SITE DATA

TOTAL ACREAGE OF SITE:	8.929 ACRES
EXISTING IMPERVIOUS AREA	2.769 ACRES
PROPOSED IMPERVIOUS AREA:	3.470 ACRES (38%)
PROPOSED LANDSCAPING:	5.459 ACRES (62%)
DISTANCE TO NEAREST CROSS STREET: (NORTH PROPERTY CORNER TO THE INTERSECTION OF RICHARD AVENUE AND SOUTHWEST BOULEVARD)	194 FEET
TOTAL NUMBER OF PARKING SPACES:	117
NUMBER OF NEW STD. SPACES:	111
NUMBER OF NEW H.C. SPACES:	6
BUILDING SQUARE FOOTAGE:	61,572 SF
CLASSROOM SQUARE FOOTAGE:	21,840 SF

ZONING

EXISTING ZONING: SD-1 EDUCATIONAL
PROPOSED ZONING: SD-1 EDUCATIONAL

SITE PLAN NOTES:

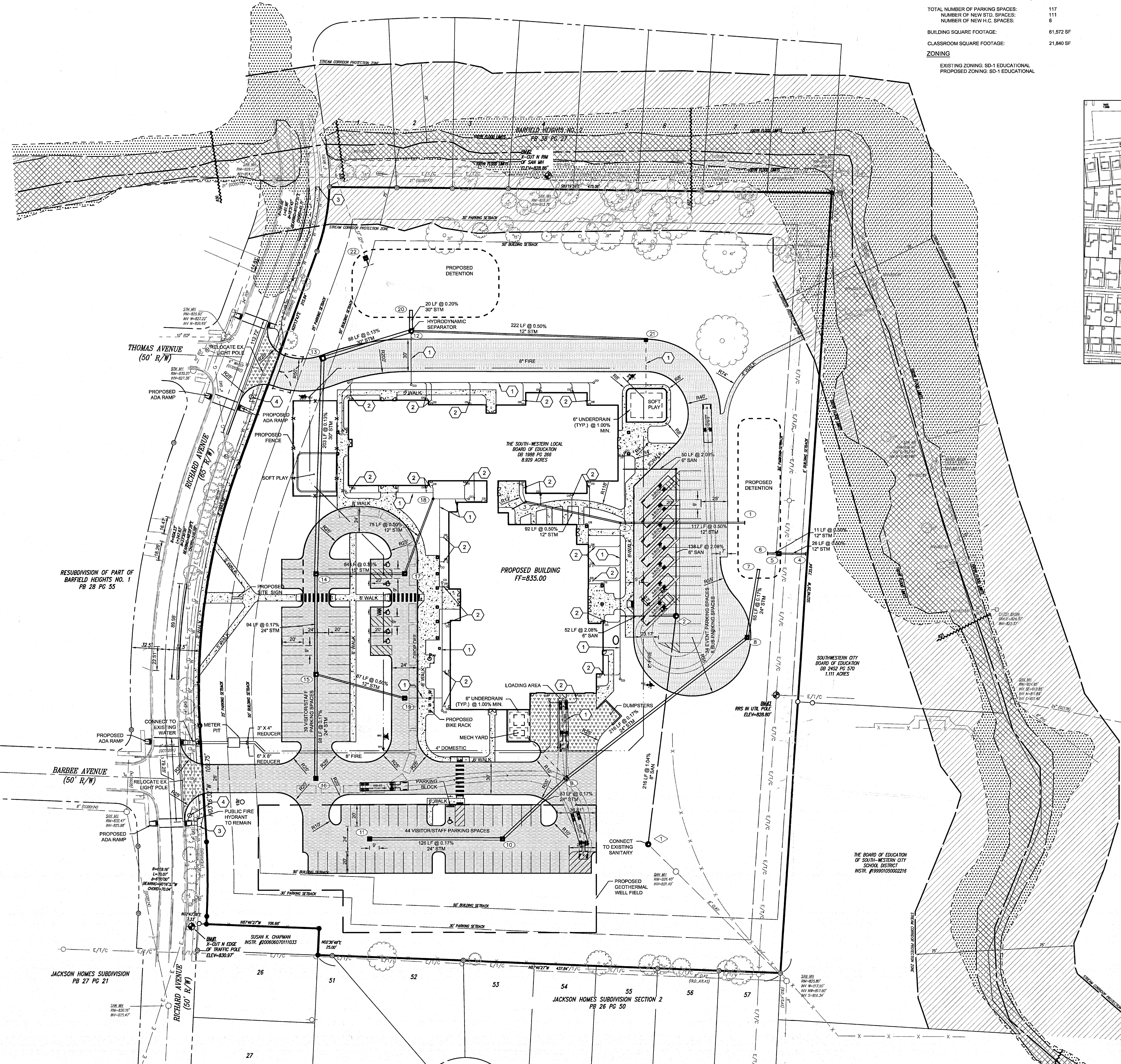
1. SIDEWALK WITHIN RIGHT-OF-WAY THAT IS TO BE REMOVED AND REPLACED DUE TO UTILITY INSTALLATION OR ENTRANCE DRIVE CONSTRUCTION SHALL BE PER C-GC-46A.
2. PIPING WITHIN THE RIGHT-OF-WAY CONNECTING TO PUBLIC STORM SEWER SHALL BE INSTALLED WITH GRANULAR TYPE A BACKFILL PER C-GC-26.
3. PROPOSED DRIVE ENTRANCES WITHIN RIGHT-OF-WAY TO BE CONSTRUCTED PER C-GC-41B.
4. CURB AND GUTTER WITHIN RIGHT-OF-WAY AT PROPOSED DRIVE ENTRANCES ALONG RICHARD AVE. TO BE REMOVED AND REPLACED PER C-GC-57B/C-GC-41A. SIDEWALKS CROSSING THE PREPAVED ENTRANCES SHALL BE ADA COMPLAINT PER C-GC-46.
5. ALL ROOFTOP MOUNTED SERVICE/MECHANICAL EQUIPMENT SHALL BE PAINTED TO MATCH THE BRICK COLOR.

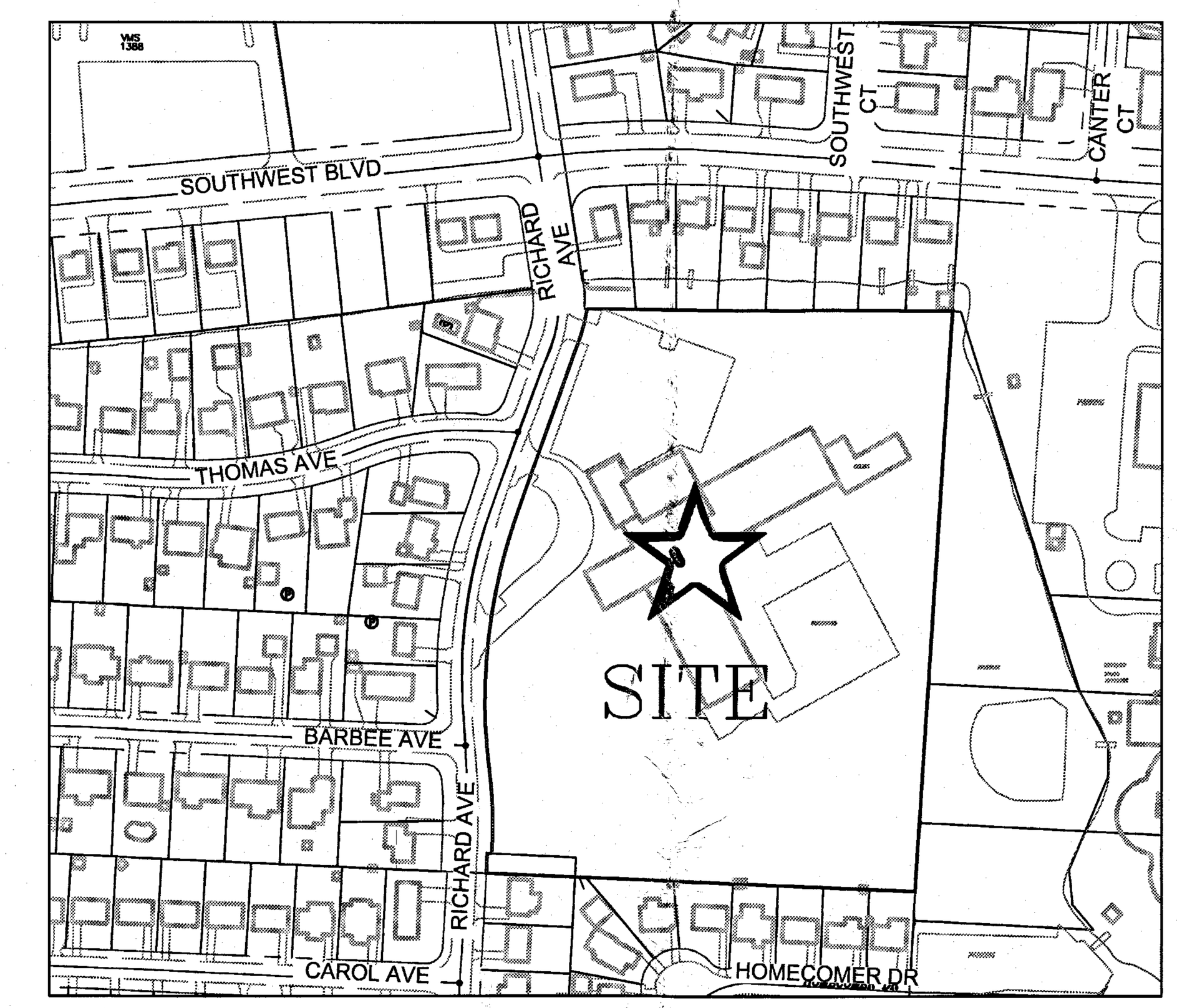
UTILITY NOTES

1. ALL ENDWALLS SHALL BE PER CITY OF GROVE CITY STANDARD DRAWING C-GC-23.
2. ALL HEADWALLS SHALL HAVE STONE FACING CONSISTING OF NORTH SHORE BUFF LIMESTONE PER CITY OF GROVE CITY REQUIREMENTS.
3. PORTIONS OF THE SITE ARE WITHIN THE 100-YEAR FLOODPLAIN ACCORDING TO FEMA MAP NO. 39049C0314K. PROPOSED CONSTRUCTION ACTIVITIES SHALL NOT ENCROACH INTO FLOODPLAIN.
4. ALL WATERMAIN CROSSINGS SHALL MAINTAIN A VERTICAL SEPARATION OF 18" MINIMUM. SANITARY SEWER SHALL BE LOCATED A MINIMUM OF 18" BELOW WATERMAIN AT ALL CROSSINGS.

PROJECT NARRATIVE:

THE PROPOSED RICHARD AVENUE SCHOOL WILL BE LOCATED ON THE SAME SITE AS THE EXISTING ELEMENTARY SCHOOL. THE PROJECT WILL BEGIN WITH INSTALLING REQUIRED EROSION CONTROL ITEMS. ONCE EROSION CONTROL ITEMS ARE IN PLACE, DEMOLITION OF THE EXISTING BUILDING AND PARKING LOTS WILL TAKE PLACE. FOLLOWING DEMOLITION, TOP SOIL WILL BE STRIPED AND STOCK PILED AND MAINTAINED WITH TEMPORARY SEEDING THROUGH THE COMPLETION OF THE PROJECT, MASS GRADING FOR THE BUILDING PAD AND PARKING WILL BE PERFORMED. THIS PROJECT INCLUDES THE INSTALLATION OF SITE UTILITIES (INCLUDING NEW STORM SYSTEMS, SANITARY SERVICE, AND WATER LINES). REQUIRED EROSION CONTROL MEASURES WILL BE INSTALLED AS WORK PROGRESSES. FOLLOWING THE COMPLETION OF SITE UTILITIES AND THE BUILDING PAD, ASPHALT PAVING FOR PARKING LOTS WILL BE PLACED ALONG WITH THE INSTALLATION OF CONCRETE WALKS AROUND THE SITE. TO COMPLETE THE PROJECT, THE SITE WILL BE STABILIZED WITH LANDSCAPING AND PERMANENT SEEDING.





LOCATION MAP

STORM SCHEDULE

HW-1
N: 688692.85
E: 1806110.13
GROVE CITY STANDARD
ENDWALL C-CG-23
INV=828.25 (12") W

YD-2
N: 688692.81
E: 1805992.65
YARD DRAIN
GRATE=834.49
INV IN=828.84 (12") S
INV IN=828.84 (12") W
INV OUT=828.84 (12") E

YD-3
N: 688712.51
E: 1805903.26
YARD DRAIN
GRATE=834.53
INV IN=828.84 (8") N
INV IN=829.97 (4") SW
INV OUT=829.30 (12") E

HW-4
N: 688663.19
E: 1806168.17
GROVE CITY STANDARD
ENDWALL C-CG-23
INV=827.07 (12") W

CB-5
N: 688663.61
E: 1806142.56
GROVE CITY STANDARD
INLET C-CG-4 (2'X2')
GRATE=829.93
24"X6" WINDOW INV=829.73 (N,S)
24"X6" WINDOW INV=829.27 (W)
INV IN=827.20 (12") W
INV OUT=827.20 (12") E

HW-6
N: 688663.79
E: 1806131.82
GROVE CITY STANDARD
HEADWALL C-CG-24
6" ORIFICE PLATE INV=872.25
INV=827.25 (12") E

HW-7
N: 688648.82
E: 1806123.34
GROVE CITY STANDARD
ENDWALL C-CG-23
INV=828.25 (24") S

CB-8
N: 688584.85
E: 1806112.62
GROVE CITY STANDARD
INLET C-CG-4 (3'X3')
GRATE=832.28
INV IN=828.36 (24") SW
INV OUT=828.36 (24") N

CB-9
N: 688452.23
E: 1805941.82
GROVE CITY STANDARD
INLET C-CG-4 (3'X3')
GRATE=833.31
INV IN=828.73 (6") NW
INV IN=828.73 (12") N
INV IN=828.73 (24") SW
INV OUT=828.73 (24") NE

CB-10
N: 688395.23
E: 1805881.59
GROVE CITY STANDARD
INLET C-CG-4 (3'X3')
GRATE=832.37
INV IN=828.87 (24") W
INV OUT=828.87 (24") NE

CB-11
N: 688395.23
E: 1805755.59
GROVE CITY STANDARD
INLET C-CG-4 (3'X3')
GRATE=832.37
INV OUT=829.08 (24") E

MH-12
N: 688872.97
E: 1805794.80
CONTECH CDS3020
WATER QUALITY STRUCTURE
OR APPROVED EQUAL
GRATE=831.58
INV IN=827.14 (30") W
INV IN=827.14 (12") E
INV OUT=827.14 (30") N

CB-13
N: 688847.60
E: 1805710.93
GROVE CITY STANDARD
INLET C-CG-4 (4'X4')
GRATE=831.39
INV IN=827.25 (30") S
INV OUT=827.25 (30") E

CB-14
N: 688644.81
E: 1805704.59
GROVE CITY STANDARD
INLET C-CG-4 (3'X3')
GRATE=831.96
INV IN=828.76 (15") E
INV IN=828.01 (24") S
INV OUT=827.51 (30") N

CB-15
N: 688550.31
E: 1805704.59
GROVE CITY STANDARD
INLET C-CG-4 (3'X3')
GRATE=831.65
INV IN=829.17 (12") E
INV IN=828.17 (24") S
INV OUT=828.17 (24") N

CB-16
N: 688452.23
E: 1805704.59
GROVE CITY STANDARD
INLET C-CG-4 (3'X3')
GRATE=832.20
INV OUT=828.34 (24") N

CB-17
N: 688644.81
E: 1805788.59
GROVE CITY STANDARD
INLET C-CG-4 (2'X2')
GRATE=833.52
INV IN=829.30 (12") N
INV OUT=829.05 (15") W

YD-18
N: 688715.17
E: 1805815.65
YARD DRAIN
GRATE=833.43
INV IN=829.68 (12") N
INV IN=829.88 (12") E
INV OUT=829.68 (12") S

CB-19
N: 688527.73
E: 1805788.59
GROVE CITY STANDARD
INLET C-CG-4 (2'X2')
GRATE=833.05
INV IN=828.55 (12") E
INV OUT=829.60 (12") W

HW-20
N: 688892.53
E: 1805794.80
GROVE CITY STANDARD
ENDWALL C-CG-23
INV=827.10 (30") S

CB-21
N: 688865.63
E: 1806016.82
GROVE CITY STANDARD
INLET C-GC-6
GRATE=832.13
INV IN=827.83 (6") S
INV OUT=828.24 (12") W

CB-22
N: 688941.79
E: 1805751.95
GROVE CITY STANDARD
INLET C-CG-4 (2'X2')
GRATE=830.55
24"X3" WINDOW INV=830.25 (S)
8" ORIFICE INV=828.62
0.918" ORIFICE INV=827.00
INV IN=826.79 (6") S
INV OUT=826.72 (12") N

SANITARY SCHEDULE

MH-2
GROVE CITY STD DWG
C-CG-01
N 688605.09
E 1806045.29
RIM=829.72
INV IN=824.39 (6") W
INV IN=824.39 (6") N
INV OUT=824.22 (8") S

MH-1
GROVE CITY STD DWG
C-CG-01
N 688390.28
E 1806019.17
RIM=826.99
INV IN=821.97 (8") N
INV OUT=822.10 (8") SE

RECEIVED
JUL 23 2014
GC PLANNING COMMISSION

LEGEND

CONCRETE MONUMENT FOUND
5/8" CAPPED IRON PIN SET
5/8" IRON PIN FOUND
1" IRON PIPE FOUND
NAIL SET
BENCHMARK
EX. UTILITY POLE
EX. GUY WIRE
EX. UNDERGROUND ELECTRIC
EX. OVERHEAD ELECTRIC
EX. HVAC UNIT
EX. TRANSFORMER
EX. GROUND LIGHT
EX. ELECTRIC BOX
EX. LIGHT POLE
EX. UNDERGROUND TELEPHONE
EX. OVERHEAD TELEPHONE
EX. TELEPHONE MANHOLE
EX. TELEPHONE PEDESTAL
EX. GAS MAIN
EX. GAS VALVE
EX. UNDERGROUND CABLE TV
EX. WATER MAIN
EX. FIRE HYDRANT
EX. WATER VALVE
EX. WATER METER
EX. IRRIGATION CONTROL VALVE
EX. MANHOLE
EX. CLEAN OUT
EX. SANITARY SEWER
EX. STORM SEWER
EX. CATCH BASIN
EX. INLET
EX. YARD DRAIN
EX. DOWN SPOUT
EX. TRAFFIC CONTROL CABINET
EX. TRAFFIC SIGNAL POLE
EX. SIGN
EX. GUARD POST (PIPE BOLLARD)
EX. FLAG POLE
EX. FENCE
EX. SOIL BORING
EX. HARDWOOD TREE
EX. CONTOUR LINES
EX. CONCRETE
EX. ASPHALT
FLOOD ZONE X
STREAM CORRIDOR PROTECTION ZONE
FLOODWAY
FLOOD ZONE AE
BASE FLOOD ELEVATION

PROPOSED SYMBOLS

FIRE DEPARTMENT CONNECTION
FIRE HYDRANT
PROPOSED CATCH BASIN
PROPOSED STORM MANHOLE
PROPOSED SANITARY MANHOLE
PROPOSED STORM PIPE
PROPOSED SANITARY PIPE
PROPOSED WATER PIPE
PROPOSED ASPHALT PAVEMENT
PROPOSED HEAVY DUTY CONCRETE
PROPOSED CONCRETE WALK

CODED NOTES

1. 12" STM @ 0.50% MIN
2. 8" STM @ 1.00% MIN
3. REMOVE AND REPLACE WALK AT NEAREST JOINT
4. PROPOSED LIGHT POLE LOCATION, CONTRACTOR TO COORDINATE WITH AEP

0 20 40 80

STATE OF OHIO
MICHAEL J. COUVREUR
E-70851
REGISTERED
PROFESSIONAL ENGINEER

THE KLEINGERS GROUP
CIVIL ENGINEERING
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www.kleingers.com
350 Worthington Rd, Ste B
Westerville, OH 43082
614.882.4311

OHIO Utilities Protection SERVICE
811 or 1-800-362-2764 Call Before You Dig

SHP LEADING DESIGN

4805 Montgomery Road Cincinnati, Ohio 45212	Suite 400 513-381-2112
236 High Street Hamilton, Ohio 45011	513-863-5441
250 Civic Center Drive Columbus, Ohio 43215	Suite 200 614-223-2124
1675 Broadway Denver, Colorado 80202	Suite 1300 303-209-7866

City Administrator ________
Service Director ________
Review for the City of Grove City ________
Jackson Township Fire Department ________

DEVELOPMENT PLAN

CITY PROJECT NO. ____________

RICHARD AVENUE ELEMENTARY SCHOOL

3646 Richard Ave., Grove City, Ohio 43123

SOUTH-WESTERN CITY SCHOOL DISTRICT

3805 Marlane Drive, Grove City, OH 43123

SITE PLAN

DATE 07/23/14

C100

EROSION CONTROL LEGEND

- DB — DANDY BAG
- BD — DANDY CURB PROTECTION
- SF — SILT FENCE
- 100 YEAR FLOOD ROUTE
- CONSTRUCTION ENTRANCE
- CWO — CONCRETE WASHOUT
- LIMITS OF DISTURBANCE

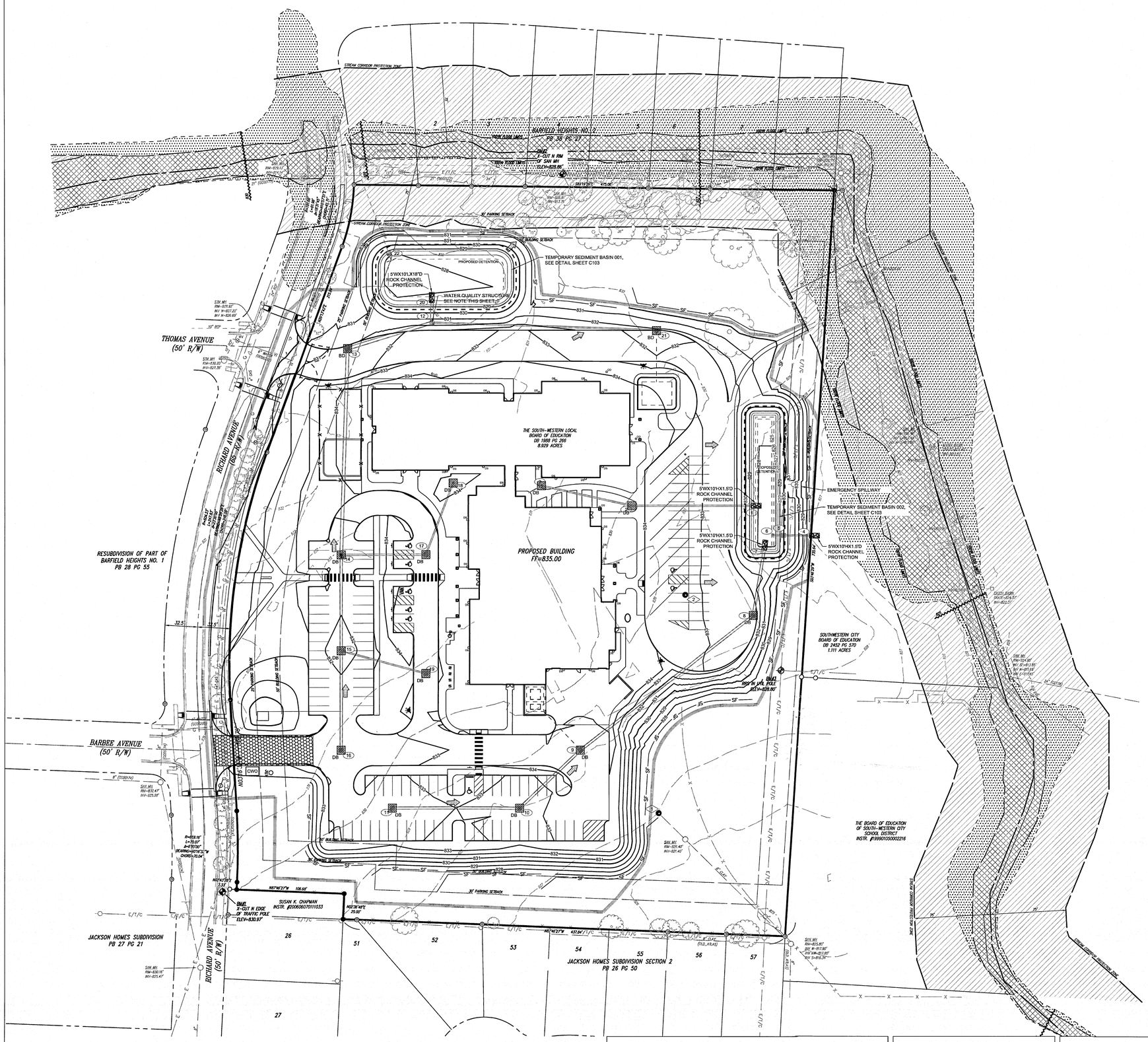
WATER QUALITY TREATMENT STRUCTURE NOTE
WATER QUALITY TREATMENT STRUCTURE SHALL BE A CONTECH CDS3020 6' DIAMETER STRUCTURE OR APPROVED EQUAL. STRUCTURE SHALL HAVE MINIMUM TREATMENT CAPACITY OF 2.0 CFS AND A MINIMUM INTERNAL BYPASS CAPACITY OF 20 CFS.

GRADING LEGEND

- 675 — EX CONTOUR
- 624 — EX CONTOUR
- 825 — PROPOSED CONTOUR
- 824 — PROPOSED CONTOUR

PROPOSED SYMBOLS

- PROPOSED STORM PIPE
- CB — PROPOSED CATCH BASIN
- HW — PROPOSED HEADWALL
- MH — PROPOSED STORM MANHOLE
- YD — PROPOSED YARD DRAIN
- SMH — PROPOSED SANITARY MANHOLE
- FIRE HYDRANT



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City Administrator	
Service Director	
Review for the City of Grove City	
Jackson Township Fire Department	

DEVELOPMENT PLAN
CITY PROJECT NO. _____

RICHARD AVENUE ELEMENTARY SCHOOL
3646 Richard Ave., Grove City, Ohio 43123

SOUTH-WESTERN CITY SCHOOL DISTRICT
3805 Marlane Drive, Grove City, OH 43123

GRADING AND EROSION CONTROL PLAN

DATE 07/23/14

C101

OHIO EPA
NPDES STORMWATER CONSTRUCTION PERMIT
GENERAL PERMIT #OHC000004

PERMITTEE:
SOUTH-WESTERN CITY SCHOOL DISTRICT
3805 MARLANE DRIVE
GROVE CITY, OHIO 43123
(614) 801-3000

OWNER:
SOUTH-WESTERN CITY SCHOOL DISTRICT
3805 MARLANE DRIVE
GROVE CITY, OHIO 43123
(614) 801-3000

NPDES PERMIT: ________

DATE OF ISSUE: ________

CENTER OF PROJECT

LATITUDE: N 39°53'22.43"   LONGITUDE: W 83°04'46.70"

PROJECT DESCRIPTION

NEW ELEMENTARY SCHOOL IN GROVE CITY, FRANKLIN COUNTY, OHIO, INCLUDING THE SCHOOL BUILDING, PLAY FIELDS, PARKING LOTS, SANITARY SEWERS, STORM SEWERS, WATERLINES AND OTHER RELATED UTILITIES. SOIL DISTURBING ACTIVITIES WILL INCLUDE: CLEARING AND GRUBBING INSTALLATION OF EROSION AND SEDIMENT CONTROLS, GRADING, INSTALLATION OF THE SEWERS AND OTHER UTILITIES AND THE PREPARATION FOR FINAL SEEDING.

PROJECT DATA

TOTAL SITE AREA:	8.929 ACRES
TOTAL DISTURBED AREA:	7.13 ACRES
PROPOSED IMPERVIOUS AREA:	3.47 ACRES
EXISTING IMPERVIOUS AREA:	2.77 ACRES
RUNOFF COEFFICIENT FOR PRE-CONSTRUCTION:	C=0.57
RUNOFF COEFFICIENT FOR POST-CONSTRUCTION:	C=0.61
PRIOR LAND USE:	ELEMENTARY SCHOOL
RECEIVING WATER:	BROWN RUN TO SCIOTO BIG RUN TO SCIOTO RIVER
ESTIMATED CONSTRUCTIONS DATES:	DECEMBER 2014 - AUGUST 2016
SOIL TYPES, DESCRIPTIONS:	CsA - CROSBY-URBAN LAND COMPLEX, 0 TO 2 PERCENT SLOPES CsB - CROSBY-URBAN LAND COMPLEX, 2 TO 6 PERCENT SLOPES

EMERGENCY ACTION & SPILL PREVENTION PLAN

THE SCOPE OF WORK COVERED BY THIS PLAN INCLUDES EMERGENCY RESPONSE TO SPILLS, CONTAINMENT OF SPILLED LIQUIDS, EMERGENCY NOTIFICATION NUMBERS, AND SOIL EXCAVATION FOR SPILL CLEAN-UP.

IN THE EVENT OF A SPILL EVENT THE EMPLOYEE SHALL ASSESS THE SPILL AND IMMEDIATELY NOTIFY THE SAFETY OFFICER AND SUPERVISOR IN CHARGE, OR OTHER INDIVIDUALS AS LISTED BELOW.

TITLE	NAME	PHONE NUMBER
SITE SUPERINTENDENT	________	________
OWNER	MARK WALLER	614-801-3133

IMMEDIATELY AFTER NOTIFICATION, THE EMPLOYEE WILL BE DIRECTED BY THE SAFETY OFFICER, OR RESPONSIBLE PARTY TO START CONTAINMENT PROCEDURES TO PREVENT THE MATERIAL FROM REACHING THE STORM SEWERS, DRAINAGE DITCH, AND OTHER OUTLETS USING THE FOLLOWING ACTIONS OR ANY OTHER MEANS NECESSARY WITHOUT COMPROMISING WORKER SAFETY:

1) CLEAR PERSONNEL FROM THE SPILL AREA AND ROPE OFF AREA.
2) STOP THE SPILL.
3) USE SORBENT MATERIALS, PLUG PUTTY, OR HOLE PUTTY AS NECESSARY TO CONTROL THE SPILL AT THE SOURCE.
4) CONSTRUCT A TEMPORARY CONTAINMENT DIKE OF SORBENT MATERIALS OR DIRT TO CONTAIN SPILL.

SPILL KITS WILL BE LOCATED ON THE PROJECT AS DESIGNATED ON THE SWPPP PLAN.

UPON COMPLETION OF CONTAINMENT OPERATIONS, PROPER CLEAN-UP PROCEDURES WILL BE IMPLEMENTED IN ACCORDANCE WITH REGULATORY PROCEDURES.

ADDITIONAL EMERGENCY CONTACT NUMBERS:	24 HOUR PHONE NO.:
____	________
____	________
____	________
OHIO EPA	614-728-3898

GENERAL NOTES

THE CONTRACTOR IS HEREBY ADVISED THAT STRICTER POLLUTION CONTROL STANDARDS AND ENFORCEMENT HAVE BEEN IMPOSED BY THE OHIO EPA SINCE MARCH 10, 2003 AND WITH A REVISION IN APRIL 2008. ALSO, MANY PRIVATE CITIZEN ENVIRONMENTAL GROUPS, WHO HAVE BEEN KNOWN TO FILE CIVIL LEGAL ACTIONS, ARE PRESENT IN THE AREA AND OBSERVE ALL CONSTRUCTION OPERATIONS.

THE CONTRACTOR SHALL INFORM ALL SUBCONTRACTORS OF THE REQUIREMENTS AND RESPONSIBILITIES OF THE SWPPP AND SHALL DOCUMENT ALL SUCH NOTIFICATIONS AND/OR DISCUSSIONS. ALL SUBCONTRACTORS SHALL SIGN THE NOI.

THE CONTRACTOR WILL BE REQUIRED TO PARTICIPATE IN SEDIMENT AND EROSION CONTROL INSPECTIONS ON A WEEKLY BASIS AND SIGN AN APPROVED INSPECTION SHEET THAT SHALL BE KEPT ON FILE AT THE JOB SITE.

UNLESS OTHERWISE NOTED, STANDARDS AND SPECIFICATIONS ESTABLISHED IN THE LATEST EDITION OF THE ODNR "RAINWATER AND LAND DEVELOPMENT" HANDBOOK SHALL GOVERN THE EROSION AND SEDIMENT CONTROL INSTALLATIONS SPECIFIED ON THIS PLAN.

THIS PROJECT WILL INVOLVE SEVERAL CONSTRUCTION PHASES AND SEQUENCING THROUGHOUT ITS LIFETIME. IT IS VERY IMPORTANT THAT ALL TEMPORARY SEDIMENT AND EROSION CONTROL (S&EC) FIELD METHODS ALONG WITH THIS PLAN, ARE UPDATED TO REFLECT THE ACTUAL FIELD CONDITIONS, CURRENT WEATHER CONDITIONS AND SITE GRADE CHANGES. THE CONTRACTOR, OWNER, ENGINEER OR THE OHIO EPA CAN AND WILL MODIFY THIS PLAN AS NECESSARY.

THE CONTRACTOR WILL VOLUNTARILY SELF REPORT ANY POTENTIAL VIOLATIONS OF THE OEPA NPDES PERMIT TO THE OWNER, ENGINEER AND THE OEPA.

THE CONTRACTOR SHALL REMOVE EXISTING GROUND COVER ONLY AS NECESSARY FOR THE PROJECT PHASE CURRENTLY UNDER CONSTRICTION.

CONSTRUCTION AND DEMOLITION DEBRIS SHALL BE PROPERLY DISPOSED OF ACCORDING TO OHIO EPA REQUIREMENTS.

THE CONTRACTOR WILL BE REQUIRED TO BUILD SEDIMENT BASINS OR SEDIMENT TRAPS OR USE EQUAL METHODS TO DETAIN AND CLEAN WATER TO ACCEPTABLE EPA STANDARDS BEFORE RELEASING THE WATER BACK INTO THE STREAM.

ALL DEWATERING ACTIVITY SHALL BE CARRIED OUT IN ACCORDANCE WITH THE PRACTICES OUTLINED IN PART III.G.2.G.IV OF THE OEPA GENERAL PERMIT.

THERE SHALL BE NO TURBID DISCHARGES TO SURFACE WATERS, RESULTING FROM DEWATERING ACTIVITIES. SEDIMENT-LADEN WATER MUST PASS THROUGH A SETTLING POND, FILTER BAG, OR OTHER COMPARABLE PRACTICE, PRIOR TO DISCHARGE.

NO SOLID OR LIQUID WASTE SHALL BE DISCHARGED INTO STORM WATER RUNOFF.

ALL PROCESS WASTEWATER (EQUIPMENT WASHING, LEACHATE FROM ON-SITE WASTE DISPOSAL, ETC.) SHALL BE COLLECTED AND DISPOSED OF AT A PUBLICLY OWNED TREATMENT WORKS.

ALL CONSTRUCTION ACTIVITIES MUST COMPLY WITH ALL LOCAL EROSION/SEDIMENT CONTROL, WASTE DISPOSAL, SANITARY AND HEALTH REGULATIONS.

