRIATE SOIL MIXTURES AND FERTILIZER BEFORE PLANT INSTALLATION.
14. PLANT TREES AND SHRUBS GENERALLY NO CLOSER THEN THE FOLLOWING DISTANCES FROM SIDEWALKS, CURBS AND PARKING STALLS:
    a.) SHADE TREES ———— 5 FT.
    b.) ORNAMENTAL AND EVERGREEN TREES (CRAB, PINE, SPRUCE, ETC.) ———— 10 FT.
    c.) SHRUBS THAT ARE LESS THAN 1 FOOT TALL AND WIDE AT MATURITY. ———— 2 FT.
15. NO TREES OR EVERGREENS TO BE INSTALLED OVER ANY PROPOSED OR EXISTING UTILITY LINES AS SHOWN ON THE OVERALL LANDSCAPE PLAN. SEE ENGINEERING PLANS FOR EXACT LOCATION AND DETAILS.
16. ALL LAWN AREAS AND LANDSCAPE BEDS TO BE FULLY IRRIGATED WITH A AUTOMATIC UNDERGROUND SYSTEMS. IRRIGATION SYSTEM TO HAVE SEPARATE ZONES FOR LAWN AREAS, PARKING ISLANDS, AND SHRUB BEDS WITH DIFFERENT CONTROL MOISTURE LEVEL ADJUSTMENT PER ZONE AS REQUIRED.
17. UNLESS NOTED OTHERWISE, LANDSCAPE BEDS ADJACENT TO LAWN TO RECIEVE EDGING. EDGING SHALL BE 4" X 1/8" METAL (FINISH BLACK OR GREEN) OR APPROVED EQUAL AND TO BE INSTALLED WITH HORIZONTAL METAL STAKES AT 32" O.C. OR PER MANUFACTURER'S SPECIFICATION.
18. ALL LANDSCAPE BEDS ADJACENT AND NEXT TO BUILDING SHALL BE EXCAVATED OF ALL BUILDING MATERIALS AND POOR SOILS A MIN. OF 12"-18" DEPTH. BACK FILL WITH GOOD, MEDIUM TEXTURED PLANTING SOILS. ADD A MIN. 4" OF TOPSOIL OVERFILL TO FINISH GRADE. PROVIDE POSITIVE DRAINAGE.
19. WATERING OF ALL PLANTS AND TREES TO BE PROVIDED IMMEDIATELY AND MULCHING WITHIN 24 HOURS AFTER INSTALLATION.
20. ALL TREE PITS TO BE TESTED FOR PROPER DRAINAGE PRIOR TO TREE PLANTING. PROVIDE APPROPERATES DRAINAGE SYSTEM AS REQUIRED IF THE TREE PIT DOES NOT DRAIN SUFFICIENTLY.
21. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL LANDSCAPE PLANT MATERIALS AND IRRIGATION INSTALLATION FOR A PERIOD OF ONE YEAR BEGINNING AFTER THE COMPLETION OF LANDSCAPE INSTALLTION DATE APPROVED BY THE TOWNSHIP/CITY OR LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL REPLACE DURING AND AT THE END OF THE GUARANTEE PERIOD, ANY DEAD OR UNACCEPTABLE PLANTS, AS DETERMINED BY THE TOWNSHIP/CITY OR LANDSCAPE ARCHITECT, WITHOUT COST TO THE OWNER.
22. ALL DEAD OR DISEASED PLANT MATERIALS SHALL BE REMOVED AND REPLACED WITHIN SIX (6) MONTHS AFTER IT DIES OR IN THE NEXT PLANTING SEASON, WHICHEVER OCCURS FIRST. THE PLANTING SEASON FOR DECIDUOUS SHALL BE BETWEEN MARCH 1, JUNE 1, AND OCTOBER 1 UNTIL THE PREPARED SOIL BECOMES FROZEN. THE PLANTING SEASON FOR EVERGREEN PLANTS SHALL BE BETWEEN MARCH 1 AND JUNE 1. PLANT MATERIAL INSTALLED TO REPLACE DEAD OR DISEASED MATERIAL SHALL BE AS CLOSE AS PRATICAL TO THE SIZE OF MATERIAL IT IS INTENDED TO REPLACE.



landscape plan for:

"Arvin Sango North American Technical Center"

Northfield Township, Michigan

north

scale: 0' 20' 40' 80' 120'
1" = 40'-0"

landscape requirements:

parking lot trees

TOTAL NO. OF NEW PARKING SPACES ———— 45 SPACES

	REQUIRED	PROVIDED
NO. OF PARKING LOT TREES (1-TREE PER 8-SPACES REQUIRED = 45-SPACES/8=6 TREE REQUIRED)	6 TREES	6 TREES

greenbelt

NO. OF TREES	TWP. REVIEW	10
NO. OF SHRUBS	TWP. REVIEW	30+

detention ponds

NO. OF TREES	TWP. REVIEW	11
NO. OF SHRUBS	TWP. REVIEW	136

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Northfield Township, Michigan
North Territorial Road & Jomar Drive

BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

Do Not scale drawings. Use figured dimensions only.