OTHER EROSION CONTROL ITEMS MAY BE NECESSARY DUE TO ENVIRONMENTAL CONDITIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION AND IMPLEMENTATION OF ADDITIONAL EROSION CONTROL ITEMS, AT THE ENGINEER'S DISCRETION.

NO SOIL, ROCK, DEBRIS OR OTHER MATERIAL SHALL BE DUMPED OR PLACED IN ANY AREAS NOT ADEQUATELY PROTECTED BY EROSION CONTROL INSTALLATIONS.

IT IS PREFERRED TO USE PERMANENT EROSION CONTROL ITEMS AS SHOWN IN THE PLANS TO CONTROL CONSTRUCTION POLLUTION WHEN POSSIBLE. OTHERWISE, THE TEMPORARY POLLUTION PREVENTION ITEMS ARE TO BE USED.

MOST TEMPORARY S&EC METHODS, INCLUDING BUT NOT LIMITED T0, SILT FENCE AND DITCH CHECKS MAY ALL HAVE TO BE PERIODICALLY REMOVED AND REPLACED, OR MOVED FROM THE EXISTING ROAD DITCH OR STRIPPED AREAS AS WORK PROGRESSES. ANY CHANGES SHALL BE NOTED IN THE PLAN BY RED LINE AND DATED ON A CORRECTIVE ACTION LOG.

ALL TEMPORARY SEDIMENT CONTROLS AND STORM WATER QUALITY METHODS WILL BE BUILT/INSTALLED AS THE PROJECT PROGRESSES TO ELIMINATE UNNECESSARY DISTURBANCE AND REDUNDANCY. ALL TEMPORARY CONTROLS SHALL BE IN PLACE AND FUNCTIONING PROPERLY WHEN THREATENING WEATHER IS IMMINENT.

"TEMPORARY STABILIZATION" MEANS THE ESTABLISHMENT OF TEMPORARY VEGETATION, MULCHING, GEOTEXTILES, SOD, PRESERVATION OF EXISTING VEGETATION AND OTHER TECHNIQUES CAPABLE OF QUICKLY ESTABLISHING COVER OVER DISTURBED AREAS TO PROVIDE EROSION CONTROL BETWEEN CONSTRUCTION OPERATIONS.

"PERMANENT STABILIZATION" MEANS THE ESTABLISHMENT OF PERMANENT VEGETATION, DECORATIVE LANDSCAPE MULCHING, MATTING, SOD, RIP RAP AND LANDSCAPING TECHNIQUES TO PROVIDE PERMANENT EROSION CONTROL ON AREAS WHERE CONSTRUCTION OPERATIONS ARE COMPLETE OR WHERE NO FURTHER DISTURBANCE IS EXPECTED FOR AT LEAST A YEAR.

OFF-SITE TRACKING OF SEDIMENTS SHALL BE MINIMIZED. A STABILIZED CONSTRUCTION ENTRANCE WILL BE PROVIDED TO HELP REDUCE VEHICLE TRACKING OF SEDIMENTS. ALL PAVED STREETS ADJACENT TO THE SITE WILL BE SWEPT DAILY TO REMOVE ANY EXCESS MUD, DIRT OR ROCK TRACKED FROM THE SITE. DUMP TRUCKS HAULING MATERIAL FROM THE CONSTRUCTION SITE WILL BE COVERED WITH A TARP.

OPERATION SEQUENCE FOR TEMPORARY AND PERMANENT BMP INSTALLATION

TO COMPLETE THE EXCAVATION AND CONSTRUCTION OF THE PROPOSED JOB IMPROVEMENTS, COORDINATION OF THE CONTRACTOR'S WORK CREWS WILL BE REQUIRED. TEMPORARY SEDIMENT CONTROL AND STORAGE DURING THE PROPOSED CONSTRUCTION WILL OCCUR IN TEMPORARY SEDIMENT BASIN, LOCATED IN THE PROPOSED DETENTION BASIN. WORK WILL GENERALLY PROCEED FROM DOWNSTREAM TO UPSTREAM IN THESE WORK AREAS. MUDDY WATER FROM EXCAVATED AREAS SHOULD BE PUMPED INTO DIVERSION CHANNELS THAT DISCHARGE INTO THE TEMPORARY SEDIMENT BASIN.

CONSTRUCTION WILL START IN DECEMBER 2014 WITH THE CONSTRUCTION OF PROPOSED DETENTION BASINS AND TEMPORARY SEDIMENT BASINS. FOLLOWING THE INSTALLATION OF ALL EROSION CONTROL ITEMS, DEMOLITION OF EXISTING STRUCTURES WILL BEGIN, FOLLOWED BY CONSTRUCTION OF THE PROPOSED SCHOOL BUILDING, ALL PROPOSED UTILITIES, AND ALL PROPOSED SITE IMPROVEMENTS. ACTIVITIES FOR CONSTRUCTION WILL INCLUDE MASS GRADING, EXCAVATION AND TRENCHING.

THE GENERAL CONSTRUCTION SEQUENCE IS AS FOLLOWS:

A. INSTALL PERIMETER EROSION CONTROL ITEMS AND INLET PROTECTION EXISTING STRUCTURES.
B. DEMOLISH EXISTING BUILDING AND PAVEMENT AREAS. REMOVE, CUT AND CAP ALL UTILITIES.
C. STRIP TOPSOIL AND UNSUITABLE MATERIAL ACROSS THE SITE. STOCKPILE TOPSOIL ONSITE AND MAINTAIN WITH TEMPORARY SEEDING.
D. INSTALL ALL TEMPORARY SEDIMENT CONTROLS WITHIN 24 HOURS FOLLOWING THE STRIPPING OPERATION. USE TEMPORARY DIVERSION CHANNELS TO ROUTE RUNOFF TO SEDIMENT BASIN PRIOR TO THE INSTALLATION OF THE PROPOSED STORM SEWER SYSTEM.
E. PERFORM MASS GRADING FOR BUILDING PAD AND PARKING AREAS.
F. INSTALL SITE UTILITIES AND INSTALL INLET PROTECTION STRUCTURES AS WORK PROGRESSES.
G. ANY DISTURBED OR EXPOSED AREAS SHALL BE STABILIZED PER OEPA TEMPORARY AND PERMANENT STABILIZATION REGULATIONS INCLUDING:
   1. SEEDING   2. DITCH MATTING   3. INLET PROTECTION
   4. MULCHING   5. WATERING
H. INSTALL FINAL PAVING AND PERMANENT SEEDING.
I. PROVIDE PERMANENT STABILIZATION FOR ANY DISTURBED AREAS AND REMOVE TEMPORARY SEDIMENT CONTROLS, PERIMETER CONTROLS, AND INLET PROTECTION. EXCAVATE ACCUMULATED SEDIMENT FROM SEDIMENT BASIN AND REMOVE SKIMMER DEVICE. STABILIZE DETENTION BASIN AREA.

STABILIZATION PRACTICES

PERMANENT SEEDING AND MULCHING STABILIZATION SHALL BE PROVIDED PER OEPA GUIDELINES AS SET FORTH IN PART II.B OF OHIO EPA PERMIT NO.: OHC000004. (SEE TABLE 1)

TABLE 1: PERMANENT STABILIZATION

AREA REQUIRING PERMANENT STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS
ANY AREAS THAT WILL LIE DORMANT FOR ONE YEAR OR MORE	WITHIN SEVEN DAYS OF THE MOST RECENT DISTURBANCE
ANY AREAS WITHIN 50 FEET OF A SURFACE WATER OF THE STATE AND AT FINAL GRADE	WITHIN TWO DAYS OF REACHING FINAL GRADE
ANY OTHER AREAS AT FINAL GRADE	WITHIN SEVEN DAYS OF REACHING FINAL GRADE WITHIN THAT AREA

TEMPORARY SEEDING AND MULCHING STABILIZATION SHALL BE PROVIDED PER OEPA GUIDELINES AS SET FORTH IN PART II.B OF OHIO EPA PERMIT NO.: OHCO00004. (SEE TABLE 2)

TABLE 2: TEMPORARY STABILIZATION

AREA REQUIRING TEMPORARY STABILIZATION	TIME FRAME TO APPLY EROSION CONTROLS
ANY DISTURBED AREAS WITH 50 FEET OF A SURFACE WATER OF THE STATE AND NOT AT FINAL GRADE	WITHIN TWO DAYS OF THE MOST RECENT DISTURBANCE IF THE AREA WILL REMAIN IDLE FOR MORE THAN 14 DAYS
FOR ALL CONSTRUCTION ACTIVITIES, ANY DISTURBED AREAS THAT WILL BE DORMANT FOR MORE THAN 14 DAYS BUT LESS THAN ONE YEAR, AND NOT WITHIN 50 FEET OF A SURFACE WATER OF THE STATE	WITHIN SEVEN DAYS OF THE MOST RECENT DISTURBANCE WITHIN THE AREA FOR RESIDENTIAL SUBDIVISIONS, DISTURBED AREAS MUST BE STABILIZED AT LEAST SEVEN DAYS PRIOR TO TRANSFER OF PERMIT COVERAGE FOR THE INDIVIDUAL LOT(S).
DISTURBED AREAS THAT WILL BE IDLE OVER WINTER	PRIOR TO THE ONSET OF WINTER WEATHER

ALL TEMPORARY EROSION AND SEDIMENT CONTROL INSTALLATIONS SHALL BE REMOVED WHEN 70% VEGETATION HAS BEEN REACHED.

SEEDING & MULCHING

MULCH AND/OR OTHER APPROPRIATE VEGETATIVE PRACTICES SHALL BE APPLIED TO DISTURBED AREAS WITHIN 7 DAYS OF GRADING IF THE AREA IS TO REMAIN DORMANT (UNDISTURBED) FOR MORE THAN 14 DAYS OR ON AREAS AND PORTIONS OF THE SITE WHICH CAN BE BROUGHT TO FINAL GRADE.

MULCH SHALL CONSIST OF UNROTTED SMALL GRAIN STRAW APPLIED AT THE RATE OF 3 TONS/AC. OR 138 LB./1000 SQ. FT. (TWO TO THREE BALES). THE STRAW MULCH SHALL BE SPREAD UNIFORMLY BY HAND OR MECHANICALLY SO THE SOIL SURFACE IS COVERED. FOR UNIFORM DISTRIBUTION OF HAND-SPREAD MULCH, DIVIDE AREA INTO APPROXIMATELY 1000-SQ.-FT. SECTIONS AND PLACE THREE 45-LB. BALES OF STRAW IN EACH SECTION.

MULCH SHALL BE ANCHORED IMMEDIATELY TO MINIMIZE LOSS BY WIND OR RUNOFF. THE FOLLOWING ARE ACCEPTABLE METHODS FOR ANCHORING MULCH:

1) MECHANICAL-USE A DISK, CRIMPER, OR SIMILAR TYPE TOOL SET STRAIGHT TO PUNCH OR ANCHOR THE MULCH MATERIAL INTO THE SOIL. STRAW MECHANICALLY ANCHORED SHALL NOT BE FINELY CHOPPED BUT BE LEFT GENERALLY LONGER THAN 6 IN.
2) MULCH NETTINGS-USE ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS, FOLLOWING ALL PLACEMENT AND ANCHORING SUGGESTIONS. USE IN AREAS OF WATER CONCENTRATION AND STEEP SLOPES TO HOLD MULCH IN PLACE.
3) ASPHALT EMULSION-FOR STRAW MULCH, APPLY AT THE RATE OF 160 GAL./AC. (0.1 GAL./SY) INTO THE MULCH AS IT IS BEING APPLIED OR AS RECOMMENDED BY THE MANUFACTURE.
4) SYNTHETIC BINDERS-FOR STRAW MULCH, SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRI-TAC), DCA-70, PETROSET, TERRA TACK OR EQUAL MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER.

TEMPORARY SEEDING & MULCHING FOR EROSION CONTROL

SEED TYPE	PER 1000 SQ FT	PER ACRE
PERENNIAL RYEGRASS TALL FESCUE ANNUAL RYEGRASS	1 POUND 1 POUND 1 POUND	40 POUNDS 40 POUNDS 40 POUNDS
SMALL GRAIN STRAW	90 POUNDS	2 TONS
FERTILIZER	6 POUNDS OF 10-10-10 OR 12-12-12	250 POUNDS OF 10-10-10 OR 12-12-12

NOTE: OTHER APPROVED SPECIES MAY BE SUBSTITUTED

WINTER SEEDING & MULCHING

WINTER SEED AND MULCH IS REQUIRED FOR EARTH DISTURBANCE ACTIVITY OPERATIONS OCCURRING BETWEEN OCTOBER 15 AND MARCH 15 AND CAN ONLY BE INSTALLED DURING THAT TIME. ALL STRAW MULCH INCLUDED IN THIS WORK MUST BE EITHER CRIMPED IN PLACE OR INSTALLED WITH A BIODEGRADABLE BONDED FIBER MATRIX. CRIMPED MULCH IS REQUIRED TO BE ANCHORED INTO THE SOIL SURFACE WITH A MECHANICAL CRIMPING IMPLEMENT OR OTHER SUITABLE IMPLEMENT APPROVED BY THE ENGINEER. THE MULCH INCLUDED IN THIS WORK MUST BE CAPABLE OF PROVIDING SUFFICIENT DURABLE PROTECTIVE COVER THAT PROVIDES OEPA NPDES PERMIT COMPLIANT EROSION CONTROL FOR A MINIMUM OF 6 MONTHS. THE USE OF OTHER SEED AND/OR MULCH MATERIALS IN THIS TIME PERIOD REQUIRES SPECIFIC APPROVAL BY THE ENGINEER. THE USE OF WINTER SEEDING AND MULCHING IS NOT AN ACCEPTABLE PRACTICE FOR PROTECTING THE SUBGRADE SURFACE.

STOCKPILE

SILT FENCING SHALL BE INSTALLED AROUND TEMPORARY SPOIL STOCKPILES. THESE STOCKPILES SHALL BE STRAW MULCHED AND/OR TEMPORARILY SEEDED WITHIN 7 WORKING DAYS IF LEFT DORMANT FOR 14 DAYS OR LONGER.

TIMING OF CONTROLS/MEASURES

AS INDICATED IN THE SEQUENCE OF MAJOR ACTIVITIES, CONSTRUCTION ENTRANCE(S) AND SILT FENCE WILL BE CONSTRUCTED PRIOR TO CLEARING OR GRADING OF ANY OTHER PORTIONS OF THE SITE. SEDIMENT CONTROL DEVICES SHALL BE IMPLEMENTED FOR ALL AREAS REMAINING DISTURBED LONGER THAN 14 DAYS AND/OR WITHIN 7 DAYS OF ANY GRUBBING ACTIVITIES. AREAS WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR MORE THAN 14 DAYS WILL BE STABILIZED WITH A TEMPORARY SEED AND MULCH WITHIN 2 DAYS OF THE LAST DISTURBANCE IF THE AREA IS WITHIN 50 FEET OF A STREAM, AND WITHIN 7 DAYS OF THE LAST DISTURBANCE IF THE AREA IS MORE THAN 50 FEET AWAY FROM A STREAM. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN AREA, THAT AREA WILL BE STABILIZED WITH PERMANENT SEED AND MULCH. AFTER THE ENTIRE SITE IS STABILIZED, THE ACCUMULATED SEDIMENT WILL BE REMOVED FROM THE BASIN.

STABILIZATION TYPE	J	F	M	A	M	J	J	A	S	O	N	D
PERMANENT SEEDING			●	●	●	*	*	*	●	●		
DORMANT SEEDING	●	●	●							●	●	●
TEMPORARY SEEDING			●	●	●	*	*	*	●	●		
SODDING			**	**	**	**	**	**	**			
MULCHING	●	●	●	●	●	●	●	●	●	●	●	●

* - IRRIGATION NEEDED
** - IRRIGATION NEEDED FOR 2-3 WEEKS AFTER SOD IS APPLIED

INSPECTIONS

ALL BMPS ON THIS SITE SHALL BE INSPECTED BY THE CONTRACTOR OR DESIGNATED REPRESENTATIVE AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS AFTER A RAIN EVENT OF 0.5 INCHES PER 24 HOUR PERIOD. A RECORD OF THESE INSPECTIONS SHALL BE MAINTAINED IN THE CONSTRUCTION OFFICE WITH THE SWPPP FOR PUBLIC VIEWING. ANY VIOLATIONS WILL BE REPORTED THROUGH THE PROJECT PERSONNEL. A RAIN GAUGE WILL BE LOCATED WITHIN THE PROJECT LIMITS.

FOLLOWING EACH INSPECTION, A CHECKLIST MUST BE COMPLETED AND SIGNED BY THE QUALIFIED INSPECTION PERSONNEL REPRESENTATIVE. AT A MINIMUM, THE INSPECTION REPORT SHALL INCLUDE:

I. THE INSPECTION DATE;
II. NAMES, TITLES, AND QUALIFICATIONS OF PERSONNEL MAKING THE INSPECTION;
III. WEATHER INFORMATION FOR THE PERIOD SINCE THE LAST INSPECTION (OR SINCE COMMENCEMENT OF CONSTRUCTION ACTIVITY IF THE FIRST INSPECTION) INCLUDING A BEST ESTIMATE OF THE BEGINNING OF EACH STORM EVENT, DURATION OF EACH STORM EVENT, APPROXIMATE AMOUNT OF RAINFALL FOR EACH STORM EVENT (IN INCHES), AND WHETHER ANY DISCHARGES OCCURRED;
IV. WEATHER INFORMATION AND A DESCRIPTION OF ANY DISCHARGES OCCURRING AT THE TIME OF THE INSPECTION;
V. LOCATION(S) OF DISCHARGES OF SEDIMENT OR OTHER POLLUTANTS FROM THE SITE;
VI. LOCATION(S) OF BMPS THAT NEED TO BE MAINTAINED;
VII. LOCATION(S) OF BMPS THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION;
VIII. LOCATION(S) WHERE ADDITIONAL BMPS ARE NEEDED THAT DID NOT EXIST AT THE TIME OF INSPECTION; AND
IX. CORRECTIVE ACTION REQUIRED INCLUDING ANY CHANGES TO THE SWP3 NECESSARY AND IMPLEMENTATION DATES.

THE PERMITTEE SHALL MAINTAIN A RECORD OF ALL INSPECTIONS FOR A PERIOD OF 3 YEARS FOLLOWING THE SUBMITTAL OF THE NOTICE OF TERMINATION.

MAINTENANCE

THE CONTRACTOR SHALL MAINTAIN, REPAIR, OR REPLACE ALL EROSION CONTROL INSTALLATIONS AS NEEDED TO ENSURE THE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL REPAIRS TO BMPS SHALL BE MADE WITHIN 3 DAYS (OR SOONER IF POSSIBLE) OF NOTIFICATION OF DEFICIENCIES. IF THE CORRECTIONS ARE NOT MADE WITHIN THE 3 DAY PERIOD, LIQUIDATED DAMAGES MAY BE ASSESSED AS PER THE ODOT CMS SECTION 108.27.

ONGOING INSPECTION OF INSTALLATIONS WILL BE PERFORMED BY THE CONTRACTOR OR DESIGNATED REPRESENTATIVE.

ANY TRAPPED SEDIMENT OR DEBRIS REMOVED DURING CLEANING OF OR REMOVAL OF BMP INSTALLATIONS SHALL BE PLACED IN AREAS NOT SUBJECT TO EROSION AND PERMANENTLY STABILIZED.

SPILL PREVENTION

MATERIAL MANAGEMENT PRACTICES:

THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT WILL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES TO STORM WATER RUNOFF.

GOOD HOUSEKEEPING:

THE FOLLOWING GOOD HOUSEKEEPING PRACTICES WILL BE FOLLOWED ONSITE DURING THE CONSTRUCTION PROJECT.

1. AN EFFORT WILL BE MADE TO STORE ONLY ENOUGH PRODUCT REQUIRED TO DO THE JOB.
2. ALL MATERIALS STORED ONSITE WILL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE.
3. PRODUCTS WILL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THE ORIGINAL MANUFACTURER'S LABEL.
4. SUBSTANCES WILL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.
5. WHENEVER POSSIBLE, ALL OF A PRODUCT WILL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
6. MANUFACTURERS' RECOMMENDATIONS FOR PROPER USE AND DISPOSAL WILL BE FOLLOWED.
7. THE SITE SUPERINTENDENT WILL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS ONSITE.

HAZARDOUS PRODUCTS:

THESE PRACTICES ARE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS.

1. PRODUCTS WILL BE KEPT IN ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.
2. ORIGINAL LABELS AND MATERIAL SAFETY DATA WILL BE RETAINED; THEY CONTAIN IMPORTANT PRODUCT INFORMATION.
3. IF SURPLUS PRODUCT MUST BE DISPOSED OF, MANUFACTURERS' OR LOCAL AND STATE RECOMMENDED METHODS FOR PROPER DISPOSAL WILL BE FOLLOWED.

SPILL CONTROL PRACTICES

IN ADDITION TO THE GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTIONS OF THIS PLAN, THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:

1. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY. MANUFACTURERS' RECOMMENDED METHODS FOR SPILL CLEANUP POSTED AND SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.
2. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT IN THE MATERIAL STORAGE AREA ONSITE. EQUIPMENT AND MATERIALS WILL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUST PANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST, AND PLASTIC AND METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE.
3. THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.
4. SPILLS OF TOXIC OR HAZARDOUS MATERIAL WILL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE. SPILLS OF 25 OR MORE GALLONS OF PETROLEUM WASTE MUST BE REPORTED TO OHIO EPA (1-800-282-9378), THE LOCAL FIRE DEPARTMENT, AND THE LOCAL EMERGENCY PLANNING COMMITTEE WITHIN 30 MINUTES OF THE SPILL.
5. SOILS CONTAMINATED BY PETROLEUM OR OTHER CHEMICAL SPILLS MUST BE TREATED/DISPOSED AT AN OHIO EPA APPROVED SOLID WASTE MANAGEMENT FACILITY OR HAZARDOUS WASTE TREATMENT, STORAGE OR DISPOSAL FACILITY (TSDF).
6. THE SPILL PREVENTION PLAN WILL BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM REOCCURRING AND HOW TO CLEAN UP THE SPILL IF THERE IS ANOTHER ONE. A DESCRIPTION OF THE SPILL, WHAT CAUSED IT, AND THE CLEANUP MEASURES WILL ALSO BE INCLUDED.
7. THE SITE SUPERINTENDENT RESPONSIBLE FOR THE DAY-TO-DAY SITE OPERATIONS, WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR. HE WILL DESIGNATE SITE PERSONNEL WHO WILL RECEIVE SPILL PREVENTION AND CLEANUP TRAINING. THESE INDIVIDUALS WILL EACH BECOME RESPONSIBLE FOR A PARTICULAR PHASE OF PREVENTION AND CLEANUP. THE NAMES OF RESPONSIBLE SPILL PERSONNEL WILL BE POSTED IN THE MATERIAL STORAGE AREA AND IN THE OFFICE TRAILER ONSITE.

PRODUCT SPECIFIC PRACTICES

THE FOLLOWING PRODUCT SPECIFIC PRACTICES WILL BE FOLLOWED ONSITE:

PETROLEUM PRODUCTS - ALL ONSITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT SUBSTANCES USED ONSITE WILL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

FUEL STORAGE TANKS SHALL BE LOCATED AWAY FROM SURFACE WATERS AND STORM SEWER SYSTEM INLETS. FUEL TANKS SHALL BE STORED IN A DIKED AREA CAPABLE OF HOLDING 150% OF THE TANK CAPACITY.

FERTILIZERS - FERTILIZERS USED WILL BE APPLIED ONLY IN THE MINIMUM AMOUNTS RECOMMENDED BY THE MANUFACTURER. ONCE APPLIED, FERTILIZER WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORM WATER. STORAGE WILL BE IN A COVERED SHED. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER WILL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.

PAINTS - ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM BUT WILL BE PROPERLY DISPOSED OF ACCORDING TO MANUFACTURERS' INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.

CONCRETE TRUCKS - CONCRETE TRUCKS WILL NOT BE ALLOWED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH WATER ON THE SITE.

DUST CONTROL

DUST CONTROL INVOLVES PREVENTING OR REDUCING DUST FROM EXPOSED SOILS OR OTHER SOURCES DURING LAND DISTURBING, DEMOLITION AND CONSTRUCTION ACTIVITIES TO REDUCE THE PRESENCE OF AIRBORNE SUBSTANCES WHICH MAY PRESENT HEALTH HAZARDS, TRAFFIC SAFETY PROBLEMS OR HARM ANIMAL OR PLANT LIFE.

THE FOLLOWING SPECIFICATIONS FOR DUST CONTROL SHALL BE FOLLOWED ONSITE:

1. VEGETATIVE COVER AND/MULCH - APPLY TEMPORARY OR PERMANENT SEEDING AND MULCH TO AREAS THAT WILL REMAIN IDLE FOR OVER 14 DAYS. SAVING EXISTING TREES AND LARGE SHRUBS WILL ALSO REDUCE SOIL AND AIR MOVEMENT ACROSS DISTURBED AREAS. SEE TEMPORARY SEEDING; PERMANENT SEEDING; MULCHING PRACTICES; AND TREE AND NATURAL AREA PROTECTION PRACTICES.
2. WATERING - SPRAY SITE WITH WATER UNTIL THE SURFACE IS WET BEFORE AND DURING GRADING AND REPEAT AS NEEDED, ESPECIALLY ON HAUL ROADS AND OTHER HEAVY TRAFFIC ROUTES. WATERING SHALL BE DONE AT A RATE THAT PREVENTS DUST BUT DOES NOT CAUSE SOIL EROSION. WETTING AGENTS SHALL BE UTILIZED ACCORDING TO MANUFACTURERS INSTRUCTIONS.
3. SPRAY-ON ADHESIVES - APPLY ADHESIVE ACCORDING TO THE FOLLOWING TABLE OR MANUFACTURERS' INSTRUCTIONS.

I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

SITE SUPERINTENDENT ________ DATE ____
COMPANY

STATE OF OHIO — MICHAEL J. COUVREUR — E-70851 — REGISTERED PROFESSIONAL ENGINEER

THE KLEINGERS GROUP
CIVIL ENGINEERING | SURVEYING | LANDSCAPE ARCHITECTURE
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236 High Street, Hamilton, Ohio 45011 — 513-863-5441
250 Civic Center Drive, Columbus, Ohio 43215 — Suite 200, 614-223-2124
1675 Broadway, Denver, Colorado 80202 — Suite 1300, 303-209-7866

City Administrator ________
Service Director ________
Review for the City of Grove City ________
Jackson Township Fire Department ________

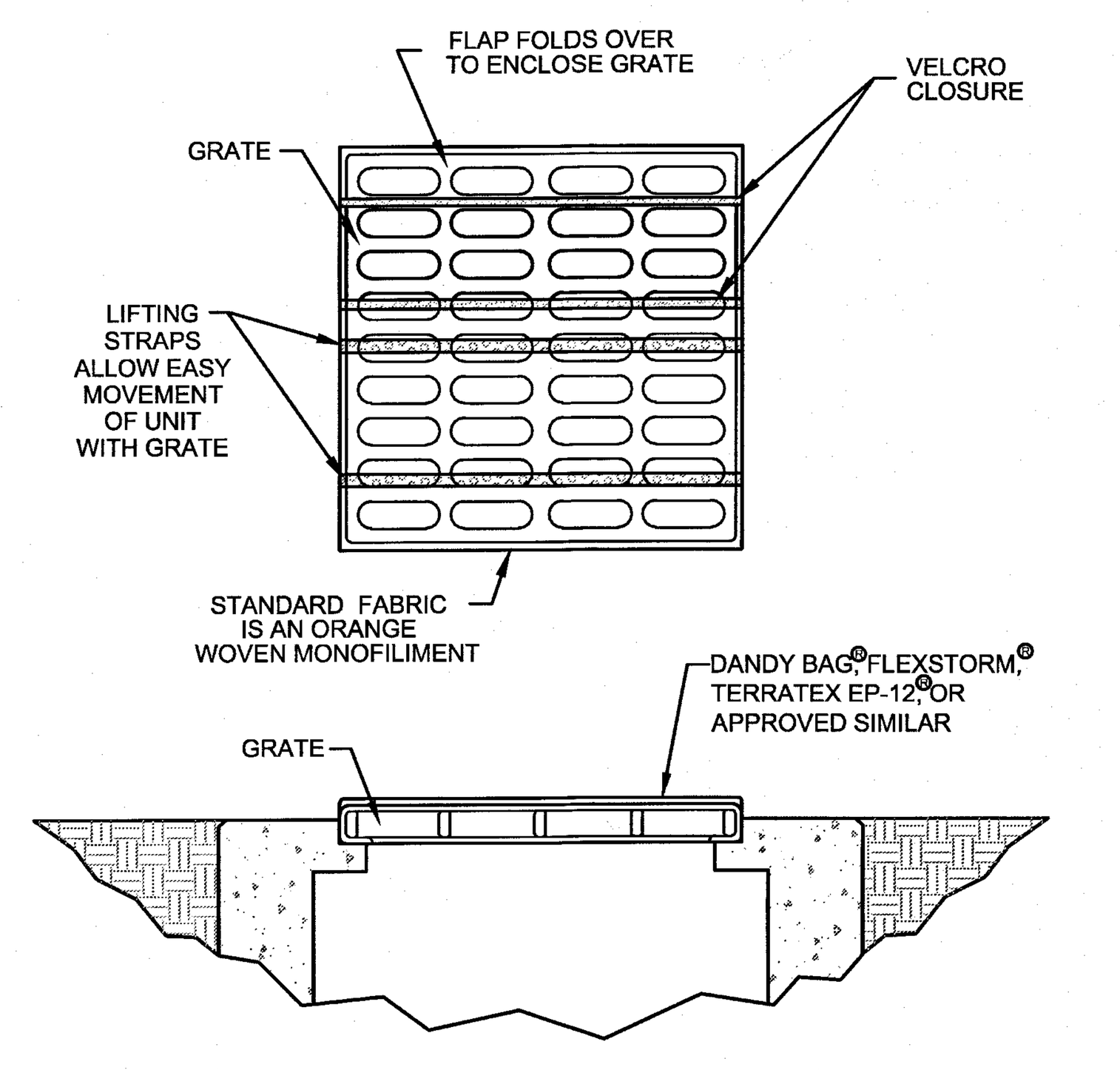
DEVELOPMENT PLAN
CITY PROJECT NO. ________

RICHARD AVENUE ELEMENTARY SCHOOL
3646 Richard Ave., Grove City, Ohio 43123

SOUTH-WESTERN CITY SCHOOL DISTRICT
3805 Marlane Drive, Grove City, OH 43123

EROSION CONTROL NOTES

DATE 07/23/14



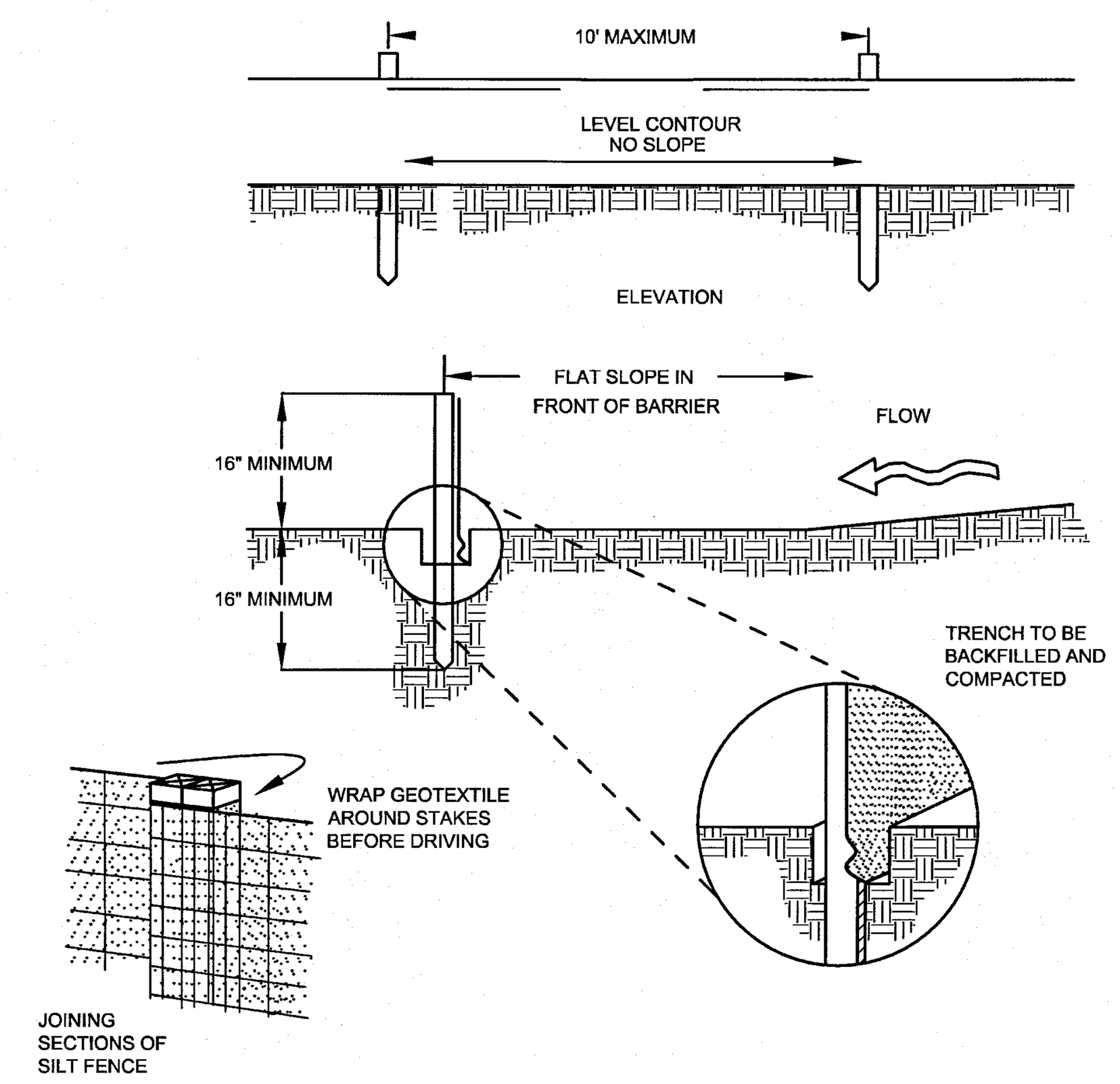
DANDY BAG®*
N.T.S.

INSTALLATION AND MAINTENANCE GUIDELINES

INSTALLATION: THE EMPTY DANDY BAG®* SHOULD BE PLACED OVER THE GRATE AS THE GRATE STANDS ON END. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN POUCH, ON THE BOTTOM (BELOW-GRADE SIDE) OF THE UNIT. ATTACH ABSORBENT PILLOW TO TETHER LOOP. TUCK THE ENCLOSURE FLAP INSIDE TO COMPLETELY ENCLOSE THE GRATE. HOLDING THE LIFTING DEVICES (DO NOT RELY ON LIFTING DEVICES TO SUPPORT THE ENTIRE WEIGHT OF THE GRATE), PLACE THE GRATE INTO ITS FRAME.

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM SURFACE AND VICINITY OF UNIT AFTER EACH STORM EVENT. REMOVE SEDIMENT THAT HAS ACCUMULATED WITHIN THE CONTAINMENT AREA OF THE DANDY BAG®* AS NEEDED. IF USING OPTIONAL OIL ABSORBENTS; REMOVE AND REPLACE ABSORBENT PILLOW WHEN NEAR SATURATION.

* FLEXSTORM®, TERRATEX EP-12® OR APPROVED EQUAL MAY BE USED IN LIEU OF DANDY BAG®



SILT FENCE (SF)
N.T.S.

NOTES:

1. SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
2. ALL SILT FENCE SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE SO THAT WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO THAT SMALL SWALES OR DEPRESSIONS WHICH MAY CARRY SMALL CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.
3. ENDS OF THE SILT FENCES SHALL BE BROUGHT UPSLOPE SLIGHTLY SO THAT WATER PONDED BY THE SILT FENCE WILL BE PREVENTED FROM FLOWING AROUND THE ENDS.
4. SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
5. WHERE POSSIBLE, VEGETATION SHALL BE PRESERVED FOR 5 FT. (OR AS MUCH AS POSSIBLE) UPSLOPE FROM THE SILT FENCE. IF VEGETATION IS REMOVED, IT SHALL BE REESTABLISHED WITHIN 7 DAYS FROM THE INSTALLATION OF THE SILT FENCE.
6. THE HEIGHT OF THE SILT FENCE SHALL BE A MINIMUM OF 16 IN. ABOVE THE ORIGINAL GROUND SURFACE.
7. THE SILT FENCE SHALL BE PLACED IN AN EXCAVATED OR SLICED TRENCH CUT A MINIMUM OF 6 IN. DEEP. THE TRENCH SHALL BE CUT WITH A TRENCHER, CABLE LAYING MACHINE, OR OTHER SUITABLE DEVICE WHICH WILL ENSURE AN ADEQUATELY UNIFORM TRENCH DEPTH.
8. THE SILT FENCE SHALL BE PLACED WITH THE STAKES ON THE DOWNSLOPE SIDE OF THE GEOTEXTILE. A MINIMUM OF 8 IN. OF GEOTEXTILE MUST BE BELOW THE GROUND SURFACE. EXCESS MATERIAL SHALL LAY ON THE BOTTOM OF THE 6-IN.-DEEP TRENCH. THE TRENCH SHALL BE BACKFILLED AND COMPACTED ON BOTH SIDES OF THE FABRIC.
9. SEAMS BETWEEN SECTION OF SILT FENCE SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST WITH A MINIMUM 6 IN. OVERLAP PRIOR TO DRIVING INTO THE GROUND, (SEE DETAIL).
10. MAINTENANCE--SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSE FLOW THROUGH THE GEOTEXTILE. IF RUNOFF OVERTOPS THE SILT FENCE, FLOWS UNDER THE FABRIC OR AROUND THE FENCE ENDS, OR IN ANY OTHER WAY BECOMES A CONCENTRATED FLOW DISCHARGE, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE: 1) THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED, 2) ACCUMULATED SEDIMENT SHALL BE REMOVED, OR 3) OTHER PRACTICES SHALL BE INSTALLED.

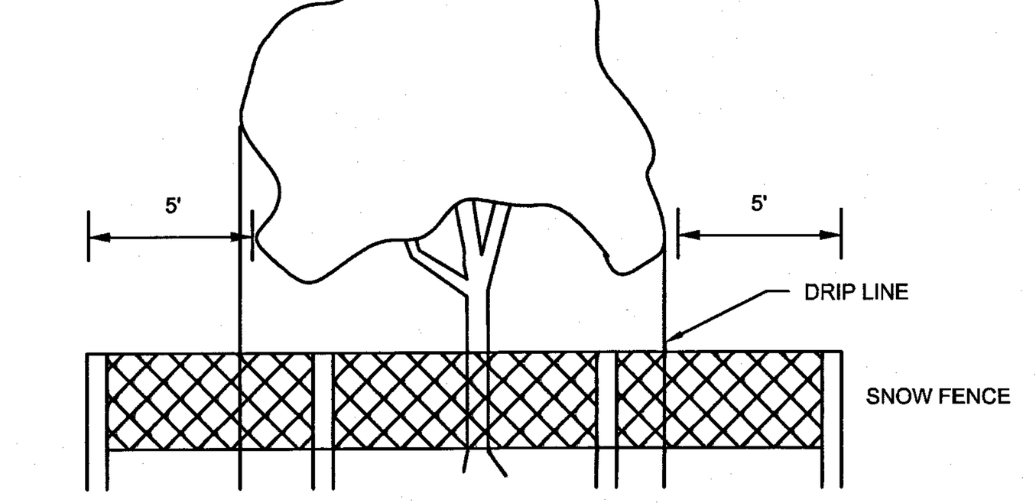
CRITERIA FOR SILT FENCE MATERIALS

1. FENCE POSTS--THE LENGTH SHALL BE A MINIMUM OF 32 IN. LONG. WOOD POSTS WILL BE 2-BY-2-IN. NOMINAL DIMENSIONED HARDWOOD OF SOUND QUALITY. THEY SHOULD BE FREE OF KNOTS, SPLITS, AND OTHER VISIBLE IMPERFECTIONS, THAT WILL WEAKEN THE POSTS. THE MAXIMUM SPACING BETWEEN POSTS SHALL BE 10 FT. POSTS SHALL BE DRIVEN A MINIMUM OF 16 IN. INTO THE GROUND, WHERE POSSIBLE. IF NOT POSSIBLE, THE POSTS SHALL BE ADEQUATELY SECURED TO PREVENT OVERTURNING OF THE FENCE DUE TO SEDIMENT/WATER LOADING.
2. SILT FENCE FABRIC SHALL BE ODOT TYPE C GEOTEXTILE FABRIC OR AS DESCRIBED IN THE CHART BELOW:

FABRIC PROPERTIES AND TESTING METHOD

MINIMUM TENSILE STRENGTH................	120 LBS, ASTM D 4632
MAXIMUM ELONGATION AT 60 LBS................	50%, ASTM D 4632
MINIMUM PUNCTURE STRENGTH................	50 LBS, ASTM D 4833
MINIMUM TEAR STRENGTH................	40 LBS, ASTM D 4533
APPARENT OPENING SIZE................	< 0.84MM, ASTM D 4751
MINIMUM PERMITTIVITY................	$1X10^{-2}$ SEC, ASTM D 4491
ULTRAVIOLET EXPOSURE STRENGTH RETENTION................	70%, ASTM G 4355

* STRAW WATTLES MAY BE USED INSTEAD OF SILT FENCE.

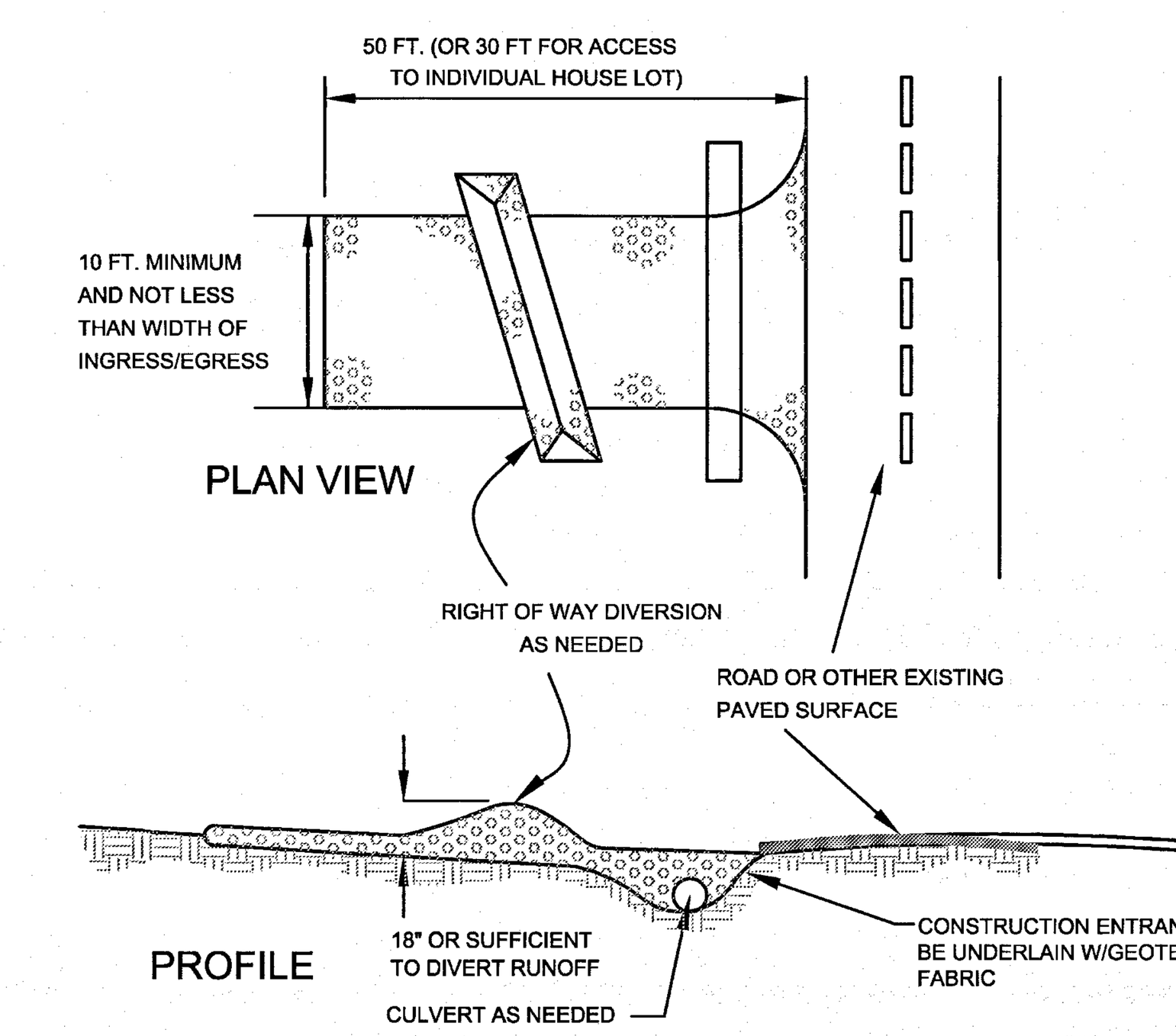


PROTECT EXISTING TREES AND OTHER VEGETATION INDICATED TO REMAIN IN PLACE AGAINST UNNECESSARY CUTTING, BREAKING OR SKINNING OF ROOTS, SKINNING OR BRUISING OF BARK, SMOTHERING OF TREES BY STOCKPILING CONSTRUCTION MATERIALS OR EXCAVATED MATERIALS WITHIN DRIP LINE, EXCESS FOOT OR VEHICULAR TRAFFIC, OR PARKING OF VEHICLES WITHIN DRIP LINE. PROVIDE TEMPORARY GUARDS TO PROTECT TREES AND AND VEGETATION TO BE LEFT STANDING.

PROTECTION OF EXISTING TREES AND VEGETATION
N.T.S.

NOTES:

1. SIGNAGE SHALL CLEARLY IDENTIFY THE TREE AND NATURAL PRESERVATION AREA AND STATE THAT NO CLEARING OR EQUIPMENT IS ALLOWED WITHIN IT.
2. TREE AND NATURAL PRESERVATION AREA SHALL BE FENCED PRIOR TO BEGINNING CLEARING OPERATIONS.
3. FENCE MATERIALS SHALL BE METAL FENCE POSTS WITH SNOW FENCE.
4. FENCE SHALL BE PLACED AS SHOWN ON PLANS AND BEYOND THE DRIP LINE OR CANOPY OF TREES TO BE PROTECTED.
5. IF ANY CLEARING IS DONE AROUND SPECIMEN TREES IT SHALL BE DONE BY CUTTING AT GROUND LEVEL WITH HAND HELD TOOLS AND SHALL NOT BE GRUBBED OR PULLED OUT. NO CLEARING SHALL BE DONE IN BUFFER STRIPS OR OTHER PRESERVED FORESTED AREAS.
6. NO FILLING OR STOCKPILING OF MATERIALS SHALL OCCUR WITHIN THE TREE PROTECTION AREA, INCLUDING DEPOSITION OF SEDIMENT.
7. WHERE UTILITIES MUST RUN THROUGH A TREE'S DRIP LINE, TUNNELING SHOULD BE USED TO MINIMIZE ROOT DAMAGE. TUNNELING SHOULD BE AT A MINIMUM DEPTH OF 24 INCHES FOR TREES LESS THAN 12 INCHES IN DIAMETER OR AT A MINIMUM DEPTH OF 36 INCHES FOR LARGER DIAMETER TREES.
8. WHERE TUNNELING WILL BE PERFORMED WITHIN THE DRIP LINE OF A TREE, THE TUNNEL SHOULD BE PLACED A MINIMUM OF 2 FEET AWAY FROM THE TREE TRUNK TO AVOID TAPROOTS.
9. MINIMIZE EXCAVATION OR TRENCHING WITHIN THE DRIP LINE OF THE TREE. ROUTE TRENCHES AROUND THE DRIP LINE OF TREES.
10. ROOTS 2 INCHES OR LARGER THAT ARE SEVERED BY TRENCHING SHOULD BE SAWN OFF NEATLY IN ORDER TO ENCOURAGE NEW GROWTH AND DISCOURAGE DECAY.
11. SOIL EXCAVATED DURING TRENCHING SHALL BE PILED ON THE SIDE AWAY FROM THE TREE.
12. ROOTS SHALL BE KEPT MOIST WHILE TRENCHES ARE OPEN AND REFILLED IMMEDIATELY AFTER UTILITIES ARE INSTALLED OR REPAIRED.
13. ARBORIST TO DELINEATE DRIP LINE OF TREES TO REMAIN, TO PROTECT WITH FENCING. DO NOT ALLOW WATER PONDING WITHIN DRIP LINE.



CONSTRUCTION ENTRANCE (SCD 2230)

1. STONE SIZED--TWO-INCH STONE SHALL BE USED, OR RECYCLED CONCRETE EQUIVALENT.

2. LENGTH--THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREA BUT NOT LESS THAN 50 FT. (EXCEPT ON SINGLE RESIDENCE LET WHERE A 30-FT. MINIMUM LENGTH APPLIES).

3. THICKNESS--THE STONE LAYER SHALL BE BE AT LEAST 6 IN. THICK.

4. WIDTH--THE ENTRANCE SHALL BE AT LEAST 10 FT. WIDE, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.

5. BEDDING--A GEOTEXTILE SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. IT SHALL HAVE A GRAB TENSILE STRENGTH OF AT LEAST 200 LB. AND A MULLEN BURST STRENGTH OF AT LEAST 190 LB.

6. CULVERT--A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FLOWING ACROSS THE ENTRANCE FROM BEING DIRECTED OUT ONTO PAVED SURFACES.

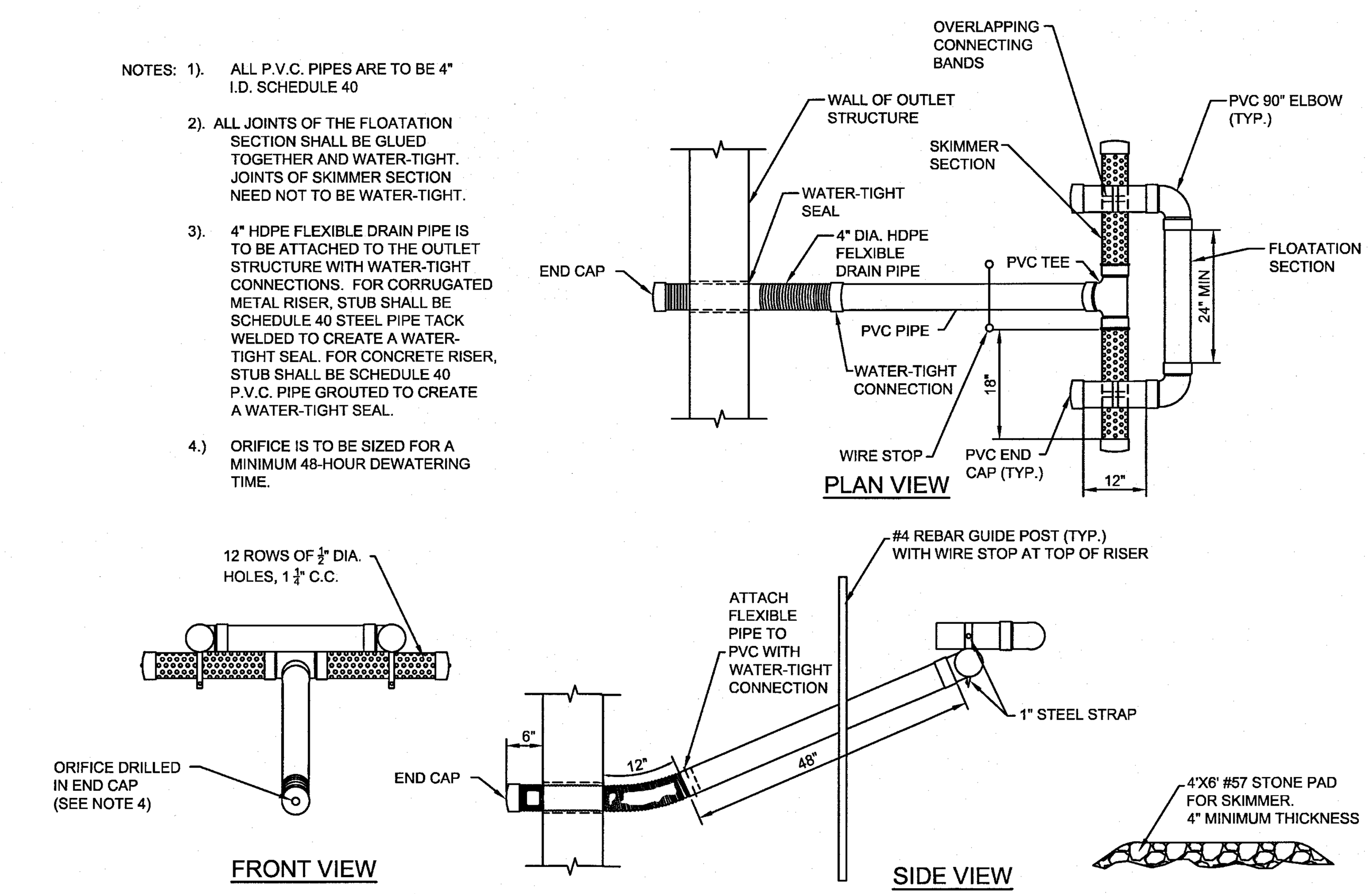
7. WATER BAR--A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES,

8. MAINTENANCE--TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.

9. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION-SITE SHALL BE RESTRICTED FROM MUDDY AREAS.

10. CONSTRUCTION ENTRANCE SIGN--A "CONSTRUCTION ENTRANCE AHEAD" SIGN WILL BE NEEDED FOR EACH DIRECTION, PRIOR TO THE ENTRANCE.

NOTES:
1). ALL P.V.C. PIPES ARE TO BE 4" I.D. SCHEDULE 40
2). ALL JOINTS OF THE FLOATATION SECTION SHALL BE GLUED TOGETHER AND WATER-TIGHT. JOINTS OF SKIMMER SECTION NEED NOT TO BE WATER-TIGHT.
3). 4" HDPE FLEXIBLE DRAIN PIPE IS TO BE ATTACHED TO THE OUTLET STRUCTURE WITH WATER-TIGHT CONNECTIONS. FOR CORRUGATED METAL RISER, STUB SHALL BE SCHEDULE 40 STEEL PIPE TACK WELDED TO CREATE A WATER-TIGHT SEAL. FOR CONCRETE RISER, STUB SHALL BE SCHEDULE 40 P.V.C. PIPE GROUTED TO CREATE A WATER-TIGHT SEAL.
4.) ORIFICE IS TO BE SIZED FOR A MINIMUM 48-HOUR DEWATERING TIME.



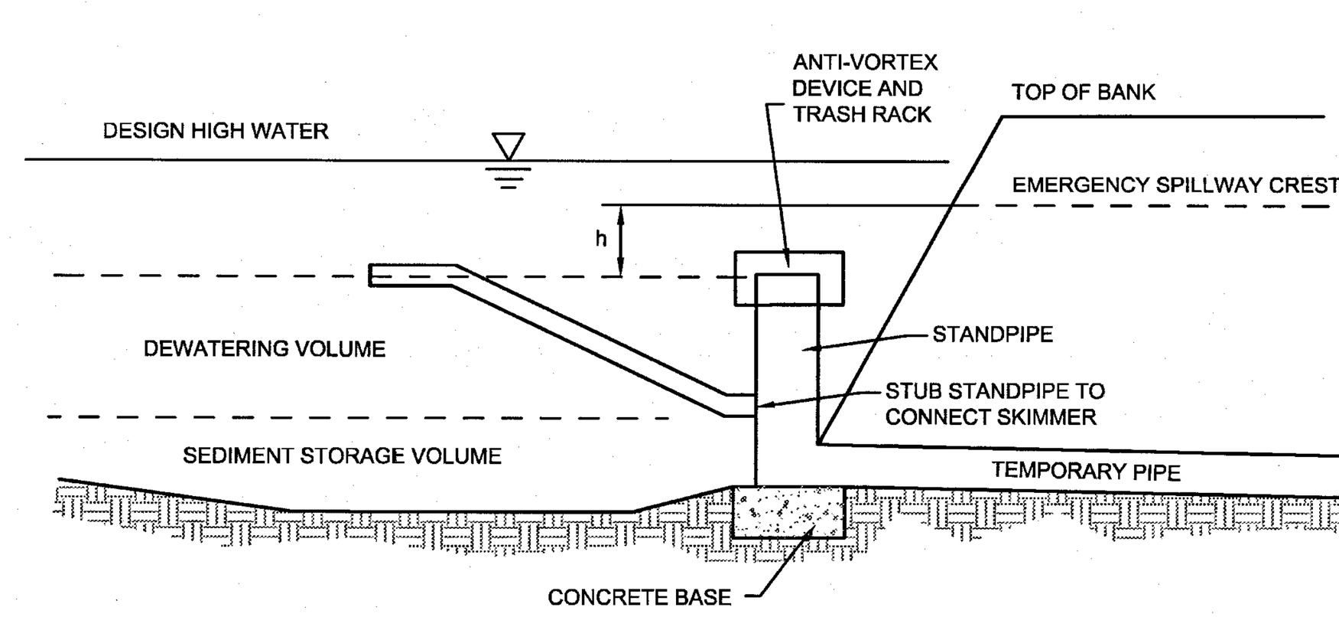
TEMPORARY SEDIMENT BASIN 001 DEWATERING VOLUME
1800 CF PER ACRE OF TOTAL DISTURBED AREA
1800 CF/AC * 2.419 AC = 4,354 CF
2.00" ORIFICE ELEVATION = 827.00
TOP OF BASIN ELEVATION = 828.00
VOLUME PROVIDED = 5,982 CF
DRAWDOWN TIME = 3.73 DAYS

TEMPORARY SEDIMENT BASIN 001 SEDIMENT VOLUME
1000 CF PER ACRE OF TOTAL DISTURBED AREA
1000 CF/AC * 2.419 AC = 2,419 CF
1.00" ORIFICE ELEVATION =827.00
BOTTOM OF BASIN ELEVATION = 825.00
VOLUME PROVIDED = 6,114 CF

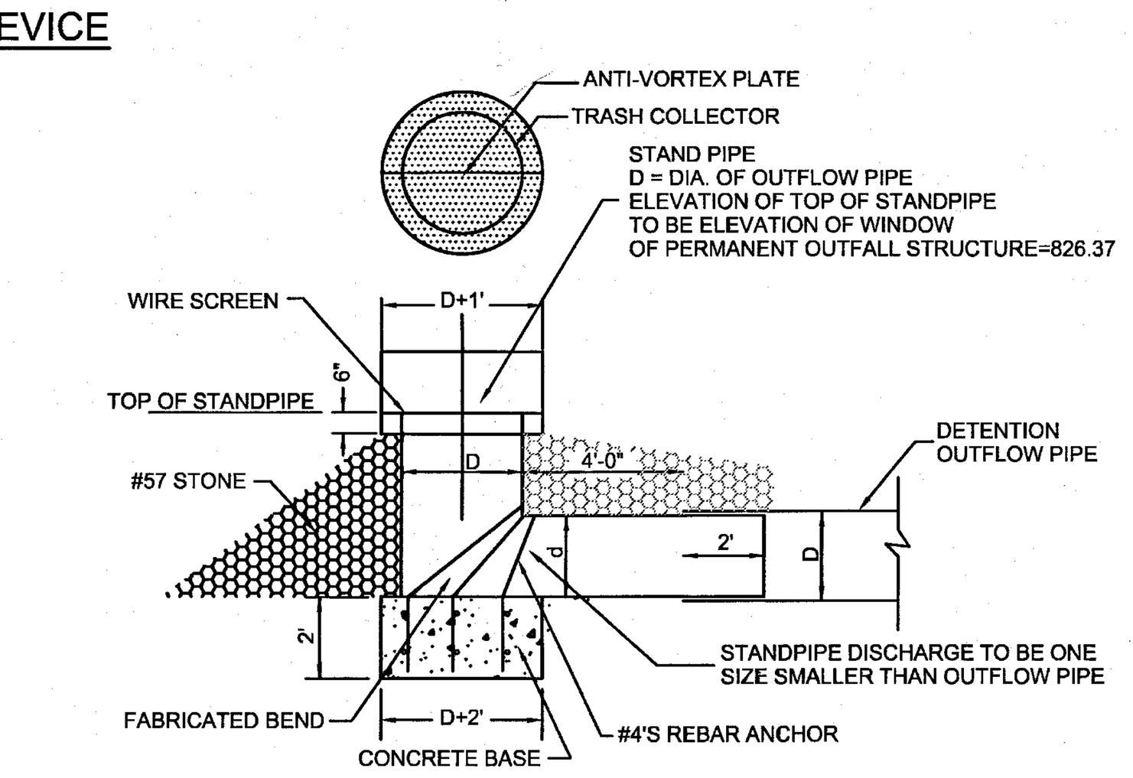
TEMPORARY SEDIMENT BASIN 002 DEWATERING VOLUME
1800 CF PER ACRE OF TOTAL DISTURBED AREA
1800 CF/AC * 2.22 AC =3,996 CF
1.50" ORIFICE ELEVATION = 827.25
TOP OF BASIN ELEVATION = 829.00
VOLUME PROVIDED = 7,077 CF
DRAWDOWN TIME = 2.50 DAYS

TEMPORARY SEDIMENT BASIN 002 SEDIMENT VOLUME
1000 CF PER ACRE OF TOTAL DISTURBED AREA
1000 CF/AC * 2.22 AC = 2,220CF
1.50" ORIFICE ELEVATION = 827.25
BOTTOM OF BASIN ELEVATION = 825.00
VOLUME PROVIDED = 4,624 CF

SKIMMER DEWATERING DEVICE
N.T.S.

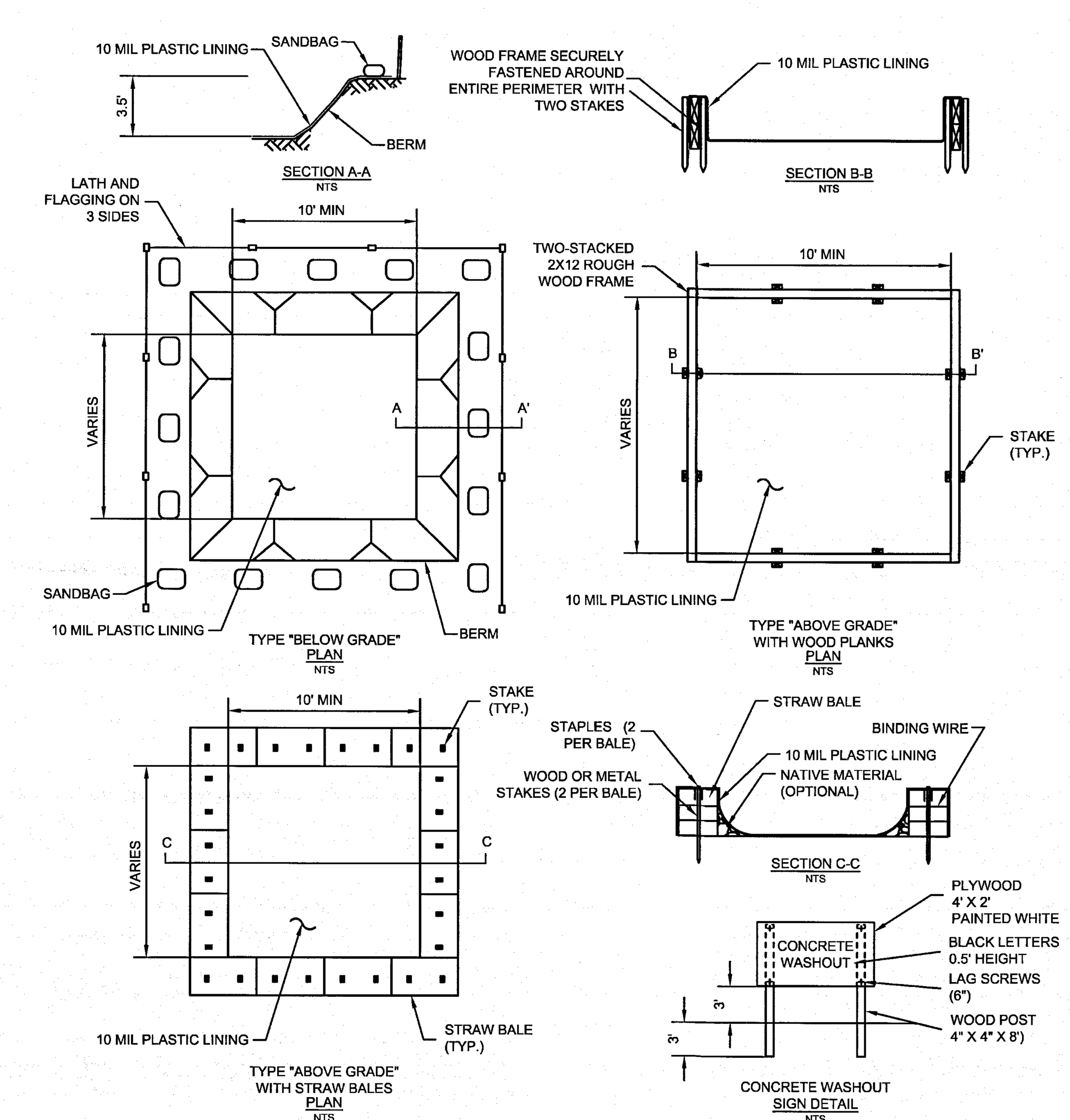


SEDIMENT BASIN OUTLET DETAIL
NTS



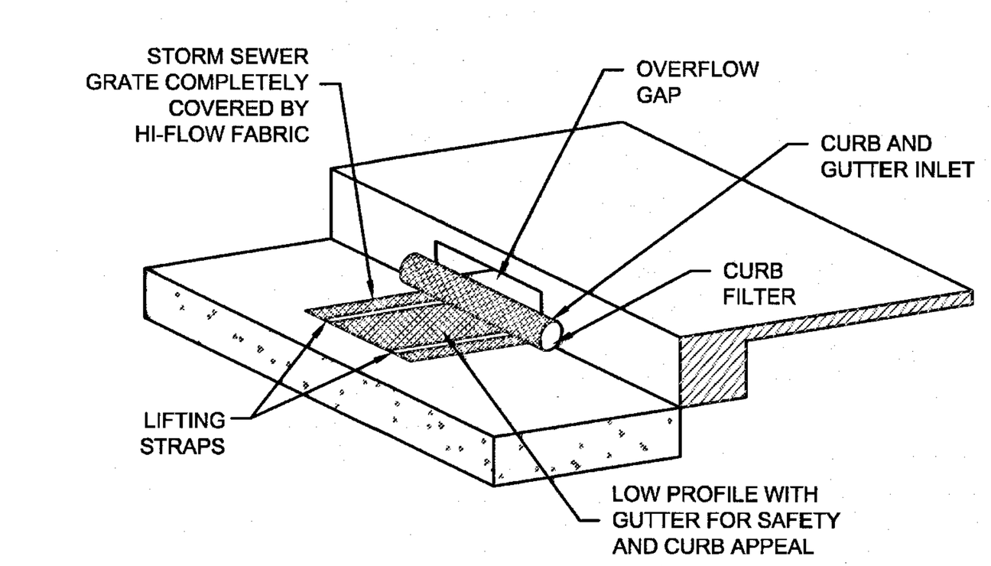
SEDIMENT BASIN TEMPORARY STANDPIPE DETAIL
NTS

TO BE INSTALLED AND REMOVED BY CONTRACTOR WHEN DIRECTED BY CONSTRUCTION MANAGER. AREA THEN TO BE RETURNED TO ITS PERMANENT INTENDED DESIGN CONDITION.



NOTES:
1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

CONCRETE WASHOUT DETAIL
NTS



SPECIFICATIONS

MECHANICAL PROPERTIES	TEST METHOD	UNITS	MARV
GRAB TENSILE STRENGTH	ASTM D 4632	KN (LBS)	1.62 (365) X 0.89 (200)
GRAB TENSILE ELONGATION	ASTM D 4632	%	24 X 10
PUNCTURE STRENGTH	ASTM D 4833	KN (LBS)	0.40 (90)
MULLEN BURST STRENGTH	ASTM D 3786	KPA (PSI)	3097 (450)
TRAPEZOID TEAR STRENGTH	ASTM D 4533	KN (LBS)	0.51 (115) X 0.33 (75)
UV RESISTENCE	ASTM D 4355	%	90
APPARENT OPENING SIZE	ASTM D 4751	MM (US STD SIEVE)	0.425 (40)
FLOW RATE	ASTM D 4491	$1/MIN/M^2$ ($GAL/MIN/FT^2$)	5907 (145)
PERMITTIVITY	ASTM D 4491	SEC^{-1}	2.1

INSTALLATION: STAND GRATE ON END. SLIDE THE DANDY CURB BAG ON WITH DAM ON TOP OF THE GRATE. PULL EXCESS DOWN. LAY UNIT ON ITS SIDE. CAREFULLY TUCK FLAP IN. PRESS VELCRO STRIPS TOGETHER. INSTALL THE UNIT MAKING SURE FRONT EDGE OF GRATE IS INSERTED IN FRAME FIRST THEN LOWER BACK INTO PLACE. PRESS VELCRO DOTS TOGETHER THAT ARE LOCATED UNDER STRAPS TO HOLD STRAPS TO SURFACE OF UNIT.

MAINTENANCE: WITH A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL REMOVE SILT & OTHER DEBRIS OFF SURFACE AFTER EACH EVENT. REMOVE FINE MATERIAL FROM INSIDE ENVELOPE AS NEEDED.

DANDY CURB DETAIL
NTS

STATE OF OHIO
MICHAEL J. COUVREUR
E-70851
REGISTERED PROFESSIONAL ENGINEER

THE KLEINGERS GROUP
CIVIL ENGINEERING
SURVEYING
LANDSCAPE ARCHITECTURE
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SHP
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236 High Street, Hamilton, Ohio 45011 — 513-863-5441
250 Civic Center Drive, Columbus, Ohio 43215 — Suite 200, 614-223-2124
1675 Broadway, Denver, Colorado 80202 — Suite 1300, 303-209-7866

City Administrator ____________
Service Director ____________
Review for the City of Grove City ____________
Jackson Township Fire Department ____________

DEVELOPMENT PLAN
CITY PROJECT NO. ____________

RICHARD AVENUE ELEMENTARY SCHOOL
3646 Richard Ave., Grove City, Ohio 43123

SOUTH-WESTERN CITY SCHOOL DISTRICT
3805 Marlane Drive, Grove City, OH 43123

EROSION CONTROL DETAILS

DATE 07/23/14

C103

NOTES:

1.) OCCUPATION IN GENERAL FITS SURVEY.