DRAWN BY: JP, AP
SCALE: 1"=40'-0"
DATE: 4-11-2016
SHEET TITLE: LANDSCAPE PLAN

L-1

JOB NUMBER: LS16.035.02
SHEET NUMBER: 1 OF 2

plant material list

key	quant. LS-1	botanical name	common name	size	comments
		LARGE AND SMALL DECIDUOUS TREES			
CO	6	CELTIS OCCIDENTALIS	HACKBERRY	2 1/2" B&B	
AF	5	ACER X FREEMANII 'JEFFERSRED'	AUTUMN BLAZE RED MAPLE	2 1/2" B&B	
AR	4	ACER RUBRUM	RED MAPLE	2 1/2" B&B	
TC	[illegible]	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LINDEN	2 1/2" B&B	
QB	[illegible]	QUERCUS BICOLOR	SWAMP WHITE OAK	2 1/2" B&B	
TA	[illegible]	TILIA AMERICANA 'BOULEVARD'	BOULEVARD AMERICAN LINDEN	2 1/2" B&B	
AC	[illegible]	AMELANCHIER X G. 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	[illegible] B&B	MULTI-STEM
MF	1	MALUS FLORIBUNDA	JAPANESE FLOWERING CRABAPPLE	[illegible] B&B	
MS	1	MALUS 'SNOWDRIFT'	SNOWDRIFT CRABAPPLE	[illegible] B&B	
		SHRUBS			
VC	[illegible]	VIBURNUM CARLESII	KOREAN SPICE FRAGRANT VIBURNUM	[illegible] B&B	
AM	[illegible]	ARONIA MELANOCARPA	BLACK CHOKEBERRY	[illegible] B&B	
IV	[illegible]	ILEX VERTICILLATA	MICHIGAN HOLLY	[illegible] B&B	
CS	[illegible]	CORNUS STOLONIFERA	REDTWIG DOGWOOD	[illegible] B&B	
VL	[illegible]	VIBURNUM LENTAGO	NANNYBERRY VIBURNUM	[illegible] B&B	
CF	[illegible]	CORNUS S. 'FLAVIRAMEA'	YELLOWTWIG DOGWOOD	[illegible] B&B	
VHK	[illegible]	VIBURNUM X B. 'MOHAWK'	MOHAWK VIBURNUM	[illegible] B&B	
RK	4	ROSA 'RADTKOPINK'	PINK DOUBLE KNOCK OUT ROSE	[illegible] CONT.	

key	quant. LS-1	botanical name	common name	size	comments
		LARGE AND SMALL EVERGREENS			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] B&B	[illegible] O.C. SPACING
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] B&B	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] B&B	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] B&B	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] B&B	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] B&B	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] B&B	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] B&B	
[illegible]	[illegible]	[illegible]			
		PERENNIALS AND GRASSES			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] CONT.	
[illegible]	[illegible]	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER'	KARL FOERSTER'S FEATHER REED GRASS	[illegible] CONT.	

basin vegetation notes

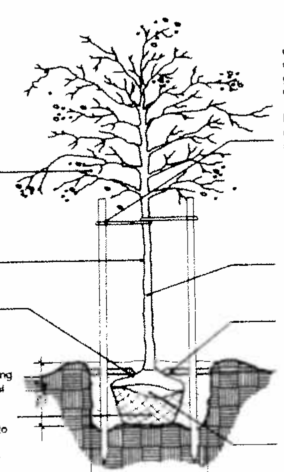
basin construction notes

basin maintenance notes

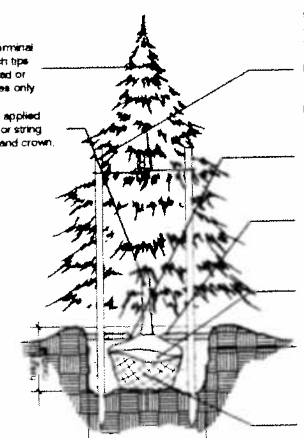
upland zone seed mix

edge zone seed mixtures

pond zone plant list (plugs and bare root)



tree planting detail
no scale



evergreen planting detail
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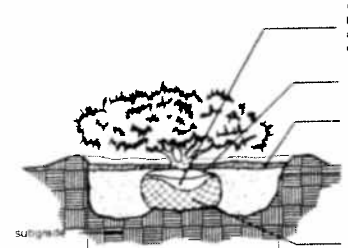

shrub planting detail
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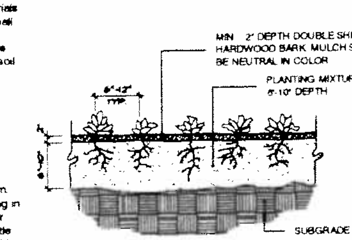

perennial planting detail
no scale

Plant Material List, Planting Details and Notes

ARVIN SANGO, INC.

ACS
Design · Construction · Integration
3330 University Avenue, Suite 200
Madison, WI 53705
Tel: (608) 663-1590 Fax: (608) 663-1591
www.acscm.com

FPA
Felino A. Pascual and Associates
Community Land Planner and registered Landscape Architect
24333 Orchard Lake Rd. Suite G
Farmington Hills, MI 48336
ph (248) 557-5588
fax (248) 557-5416

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LS16.035.04	REVIEW	4-4-2016
	IWP	4-13-2016

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DRAWN BY JP, AP
SCALE 1" = 1'-0"
DATE 4-11-2016

SHEET TITLE
LANDSCAPE PLAN

L-2

JOB NUMBER LS16.035.02
SHEET NUMBER 2 OF 2