2.) SOURCE DOCUMENTS AS NOTED.

3.) ALL MONUMENTATION IS IN GOOD CONDITION UNLESS OTHERWISE NOTED.

4.) BEARINGS ARE BASED ON THE STATE PLANE COORDINATE SYSTEM, (OSPC), OHIO SOUTH ZONE, BASED ON A GPS SURVEY UTILIZING CORS STATION "COLB" AND MONUMENT "S15". THE PROJECT COORDINATES ARE BASED ON OSPC AND HAVE BEEN SCALED TO GROUND BY USING A PROJECT ADJUSTMENT FACTOR OF 1.0000594828 APPLIED AT BASE POINT N 688,700.00 E 1,805,900.00. GRID AND GROUND COORDINATES ARE IDENTICAL AT THE BASE POINT.

5.) VERTICAL DATUM IS NAVD88 BASED ON BM S15.

6.) UTILITIES SHOWN ARE BASED ON PHYSICAL MARKINGS, PLAN INFORMATION PROVIDED BY UTILITY OWNERS, AND LOCATIONS OF ABOVE-GROUND APPURTENANCES. THE OHIO UTILITY PROTECTION SERVICE (OUPS) WAS CONTACTED ON FEBRUARY 21, 2013; OUPS TICKET #A302200137 & A302200139.

8.) THIS DRAWING IS BASED ON AN ACTUAL FIELD SURVEY PERFORMED BY KLEINGERS AND ASSOCIATES IN JANUARY, 2013.

FIRE DEPARTMENT CONNECTION

BARFIELD HEIGHTS NO. 2
PB 38 PG 27

BM#2
X-CUT N RIM OF SAN MH
ELEV=828.86'

S89°19'59"E 475.06'

THOMAS AVENUE (50' R/W)

RICHARD AVENUE (65' R/W)

RESUBDIVISION OF PART OF BARFIELD HEIGHTS NO. 1 PB 28 PG 55

RICHARD AVENUE ELEMENTARY SCHOOL

PLAYGROUND

THE SOUTH-WESTERN LOCAL BOARD OF EDUCATION DB 1988 PG 266 8.929 ACRES

SOUTHWESTERN CITY BOARD OF EDUCATION DB 2452 PG 570 1.111 ACRES

BM#3
RRS IN UTIL POLE
ELEV=828.80'

THE BOARD OF EDUCATION OF SOUTH-WESTERN CITY SCHOOL DISTRICT INSTR. #199901050002216

BARBEE AVENUE (50' R/W)

R=669.16'
L=70.07'
Δ=6°00'00"
BEARING=N07°6'32"W
CHORD=70.04'

N02°43'28"E 7.33'

N87°46'27"W 106.68'

BM#1
X-CUT N EDGE OF TRAFFIC POLE
ELEV=830.97'

SUSAN K. CHAPMAN INSTR. #200606070111033

N02°36'48"E 25.00'

N87°46'27"W 437.84'

JACKSON HOMES SUBDIVISION PB 27 PG 21

JACKSON HOMES SUBDIVISION SECTION 2 PB, 26 PG 50

26 27 51 52 53 54 55 56 57

0 20 40 60
SCALE: 1"=40'

NORTH

LEGEND

- CONCRETE MONUMENT FOUND
- 5/8" CAPPED IRON PIN SET
- 5/8" IRON PIN FOUND
- 1" IRON PIPE FOUND
- NAIL SET
- BENCHMARK
- EX. UTILITY POLE
- EX. GUY WIRE
- EX. UNDERGROUND ELECTRIC
- EX. OVERHEAD ELECTRIC
- EX. HVAC UNIT
- EX. TRANSFORMER
- EX. GROUND LIGHT
- EX. ELECTRIC BOX
- EX. LIGHT POLE
- EX. UNDERGROUND TELEPHONE
- EX. OVERHEAD TELEPHONE
- EX. TELEPHONE MANHOLE
- EX. TELEPHONE PEDESTAL
- EX. GAS MAIN
- EX. GAS VALVE
- EX. UNDERGROUND CABLE TV
- EX. WATER MAIN
- EX. FIRE HYDRANT
- EX. WATER VALVE
- EX. WATER METER
- EX. IRRIGATION CONTROL VALVE
- EX. MANHOLE
- EX. CLEAN OUT
- EX. SANITARY SEWER
- EX. STORM SEWER
- EX. CATCH BASIN
- EX. INLET
- EX. YARD DRAIN
- EX. DOWN SPOUT
- EX. TRAFFIC CONTROL CABINET
- EX. TRAFFIC SIGNAL POLE
- EX. SIGN
- EX. GUARD POST (PIPE BOLLARD)
- EX. FLAG POLE
- EX. FENCE
- EX. SOIL BORING
- EX. HARDWOOD TREE
- EX. CONTOUR LINES
- EX. CONCRETE
- EX. ASPHALT

I HEREBY CERTIFY THAT THIS PLAT IS BASED UPON A FIELD SURVEY MADE UNDER MY DIRECTION.

Michael L. Keller 7/22/14

MICHAEL L. KELLER DATE
OHIO PROFESSIONAL SURVEYOR NO. 7978

STATE OF OHIO · MICHAEL L. KELLER · 7978 · REGISTERED PROFESSIONAL SURVEYOR

KLEINGERS & ASSOCIATES
350 Worthington Rd. Suite B, Westerville, OH 43082
(614) 882-4311 Fax (614) 882-4479
www.KLEINGERS.com

REVISIONS

BOUNDARY & TOPOGRAPHIC SURVEY
RICHARD AVENUE ELEMENTARY SCHOOL
VMS NO. 1388
GROVE CITY, FRANKLIN COUNTY, OHIO
FOR: SOUTH-WESTERN CITY SCHOOLS

SCALE: 1"=40'
DATE: 02/26/13
DRAWN: MLK
DESIGNED:
CHECKED: MLK
XREF:
JOB NO.: 120157.001

SWCS RICHARD AVE E.S.

THE KLEINGERS GROUP
CIVIL ENGINEERING | SURVEYING | LANDSCAPE ARCHITECTURE
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City Administrator _____
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DEVELOPMENT PLAN
CITY PROJECT NO. _____

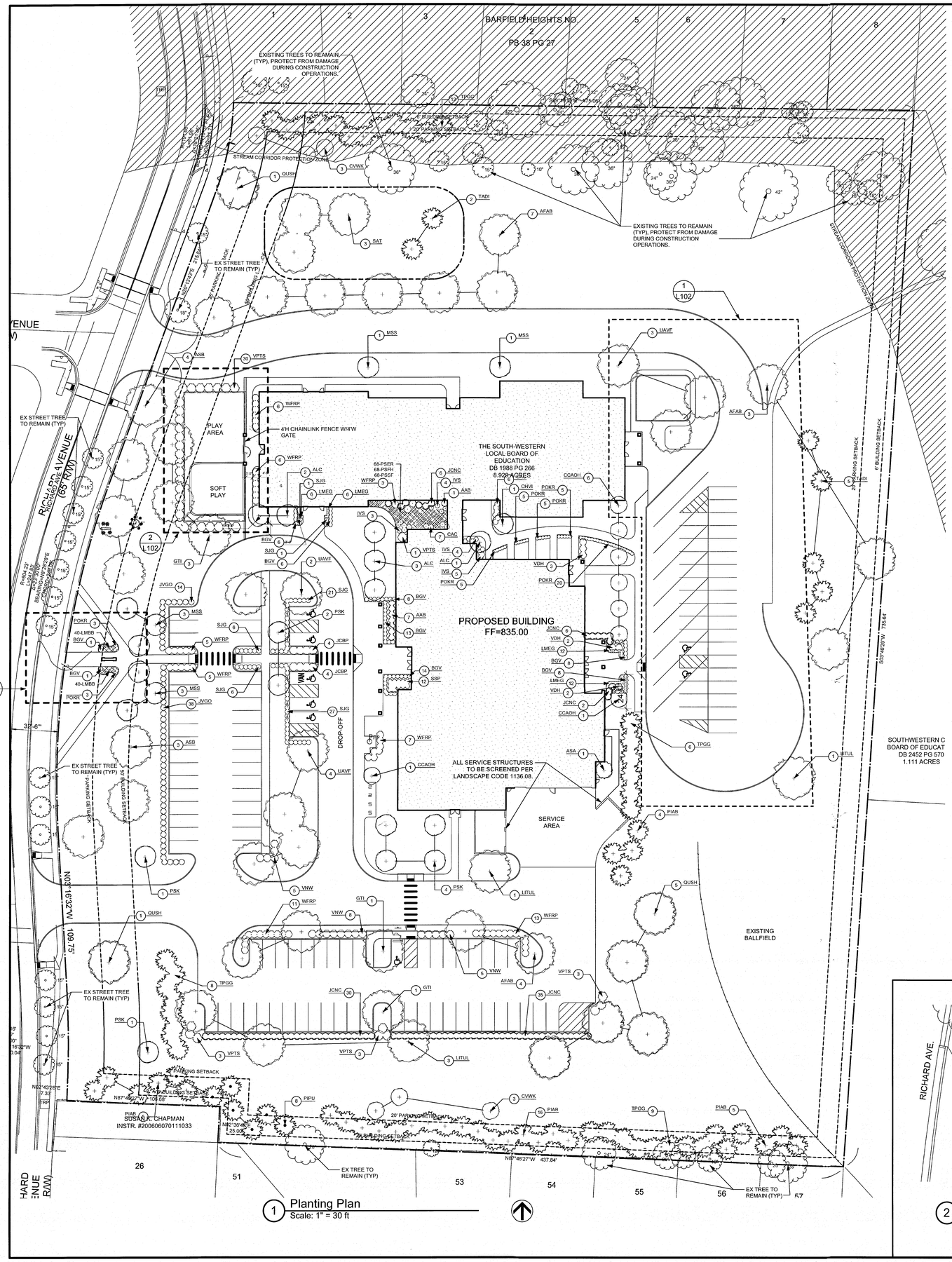
RICHARD AVENUE ELEMENTARY SCHOOL
3646 Richard Ave., Grove City, Ohio 43123

SOUTH-WESTERN CITY SCHOOL DISTRICT
3805 Marlane Drive, Grove City, OH 43123

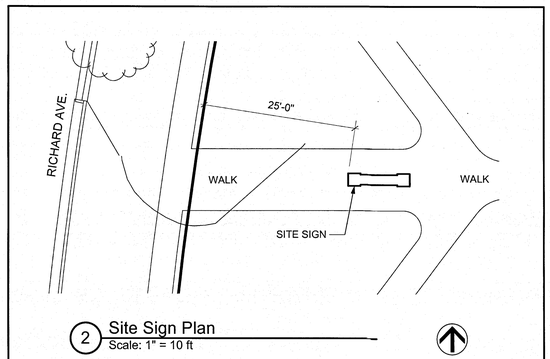
SITE SURVEY

DATE 07/23/14

C104



1 Planting Plan
Scale: 1" = 30 ft



2 Site Sign Plan
Scale: 1" = 10 ft

Plant List					
ID	Qty	Latin Name	Common Name	Scheduled Size	Remarks
AAB	8	Aronia arbutifolia 'Brilliantissima'	Brilliant Red Chokeberry	7 Gal	Fully rooted containers, matching forms
AFAB	14	Acer x freemanii 'Jeffsred' P.P.# 4864	Autumn Blaze(R) Maple	2.5" Cal	Limbed to 6'
ALC	6	Amelanchier laevis 'Cumulus'	Cumulus Serviceberry	2" Cal	Select specimentree-form, matching forms.
ASA	1	Acer saccharum 'Astis'	Steeple(R) Sugar Maple	2.5" Cal	Limbed to 6'
ASB	7	Acer saccharum 'Bonfire' P.P.# 3817	Bonfire Rock Maple	3" Cal	Limbed to 6'
BGV	65	Buxus 'Green Velvet' (COPF)	Green Velvet Boxwood	18" Spr	B&B
CAC	13	Clethra alnifolia 'Caleb' P.P.A.F., CBRAF	Vanilla Spice® Summersweet	3 Gal	Matching form, fully rooted containers
CCAOH	8	Cercis canadensis 'Ace Of Hearts' P.P.A.F.	Ace of Hearts Redbud	2" Cal	Select specimen, matching forms.
CHVI	1	Chionanthus virginicus	White Fringe Tree	5'-6'HT	Select specimen, B&B
CVWK	6	Crataegus viridis 'Winter King'	Winter King Hawthorn	2" Cal	Select specimen, matching forms.
GTI	5	Gleditsia triacanthos var. inermis 'Imperial'	Imperial Honeylocust	2.5" Cal	Limbed to 6'
ID	0	Latin Name	Common Name	Scheduled Size	Notes
IVS	16	Itea virginica 'Sprich' P.P. #10,988	Little Henry® Dwarf Virginia Sweetspire	5 Gal	Fully rooted container, matching form
JCBP	8	Juniperus conferta `Blue Pacific'	Blue Pacific Shore Juniper	3 Gal	Fully rooted container, matching form
JCNC	79	Juniperus chinensis 'Nick's Compact'	Nick's Compact Juniper	3 Gal	Matching form, fully rooted pots
JVGO	52	Juniperus virginiana 'Grey Owl'	Grey Owl Juniper	3 Gal	Matching form, fully rooted container
LITUL	5	Liriodendron tulipifera	Tulip Tree	2.5" Cal	Limbed to 6'
LMBB	80	Liriope muscari 'Big Blue'	Big Blue Liriope	6" Pot	Fully rooted pots
LMEG	36	Liriope muscari 'Evergreen Giant'	Evergreen Giant Lilyturf	1 Gal	Fully rooted pots
MSS	8	Malus x 'Spring Snow' P.P.# 2667	Spring Snow Crabapple	2" Cal	Select specimen, matching forms.
PIAB	30	Picea abies	Norway Spruce	6' Ht	Selected for full matching form.
PIPU	8	Picea pungens	Colorado Spruce	6' Ht	Selected for full matching form and consistent color.
POKR	46	Pennisetum orientale 'Karley Rose' P.P.A.F.	Karley Rose Fountain Grass	1 Gall	Fully rooted pots
PSER	68	Phlox subulata 'Emerald Red'	Emerald Red Creeping Phlox	6" Pot	Fully rooted pots
PSFH	68	Phlox subulata 'Fort Hills'	Fort Hills Creeping Phlox	6" Pot	Fully rooted pots
PSK	8	Prunus serrulata 'Kwanzan'	Kwanzan Flowering Cherry	2" Cal	Select specimentree-form, matching forms.
PSSF	68	Phlox subulata 'Snowflake'	Snowflake Creeping Phlox	4" pot	Fully rooted pots
QUSH	7	Quercus shumardii	Shumard Oak	3" Cal	Limbed up to 6' Ht.
SAT	3	Salix alba 'Tristis'	Golden Niobe Willow	2.5" Cal	Limbed to 6' Ht
SJG	62	Spiraea japonica 'Galen' P.P.A.F.	Double Play® Artist Spirea	3 Gal	Matching form, fully rooted container
SSP	12	Symphoricarpos 'Scarlet Pearl' P.P.# 13244	Scarlet Pearl Snowberry	5 Gal	Fully rooted container, matching form
TADI	7	Taxodium distichum	Bald Cypress	6' Ht	B&B, Selected for full matching form.
TPGG	35	Thuja x plicata 'Green Giant'	Green Giant Arborvitae	6' Ht	B&B, Selected for full matching form.
UAVF	9	Ulmus americana 'Valley Forge'	Valley Forge Elm	2.5" Cal	Limbed to 6' Ht
VDH	7	Viburnum dilatatum 'Henneke' P.P.A.F.	Cardinal Candy(Tm) Viburnum	4'HT	B&B Matching forms
VNW	18	Viburnum nudum 'Winterthur'	Winterthur Smooth Viburnum	4'HT	B&B
VPTS	40	Viburnum plicatum tomentosum 'Shasta'	Shasta Viburnum	4'HT	B&B
WFRP	56	Weigela florida 'Red Prince'	Red Prince Weigela	3 Gal	Matching form, fully rooted pots

LEGEND

EVERGREEN TREE
EVERGREEN/SMALL SHRUB
ORNAMENTAL GRASS
LARGE SHRUB
SHADE TREE
FLOWERING TREE
GROUND COVER
MEDIUM SHRUB
EXISTING TREE

PLANTING NOTES

1. ALL PLANTS SHALL BE BALLED AND BURLAPPED UNLESS OTHERWISE STATED IN THE PLANT LIST. SYNTHETIC OR TREATED BURLAP SHALL NOT BE USED IN BALLING AND BURLAPPING ANY PLANTS ON THIS PROJECT.

2. ALL PLANT MATERIALS SHALL MEET OR EXCEED THE SIZES GIVEN IN THE PLANT LISTS AND SHALL HAVE A HABIT OF GROWTH THAT IS NORMAL FOR THE SPECIES AND A WELL-BRANCHED STRUCTURE. THEY SHALL BE SOUND, HEALTHY AND VIGOROUS, WITH BALANCED ROOT AND TOP GROWTH. PLANTS SHALL BE FREE OF DISEASE, INSECTS, EGGS, LARVAE AND DEFECTS SUCH AS KNOTS, SUNSCALD, INJURIES, ABRASIONS, OR DISFIGUREMENT. ALL MEASUREMENTS SUCH AS CALIPER, HEIGHT, SPREAD AND QUALITY DESIGNATIONS MUST BE IN ACCORDANCE WITH THE LATEST EDITION OF AMERICAN STANDARD FOR NURSERY STOCK ANSI Z60.1. PLANT MATERIALS FOR THIS PROJECT MUST COME FROM NURSERIES LOCATED IN ZONES 5A TO 6A AS SET FORTH IN THE MOST RECENT USDA PLANT HARDINESS ZONE CHART AND WITH A SIMILAR SOIL TYPE OF CLAY LOAM.

3. ALL PLANTS AND PLANTINGS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT AND SHALL BE INSTALLED ONLY AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE LANDSCAPE ARCHITECT.

4. SUBSTITUTIONS WILL NOT BE PERMITTED AFTER THE CONTRACT IS AWARDED. SUBMIT PROOF IN WRITING THAT A PLANT IS NOT OBTAINABLE AND PROPOSED SUBSTITUTION LIST FOR APPROVAL BY THE LANDSCAPE ARCHITECT FOR USE OF THE NEAREST EQUIVALENT OBTAINABLE SIZE OR VARIETY OF PLANT HAVING THE SAME ESSENTIAL CHARACTERISTICS.

5. SHOULD THE LANDSCAPE CONTRACTOR ENCOUNTER UNSATISFACTORY SURFACE OR SUBSURFACE DRAINAGE CONDITIONS, TOPSOIL DEPTH, HARD PAN, UTILITY LINES, CONSTRUCTION DEBRIS OR OTHER CONDITIONS THAT WILL JEOPARDIZE THE HEALTH AND VIGOR OF THE PLANTS, HE MUST ADVISE THE LANDSCAPE ARCHITECT OF THE CONDITIONS PRIOR TO INSTALLING THE PLANTS AND NOT INSTALL PLANTS UNTIL RECEIVING WRITTEN AUTHORIZATION FROM THE LANDSCAPE ARCHITECT. OTHERWISE THE LANDSCAPE CONTRACTOR WARRANTS THAT THE PLANTING AREAS ARE SUITABLE FOR PROPER GROWTH AND DEVELOPMENT OF THE PLANTS TO BE INSTALLED.

6. PERFORM PERCOLATION TESTS FOR BED AREAS AND TREES IN LAWN AREAS, PRIOR TO PLANTING. PERCOLATION TEST SHALL BE PERFORMED BY DIGGING A HOLE TO THE DEPTH OF THE ROOTBALL; FILL THE HOLE WITH WATER. THE WATER SHOULD DRAIN THROUGH THE HOLE WITHIN 24 HOURS. PERFORM THE PERCOLATION TEST A THREE (3) TIMES MIN. IN EACH BED AND AT 15 TREE LOCATIONS. TREE LOCATIONS SHALL BE RANDOM THROUGHOUT THE SITE. SHOULD THE TESTS REPEATEDLY FAIL, CONTACT LANDCAPE ARCHITECT FOR DIRECTION. SHOULD THE LANDSCAPE CONTRACTOR ELECT NOT TO REPORT POOR DRAINAGE CONDITIONS, IT REMAINS THEIR RESPONSIBILITY TO WARRANTY AND REPLACE ALL RESULTING DEAD PLANTS.

7. PLANTING MIX: ALL BED AREAS AS SHOWN ON PLANS TO BE DUG OUT TO 12" DEEP AND BACK FILLED WITH PLANTING MIX OF 8" TOPSOIL AND 4" PINEBARK FINES. HEDGE BEDS TO BE DEVELOPED 3' WIDE FOLLOWING CENTERLINE OF HEDGE. BACKFILL ISOLATED PARKING LOT ISLAND PLANTING AREAS WITH PLANTING MIX TO A DEPTH OF 12". REMOVE ALL UNDESIRABLE MATERIAL LARGER THAN TWO INCHES IN ANY DIMENSION AND DISPOSE OF OFF THE SITE DURING THIS OPERATION. REMOVE ANY ROCK OR UNDERGROUND OBSTRUCTION TO THE DEPTH NECCESSARY FOR PLANTING AS SPECIFIED, UNLESS OTHER PLANTING LOCATIONS ARE ACCEPTED BY THE LANDSCAPE ARCHITECT.

8. BED AREAS, INCLUDING TREE CIRCLES ARE TO BE MULCHED WITH 2" OF SHREDDED HARDWOOD BARK MULCH. SUBMIT SAMPLE FOR REVIEW BY LANDSCAPE ARCHITECT. PROVIDE A SMOOTH SHOVEL CUT EDGE TO ALL BED LINES AS SHOWN ON THE DRAWINGS. APPLY PRE-EMERGENT HERBICIDE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND RATES TO ALL BED AREAS AND TREE CIRCLES PRIOR TO PLACING MULCH.

10. FINISH GRADING: THE FINISH SURFACE SHALL BE SMOOTH AND FREE OF BUMPS, DEPRESSIONS, OTHER IRREGULARITIES OR FOREIGN MATERIALS.

11. PLANTING PITS FOR TREES AND SHRUBS SHALL BE DUG THREE TIMES IN DIAMETER THE SPREAD OF THE ROOTS, (OR A MIN. 3' RADIUS/6' DIA PLANTING PIT) AND HAVE A DEPTH EQUAL TO THE HEIGHT OF THE ROOTBALL OR CONTAINER, WITH SLOPED SIDES AND FLAT BOTTOMS. ANY HEAVY CLAY OR OTHER SOIL UNSUITABLE FOR PLANTING ENCOUNTERED IN THE HOLES SHALL BE REMOVED FROM THE SITE, UNLESS DISPOSITION ON THE PROJECT SITE IS DIRECTED BY THE GENERAL CONTRACTOR OR CONSTRUCTION MANAGER. NO MORE THAN 1" OF BACKFILL SHALL BE PLACED ON TOP OF THE ROOTBALL.

12. ALL CORDS AND BINDINGS SHALL BE CUT FROM PLANTS PRIOR TO BACKFILLING. THE TOP 1/2 OF WIRE BASKET AND TOP 1/3 OF BURLAP SHALL BE REMOVED FROM THE ROOTBALL OF TREES AND SHRUBS, PRIOR TO BACKFILLING.

13. ALL PLANTS, TREES, SHRUBS AND VINES SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR AFTER FORMAL ACCEPTANCE OF THE PLANTING BY THE OWNER. FOR FINAL ACCEPTANCE, AN INSPECTION WILL BE MADE BY THE OWNER AND LANDSCAPE ARCHITECT UPON WRITTEN OR VERBAL NOTICE REQUESTING SUCH INSPECTION, SUBMITTED BY THE CONTRACTOR AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED DATE. FINAL ACCEPTANCE WILL BE GIVEN WHEN THE CONTRACTOR HAS CORRECTED ALL PUNCH LIST ITEMS FOUND IN THE FIANL ACCEPTANCE INSPECTION. MATERIAL SHALL BE ALIVE AND IN SATISFACTORY GROWTH AS DETERMINED BY THE LANDSCAPE ARCHITECT AT THE BEGINNING AND END OF THE GUARANTEE PERIOD. THE CONTRACTOR SHALL CHECK THE PLANTINGS REGULARLY DURING THE GUARANTEE PERIOD. SHOULD THE CONTRACTOR FIND THE PLANT MATERIAL IS NOT RECEIVING THE PROPER MAINTENANCE AT ANY TIME PRIOR TO THE END OF THE GUARANTEE PERIOD, HE SHOULD ADVISE THE LANDSCAPE ARCHITECT AND THE OWNER IMMEDIATELY IN WRITING SO CORRECTIVE MEASURES MAY BE INITIATED. REPLACEMENT: AT THE END OF THE GUARANTEE PERIOD, AN INSPECTION WILL BE MADE BY THE OWNER AND LANDSCAPE ARCHITECT UPON WRITTEN OR VERBAL NOTICE REQUESTING SUCH INSPECTION, SUBMITTED BY THE CONTRACTOR AT LEAST TEN (10) DAYS PRIOR TO THE ANTICIPATED DATE. ANY PLANT REQUIRED UNDER THIS CONTRACT THAT IS DEAD OR NOT SATISFACTORY IN GROWTH AS DETERMINED BY THE LANDSCAPE ARCHITECT SHALL BE REMOVED FROM THE SITE. THESE AND ANY PLANTS MISSING DUE TO THE CONTRACTOR'S NEGLIGENCE, SHALL BE REPLACED AS SOON AS CONDITIONS PERMIT DURING THE NORMAL PLANTING SEASON. IF REPLACEMENTS ARE PLANTED WHILE THEY ARE DORMANT, THEY MUST FULLY LEAFOUT THE FOLLOWING SPRING TO MEET THE REQUIREMENTS OF THIS PROJECT.

14. THE CONTRACTOR SHALL REMOVE FROM THE PROJECT SITE ALL EXCESS MATERIAL, DEBRIS, EQUIPMENT AND RELATED ITEMS PERTINENT TO THE WORK UNDER THIS CONTRACT AS REQUIRED IN PROJECT DOCUMENTS.

15. REFER TO SPECIFICATION 329200 FOR SEED MIX, BROADCAST RATES. BEFORE BROADCASTING SEED, ALL SOFT SPOTS AND INEQUALITIES IN GRADE SHALL BE CORRECTED AND FERTILIZER SHALL BE SPREAD AND RAKED IN AND WATERED THOROUGHLY. SEED MAY BE APPLIED BY 'HYDROSEEDING' METHODS. A BIODEGRADABLE ERSOSION CONTROL MAT SHALL BE PLACED ALONG BOTTOM OF ALL SWALE AREAS AND SLOPES OF 3:1 AND GREATER, IN PLACE OF STRAW MULCH.

STATE OF OHIO
Edward L. Melvin
965
REGISTERED
LANDSCAPE ARCHITECT

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LEADING DESIGN

SOUTH-WESTERN CITY SCHOOL DISTRICT
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3646 Richard Avenue, Grove City, OH 43123

SOUTH-WESTERN CITY SCHOOL DISTRICT
3805 Marlane Drive, Grove City, OH 43123

ISSUANCES

06-13-14	DESIGN DEVELOPMENT
07-23-14	PLANNING & DEVELOPMENT REISSUE

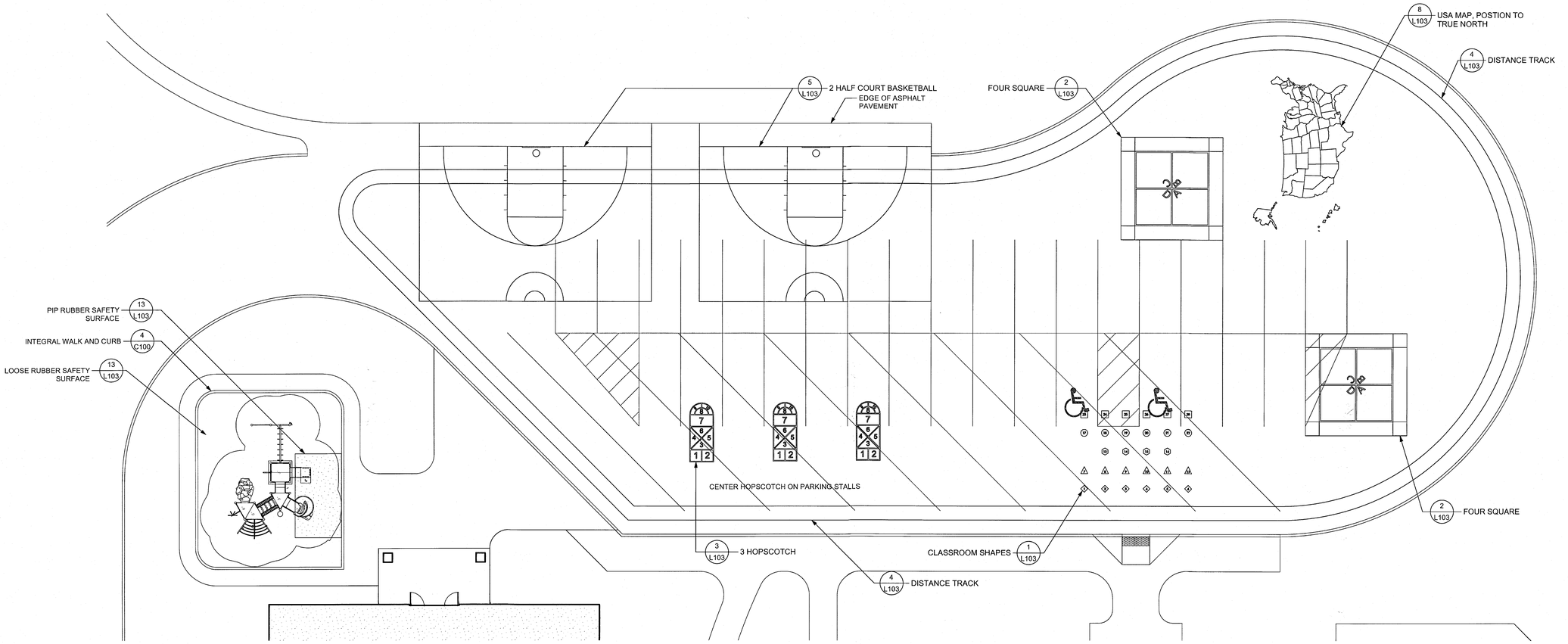
Planting Plan

DATE 07-23-2014

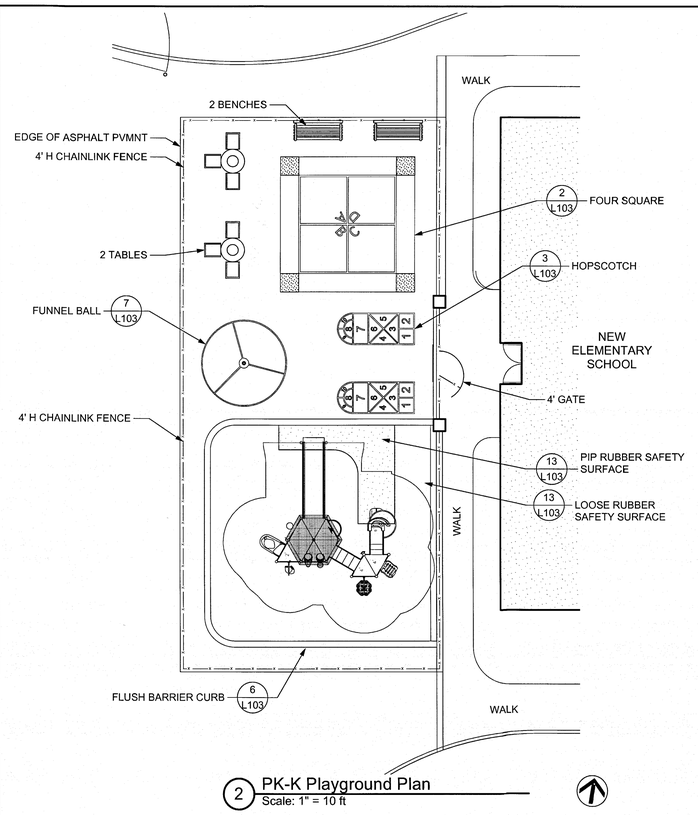
COMM NO. 2012014.10

L100

0"-1" REFFRENCE LINE



1 1-6 Playground Plan
Scale: 1" = 10 ft



2 PK-K Playground Plan
Scale: 1" = 10 ft

© 1" REFERENCE LINE

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ISSUANCES

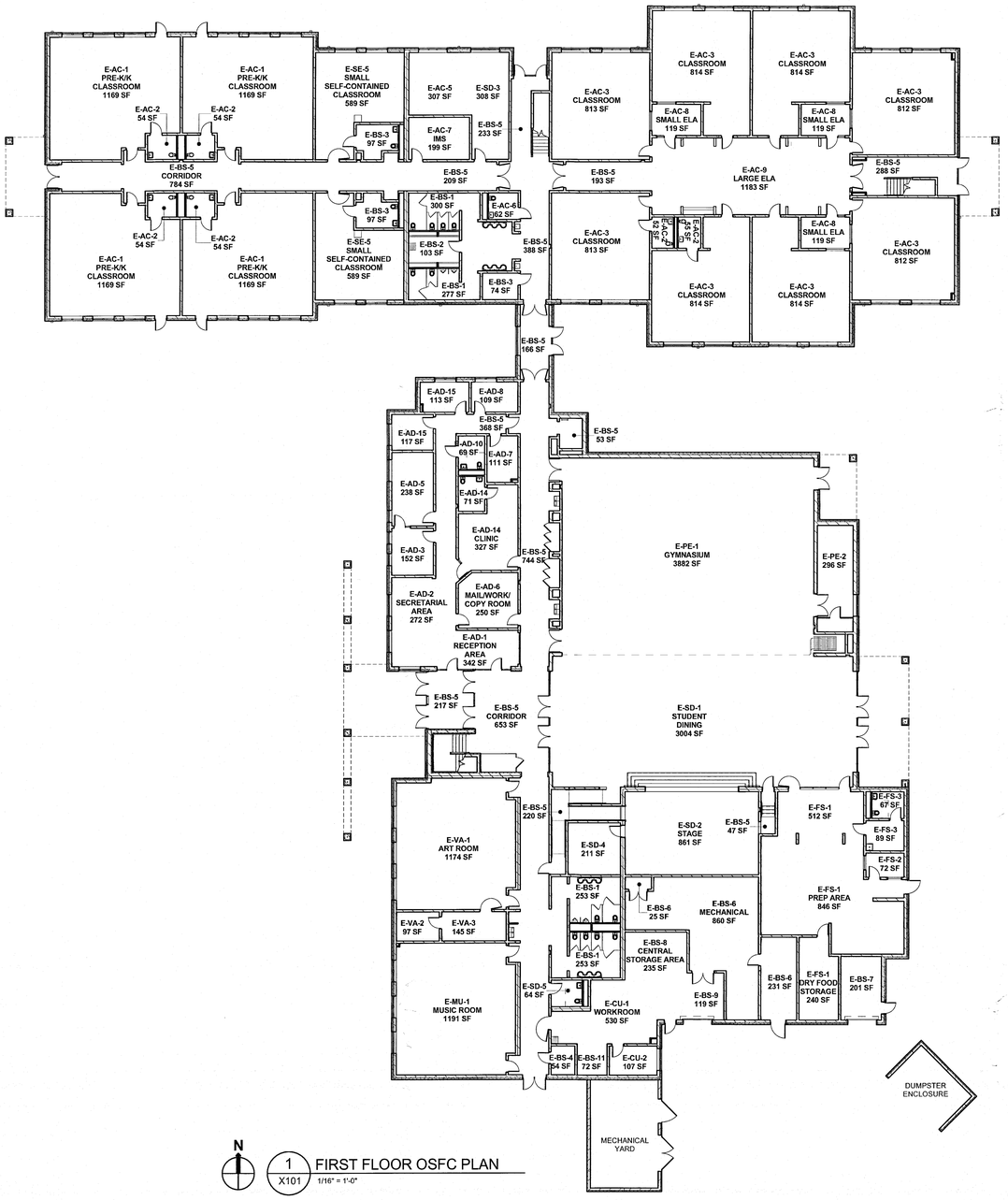
06-13-14	DESIGN DEVELOPMENT
07-23-14	PLANNING & DEVEOPMENT REISSUE

Enlarged Playground Plans

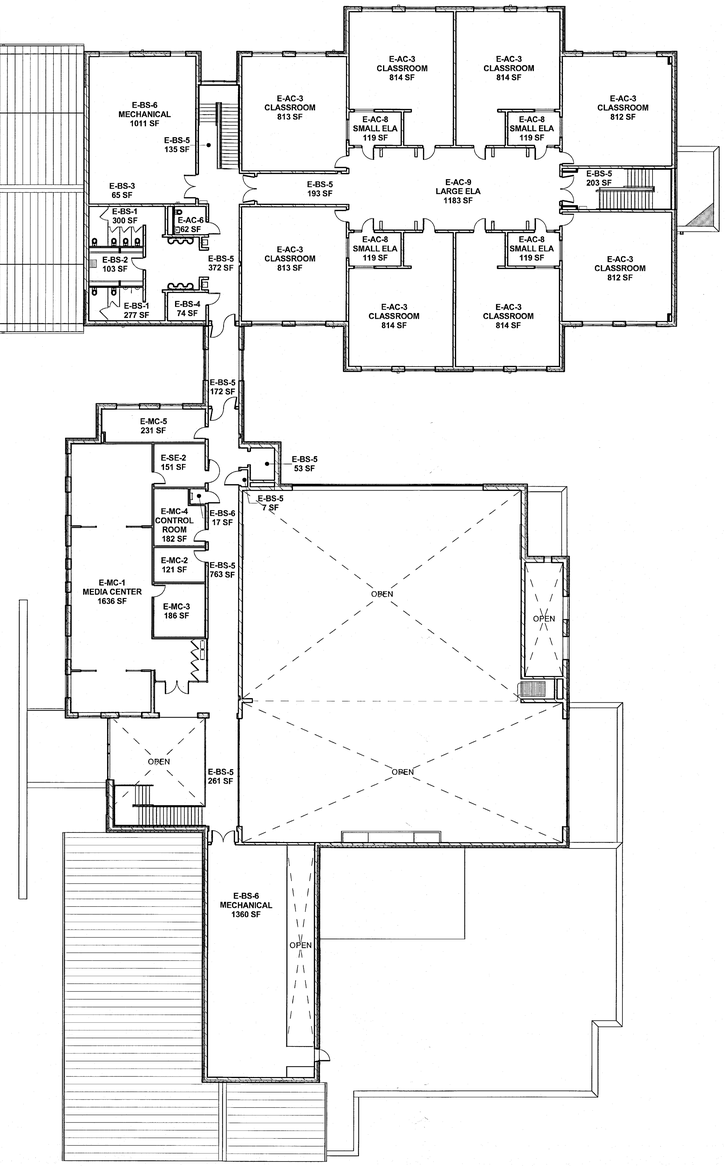
DATE 07-23-2014

COMM NO. 2012014.10

L102



1 X101 FIRST FLOOR OSFC PLAN
1/16" = 1'-0"



2 X101 SECOND FLOOR OSFC PLAN
1/16" = 1'-0"

OSFC DEPARTMENT SCHEDULE (NET AREA)		
DEPARTMENT	AREA	POR SF
ACADEMIC CORE	21840 SF	22028 SF
ADMINISTRATIVE SPACES	2172 SF	2115 SF
BUILDING SERVICES	13532 SF	13587 SF
BUILDING SERVICES 1	386 SF	389 SF
CUSTODIAL SPACES	638 SF	400 SF
FOOD SERVICE SPACES	1825 SF	2035 SF
MEDIA CENTER SPACES	2355 SF	2330 SF
MUSIC SPACES	1191 SF	1200 SF
PHYSICAL EDUCATION SPACES	4178 SF	4300 SF
SPECIAL EDUCATION SPACES	1523 SF	1550 SF
STUDENT DINING	4447 SF	4480 SF
VISUAL ARTS SPACES	1415 SF	1425 SF
	55504 SF	55839 SF

OSFC GROSS BUILDING AREA	
BUILDING AREA	AREA (GROSS)
FIRST FLOOR GRADES 1-4 (520 STUDENTS)	12355 SF
SECOND FLOOR GRADES 1-4 (520 STUDENTS)	12120 SF
FIRST FLOOR CORE (520 STUDENTS)	23597 SF
SECOND FLOOR CORE (520 STUDENTS)	5809 SF
PK-K WING (520 STUDENTS)	7692 SF
	61572 SF
POR GSF ALLOWABLE	61616 SF

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SOUTH-WESTERN CITY SCHOOL DISTRICT
3805 Marlane Drive, Grove City, OH 43123

ISSUANCES	
04-11-14	SCHEMATIC DESIGN
06-13-14	DESIGN DEVELOPMENT
06-13-14	ZONING SUBMISSION

OSFC DATA

DATE 06-13-14

COMM NO. 2012014.10

X101

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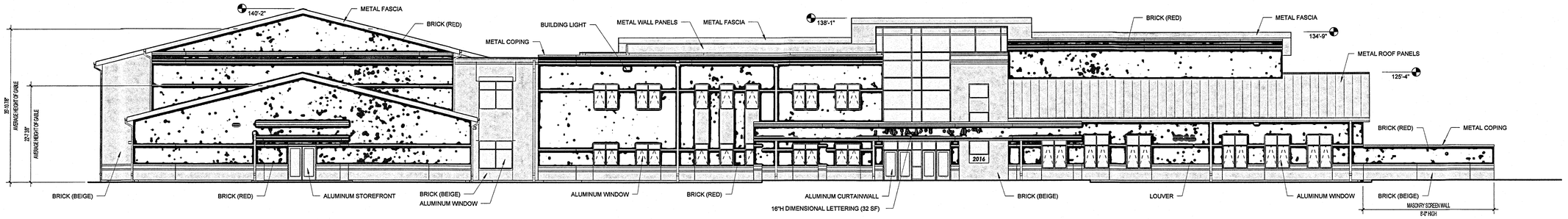
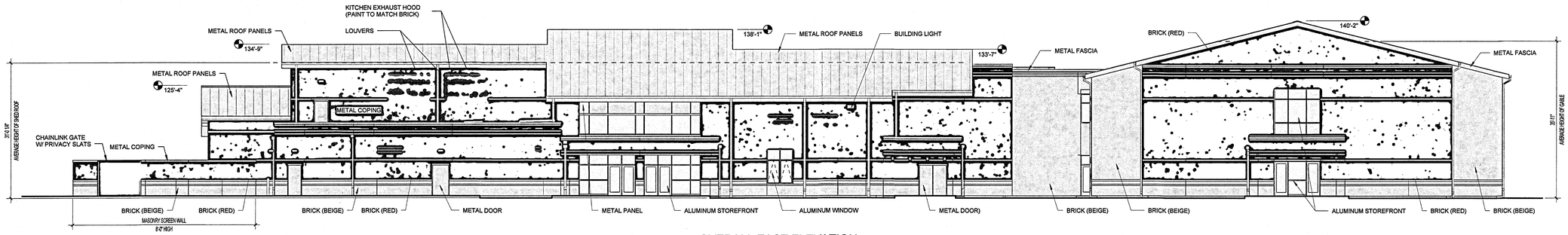
0" 1" REFERENCE LINE



OVERALL WEST ELEVATION

3/32" = 1'-0"



OVERALL EAST ELEVATION

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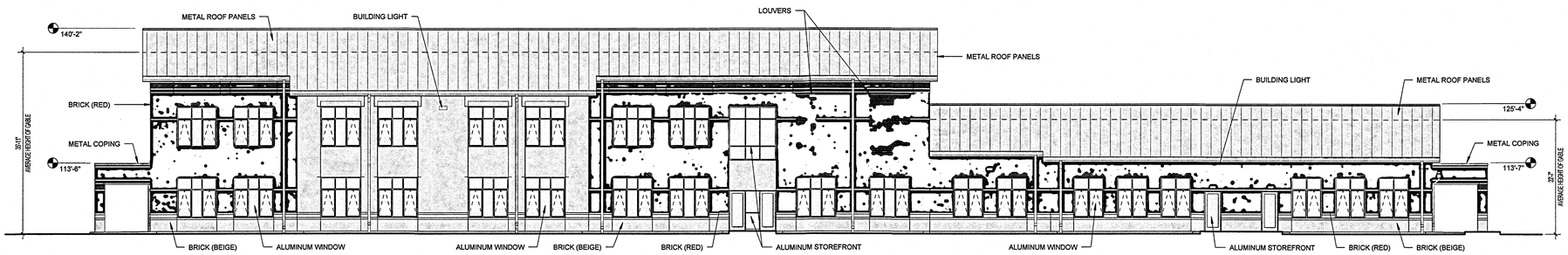
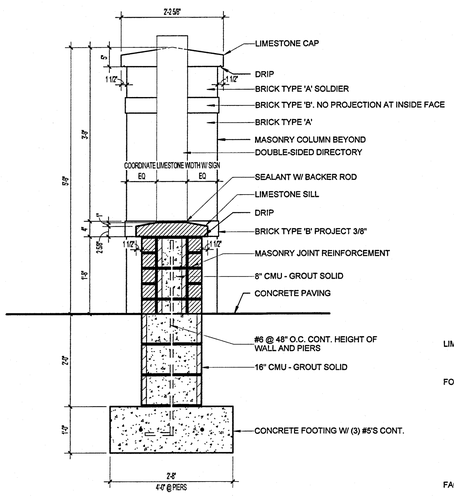


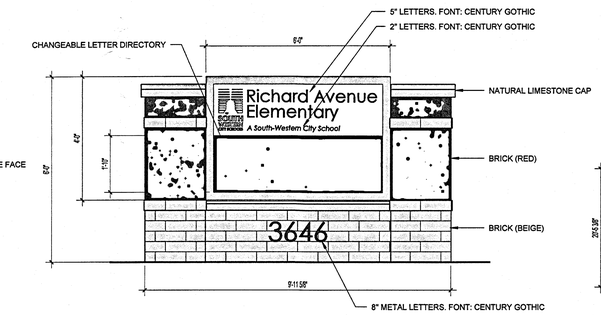
OVERALL NORTH ELEVATION

3/32" = 1'-0"



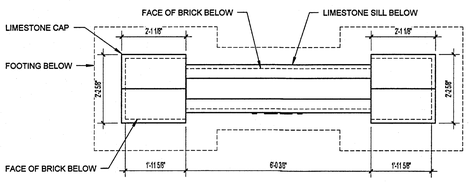
SITE SIGN SECTION

3/4" = 1'-0"



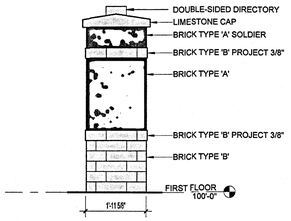
TWO-SIDED SITE SIGN ELEVATION

1/2" = 1'-0"



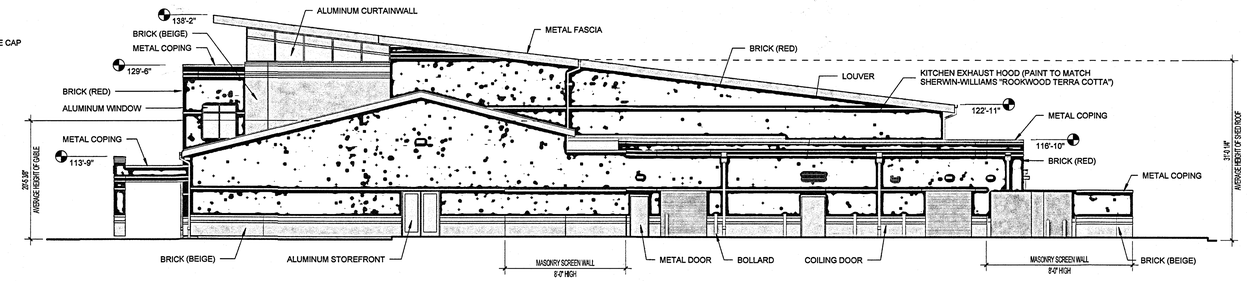
SITE SIGN PLAN

1/2" = 1'-0"



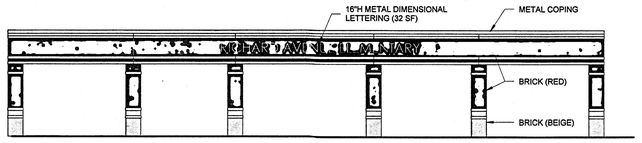
SITE SIGN SIDE ELEVATION

1/2" = 1'-0"



OVERALL SOUTH ELEVATION

3/32" = 1'-0"



ENTRY CANOPY ELEVATION

1/8" = 1'-0"

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RICHARD AVENUE ELEMENTARY SCHOOL
3646 Richard Ave., Grove City, OH 43123

SOUTH-WESTERN CITY SCHOOL DISTRICT
3805 Marlane Drive, Grove City, OH 43123

ISSUANCES	
06-13-14	ZONING SUBMISSION
07-23-14	ZONING RESUBMISSION

EXTERIOR ELEVATIONS

DATE 06-13-14

COMM NO. 2012014.10

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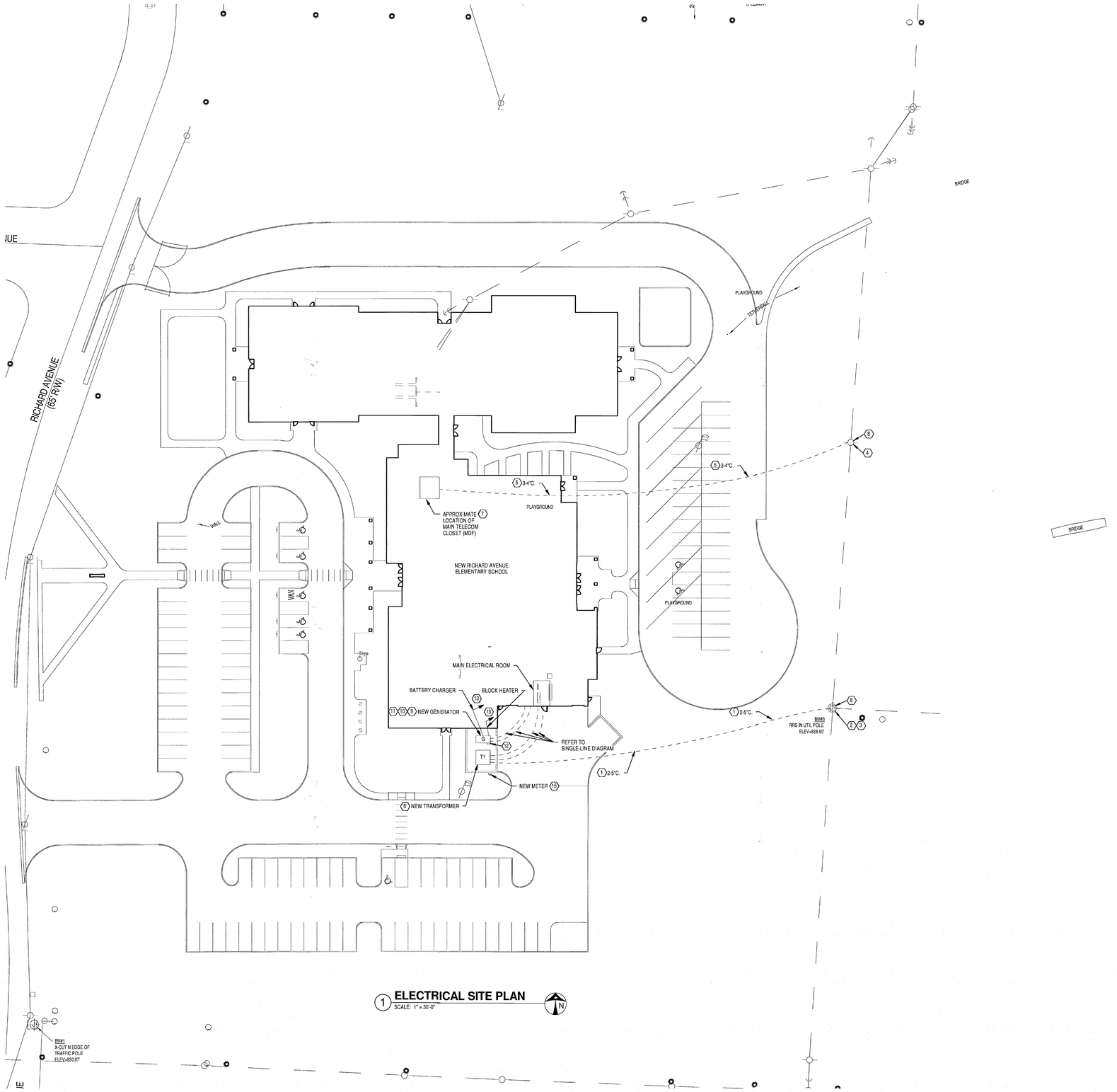
"0-1" REFERENCE LINE"



1 **ELECTRICAL SITE PLAN**
SCALE: 1" = 30'-0"

NOTES

1. NEW UNDERGROUND PRIMARY ELECTRIC DUCTBANK CONSISTING OF 2-5" DUCTS PER DETAILS ON SHEET E003. DUCTS SHALL BE ENCASED IN 3000LB CONCRETE. DUCTBANK PROVIDED BY E.C.; ALL PRIMARY CONDUCTORS PROVIDED BY POWER CO. COORDINATE EXACT LOCATION/ROUTE OF DUCTBANK AND SERVICE ENTRANCE REQUIREMENTS WITH POWER CO. PRIOR TO THIS WORK.
2. EXISTING POWER CO. RISER POLE. POWER CO. TO PROVIDE NEW FUSED CUT-OUTS ON POLE AND MAKE CONNECTION TO OVERHEAD PRIMARY. POWER CO. TO EXTEND NEW UNDERGROUND PRIMARY FROM FUSED CUT-OUTS ON POLE TO NEW TRANSFORMER AT THE NEW ELEMENTARY SCHOOL. WORK TO BE COORDINATED WITH THE POWER CO.
3. E.C. SHALL PROVIDE PVC SCHEDULE 40 UNDERGROUND CONDUIT FROM NEW TRANSFORMER AT THE NEW ELEMENTARY SCHOOL UP BASE OF UTILITY POLE TO LOCATION OF NEW FUSED CUT-OUTS. COORDINATE REQUIREMENTS WITH POWER CO. PRIOR TO ROUGH-IN AND PROVIDE ACCORDINGLY. REFER TO SINGLE-LINE DIAGRAM AND POWER CO. DRAWINGS.
4. PROVIDE PVC SCHEDULE 40 CONDUIT UP UTILITY POLE TO 18" ABOVE GRADE WITH LONG SWEEPING BENDS FOR TELEPHONE AND CATV SERVICE DUCTBANK. COORDINATE WORK WITH UTILITY COMPANIES PRIOR TO ROUGH-IN. CAP ALL SPARE CONDUITS AT POLE.
5. NEW UNDERGROUND TELEPHONE SERVICE CONSISTING OF 2-4" DUCTS AND CABLE TV SERVICE CONSISTING OF 1-4" DUCT (3-4" DUCTS TOTAL) PER DETAILS ON SHEET E003. DUCTS SHALL BE ENCASED IN 3000LB CONCRETE. RUN CONDUITS TO LOCATION OF MDF IN NEW ELEMENTARY AND STUB 6" ABOVE FLOOR. COORDINATE EXACT LOCATION/ROUTE OF DUCT BANK WITH UTILITY COMPANIES PRIOR TO THIS WORK. VERIFY EXACT END OF CONDUIT RUN IN MAIN TELECOM CLOSET WITH DIV. 27 CONTROLLER AND PROVIDE ACCORDINGLY.
6. APPROXIMATE LOCATION OF PAD MOUNTED TRANSFORMER; E.C. SHALL PROVIDE TRANSFORMER PAD PER DETAIL A, SHEET E003 AND PER POWER CO. STANDARD DRAWINGS. VERIFY EXACT LOCATION WITH ARCHITECT PRIOR TO ROUGH-IN. POWER CO. SHALL INSTALL TRANSFORMER AND PERFORM FINAL TERMINATIONS. POWER CO. SHALL EXTEND PRIMARY ELECTRIC FEEDER FROM UTILITY POLE TO LOCATION OF TRANSFORMER AND CONNECT TO PRIMARY SECTION. E.C. SHALL EXTEND SECONDARY ELECTRIC SERVICE FROM TRANSFORMER TO MAIN SERVICE DISCONNECT SWITCH LOCATED IN THE BUILDING. REFER TO SINGLE-LINE DIAGRAM.
7. APPROXIMATE LOCATION OF MAIN TELECOM CLOSET (MDF) LOCATED ON SECOND FLOOR. REFER ARCHITECTURAL PLANS FOR EXACT LOCATION.
8. EXISTING UTILITY POLE TO REMAIN.
9. PROVIDE A MINIMUM CLEARANCE OF 5' AROUND ALL SIDES OF THE GENERATOR. REFER TO DETAIL I, SHEET E005.
10. EMERGENCY FEEDER, BRANCH CIRCUITS AND CONTROLS CIRCUITS TO BE INSTALLED PER MANUFACTURERS INSTRUCTIONS. REFER TO SINGLE-LINE DIAGRAM. PROVIDE CONTROL WIRING IN SEPARATE CONDUIT (COMMON TRENCH) BETWEEN GENERATOR AND ATS AND ANNUNCIATOR PANEL PER MANUFACTURER INSTRUCTIONS.
11. PROVIDE CONCRETE PAD FOR GENERATOR PER MANUFACTURERS RECOMMENDATIONS AND PER DETAILS ON SHEET E003 AND I ON SHEET E005.
12. FIRE ALARM SYSTEM MODULES CONNECT TO SUPERVISORY OUTPUTS IN CONTROL PANEL FOR "GENERATOR RUN AND GENERATOR TROUBLE" ALARMS. RUN WIRING U/G AND TIE INTO FIRE ALARM SYSTEM AT ELEMENTARY SCHOOL. PROVIDE 2-2"C. FOR THIS WIRING.
13. RUN 20A, 208V-1PH CIRCUIT WITH 2-#10, 1-#10 GRD. IN 1"C. TO SERVE EQUIPMENT INDICATED. CIRCUIT SHALL BE RUN FROM ELECTRICAL PANEL LOCATED WITHIN THE MAIN ELECTRICAL ROOM. REFER TO SHEET E003 FOR EXACT CIRCUIT NUMBERS.
14. FLUSH GRADE PULLBOX ENCLOSURE WITH GREEN GASKETED COVER WITH APPROPRIATE LOGO, PER DETAIL D, SHEET E003.
15. NEW ELECTRIC METER; E.C. SHALL VERIFY EXACT MOUNTING LOCATION WITH POWER CO. PRIOR TO ROUGH-IN AND PROVIDE ACCORDINGLY.

GENERAL NOTES:

A. ALL UNDERGROUND CONDUITS AND DUCTBANKS SHALL BE DIRECT BURIED PER DETAIL D, ON SHEET E003 UNLESS INDICATED OTHERWISE. ALL PRIMARY AND SECONDARY CONDUITS AND DUCTBANKS SHALL HAVE LONG SWEEPING BENDS. ALL CONDUITS BURIED UNDER DRIVEWAYS AND PARKING AREAS WHERE AUTOMOBILE TRAFFIC PASSES THROUGH SHALL BE CONCRETE ENCASED. PROVIDE ALL CONDUITS WITH PULLWIRE; ALL CONDUITS SHALL BE 1.5" UNLESS INDICATED OTHERWISE. E.C. SHALL UTILIZE COMMON TRENCH(ES) WHERE EVER FEASIBLE.

B. E.C. SHALL PROVIDE EXTERIOR MOUNTED WEATHERPROOF FIRE ALARM AUDIOVISUAL DEVICE ON THE OUTSIDE OF THE BUILDING AS DIRECTED BY LOCAL FIRE DEPARTMENT. REFER TO SPEC. SECTION 28 31 00.

C. ALL PRIMARY CONDUCTORS, LOAD BREAK ELBOWS, TERMINATIONS AT RISER POLE, METERING CABINET TRANSFORMERS, AND JUNCTION BOXES SHALL BE PROVIDED BY POWER CO. ALL WORK SHALL BE COORDINATED WITH SOUTHWEST CITY SCHOOLS AND THE POWER CO.

D. NEW BUILDING SHALL BE PROVIDED WITH LIGHTNING PROTECTION SYSTEM PER SPEC SECTION 26 41 00.

CALL 811
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UTILITIES PROTECTION SERVICE

STATE OF OHIO
RICHARD L. PAVLAK
47352
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PROJECT NO. 2012-07072.16

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250 Civic Center Drive Columbus, Ohio 43215	Suite 200 614-223-2124	Review for the City of Grove City Jackson	
1675 Broadway Denver, Colorado 80202	Suite 1300 303-209-7866	Township Fire Department	

DEVELOPMENT PLAN
CITY PROJECT NO.

RICHARD AVENUE ELEMENTARY SCHOOL
3646 Richard Ave., Grove City, OH 43123

SOUTH-WESTERN CITY SCHOOL DISTRICT
3805 Marlane Drive, Grove City, OH 43123

ELECTRICAL UTILITY SITE PLAN

DATE 06-13-14

E002A

"0'-1" REFERENCE LINE"

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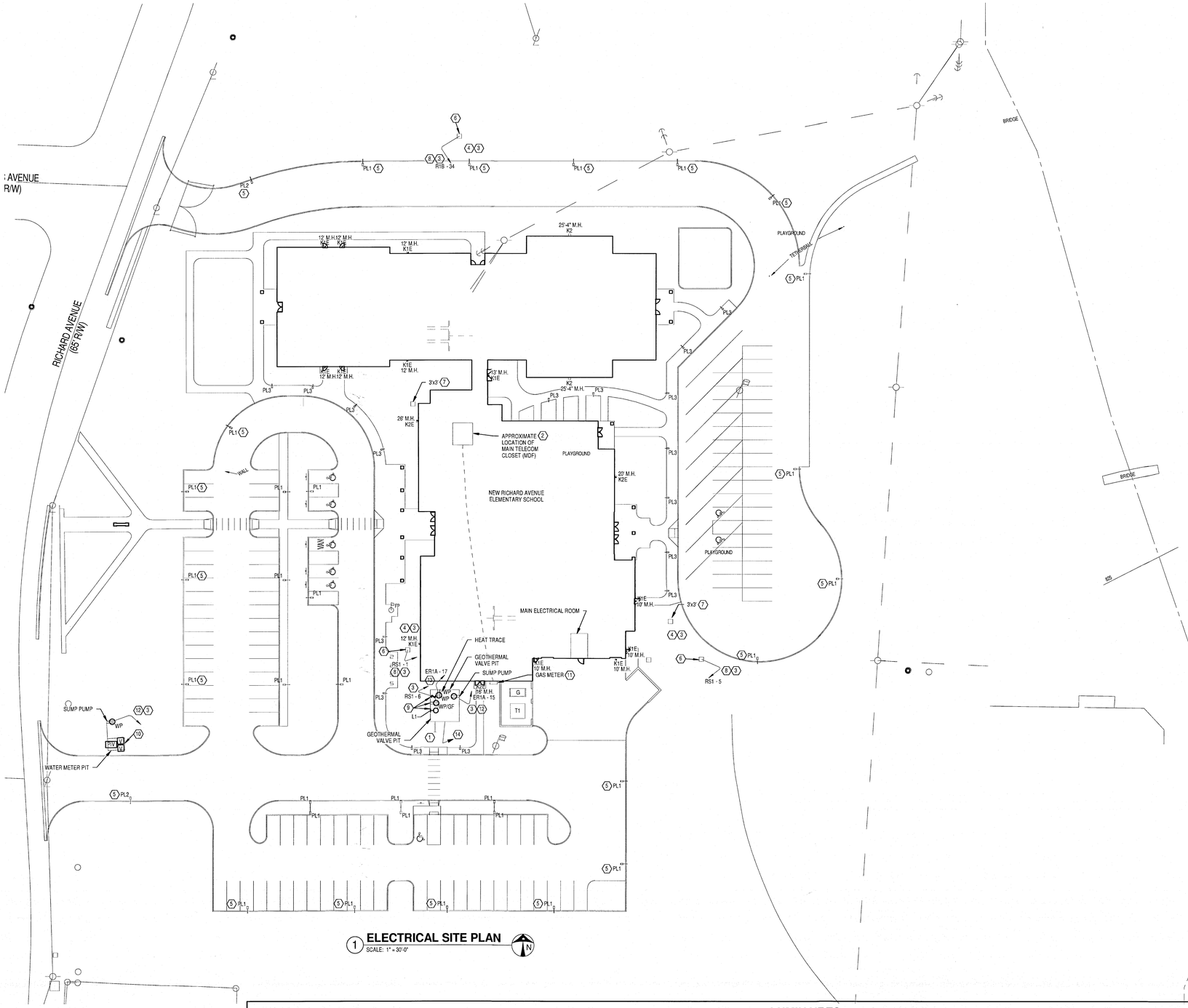


1 ELECTRICAL SITE PLAN

SCALE: 1" = 30'-0"

NOTES

1. PROVIDE STUBBED 2" CONDUIT (WITH PULLWIRE) CAPPED AT 30" BELOW GRADE; INDICATE WITH FLUSH GRADE LOCATING PIN.
2. APPROXIMATE LOCATION OF MAIN TELECOM CLOSET (MDF) LOCATED ON SECOND FLOOR. REFER ARCHITECTURAL PLANS FOR EXACT LOCATION.
3. ALL CONDUITS INSTALLED UNDER DRIVEWAYS AND PARKING AREAS WHERE AUTOMOBILE TRAFFIC PASSES THROUGH SHALL BE CONCRETE ENCASED.
4. RUN 20A, 277V-1PH LIGHTING CIRCUIT WITH 2-#8, 1-#8 GRD. IN COMMON 1.5" CONDUIT WITH RECEPTACLE CIRCUIT TO EXTERIOR LIGHTING PULLBOX (NOTE 7, THIS SHEET). EXTEND FROM PULLBOX TO PANEL IN MAIN ELECTRIC ROOM AS INDICATED. RUN LIGHTING BRANCH CIRCUITS THRU EXTERIOR LIGHTING CONTROLS PER DETAILS ON SHEET E005.
5. PROVIDE HOUSE SIDE SHIELD ON THIS LUMINAIRE.
6. FLUSH GRADE PULLBOX ENCLOSURE WITH GREEN GASKETED COVER WITH APPROPRIATE LOGO, PER DETAIL D, SHEET E003.
7. FLUSH GRADE PULLBOX PER NOTE 6, THIS SHEET. PULLBOX CONTAINS ALL EXTERIOR LIGHTING (AND RECEPTACLE) CONDUITS; EXTEND 2-4" CONDUITS FROM THIS PULLBOX TO MAIN ELECTRIC ROOM TO SERVE EXTERIOR LIGHTING AND EXTEND 2-4"C. FROM THIS PULLBOX TO SERVE EXTERIOR RECEPTACLE CIRCUITS. PROVIDE DIVIDER PLATE INSIDE PULLBOX TO SEGREGATE THE LIGHTING AND RECEPTACLE CIRCUITS AND PROVIDE LABEL ON WIRING TO INDICATE BRANCH CIRCUITS. REFER TO NOTES ON THIS SHEET.
8. RUN 20A, 120V RECEPTACLE CIRCUIT WITH 2-#8, 1-#8 GRD. IN COMMON 1.5" CONDUIT WITH LIGHTING CIRCUIT TO EXTERIOR LIGHTING PULLBOX (NOTE 7, THIS SHEET). EXTEND FROM PULLBOX TO PANEL IN MAIN ELECTRIC ROOM AS INDICATED.
9. VERIFY EXACT MOUNTING LOCATION OF WORK LIGHT, SWITCH AND RECEPTACLE WITH H.C. PRIOR TO ROUGH-IN AND PROVIDE ACCORDINGLY
10. E.C. SHALL PROVIDE 2-1"C. WITH FIRE ALARM WIRING FROM FIRE ALARM DEVICES MOUNTED IN WATER METER PIT INTO BUILDING AND TO MAIN FIRE ALARM PANEL FOR MONITORING FIRE ALARM DEVICES. WIRE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
11. PROVIDE 1.5" EMPTY CONDUIT (WITH PULL WIRE) FROM GAS METER TO MAIN MDF CLOSET; VERIFY EXACT LOCATION OF GAS METER AND END OF RUN WITH DIV. 23 CONTRACTOR PRIOR TO ROUGH IN. LABEL EACH ED OF PULLWIRE TO READ 'GAS METER'.
12. PROVIDE WEATHERPROOF, RECEPTACLE WITH 120V-1PH BRANCH CIRCUIT WITH (2-#8, 1-#8 GRD., IN 1"C.) TO SERVE FUTURE SUMP PUMP. RUN CIRCUIT TO PANEL INDICATED.
13. E.C. SHALL PROVIDE 20A, 120V HEAT TRACE CIRCUIT WITH 2-#8, 1-#8 GRD. IN 1"C. RUN FROM EMERGENCY POWER PANEL LOCATED IN MAIN ELECTRIC ROOM. PROVIDE GROUND FAULT PROTECTED TYPE BREAKER IN PANEL TO SERVE THE CIRCUIT.
14. E.C. SHALL PROVIDE 1.5" EMPTY CONDUIT (WITH PULLSTRING) FROM GEOTHERMAL VALVE PIT TO MAIN MECHANICAL ROOM FOR CONTROL WIRING. VERIFY STUB END LOCATION OF CONDUIT IN VALVE PIT AND MECHANICAL ROOM WITH HC PRIOR TO ROUGH-IN AND PROVIDE ACCORDINGLY.

GENERAL NOTES:

A. ALL UNDERGROUND CONDUITS AND DUCTBANKS SHALL BE DIRECT BURIED PER DETAIL Q, ON SHEET E003 UNLESS INDICATED OTHERWISE. ALL PRIMARY AND SECONDARY CONDUITS AND DUCTBANKS SHALL HAVE LONG SWEEPING BENDS. ALL CONDUITS BURIED UNDER DRIVEWAYS AND PARKING AREAS WHERE AUTOMOBILE TRAFFIC PASSES THROUGH SHALL BE CONCRETE ENCASED. PROVIDE ALL CONDUITS WITH PULLWIRE; ALL CONDUITS SHALL BE 1.5" UNLESS INDICATED OTHERWISE. E.C. SHALL UTILIZE COMMON TRENCH(ES) WHERE EVER FEASIBLE.

B. E.C. SHALL PROVIDE EXTERIOR MOUNTED WEATHERPROOF FIRE ALARM AUDIOVISUAL DEVICE ON THE OUTSIDE OF THE BUILDING AS DIRECTED BY LOCAL FIRE DEPARTMENT. REFER TO SPEC. SECTION 28 31 00.

C. ALL PRIMARY CONDUCTORS, LOAD BREAK ELBOWS, TERMINATIONS AT RISER POLE, METERING CABINET TRANSFORMERS, AND JUNCTION BOXES SHALL BE PROVIDED BY POWER CO. ALL WORK SHALL BE COORDINATED WITH SOUTHWEST CITY SCHOOLS AND THE POWER CO.

D. NEW BUILDING SHALL BE PROVIDED WITH LIGHTNING PROTECTION SYSTEM PER SPEC SECTION 26 41 00.

CALL 811
MINIMUM 2 WORK DAYS BEFORE YOU DIG
UTILITIES PROTECTION SERVICE

LUMINAIRES

MARK	LAMPS: FLUORESCENT	LAMPS: INCANDESCENT	LAMPS: H.I.D.	LAMPS: L.E.D.	WATTS / LAMP	CATALOG NO.	COLOR	LOAD (VA)	FIXTURE VOLTAGE	MANUFACTURER	CATALOG NO.	OTHER ACCEPTABLE MANUFACTURERS	DIFFUSING MEDIA	TRIM COLOR: WHITE	TRIM COLOR: BLACK	TRIM COLOR: ALUMINUM	TRIM COLOR: BRONZE	TRIM COLOR: STANDARD	TRIM COLOR: SEE NOTE	MOUNTING	SIZE: DIAMETER	SIZE: WIDTH	SIZE: LENGTH	SIZE: DEPTH	SEE NOTE
K1E				1	60	LED	3500K	60	277	KIM	#WD14-D-3-60-L3K-277-DB	LITHONIA, WIDELITE, BEACON, GARDCO	TEMPERED LENS				•			WM (7)		13"	14.5"	6.5"	7,10
K2				1	120	LED	3500K	120	277	KIM	#WD18-D-3-120-L3K-277-DB	LITHONIA, WIDELITE, BEACON, GARDCO	TEMPERED LENS				•			WM (7)		17"	18"	8.75"	7,10
K2E				1	120	LED	3500K	120	277	KIM	#WD18-D-3-120-L3K-277-DB	LITHONIA, WIDELITE, BEACON, GARDCO	TEMPERED LENS				•			WM (7)		17"	18"	8.75"	7,10
PL1				1	96	LED	4000K	96	277	KIM	#1SA-ALT96-96L4K277-DB-SF	LITHONIA, WIDELITE, LSI, HOLOPHANE, GARDCO, McGRAW EDISON	1 TYPE 3 OPTIC WITH TEMPERED GLASS LENS				•			20' SQ. POLE W/CONCRETE BASE		16"	22"	8"	8,23,25,27,32
PL2				1	96	LED	4000K	96	277	KIM	#1SA-ALT96-96L4K277-DB-SF	LITHONIA, WIDELITE, LSI, HOLOPHANE, GARDCO, McGRAW EDISON	1 TYPE 4 OPTIC WITH TEMPERED GLASS LENS				•			20' SQ. POLE W/CONCRETE BASE		16"	22"	8"	8,23,25,27,32
PL3				1	60	LED	4000K	60	277	KIM	#1SA-ALT60-60L4K277-DB-SF	LITHONIA, WIDELITE, LSI, HOLOPHANE, GARDCO, McGRAW EDISON	1 TYPE 3 OPTIC WITH TEMPERED GLASS LENS				•			12' SQ. POLE W/CONCRETE BASE		12"	17"	6"	4,8,23,27,32

LUMINAIRE SCHEDULE NOTES

4. PROVIDE CONCRETE POLE BASE PER DETAIL "L" SHEET E003.
7. INSTALL LUMINAIRE AT MOUNTING HEIGHT AS INDICATED ON PLAN. VERIFY FINAL LOCATION WITH ARCHITECT PRIOR TO ROUGH-IN TO AVOID CONFLICT WITH ARCHITECTURAL AESTHETICS.
8. EACH POLE SHALL BE SIZED TO ACCOMMODATE EPA OF COMPLETE LUMINAIRE/POLE ASSEMBLY FOR WIND VELOCITY OF 90 MPH AND GUSTING WIND EQUIVALENT OF 117 MPH. E.C. SHALL TOUCH UP ALL PAINT ON SITE AFTER INSTALLATION.
10. PROVIDE FIXTURE COMPLETE WITH LENS, FUSING, COLD WEATHER BALLAST, RECESSED BACKBOX AND WALL ACCESSORIES FOR A COMPLETE INSTALLATION.
23. MANUFACTURER SHALL SUBMIT POINT-TO-POINT AIMING DRAWINGS OF THE TOTAL PROJECT AREA INDICATING ORIENTATION OF EACH LUMINAIRE'S OPTIC ASSEMBLY. ORIENTATION INDICATED ON PLAN REFERS TO DIRECTION OF LUMINARIES AS REFERENCED TO ASSOCIATED POLE. LOCATE ASSEMBLIES AS INDICATED ON PLAN IN CONFORMANCE WITH MANUFACTURERS RECOMMENDED OPTIC ORIENTATION.
25. PROVIDE CONCRETE POLE BASE PER DETAIL "K", SHEET E003.
27. PROVIDE DUPLEX RECEPTACLE IN POLE DIRECTLY ABOVE HANDHOLE FOR EACH ASSEMBLY.
32. PROVIDE FIXTURE WITH COLD WEATHER BALLAST.

"0'-1" REFERENCE LINE"

STATE OF OHIO
RICHARD L. PAVLAK
47352
REGISTERED PROFESSIONAL ENGINEER

Heapy Engineering
M/P Design Technology Planning Commissioning Energy
Nationally Recognized Leader in Sustainability
PROJECT NO. 2012-07072.16

SHP LEADING DESIGN

4805 Montgomery Road Cincinnati, Ohio 45212	Suite 400 513-381-2112	City Administrator	
236 High Street Hamilton, Ohio 45011	513-863-5441	Service Director	
250 Civic Center Drive Columbus, Ohio 43215	Suite 200 614-223-2124	Review for the City of Grove City Jackson	
1675 Broadway Denver, Colorado 80202	Suite 1300 303-209-7666	Township Fire Department	

DEVELOPMENT PLAN
CITY PROJECT NO._____

RICHARD AVENUE ELEMENTARY SCHOOL
3646 Richard Ave., Grove City, OH 43123

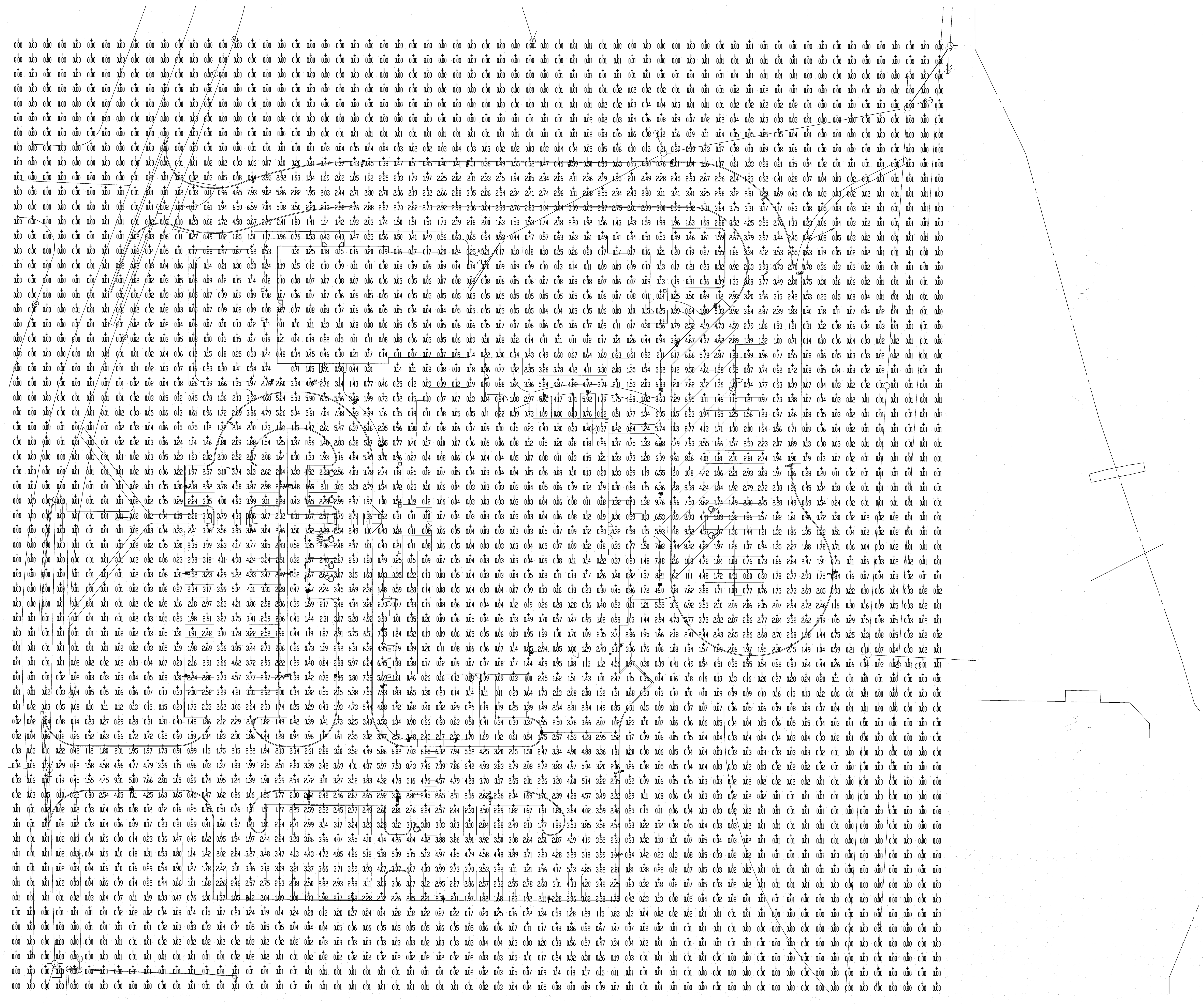
SOUTH-WESTERN CITY SCHOOL DISTRICT
3805 Marlane Drive, Grove City, OH 43123

ELECTRICAL POWER & LIGHTING SITE PLAN

DATE 06-13-14

E002B

C:\BIM\Model\2012-07072.16 CENTRAL - Richard Avenue_JAEvers.rvt
6/12/2014 7:47:03 PM



ELECTRICAL SITE PLAN

SCALE: 1" = 30'-0"

PRELIMINARY - NOT FOR CONSTRUCTION

SHP LEADING DESIGN

4805 Montgomery Road Cincinnati, Ohio 45212 Suite 400 513-381-2112

236 High Street Hamilton, Ohio 45011 513-863-5441

250 Civic Center Drive Columbus, Ohio 43215 Suite 200 614-223-2124

1675 Broadway Denver, Colorado 80202 Suite 2450 303-209-7666

SOUTH-WESTERN CITY SCHOOL DISTRICT

RICHARD AVENUE ELEMENTARY SCHOOL

3646 Richard Ave., Grove City, OH 43123

SOUTH-WESTERN CITY SCHOOL DISTRICT

3805 Marlane Drive, Grove City, OH 43123

ISSUANCES	
06-13-14	DESIGN DEVELOPMENT

ELECTRICAL LIGHTING CALCULATIONS

DATE 06-13-14

COMM NO. 2012014.10

Heapy Engineering
Nationally Recognized Leader in Sustainability
PROJECT NO. 2012-07072.16

0'-0" REFERENCE LINE

E002L

SHP
LEADING DESIGN

July 23, 2014

Ms. Kimberly Shields, AICP
Planning / GIS Specialist
Development Department
4035 Broadway, Grove City, Ohio 43123

RE: South-Western City Schools
Richard Avenue Elementary School
3646 Richard Avenue, Grove City, Ohio 43123
Development Plan Application Control Number: 201406300028
SHP Commission Number: 2012014.10

Dear Ms. Shields,

Thank you for your review comments dated July 11, 2014 regarding the above referenced project. My responses correspond to your sections and numbered items.

Development Department

1. Revising the bus drive to be parallel parking along Richard Avenue creates a number of safety concerns as described in the following list:
    a. Unsafe condition having children passing through the parking lot and crossing pick-up / drop-off traffic.
    b. Bus pull-off drive revision would extend to the northern most property line to fit the number of busses required creating a considerable distance for children to walk in inclement weather.
    c. Buses would only be able to enter the site northbound because of the turning radius needed and it is the opposite direction the busses would be traveling because of the school's new boundary lines.
    d. Having the bus drive and the pick-up / drop-off curb cuts adjacent to one another creates an unsafe traffic flow and strong potential for traffic congestion.
    e. No fire access to the north side of the classroom wing and the east side of the building.

    For these reason we would appreciate your support to keep the current bus drive design. It provides immediate building entry / exit access for the children, allows southbound bus entry, creates safe separation of traffic, and provides adequate fire access for the children and building.
2. Refer to revised Sheet C100.
3. Refer to revised Sheet C100.
4. No action required.
5. Per our 7/17/14 meeting with Kyle Rauch, AICP (Community Development Officer, Grove City) the drive aisle can be reduced to 26 feet.
6. The recreation trail can be added by Grove City in the future and the District will work with you to development an easement which would include maintenance on your part.
7. The striped area will be modified to include the required island and landscaping.
8. Dumpster gates are not included with this design and were not included and approved on previous recently submitted elementary schools.

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4805 Montgomery Road Suite 400
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513.381.5121 fax

HAMILTON
236 High Street
Hamilton, Ohio 45011
513.863.5441 main
513.863.5696 fax

COLUMBUS
250 Civic Center Drive Suite 200
Columbus, Ohio 43215
614.223.2124 main
614.223.2130 fax

DENVER
1675 Broadway Suite 1300
Denver, Colorado 80202
303.209.7866 main
303.209.7865 fax

Steed Hammond Paul Inc.

9. Variance approval is required for the building height, but this has been approved on previous recent elementary schools.
10. The existing baseball diamond will remain as-is.
11. Refer to revised Sheet C100.
12. Per Ed Melvin's (SHP Leading Design, Landscape Architect) 7/21/14 phone conversation with Jodde Lowe the landscape design as originally submitted is acceptable and meets code.
13. The new playground design is consistent in size with previous recently submitted elementary schools, which includes the hard surface area shown on Sheet L102.

Parks and Recreation Department

14. The multi-use path (recreation trail) can be added by Grove City in the future and the District will work with you to development an easement which would include maintenance on your part.
15. The existing baseball diamond will remain as-is.
16. The existing shelter will remain as-is.

Urban Forestry

17. Refer to revised Sheet L100.
18. Per Ed Melvin's (SHP Leading Design, Landscape Architect) 7/21/14 phone conversation with Jodde Lowe the landscape design as originally submitted is acceptable and meets code.
19. The east parking lot is for bus parking and student play – the secondary use of the space is overflow parking for events. Per Ed Melvin (SHP Leading Design, Landscape Architect) 7/21/14 phone conversation with Jodde Lowe the landscape design as originally submitted is acceptable and meets code.
20. Refer to revised Sheet L100.
21. Refer to revised Sheet L100.

Engineering, EMH&T

22. Refer to revised Sheet Z201 for the building light fixtures, Sheet E002B for site lighting and building locations with descriptive information on the Luminaires schedule, the new Sheet E002L for lighting calculation, and the supplementary information 8-1/2" x 11" document that includes the lighting cut sheets.
23. Curbing will be 18" barrier curb or an integral 6" curb and walk.
24. Refer to revised Sheet C100.
25. Curbing is provided along the northern drive to prevent cars from driving into the dry detention basin. The east side basin is located east of the hard surface play area where basketball goals will be positioned along the edge of pavement. It is not desired to include curbing in this area due to safety concerns for the hard play surface.
26. The proposed sanitary sewer will be privately owned and maintained.
27. All known easements have been identified on site drawings. The school district has not recently completed a title search for the site and does not plan to have one prepared. The existing 8" sanitary sewer that will be connected to is not shown on the City's sanitary atlas. We are not proposing to add any utility easements at this time.
28. The 4-ft walk is a reconnection of a pedestrian route from the elementary playground area to the parking lot on the west side of Brookpark Middle School. The route does not appear to be ADA compliant and we recommend not installing detectable warnings and ramps on a non-compliant route. The route is intended to provide access to the hard surface play area located in the bus lot.
29. ADA compliant ramps will be provided for the "buddy" ramps on the west side of Richard Avenue that align with ramps to the proposed school site. Ramps on the west legs crossing Barbee Avenue and Thomas Avenue are outside the project limits. Refer to C100 for reorientation of the ramps.

30. Refer to revised Sheet C100.
31. Refer to revised Sheet C100 for the new curb and sidewalk. Information will be included on engineering submission for demolition in this area.
32. The existing pedestrian bridge is in working order and will remain as-is during the construction of the new Richard Avenue Elementary School.

Existing Pedestrian Bridge

33. Grove City standard drawings will be referenced on the construction plans.
34. Refer to revised Sheet C104.
35. The 100yr flood limits have been labeled. Refer to revised Sheet C100.
36. This project does not contain a retention area therefore screening or fencing is not required.
37. Refer to revised Sheet C100.
38. Ohio EPA NPDES permit will be obtained prior to land disturbance. Once obtained a copy will be provided as requested.
39. When approval of the hydrodynamic separator is obtained a copy will be provided as requested.
40. Calculations for the SCPZ have been added to the stormwater report and width of the SCPZ labeled on the plans.
41. The storm sewer piping downstream from structures 14 and 9 is sized to convey the 100yr flow in lieu of an overland flood route to each basin. Adequate freeboard will be provided and ponding will not exceed 1.0' for flood routing.
42. The plans and stormwater report have been updated. Details will be provided on the construction plans for each outlet structure.
43. The control outlets for each basin have been updated in the PondPack model to discharge to the proposed outlet pipes.
44. The soils on site are classified as Crosby-Urban land complex, which correspond to a HSG of C/D. Since the site has previously been developed and soils were compacted for construction activities and grading, a RCN corresponding to HSG D was selected for the open space areas on site.
45. The water quality drawdown calculations are derived from the basin elevations and volumes as reported by pondpack. For each incremental elevation of the basin, an average discharge is generated and the incremental drawdown computed. The incremental drawdown times are then summed to compute the total drawdown. The drawdown graph is provided as part of the stormwater management report with the 50% drain time labeled.
46. Calculations have been adjusted to maintain velocities of at least 3 feet/second.

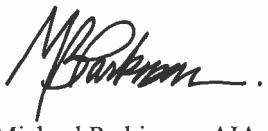
47. The pre-developed exhibit and Tc has been revised.

Jackson Township Fire Department

48. Refer to revised Sheet C100.
49. Information will be included on building permit submission.

Feel free to contact me anytime if you have further questions or concerns.

Sincerely,
SHP Leading Design



Michael Parkinson, AIA

Grove City
Board of Zoning Appeals

4035 Broadway
Grove City, Ohio 43123

South-Western City School District

3805 Marlane Drive
Grove City, Ohio 43123

Richard Avenue
Elementary School

3646 Richard Avenue
Grove City, Ohio 43123

Table of Contents

Exterior Manufacturers, Materials, and Site Furnishings
Specification 101300 Directories (Site Sign)
Site Lighting Cut Sheets

City Administrator	_____
Service Director	_____
Review for the City of Grove City Jackson	_____
Township Fire Department	_____

June 13, 2014

SHP
LEADING DESIGN

June 13, 2014

Exterior Manufacturers, Materials, and Site Furnishings

Standing Seam Metal Roof
Manufacturer: DMI
Color: Beige

Cast Iron Downspout Boots
Manufacturer: Neenah
Color: Custom color to match DMI's Putty

Gutters, Downspouts, Rake, and Fascia
Manufacturer: DMI
Color: Putty

Windows and Storefront
Manufacturer: EFCO
Color: Custom color to match DMI's Putty

Metal Coping
Manufacturer: Metal-Era
Color: Custom color to match DMI's Putty

Curtain Wall
Manufacturer: Kawneer
Color: Custom color to match DMI's Putty

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4805 Montgomery Road Suite 400
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513.381.2112 main
513.381.5121 fax

HAMILTON
236 High Street
Hamilton, Ohio 45011
513.863.5441 main
513.863.5596 fax

COLUMBUS
250 Civic Center Drive Suite 200
Columbus, Ohio 43215
614.223.2124 main
614.223.2130 fax

Steed Hammond Paul Inc.

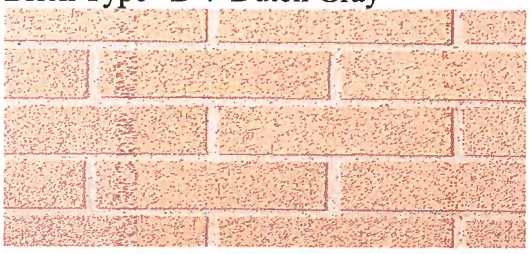
Louvers
Manufacturer: Airolite
Color: Custom color to match DMI's Putty

Site Sign Directory
Manufacturer: Nelson-Harkins, 249-N.
Color: Custom color to match DMI's Putty

Metal Wall Panels
Manufacturer: AEP
Color: Custom color to match DMI's Putty

Brick
Manufacturer: Belden
Brick Type "A": Commodore

Manufacturer: Belden
Brick Type "B": Dutch Gray



Overhead Coiling Doors
Manufacturer: Wayne-Dalton
Color: Custom color to match DMI's Putty

Mortar
Manufacturer: Brixment
Color: C-224

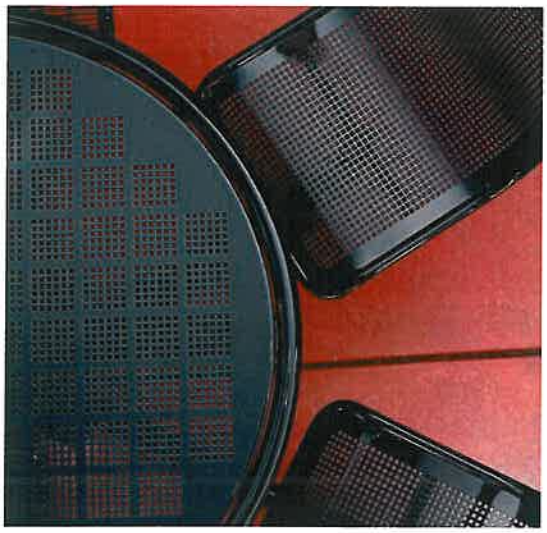
Hollow Metal Doors and Frames
Manufacturer: Ceco Door Products
Color: Custom color to match DMI's Putty

Letters
Manufacturer: Gemini
Color: Dark Bronze

Glazing:
Manufacturer: PPG
Color: Clear

Fiberglass-Sandwich Panel
Manufacturer: Kalwall
Color: White

Tables – 3 seat Carousel
Manufacturer: Landscape Forms
Color: Bronze



Benches - Scarborough
Manufacturer: Landscape Forms
Color: Bronze

Bike Racks - Flo
Manufacturer: Landscape Forms
Color: Bronze

SECTION 101300 - DIRECTORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Nonilluminated, changeable-letter, single / double-sided directories.

B. Related Sections:

1. Section 018113 "Sustainable Design Requirements" for general Project LEED requirements and for additional LEED requirements specifically applicable to this Section.
2. Section 017419 Section "Construction Waste Management and Disposal" for additional LEED requirements for handling of construction waste, general waste, excess materials, packaging, and recyclables.
3. Section 042000 "Unit Masonry" for masonry structure supporting the ground sign.
4. Section 101100 "Visual Display Units" for tackboards.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Directories shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for directories.

B. Shop Drawings: For directories. Include plans, elevations, sections, details, and attachments to other work.

1. Include sections of typical trim members.
2. Provide text and logo layout for permanent header of each sign in the required typestyles at least half size.

C. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:

1. Fabric swatches for letterboards.
2. Section of header panel for color selection.

A. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:

1. Letterboards: Not less than 8-1/2 by 11 inches, mounted on substrate indicated for final Work. Include one panel for each type, color, and texture required.
2. Trim: 6-inch- long sections of each trim profile.
3. Letters: Full-size Samples of changeable letters of each size specified.

1.5 INFORMATIONAL SUBMITTALS

A. Warranty: Special warranty specified in this Section.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Include maintenance manuals.

B. Lettering and symbols catalog to be included in Operations Manual indicating total line of lettering fonts, numerals and symbols available for use in this letterboard system and address, telephone and e-mail of source for purchase.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative of the manufacturer for installation and maintenance of units required for this Project.

B. Source Limitations: Obtain directories from single source from single manufacturer.

1.8 PROJECT CONDITIONS

A. Field Measurements: Verify recessed openings by field measurements before fabrication and indicate measurements on Shop Drawings.

B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs to be performed according to manufacturers' written instructions and warranty requirements.

1.9 COORDINATION

A. Coordinate installation of anchorage for directories. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, masonry inserts, anchor bolts, and items with integral anchors that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

   a. Structural failures of cabinets, access doors or frames.
   b. Faulty operation of hardware or illumination system.
   c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: Five years from date of Contract Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum: Alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated, and as follows:

   1. Sheet: ASTM B 209.
   2. Extruded Shapes: ASTM B 221, Alloy 6063.

B. Clear Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), with Finish 1 (smooth or polished), and 6 mm thick unless otherwise indicated; colorless sheet with visible light transmittance of 92 percent measured per ASTM D 1003.

C. Translucent Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), with Finish 1 (smooth or polished), and 6 mm thick unless otherwise indicated; white colored sheet of density required to produce uniform brightness and minimum halation effects.

D. Opaque Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), with Finish 1 (smooth or polished), and 6 mm thick unless otherwise indicated; colors as indicated.

A. Fasteners: Provide stainless-steel or aluminum screws, bolts, and other fastening devices made for exterior applications. Provide types, sizes, and lengths to suit installation conditions. Use security fasteners where exposed to view.

2.2 CHANGEABLE-LETTER DIRECTORIES

A. Enclosed-Face, Non-Illuminated Changeable-Letter Directory: Factory-fabricated, weather-resistant unit consisting of manufacturer's standard, 3-inch- deep perimeter frame with fixed letterboard on back inside surface and with glazed doors. Provide (1) unit – refer to drawings for width, height, and required type (single or double-faced unit).

   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

      a. Nelson-Harkins Industries; 248-N.
      b. Poblocki Sign Company; Model-E.
      c. Tablet & Ticket Co. (The); 950E Series.

   2. Aluminum Perimeter Frame: Extruded aluminum with weather-resistant backing for exterior use.

      a. Perimeter Frame Profile: Square.
      b. Perimeter Frame Corners: Square.
      c. Finish: Baked enamel.

d. Color: Custom color to match Dimensional Metals, Inc. "Putty".

3. Glazed, Hinged Doors: Clear acrylic sheet set in door frame equipped with full-height continuous hinge and manufacturer's standard lock with two keys. Provide factory-applied weather stripping on doors for exterior use. Provide heavy-duty, spring-loaded or pneumatic door stays at each side of door. Each door stay shall have a minimum load capacity of 30 pounds.

   a. Door Frame: Same material and finish as perimeter frame.
   b. Number of Doors: One, hinged at top, with locks.
   c. Cam Lock cores shall be CompX # M4-7054-010-B-N90-D-P. Keyed in range RD700 thru RD800. No substitutions. CompX Cam Lock Cylinder assembly may vary based on application.

4. Header Panel: Non-illuminated; with opaque, acrylic sheet panel set within overall perimeter frame; with matching frame that separates header panel from letterboard.

   a. Graphic Content and Style: Provide header panel copy that complies with requirements indicated on Drawings including two-color logo. Artwork for logos will be supplied on electronic media by Architect.
   b. Color: Match Architect's sample.

5. Letterboard: Manufacturer's standard vinyl-covered panel material, with grooves spaced at 1/4 inch o.c. to receive changeable letters.

   a. Color: Black.

6. Letters: Molded plastic with tabs for engaging grooves in letterboard. Provide manufacturer's standard assortment of not less than 1200 characters for each size, style, color, and case required; include letters, numbers, and characters. Package letters in compartmentalized carrying box.

   a. Height: 3 inches to top of capitals.
   b. Style: Roman.
   c. Color: White.
   d. Case: All capitals.

7. Width and height and installation conditions as indicated on Drawings.

2.3 FABRICATION

A. Fabricate directories to requirements indicated for dimensions, design, and thickness and finish of materials. Use metals and shapes of thickness and reinforcement to produce flat surfaces, free of oil canning, and to impart strength for size, design, and application indicated.

B. Fabricate directory cabinets and door frames with reinforced corners, mitered and welded to a hairline fit, with no exposed fasteners. Provide structural reinforcement to prevent racking and misalignment.

C. Fabricate exterior directories with vents to permit evaporation of moisture trapped inside.

D. Provide hold-open arms for doors of top-hinged directories.

E. Provide continuous rigid aluminum top cap with center ridge and drainage slope toward each face; turn down and provide drip edge. Match finish and color of header panel.

2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ALUMINUM FINISHES

A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 GENERAL

A. Comply with Division 01 Sections 017419 and 018113 and other requirements for attaining the LEED certification level specified.

3.2 EXAMINATION

A. Examine mounting substrates, with Installer present, for compliance with requirements for installation tolerances, surface conditions of substrate, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. General: Install directories in locations and at mounting heights indicated on Drawings. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

3.4 ADJUSTING AND CLEANING

A. Adjust directory doors to operate smoothly without warp or bind and so that contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

B. Touch up factory-applied finishes to restore damaged or soiled areas.

3.5 WASTE DISPOSAL

A. Comply with Waste Management requirements of Section 017419 "Construction Waste Management and Disposal".

END OF SECTION 101300

Reset Form

KIM LIGHTING

WD14

14″ Wall Director®, Electronic-LED

revision 7-12-10 • kim_wd14led_spec.pdf

Type:
Job:
Catalog number:

/ / /

Fixture | Electrical Module | Finish | Options

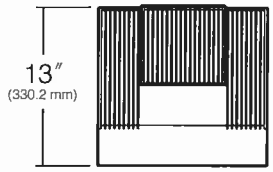
See page 2 | See pages 3-4

Approvals:

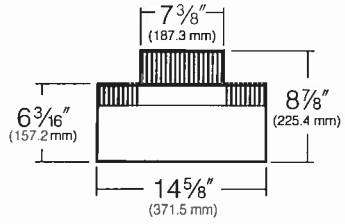
Date:

Specifications

WD14-LED
60 Light Emitting Diodes
Total Max System Watts = 73W
Maximum Weight = 26 lbs.



TOP



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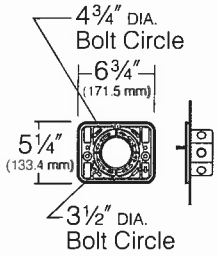
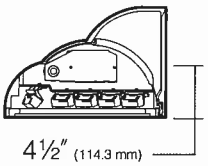


Mounting Plate
Attaches directly to any standard 4″ J-box (by others)



To J-box center

SIDE

Reflector Housing: One-piece die-cast, low copper (<0.6% Cu) aluminum alloy with integral cooling fins. Rotates against ballast housing to provide 10° of adjustment with degree markers cast into the housing. At 0° adjustment, lens is totally concealed from view above horizontal with fixture aimed downward.

Ballast Housing: One-piece die-cast, low copper (<0.6% Cu) aluminum alloy with integral cooling fins. Fastens to mounting plate with keyhole slots freeing both hands for securing and wiring. One stainless steel socket-head screw on each side of housing frees the reflector housing to rotate for aiming. Tightening the screws locks the two housings together with sealing provided by a silicone gasket. For visual aiming, adjustment may be accomplished with the fixture on.

Lens Frame: One-piece die-cast, low copper (<0.6% Cu) aluminum alloy with integral hinges and stainless steel pins. Toolless access to reflector housing with sealing provided by a one-piece extruded and vulcanized silicone gasket. Lens is clear flat 3⁄16″ thick tempered glass sealed to lens frame with a silicone gasket and retainer clips. For UP models, lens is mounted flush with frame for water run off, and is silicone sealed.

Electronic Module: All electrical components are UL and CSA recognized, mounted on a single plate and factory prewired with quick-disconnect plugs. Module includes a driver, thermal control device and surge protector.Electrical module attaches to housing with no-tool hinges and latches, accessible by opening the lens frame only. Driver is rated for -40°F starting and has a 0-10V dimming interface for multi-level illumination options.

Optical Module: Precision, replaceable MicroEmitters are positioned to achieve directional control toward desired task. The entire EmitterDeck fastens to the housing as a one-piece module.

Electrical Components: High power factor ballasts are rigidly mounted inside the housing and are factory prewired with a quick-disconnect plug for mating to the socket.

Mounting Plate: Mounting plate attaches directly to any standard 4″ junction box. All mounting plates are die-cast aluminum with reinforced ribs. Two studs are provided in each plate with flange nuts to allow fixture mounting by keyhole slots. Sealant must be applied (by others) between mounting plate and mounting surface to insure a dry junction box.

Finish/Color: Super TGIC thermoset polyester powder coat paint, 2.5 mil nominal thickness, applied over a titanated zirconium conversion coating; A.S.T.M. 2500 hour salt spray test endurance rating. Standard colors are Black, Dark Bronze, Light Gray, Stealth Gray®, Platinum Silver, or White. Custom colors are available.

Warranty: Kim Lighting warrants Wall Director LED products ("Product(s)") sold by Kim Lighting to be free from defects in material and workmanship for (i) a period of five (5) years for metal parts, (ii) a period of ten (10) years for exterior housing paint finish(s), (iii) a period of six (6) years for LED Light Engines and, (iv) a period of five (5) years for LED power components (driver, surge protector and LifeShield™ device), from the date of sale of such goods to the buyer as specified in Kim Lighting shipment documents for each product.

CAUTION: Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury.

Listings and Ratings			
ETL to UL 1598[1] Standards	IP66 Rated	CE	25°C Ambient

[1]Suitable for wet locations

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HUBBELL LIGHTING, INC.

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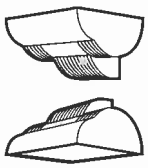


Standard Features

Fixture
Cat. No. designates **WD14** fixture, Up (U) or Down (D) configuration, and light distribution (2, 3 or 4).

WD14 x x

Housing Size:
WD14

Distribution:
☐ U = Up
☐ D = Down

Type:
☐ 2 = Type II
☐ 3 = Type III
☐ 4 = Type IV

Light Distribution:


Type II


Type III


Type IV

Electrical Module

Cat. Nos. for Electrical Modules available:

60 LxK x

Source:
60 = 60 LED's

Color Temperature:[1]
☐ L3K = 3500K
☐ L5K = 5100K
☐ L2K = 580nm - Amber

Voltage:
☐ 120 = 120V
☐ 208 = 208V
☐ 240 = 240V
☐ 277 = 277V
☐ 347 = 347V[2]
☐ 480 = 480V[2]

[1]4300K and 6500K are also available on an "Engineered-to-Order" (ETO) basis.

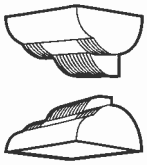
[2]Due to current unavailability of 347V and 480V drivers, specification of these voltages may feature an integral step-down transformer.

Fixture	Total System Watts	Volt	Operating Amps
WD14-Small	73	120	0.61
WD14-Small	73	208	0.35
WD14-Small	73	240	0.30
WD14-Small	73	277	0.26
WD14-Small	73	347	0.21
WD14-Small	73	480	0.15

Finish
Super TGIC powder coat paint over a titanated zirconium conversion coating.

Color: Black Dark Bronze Light Gray Stealth Gray® Platinum Silver White Custom Color[1]
Cat. No.: ☐ **BL** ☐ **DB** ☐ **LG** ☐ **SG** ☐ **PS** ☐ **WH** ☐ **CC**

[1]Custom colors subject to additional charges, minimum quantities and extended lead times. Consult representative. Custom color description: _____



Optional Features

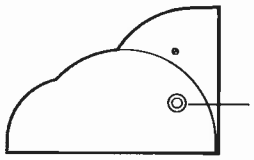
Base Socket
Cat. No. ☐ **G12**
☐ **No Option**

G12 base socket available for 70W and 150W Pulse Start Metal Halide lamps only.

Photocell Control
Cat. No. **(see right)**
☐ **No Option**

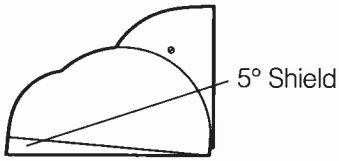
Factory installed inside housing with fully gasketed sensor on side wall.

Cat. No.	Line Volts:	Cat. No.	Line Volts:
☐ **A-30**	120V	☐ **A-33**	277V
☐ **A-31**	208V	☐ **A-34**	480V
☐ **A-32**	240V	☐ **A-35**	347V



5° Shield
Cat. No. ☐ **5DS14**
☐ **No Option**

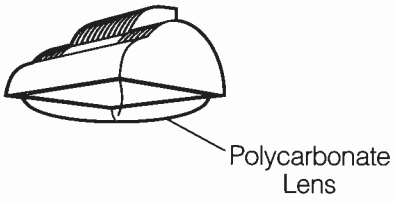
Aluminum shield field-attached to lens frame. Maintains a horizontal cutoff fixture edge when the luminaire is tilted 5°. Finished to match the fixture.



Polycarbonate Lens:
Cat. No. ☐ **LS**
☐ **No Option**

Clear flat polycarbonate lens replaces standard tempered glass lens.

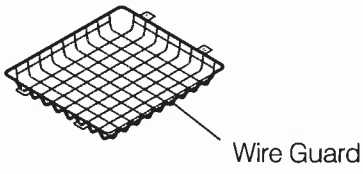
NOTE: Use only when vandalism is anticipated to be high. Useful life is limited by UV discoloration from sunlight. A program of regular inspection and periodic replacement is highly recommended to maintain optimum fixture performance.



Wire Guard
Cat. No. ☐ **WG14**
☐ **No Option**

11 ga. (.12″ dia.) BB Wire, (.75″ sq. welded mesh pattern,) 11⅜″ x 10¼″ x 1½″ deep. Finish is super TGIC thermoset polyester powder coat paint, over zinc plated wireform. Finished to mach the fixture.

NOTE: Only available with flat lens applications.



Fusing
Cat. No. **(see right)**
☐ **No Option**

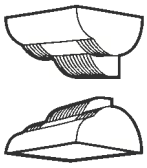
Line Volts:	120V	208V	240V	277V	347V	480V
Cat. No.:	☐ **SF**	☐ **DF**	☐ **DF**	☐ **SF**	☐ **SF**	☐ **DF**

Surface Conduit Mount
Cat. No. ☐ **SCM14U**
☐ **SCM14D**
☐ **No Option**

Cast aluminum junction box and fixture mount for attachment (by others) to existing walls, beams or columns. **SCM14** has one ¾″ NPT conduit tap in each side and bottom. Must be securely mounted to wall surface. Finished to match the fixture.

SCM14U for UP fixtures only.
SCM14D for DOWN fixtures only.

Note: Must be securely mounted to all surface.

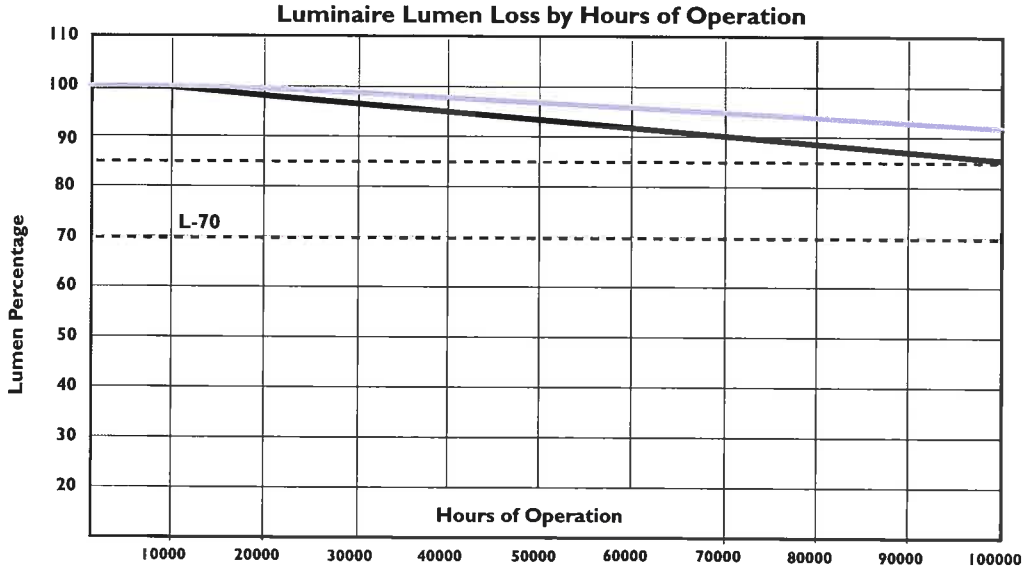


Lumen Performance Charts

NOTES:

1. Lumen loss stablization is a result of Kim Lighting's MicroEmitter™ luminaires exclusive LifeShield™ Protection System and Dual Heat Management.
2. The LifeShield™ Protection System will lower the current to the LEDs significantly if the luminaire is exposed to direct heat (sun) or excessive abnormal conditions.
3. Luminaire Lumen Loss assumptions are based on LM-80 results and an actual outdoor product testing based upon 5100K CCT, 350mA drive current. 25°C/77°F tab ambient and cathode temperature at 85°C/185°F. Assumptions past 6,000 hours are interpolated.
4. Cathode temperature baseline is at 85°C/185°F. If cathode temperature increases during ambient changes and abnormal environment conditions, % of rated lumens will slightly decrease.
5. Outdoor ambient temperatures are assumed SITU average by geographic region.
6. As Solid State Lighting technology and thermal management systems continually advance, lumen loss projections are subject to improvement.

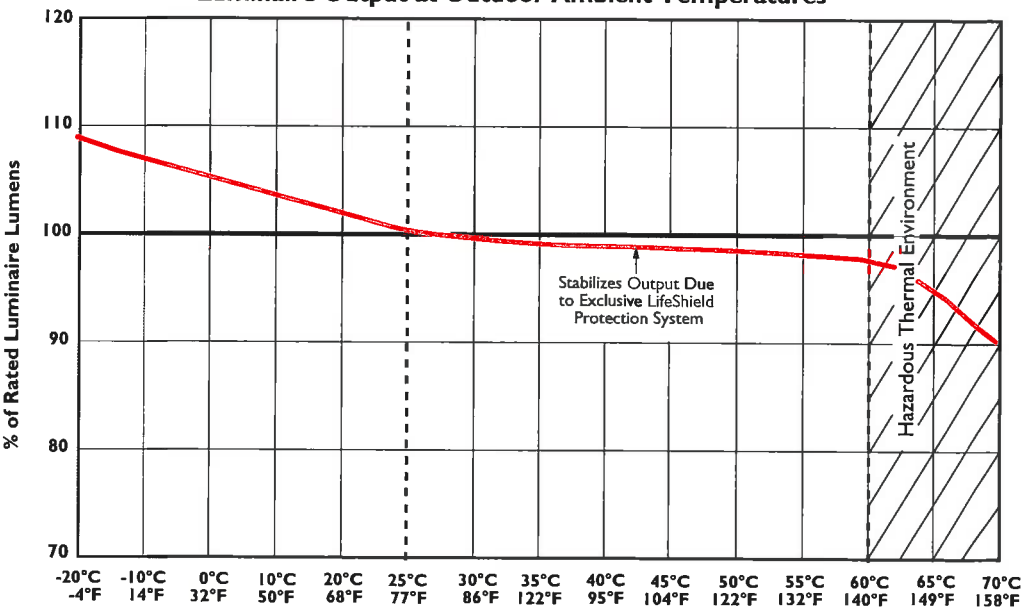
Luminaire Lumen Loss by Hours of Operation



Outdoor Temperature at 10°C/50°F. Temperature is based on continual average, annual assumptions.

Outdoor Temperature at 40°C/104°F. Temperature is based on continual average, annual assumptions.

Luminaire Output at Outdoor Ambient Temperatures



Reset Form

KIM LIGHTING

WD18

18″ Wall Director®, Electronic-LED

revision 8-16-10 • kim_wd18led_spec.pdf

Type:
Job:
Catalog number:

/ / /

Fixture | Electrical Module | Finish | Options

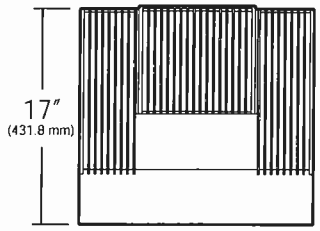
See page 2 — See pages 3-4

Approvals:

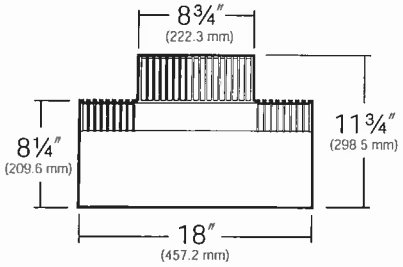
Date:

Specifications

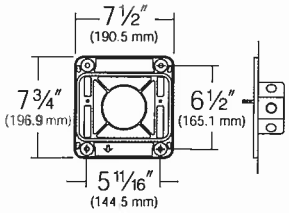
WD18-LED
120 Light Emitting Diodes
Total Max System Watts = 140W
Maximum Weight = 43 lbs.



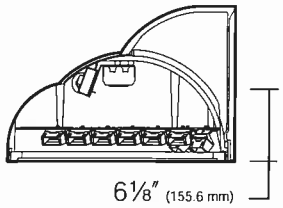
TOP



FRONT



Mounting Plate
must be securely attached to wall outside the J-box perimeter.



to J-box center

SIDE

HUBBELL LIGHTING, INC.

Reflector Housing: One-piece die-cast, low copper (<0.6% Cu) aluminum alloy with integral cooling fins. Rotates against ballast housing to provide 10° of adjustment with degree markers cast into the housing. At 0° adjustment, lens is totally concealed from view above horizontal with fixture aimed downward.

Ballast Housing: One-piece die-cast, low copper (<0.6% Cu) aluminum alloy with integral cooling fins. Fastens to mounting plate with keyhole slots freeing both hands for securing and wiring. One stainless steel socket-head screw on each side of housing frees the reflector housing to rotate for aiming. Tightening the screws locks the two housings together with sealing provided by a silicone gasket. For visual aiming, adjustment may be accomplished with the fixture on.

Lens Frame: One-piece die-cast, low copper (<0.6% Cu) aluminum alloy with integral hinges and stainless steel pins. Two stainless steel quarter-turn fasteners secure lens frame to reflector housing with sealing provided by a one-piece extruded and vulcanized silicone gasket. Lens is clear flat 3/16″ thick tempered glass sealed to lens frame with a silicone gasket and retainer clips. For UP models, lens is mounted flush with frame for water run off, and is silicone sealed.

Electronic Module: All electrical components are UL and CSA recognized, mounted on a single plate and factory prewired with quick-disconnect plugs. Module includes a driver, thermal control device and surge protector.Electrical module attaches to housing with no-tool hinges and latches, accessible by opening the lens frame only. Driver is rated for -40°F starting and has a 0-10V dimming interface for multi-level illumination options.

Optical Module: Precision, replaceable MicroEmitters are positioned to achieve directional control toward desired task. The entire EmitterDeck fastens to the housing as a one-piece module.

Mounting Plate: The standard mounting plate is attached to wall (by others) outside the junction box perimeter. All mounting plates are die-cast aluminum with reinforced ribs. Two studs are provided in each plate with flange nuts to allow fixture mounting by keyhole slots. Sealant must be applied (by others) between mounting plate and mounting surface to insure a dry junction box.

Finish: Super TGIC thermoset polyester powder coat paint, 2.5 mil nominal thickness, applied over a titanated zirconium conversion coating; A.S.T.M. 2500 hour salt spray test endurance rating. Standard colors are Black, Dark Bronze, Light Gray, Stealth Gray®, Platinum Silver, or White. Custom colors are available.

Warranty: Kim Lighting warrants Wall Director LED products ("Product(s)") sold by Kim Lighting to be free from defects in material and workmanship for (i) a period of five (5) years for metal parts, (ii) a period of ten (10) years for exterior housing paint finish(s), (iii) a period of six (6) years for LED Light Engines (MicroEmitters) and, (iv) a period of five (5) years for LED power components (LED Driver, LifeShield™ device, Surge Protector), from the date of sale of such goods to the buyer as specified in Kim Lighting shipment documents for each product.

CAUTION: Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury.

Listings and Ratings			
ETL to UL 1598[1] Standards	IP66 Rated	CE	25°C Ambient

[1]Suitable for wet locations

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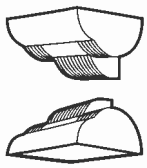


Standard Features

Fixture

Cat. No. designates **WD18** fixture, Up (U) or Down (D) configuration, and light distribution (2, 3 or 4).

WD18 x x

Housing Size:
WD18

Distribution:
☐ U = Up
☐ D = Down

☐ 2 = Type II
☐ 3 = Type III
☐ 4 = Type IV

Light Distribution:

Type II Type III Type IV

Electrical Module

Cat. Nos. for Electrical Modules available:

120 LxK x

Source:
120 = 120 LED's

Color Temperature:[1]
☐ L3K = 3500K
☐ L5K = 5100K
☐ L2K = 580nm - Amber

Voltage:
☐ 120 = 120V
☐ 208 = 208V
☐ 240 = 240V
☐ 277 = 277V
☐ 347 = 347V
☐ 480 = 480V

[1]4300K and 6500K are also available on an "Engineered-to-Order" (ETO) basis.

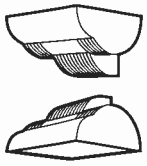
Fixture	Total System Watts	Volt	Operating Amps
WD18-Large	140	120	1.17
WD18-Large	140	208	0.67
WD18-Large	140	240	0.58
WD18-Large	140	277	0.51
WD18-Large	140	347	0.40
WD18-Large	140	480	0.29

Finish

Super TGIC powder coat paint over a titanated zirconium conversion coating.

Color: Black Dark Bronze Light Gray Stealth Gray® Platinum Silver White Custom Color[1]
Cat. No.: ☐ **BL** ☐ **DB** ☐ **LG** ☐ **SG** ☐ **PS** ☐ **WH** ☐ **CC**

[1]Custom colors subject to additional charges, minimum quantities and extended lead times. Consult representative. Custom color description: _____

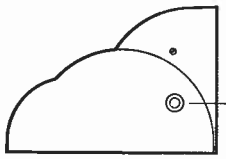


Optional Features

Photocell Control
Cat. No. **(see right)**
☐ **No Option**

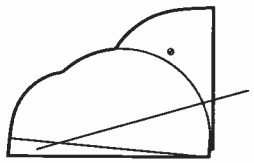
Factory installed inside housing with fully gasketed sensor on side wall.

Cat. No.	Line Volts:	Cat. No.	Line Volts:
☐ **A-30**	120V	☐ **A-33**	277V
☐ **A-31**	208V	☐ **A-34**	480V
☐ **A-32**	240V	☐ **A-35**	347V



5° Shield
Cat. No. ☐ **5DS18**
☐ **No Option**

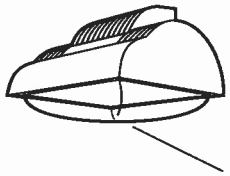
Aluminum shield field-attached to lens frame. Maintains a horizontal cutoff fixture edge when the luminaire is tilted 5°. Finished to match the fixture.



Lexan® Enclosure:
Cat. No. ☐ **LS**
☐ **No Option**

For DOWN fixture models only. Clear convex vacumm formed Lexan® enclosure with gasket replaces standard tempered glass lens. 250W max. May be used with 400W HPS only in outdoor locations where ambient air temperature during fixture operation will not exceed 85°F.

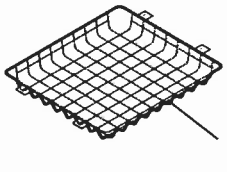
NOTE: Use only when vandalism is anticipated to be high. Useful life is limited by UV discoloration from sunlight and MH lamps. A program of regular inspection and periodic replacement is highly recommended to maintain optimum fixture performance.

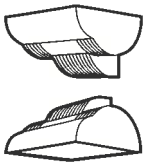


Wire Guard
Cat. No. ☐ **WG18**
☐ **No Option**

11 ga. (.12″ dia.) BB Wire, (.75″ sq. welded mesh pattern.) 15″ x 14½″ x 1½″ deep. Finish is super TGIC thermoset polyester powder coat paint, over zinc plated wireform. Finished to match the fixture.

NOTE: Only available with flat lens applications.

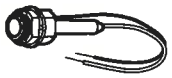




Optional Features

Fusing
Cat. No. **(see right)**
☐ **No Option**

Line Volts: 120V 208V 240V 277V 347V 480V
Cat. No.: ☐ **SF** ☐ **DF** ☐ **DF** ☐ **SF** ☐ **SF** ☐ **DF**

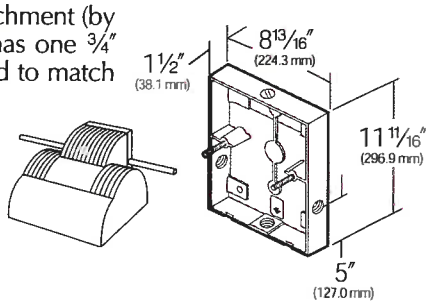


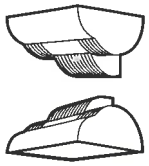
Surface Conduit Mount
Cat. No. ☐ **SCM18**
☐ **No Option**

Cast aluminum junction box and fixture mount for attachment (by others) to existing walls, beams or columns. **SCM18** has one ¾″ NPT conduit tap in each side, top and bottom. Finished to match the fixture.

SCM18 for all fixtures, UP and DOWN.

Note: Must be securely mounted to all surface.



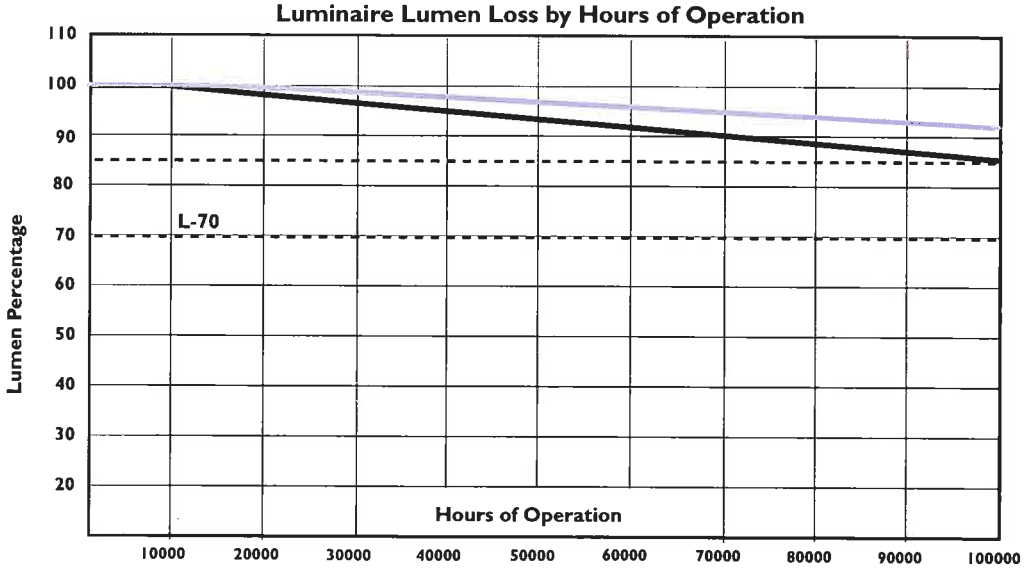


Lumen Performance Charts

NOTES:

1. Lumen loss stablization is a result of Kim Lighting's MicroEmitter™ luminaires exclusive LifeShield™ Protection System and Dual Heat Management.
2. The LifeShield™ Protection System will lower the current to the LEDs significantly if the luminaire is exposed to direct heat (sun) or excessive abnormal conditions.
3. Luminaire Lumen Loss assumptions are based on LM-80 results and an actual outdoor product testing based upon 5100K CCT, 350mA drive current. 25°C/77°F tab ambient and cathode temperature at 85°C/185°F. Assumptions past 6,000 hours are interpolated.
4. Cathode temperature baseline is at 85°C/185°F. If cathode temperature increases during ambient changes and abnormal environment conditions, % of rated lumens will slightly decrease.
5. Outdoor ambient temperatures are assumed SITU average by geographic region.
6. As Solid State Lighting technology and thermal management systems continually advance, lumen loss projections are subject to improvement.

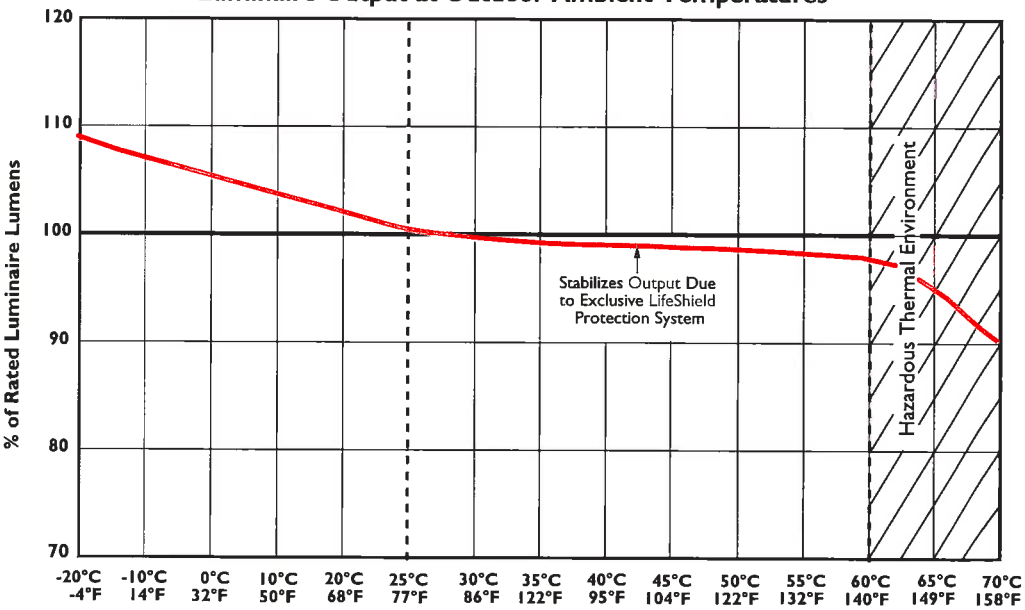
Luminaire Lumen Loss by Hours of Operation



Outdoor Temperature at 10°C/50°F. Temperature is based on continual average, annual assumptions.

Outdoor Temperature at 40°C/104°F. Temperature is based on continual average, annual assumptions.

Luminaire Output at Outdoor Ambient Temperatures

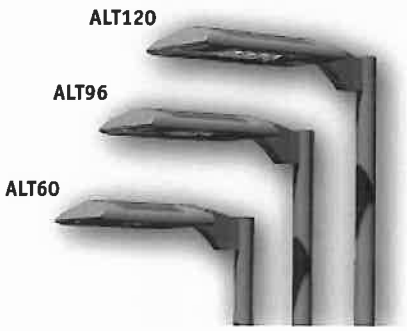


ALTITUDE™

ALT60, ALT96, ALT120 Small LED Luminaire

12' and 20' poles in combination for these fixture types.

SITE / ROADWAY



FEATURES

- The ultimate in LED luminaire design featuring innovative engineering, thermal management and unique patent pending PicoPrism™ optics
- Proportional and scalable aesthetic housing, available in six sizes to cover more environments than ever before
- WiHUBB features on/off/variable and step dimming control, SNAP protocol mesh network, AES-128 encryption detection, occupancy sensor interface and intuitive, user-friendly software

WiHUBB ENABLED

ORDERING INFORMATION (Example)

1SA	ALT3P35	120L5K277	WH	SF/A26	PRA20-4188SA/WH	—

MOUNTING

			EPA ALT60	ALT96	ALT120
	1SA	1 Arm Side Mt.	0.58	0.64	0.72
	2SB	2 Arm Side Mt.	1.17	1.28	1.44
	2SL	2 Arm Side Mt.	0.91	0.97	1.05
	3ST	3 Arm Side Mt.	1.50	1.61	1.77
	3SY*	3 Arm Side Mt.	1.50	1.61	1.77
	4SC	4 Arm Side Mt.	1.66	1.78	1.93
	1W	Single Wall Mt.	n/a	n/a	n/a

*Available on round poles only
NOTE: EPA is for Fixture only

ELECTRICAL MODULE

Source		Color Temperature[1]		Voltages	
60L	60 LEDs	580nm	Amber	120	120V
96L	96 LEDs	4K	4000K	208	208V
120L	120 LEDs	5K	5000K	240	240V
				277	277V
				347	347V
				480	480V[2]

580nm = Amber, turtle friendly
4K = 4000 Kelvin LED
5K = 5000 Kelvin LED

FIXTURE

350 Milliamp	700 Milliamp
ALT1P35 Type I	**ALT1P70** Type I
ALT2P35 Type II	**ALT2P70** Type II
ALT3P35 Type III	**ALT3P70** Type III
ALT4P35 Type IV	**ALT4P70** Type IV
ALT5P35 Type V	**ALT5P70** Type V
ALTRP35 Type R, Right	**ALTRP70** Type R, Right
ALTLP35 Type L, Left	**ALTLP70** Type L, Left

FIXTURE FINISH

SG	Stealth Gray
BL	Black
DB	Dark Bronze
LG	Light Gray
PS	Platinum Silver
WH	White
CC	Custom Color*

*Consult representative

FIXTURE OPTIONS

1SW	Wall Mounting
SF	120 Volt Single Fuse
DF	208 Volt Double Fuse
DF	240 Volt Double Fuse
SF	277 Volt Single Fuse
SF	347 Volt Single Fuse
DF	480 Volt Double Fuse
A26	Photocell Receptacle
FGL	Flat Glass Lens
FPL	Flat Polycarbonate Lens[3]
NFO	Type III or IV Neighbor Friendly Optic
WIH-IM	In-Fixture wireless control module, PSG8 pg. 381.

POLE

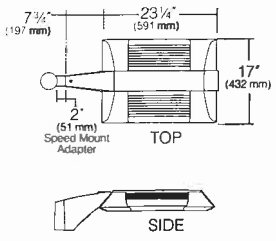
See p. **768-770** for pole ordering no. and EPA.

SLIPFITTER MOUNTING OPTIONS

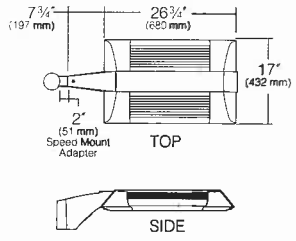
HORIZONTAL	
HSF	Horizontal Slipfitter Mount
VERTICAL	
4" Round, Standard Fixtures	
VSF-1SA	1 fixture side mt.
VSF-2SB	2 fixtures side mt. 180°
VSF-2SL	2 fixtures side mt. 90°
VSF-3ST	3 fixtures side mt. 90°
VSF-3SY	3 fixtures side mt. 120°[5]
VSF-4SC	4 fixtures side mt. 90°
4" Square, Standard Fixtures	
SVSF-1SA	1 fixture side mt.
SVSF-2SB	2 fixtures side mt. 180°
SVSF-2SL	2 fixtures side mt. 90°
SVSF-3ST	3 fixtures side mt. 90°
SVSF-4SC	4 fixtures side mt. 90°

[1] For custom optics and color temperature configurations, contact factory.
[2] 347V & 480V may include step-down transformer.
[3] Use only when vandalism is anticipated to be high. Required only for vandal protection in locations where fixtures can be reached by unauthorized persons.

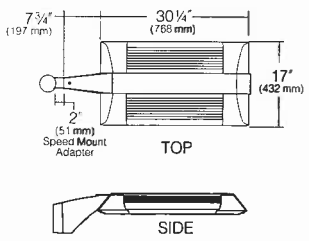
ALT60
Approx. Wt. = 27 lbs.



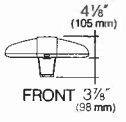
ALT96
Approx. Wt. = 30 lbs.



ALT120
Approx. Wt. = 34 lbs.



ALT60/ALT96/ALT120



KIM LIGHTING

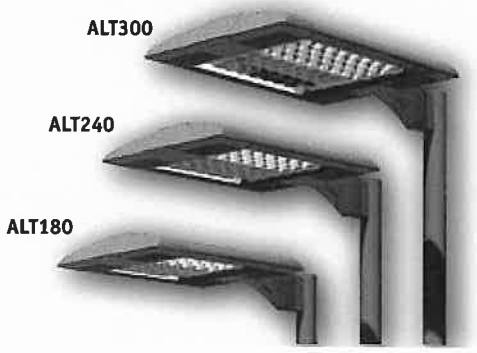
ALT180, ALT240, ALT300 Large LED Luminaire

12' and 20' poles in combination for these fixture types.

FEATURES

- The ultimate in LED luminaire design featuring innovative engineering, thermal management and unique patent pending PicoPrism™ optics
- Proportional and scalable aesthetic housing, available in six sizes to cover more environments than ever before
- WiHUBB features on/off/variable and step dimming control, SNAP protocol mesh network, AES-128 encryption detection, occupancy sensor interface and intuitive, user-friendly software

WiHUBB ENABLED



ORDERING INFORMATION (Example)

1SA	ALT3P35	180L5K277	WH	SF/A26	PRA20-4188SA/WH	—

MOUNTING

			EPA ALT180	EPA ALT240	EPA ALT300
	1SA	1 Arm Side Mt.	0.92	1.01	1.14
	2SB	2 Arm Side Mt.	1.84	2.01	2.28
	2SL	2 Arm Side Mt.	1.47	1.55	1.68
	3ST	3 Arm Side Mt.	2.38	2.56	2.82
	3SY*	3 Arm Side Mt.	2.38	2.56	2.82
	4SC	4 Arm Side Mt.	2.66	2.83	3.10
	1W	Single Wall Mt.	n/a	n/a	n/a

*Available on round poles only
NOTE: EPA is for Fixture only

ELECTRICAL MODULE

Source		Color Temperature[1]		Voltages	
180L	180 LEDs	580nm	Amber	120	120V
240L	240 LEDs	4K	4000K	208	208V
300L	300 LEDs	5K	5000K	240	240V
				277	277V
				347	347V
				480	480V[2]

580nm = Amber, turtle friendly
4K = 4000 Kelvin LED
5K = 5000 Kelvin LED

FIXTURE

350 Milliamp	700 Milliamp
ALT1P35 Type I	ALT1P70 Type I
ALT2P35 Type II	ALT2P70 Type II
ALT3P35 Type III	ALT3P70 Type III
ALT4P35 Type IV	ALT4P70 Type IV
ALT5P35 Type V	ALT5P70 Type V
ALTRP35 Type R, Right	ALTRP70 Type R, Right
ALTLP35 Type L, Left	ALTLP70 Type L, Left

FIXTURE FINISH

SG	Stealth Gray
BL	Black
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PS	Platinum Silver
WH	White
CC	Custom Color*

*Consult representative

FIXTURE OPTIONS

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DF	240 Volt Double Fuse
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SF	347 Volt Single Fuse
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FGL	Flat Glass Lens
FPL	Flat Polycarbonate Lens[3]
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POLE

See p. 768-770 for pole ordering no. and EPA.

SLIPFITTER MOUNTING OPTIONS

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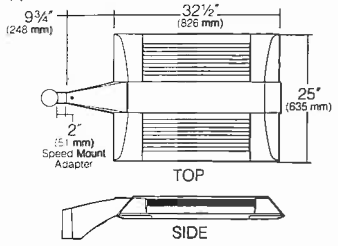
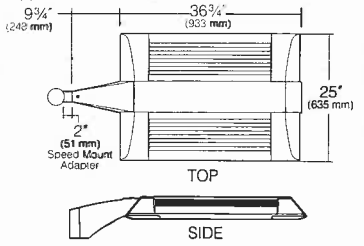
VSF-2SB	2 fixtures side mt. 180°
VSF-2SL	2 fixtures side mt. 90°
VSF-3ST	3 fixtures side mt. 90°
VSF-3SY	3 fixtures side mt. 120°[5]
VSF-4SC	4 fixtures side mt. 90°
4" Square, Standard Fixtures	
SVSF-1SA	1 fixture side mt.
SVSF-2SB	2 fixtures side mt. 180°
SVSF-2SL	2 fixtures side mt. 90°
SVSF-3ST	3 fixtures side mt. 90°
SVSF-4SC	4 fixtures side mt. 90°

[1] For custom optics and color temperature configurations, contact factory.
[2] 347V & may include step-down transformer.
[3] Use only when vandalism is anticipated to be high. Required only for vandal protection in locations where fixtures can be reached by unauthorized persons.

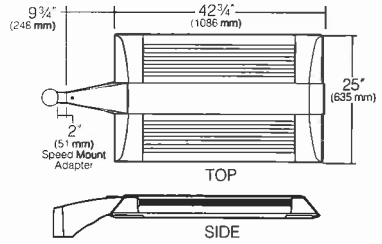
ALT180
Approx. Wt. = 49 lbs.



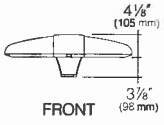
ALT240
Approx. Wt. = 55 lbs.



ALT300
Approx. Wt. = 67 lbs.

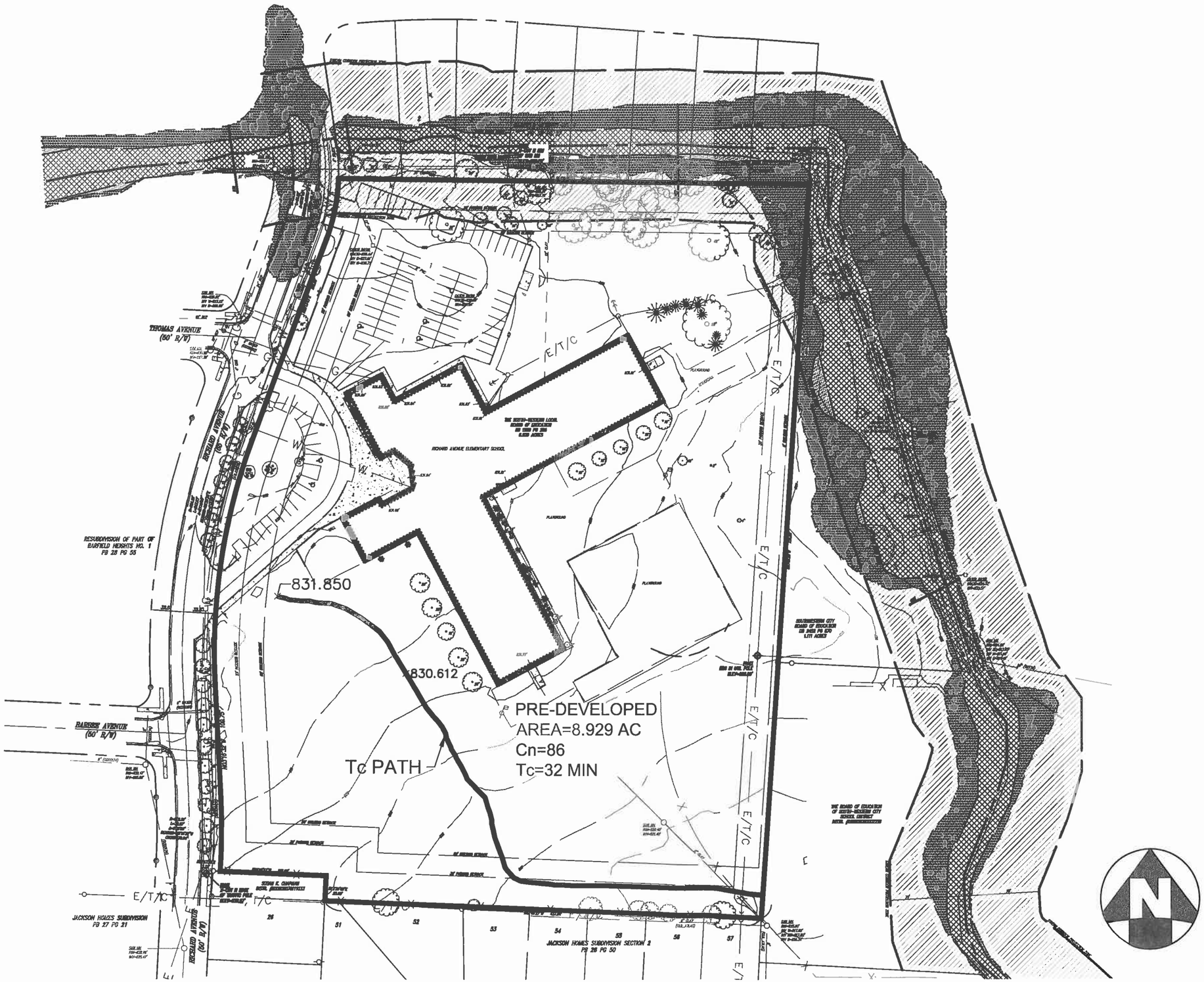


ALT180/ALT240/ALT300



KIM LIGHTING

INSPIRED PEOPLE ▶ CREATIVE DESIGN ▶ TRANSFORMING COMMUNITIES



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614.882.4311

RICHARD AVE ELEMENTARY SCHOOL

3646 RICHARD AVENUE ELEMENTARY SCHOOL
GROVE CITY, OHIO

SEAL:

NO.	DATE	DESCRIPTION

PROJECT NO:	120157.000
DATE:	07-23-2014

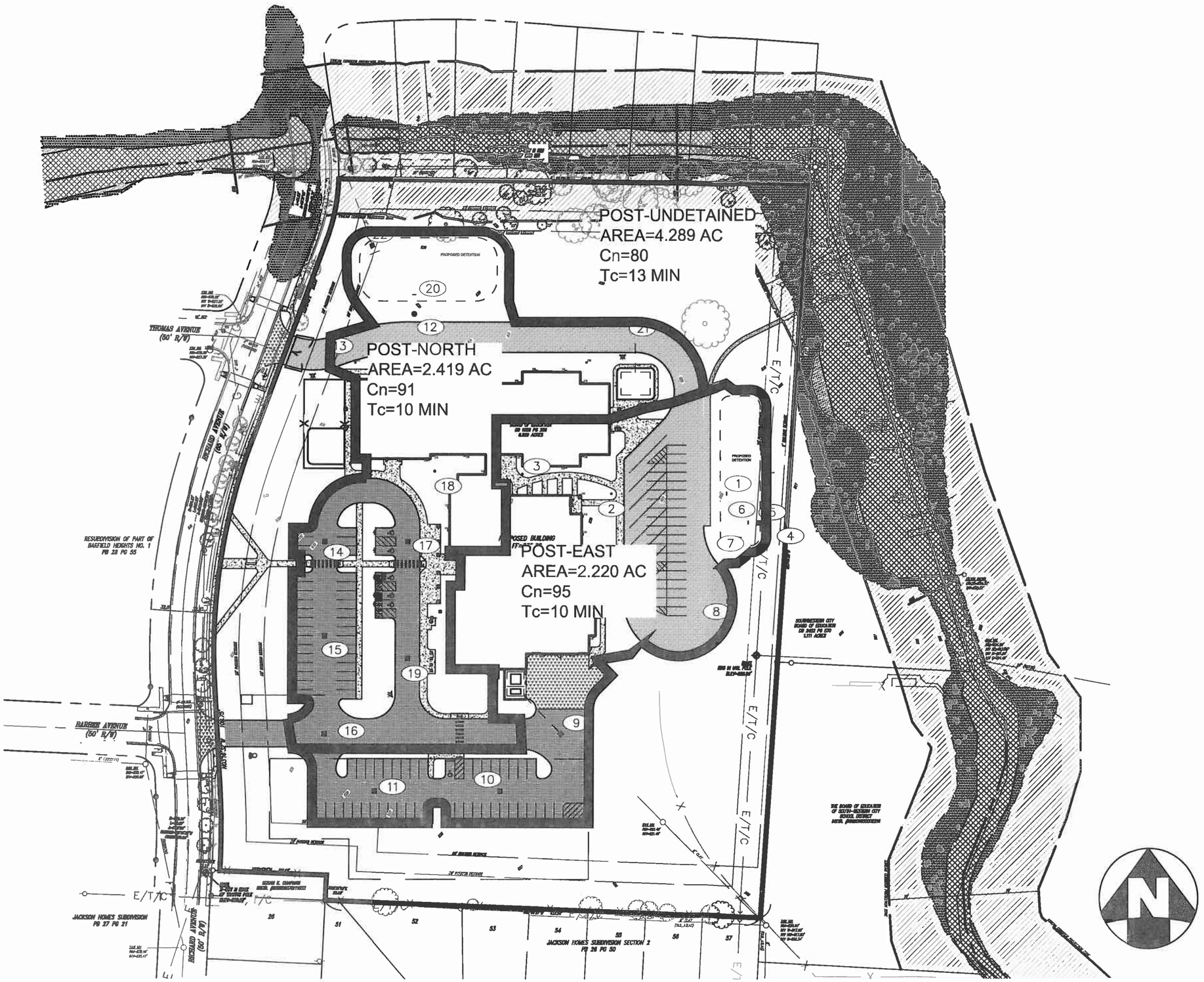
SCALE:

0 50 100 200

SHEET NAME:
PRE DEVELOPED DRAINAGE MAP

SHEET NO.
1

INSPIRED PEOPLE ▶ CREATIVE DESIGN ▶ TRANSFORMING COMMUNITIES



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GROVE CITY, OHIO

SEAL:

NO.	DATE	DESCRIPTION

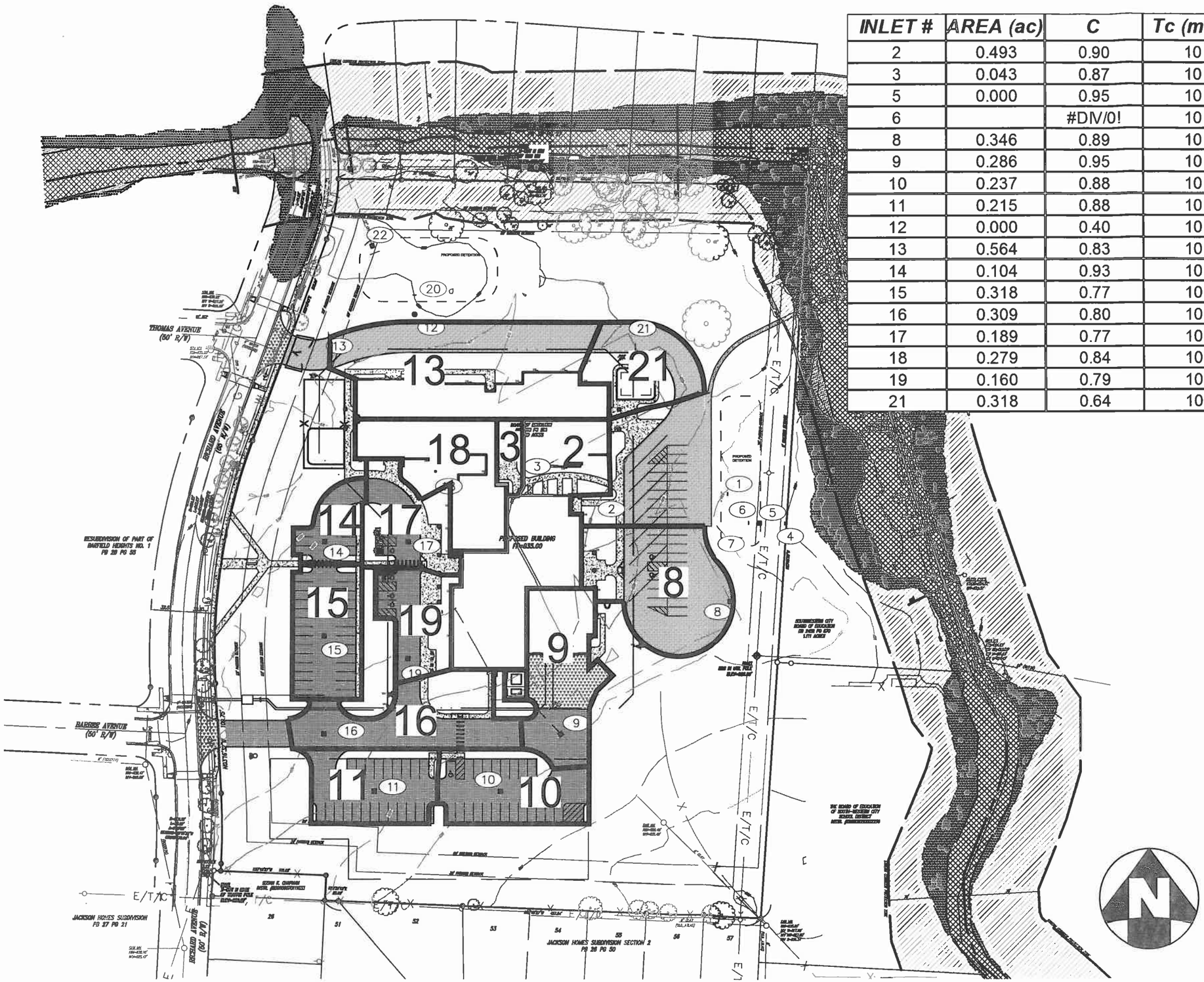
PROJECT NO:	120157.000
DATE:	07-23-2014

SCALE: 0 50 100 200

SHEET NAME:
POST DEVELOPED DRAINAGE MAP

SHEET NO.
2

INSPIRED PEOPLE ▶ CREATIVE DESIGN ▶ TRANSFORMING COMMUNITIES



INLET #	AREA (ac)	C	Tc (min)
2	0.493	0.90	10
3	0.043	0.87	10
5	0.000	0.95	10
6		#DIV/0!	10
8	0.346	0.89	10
9	0.286	0.95	10
10	0.237	0.88	10
11	0.215	0.88	10
12	0.000	0.40	10
13	0.564	0.83	10
14	0.104	0.93	10
15	0.318	0.77	10
16	0.309	0.80	10
17	0.189	0.77	10
18	0.279	0.84	10
19	0.160	0.79	10
21	0.318	0.64	10

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3646 RICHARD AVENUE ELEMENTARY SCHOOL
GROVE CITY, OHIO

SEAL:

NO.	DATE	DESCRIPTION

PROJECT NO: **120157.000**

DATE: **07-23-2014**

SCALE: 0 50 100 200

SHEET NAME:

LOCAL DRAINAGE MAP

SHEET NO.

3

H:\Columbus\P\120157\DWG\000\Sheets\120157CDRNO000.dwg, 7/22/2014 11:58:50 AM, mcouvreur

THE KLEINGERS GROUP

350 Worthington Road Suite B
Westerville, Ohio 43082
614.882.4311

STORM SEWER COMPUTATIONS

7/21/2014
i = Franklin County Stormwater Drainage Manual IDF

Project: Richard Ave
Project Number: 120157.00

Design Storm: 5 yr
Check Storm: 10 yr
Manning's n: 0.013

LOCATION			BASIN DATA									PIPE DATA							HGL CHECK							
Inlet	Station	Outlet	ΔA (ac)	ΣA (ac)	ΔT_c (min)	ΣT_c (min)	Design i (in/hr)	Coeff. C	ΔCA (ac)	ΣCA (ac)	Design Discharge (cfs)	Pipe Size (in)	Pipe Length (ft)	Pipe Slope (ft/ft)	US Invert (ft)	DS Invert (ft)	Mean Velocity (ft/sec)	Pipe Full Capacity (cfs)	Check i (in/hr)	Check Discharge (cfs)	Mean Velocity (ft/sec)	Friction Slope (ft/ft)	Head Loss (ft)	TW Elevation (ft)	HW Elevation (ft)	Grate Elevation (ft)
3		2	0.04	0.04	10	10.00	4.80	0.87	0.04	0.04	0.18	12	92	0.0050	829.30	828.84	3.22	2.53	5.20	0.19	3.22	0.0050	0.46	830.36	830.82	834.53
2		1	0.49	0.54	10	10.00	4.80	0.90	0.44	0.48	2.30	12	117	0.0050	828.84	828.25	3.23	2.54	5.20	2.49	3.23	0.0050	0.59	829.77	830.36	834.49
11		10	0.22	0.22	10	10.00	4.80	0.88	0.19	0.19	0.91	24	126	0.0017	829.08	828.87	3.00	9.41	5.20	0.99	3.00	0.0017	0.22	828.39	828.61	832.37
10		9	0.24	0.45	10	10.00	4.80	0.88	0.21	0.40	1.91	24	83	0.0017	828.87	828.73	3.01	9.45	5.20	2.07	3.01	0.0017	0.14	828.25	828.39	832.37
9		8	0.29	0.74	10	10.00	7.00	0.95	0.27	0.67	4.69	24	216	0.0017	828.73	828.36	3.00	9.42	7.10	4.76	3.00	0.0017	0.37	827.88	828.25	833.31
8		7	0.35	1.08	10	10.00	7.00	0.89	0.31	0.98	6.85	24	65	0.0017	828.36	828.25	3.00	9.43	7.10	6.95	3.00	0.0017	0.11	827.77	827.88	832.37
6		5	0.50	1.58	10	10.00	4.80	0.40	0.20	1.18	2.23*	12	11	0.0047	827.25	827.20	3.11	2.44	7.10	8.37	10.66	0.0549	0.59	827.77	828.36	-
5		4	0.00	1.58	10	10.00	4.80	0.95	0.00	1.18	2.23*	12	26	0.0062	827.20	827.04	3.59	2.82	7.10	8.37	10.66	0.0549	1.41	828.03	829.44	832.28
16		15	0.31	0.31	10	10.00	4.80	0.80	0.25	0.25	1.19	24	98	0.0017	828.34	828.17	3.01	9.45	7.10	1.76	3.01	0.0017	0.17	830.28	830.45	832.20
15		14	0.32	0.79	10	10.00	4.80	0.77	0.24	0.62	2.97	24	95	0.0017	828.17	828.01	3.01	9.45	7.10	4.40	3.01	0.0017	0.16	830.12	830.28	831.65
14		13	0.10	1.36	10	10.00	7.00	0.93	0.10	1.10	7.68	30	206	0.0013	827.51	827.25	3.00	14.72	7.10	7.79	3.00	0.0013	0.26	829.85	830.11	831.97
13		12	0.56	1.92	10	10.00	7.00	0.83	0.47	1.56	10.95	30	88	0.0013	827.25	827.14	3.02	14.81	7.10	11.11	3.02	0.0013	0.11	829.74	829.85	831.85
12		20	0.00	2.24	10	10.00	7.00	0.40	0.00	1.77	12.38	30	20	0.0020	827.14	827.10	3.79	18.60	7.10	12.56	3.79	0.0020	0.04	829.71	829.75	831.58
21		12	0.32	0.32	10	10.00	4.80	0.64	0.20	0.20	0.98	12	222	0.0050	828.24	827.14	3.20	2.51	5.20	1.06	3.20	0.0050	1.10	829.74	830.84	832.13
18		17	0.28	0.28	10	10.00	4.80	0.84	0.23	0.23	1.13	15	75	0.0050	829.68	829.30	3.75	4.60	5.20	1.22	3.75	0.0050	0.38	830.41	830.79	833.52
17		14	0.19	0.47	10	10.00	4.80	0.77	0.15	0.38	1.83	15	84	0.0035	829.05	828.76	3.10	3.81	5.20	1.98	3.10	0.0035	0.29	830.12	830.41	833.05
19		15	0.16	0.16	10	10.00	4.80	0.79	0.13	0.13	0.61	18	87	0.0049	829.60	829.17	4.19	7.41	7.10	0.90	4.19	0.0049	0.43	830.28	830.71	833.05

* Required capacity from detention for 5-year flow = 2.23 cfs

Designed:JJM
Checked:MJC

THE KLEINGERS GROUP

CINCINNATI
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DAYTON

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STORMWATER DETENTION CALCULATIONS
For the
City of Grove City

Richard Avenue Elementary School
3646 Richard Avenue

July 23, 2014

City of Grove City, Ohio

THE KLEINGERS GROUP

Richard Avenue Elementary School
Summary of Stormwater Detention Calculations

The stormwater detention calculations contained in this report were performed by using the SCS Unit Hydrograph hydrologic method in the Haestad Methods' PondPack, Version 10.1 software.

Detention Strategy

The proposed project will construct a new 61,572 SF elementary school building on the site of the existing Richard Avenue Elementary School located at 3646 Richard Avenue. The current site generally drains from west to east to Brown Run. The existing school building on the site is proposed to be demolished. Stormwater requirements will be met with two proposed detention basins. The water tributary to the north basin will be treated for water quality.

The calculations and supporting information for the detention system are as follows, continuing with output data. Hydrographs were generated as follows:

- Pre-developed condition hydrographs were generated for the "Pre-developed" site tributary areas for storm frequencies of 1, 2, 5, 10, 25, 50, and 100-year storms. Please refer to the drainage map at the back of this report for a delineation of the drainage areas.
- Post-developed condition hydrographs were generated for the "Post Developed" site tributary areas for storm frequencies of 1, 2, 5, 10, 25, 50, and 100-year storms. Please refer to the drainage map at the back of this report for a delineation of the drainage areas.

Calculations for the pre-developed and post-developed flow rates and stormwater detention for each drainage area can be found in Appendix A.

Pre-Developed Condition

The following is the pre-developed data used to produce the runoff hydrograph for the area:

Pre-developed	CN=86 (pg. 4.04)	T_C = 0.5302 hrs (pg. 3.07)	Area = 8.929 Ac

The runoff hydrographs for the "Pre-Developed" areas were calculated and peak flow rates for each storm frequency are:

Pre-developed:

Q_1= 7.16 cfs (pg. 5.22)
Q_2= 9.74 cfs (pg. 5.23)
Q_5= 13.56 cfs (pg. 5.24)
Q_{10}= 16.76 cfs (pg. 5.25)
Q_{25}= 21.31 cfs (pg. 5.26)
Q_{50}= 25.10 cfs (pg. 5.27)
Q_{100}=29.10 cfs (pg. 5.28)

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Post Developed Condition

The following is the post developed data used to produce the runoff hydrographs for the area:

Post-North	CN=91 (pg. 4.02)	T_C = 0.1667 hrs (pg. 3.03)	Area = 2.419 Ac
Post-East	CN=95 (pg. 4.01)	T_C = 0.1667 hrs (pg. 3.01)	Area = 2.220 Ac
Post-Undetained	CN=80 (pg. 4.03)	T_C = 0.2169 hrs (pg. 3.05)	Area = 4.289 Ac

The runoff hydrographs for the "Post Developed" areas were calculated and peak flow rates for each storm frequency are:

Post-North:

Q_1= 4.39 cfs (pg. 5.08)
Q_2= 5.61 cfs (pg. 5.09)
Q_5= 7.35 cfs (pg. 5.10)
Q_{10}= 8.78 cfs (pg. 5.11)
Q_{25}= 10.77 cfs (pg. 5.12)
Q_{50}= 12.41 cfs (pg. 5.13)
Q_{100}= 14.13 cfs (pg. 5.14)

Post-East:

Q_1= 4.83 cfs (pg. 5.01)
Q_2= 5.95 cfs (pg. 5.02)
Q_5= 7.53 cfs (pg. 5.03)
Q_{10}= 8.81 cfs (pg. 5.04)
Q_{25}= 10.59 cfs (pg. 5.05)
Q_{50}= 12.07 cfs (pg. 5.06)
Q_{100}= 13.61 cfs (pg. 5.07)

Post-Undetained:

Q_1= 3.62 cfs (pg. 5.15)
Q_2= 5.25 cfs (pg. 5.16)
Q_5= 7.73 cfs (pg. 5.17)
Q_{10}= 9.86 cfs (pg. 5.18)
Q_{25}= 13.01 cfs (pg. 5.19)
Q_{50}= 15.71 cfs (pg. 5.20)
Q_{100}= 18.60 cfs (pg. 5.21)

Stormwater Runoff Control Criteria

The City of Grove City requires projects to adhere to the stormwater management requirements provided in the Grove City Subdivision Regulations. These regulations stipulate a critical year storm design method. This method is used to determine the allowable release rates from the analysis areas. The critical storm method states that the percent increase in runoff volume for a one year frequency, 24-hour storm determines the critical storm event. The post-developed runoff must be controlled for storms of a frequency between one year and the critical storm so that the rate of runoff does not exceed the peak rate of runoff for a pre-developed 24-hour, one year frequency storm. All storm events greater than the critical year must be controlled such that the post-developed runoff rate does not exceed the pre-developed runoff rate for the same given storm event frequency.

The 1 year pre-developed hydrological volume for the site is 0.747 acre-feet (pg. 1.04). The 1 year post-developed hydrological volume for the site is 0.826 acre-feet (pg. 1.03). The difference between the two hydrological volumes represents an increase in stormwater runoff of 11%. Referencing the Grove City Subdivision Regulations, this percentage signifies that the project must adhere to the 2 year critical year storm event.

The post developed case for this site was separated into three tributary areas. One area, labeled as "Post North", which only included site area tributary to the proposed extended detention basin. The other area detention area, labeled as "Post East", included those site areas that are tributary to a dry basin. The third area is site area not tributary to either on site detention basins. The combined outflow of the "Post-Detained" and "Post-Undetained" resulted in the "Post-Out" flows. These resulting flows were held to the required peak flow release rates determined by the "Pre-developed" storm events.

Stream Corridor Protection Zone

Brown Run meanders along the northern and western portions of the site. The Grove City Natural Stream Protection Policy requires a riparian setback for all natural open watercourses. The setback is established by the equation:

SW=129*(DA)^0.43

Where: SW=setback width measured in feet, centered on the watercourse
DA=Drainage area in square miles (minimum SW=25 feet)

The USGS Streamstats website (http://water.usgs.gov/osw/streamstats/ohio.html) was utilized to define the tributary area to Brown Run near the southeast corner of the site. The tributary area was reported as 1.42 square miles, resulting in a setback width of 150 feet centered on the watercourse.

Water Quality

The Ohio Environmental Protection Agency (OEPA) requires projects to capture and treat stormwater for a storm event of 0.75" or less.

The required water quality volume is calculated by the equation:

$$WQ_v = \frac{CPA}{12}$$

Where WQ_v = water quality volume in acre-feet
C = runoff coefficient, $0.858i^3-0.78i^2+0.774i+0.04$, i = fraction of post-construction impervious surface
P = 0.75 in precipitation depth
A = area draining into the BMP in acres

As permitted by the OEPA, 20% of the calculated WQv storage will be provided for the redevelopment area and 100% of the calculated WQv storage will be provided for the new development area.
New development area is calculated as the difference between the post developed impervious area (3.47 acres) and the pre-developed impervious area (2.77 acres).

$$WQ_v = \frac{(0.89)(0.75)(0.699)}{12} = 0.039\ acre-feet$$

The redevelopment area is the remaining portion of the site (8.929 acres –0.699 acres = 8.164 acres)

$$WQ_v = \frac{(0.245)(0.75)(8.164)}{12} = 0.126\ acre-feet$$

$$WQ_v = 20\%\ of\ 0.126\ acre-feet = 0.0252\ acre-feet$$

The required WQv storage for the site is 0.064 acre-feet (0.039 acre-feet + 0.025 acre-feet).
In lieu of treating the entire site for water quality, only the "North Basin" area (2.419 acres) will be treated for water quality.

$$WQ_v = \frac{(0.44)(0.75)(2.419)}{12} = 0.066 acre - feet$$

The proposed WQv storage is greater than the required WQv storage, and thus should satisfy the OEPA General Permit.

Additionally, the resultant WQv should be increased 20% for sediment storage and reduced infiltration capacity. This results in a final required WQv of 0.0792 acre-feet.

Water quality capture and treatment for this site will occur in proposed extended detention basin. A 0.918" diameter orifice, invert elevation=827.00, has been designed to provide the drawdown time required. The orifice provides a 100% drawdown time of approximately 50.12 hours. Refer to the drawdown calculations and graph in the appendix of this report.

In lieu of constructing a forebay and micropool within the proposed extended detention basin for pretreatment, a hydrodynamic separator will be used to prevent sediment from entering the basin. The hydrodynamic separator has been sized based on the amount of flow to be treated:

$$Q = CiA$$

Where Q = flow in cubic feet per second
C = runoff coefficient, $0.858i^3-0.78i^2+0.774i+0.04$, i = fraction of post-construction impervious surface
i = rainfall intensity in inches per hour (taken from Franklin County Stormwater Drainage Manual IDF curve)
A = area tributary to the hydrodynamic separator, in acres

$$Q = (0.44)(1.6)(2.419) = 1.70 \text{ cubic feet per second}$$

A Contech CDS3020 structure or approved equal has been incorporated into the design for this site. This water quality structure has been sized accordingly to be able to handle the amount of flow required.

Outlet Structure

The proposed outfall structure for the extended detention basin (catch basin 22) will be placed on the north side of the extended detention basin. The outlet will consist of a horizontal perforated reverse flow pipe with a 0.918" orifice at invert elevation 827.00 cut into the side of the 6" pipe inside the catch basin to allow for water quality requirement. A second 8" orifice will be located at invert elevation 828.62 to meet the detention flow requirements. One 24"x3" windows (invert = 830.25) will be cut in the north face of the structure. The 100-yr water surface elevation for the extended detention basin is 830.54. The flat top lid of the outlet structure is 830.55.

The proposed outfall structure for the east basin consists of a headwall (Grove City C-CG-24) in combination with catch basin (Grove City C-CG-4). These structures will be placed on the east side of the proposed detention basin. The tributary area to the north basin is sufficient for water quality requirements, therefore the east detention basin will not provide any

water quality treatment. The outlet will consist of three windows and a 6" orifice plate. A 6" orifice plate will be installed on the west side of Headwall 6 at invert elevation 872.25. One 12"x6" window (invert=829.27) will be installed at Catch Basin 5. Two 12"x6" windows will be installed at invert elevation 829.73. The windows will control flows greater than the critical year storm to insure that post developed flows are less than or equal to the pre-developed flows for each sequential storm event. The 100 year water surface elevation for the detention basin is 830.47. The top of the dam of the basin is 831.25. An emergency spillway is located at elevation 830.50.

Storm Routing

The post-developed storm was routed through the detention system using PondPack 10.1 software. The following are the peak flow rates out of the detention system with the corresponding water surface elevation in the basin for each storm frequency:

North Basin:

1-yr storm: Q_1= 0.31 cfs @ 828.95 (pg. 8.08)
2-yr storm: Q_2= 0.67 cfs @ 829.15 (pg. 8.09)
5-yr storm: Q_5= 1.21 cfs @ 829.45 (pg. 8.10)
10-yr storm: Q_{10}= 1.49 cfs @ 829.71 (pg. 8.11)
25-yr storm: Q_{25}= 1.81 cfs @ 830.06 (pg. 8.12)
50-yr storm: Q_{50}= 2.31 cfs @ 830.33 (pg. 8.13)
100-yr storm: Q_{100}= 3.26 cfs @ 830.54 (pg.8.14)

East Basin:

1-yr storm: Q_1= 1.07 cfs @ 829.14 (pg. 8.01)
2-yr storm: Q_2= 1.46 cfs @ 829.40 (pg. 8.02)
5-yr storm: Q_5= 2.23 cfs @ 829.71 (pg. 8.03)
10-yr storm: Q_{10}= 3.87 cfs @ 829.88 (pg. 8.04)
25-yr storm: Q_{25}= 5.53 cfs @ 830.07 (pg. 8.05)
50-yr storm: Q_{50}= 6.23 cfs @ 830.25 (pg. 8.06)
100-yr storm: Q_{100}= 6.52 cfs @ 830.47 (pg.8.07)

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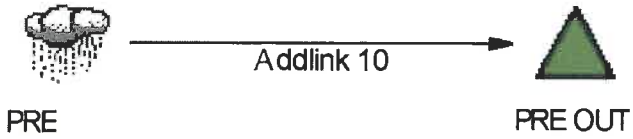
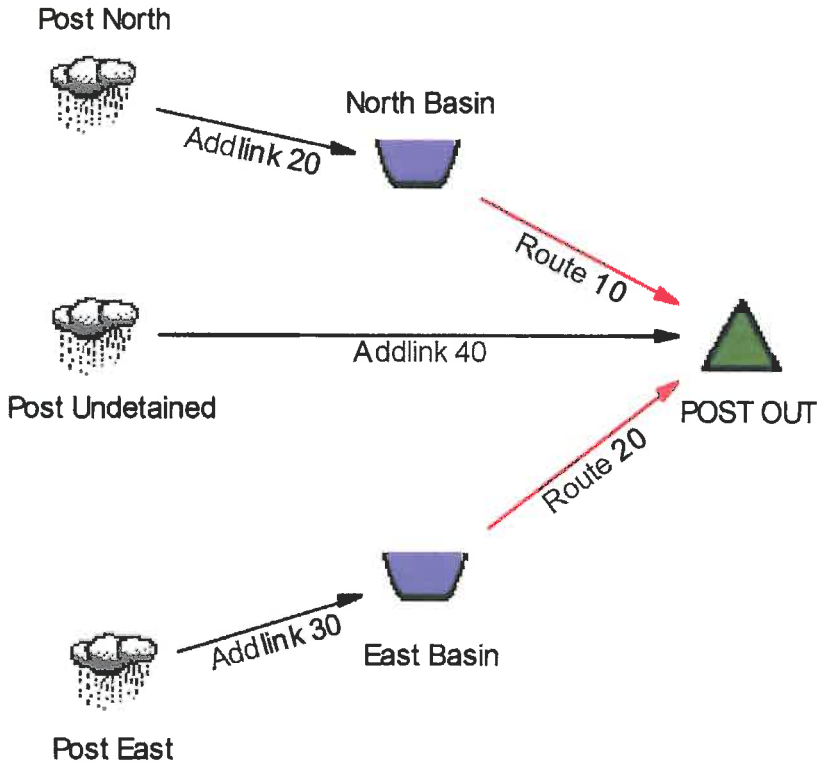
Detention Summary

Per Grove City Subdivision Regulations, the post-developed flows from the development area are less than those determined by the critical storm. The resulting flow at the watershed outlet, is as follows:

PRE-DEVELOPED RELEASE RATES	POST-DEVELOPED ("Post-Out") RELEASE RATES
Q_1=7.16 cfs *	Q_1= 4.65 cfs
Q_2= 9.74 cfs	**Q_2= 6.57 cfs ***
Q_5= 13.56 cfs	Q_5= 10.22 cfs
Q_{10}= 16.76 cfs	Q_{10}= 13.40 cfs
Q_{25}= 21.31 cfs	Q_{25}= 19.30 cfs
Q_{50}= 25.10 cfs	Q_{50}= 23.22 cfs
Q_{100}= 29.10 cfs	Q_{100}= 26.74 cfs


Addlink 10
PRE
PRE OUT


Post North
North Basin
Addlink 20
Route 10
Addlink 40
Post Undetained
POST OUT
Route 20
Addlink 30
East Basin
Post East

Appendix A

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MASTER DESIGN STORM SUMMARY

Network Storm Collection: CITY OF COLUMBUS

Return Event	Total Depth in	Rainfall Type	RNF ID
1	2.2000	Synthetic Curve	TypeII 24hr
2	2.6300	Synthetic Curve	TypeII 24hr
5	3.2400	Synthetic Curve	TypeII 24hr
10	3.7400	Synthetic Curve	TypeII 24hr
25	4.4400	Synthetic Curve	TypeII 24hr
50	5.0200	Synthetic Curve	TypeII 24hr
100	5.6300	Synthetic Curve	TypeII 24hr

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
EAST BASIN IN	POND	1	.310		12.0000	4.83		
EAST BASIN IN	POND	2	.386		12.0000	5.95		
EAST BASIN IN	POND	5	.497		12.0000	7.53		
EAST BASIN IN	POND	10	.587		12.0000	8.81		
EAST BASIN IN	POND	25	.715		12.0000	10.59		
EAST BASIN IN	POND	50	.821		12.0000	12.07		
EAST BASIN IN	POND	100	.933		12.0000	13.61		
EAST BASIN OUT	POND	1	.310		12.2000	1.07	829.14	.101
EAST BASIN OUT	POND	2	.386		12.2500	1.46	829.40	.129
EAST BASIN OUT	POND	5	.497		12.2000	2.23	829.71	.164
EAST BASIN OUT	POND	10	.587		12.1500	3.87	829.88	.185
EAST BASIN OUT	POND	25	.715		12.1500	5.53	830.07	.209
EAST BASIN OUT	POND	50	.821		12.1500	6.23	830.25	.234
EAST BASIN OUT	POND	100	.933		12.1500	6.52	830.47	.266

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
NORTH BASIN IN	POND	1	.270		12.0000	4.39		
NORTH BASIN IN	POND	2	.349		12.0000	5.61		
NORTH BASIN IN	POND	5	.463		12.0000	7.35		
NORTH BASIN IN	POND	10	.558		12.0000	8.78		
NORTH BASIN IN	POND	25	.693		12.0000	10.77		
NORTH BASIN IN	POND	50	.807		12.0000	12.41		
NORTH BASIN IN	POND	100	.926		12.0000	14.13		
NORTH BASIN OUT	POND	1	.270		12.8000	.31	828.95	.153
NORTH BASIN OUT	POND	2	.349		12.4500	.67	829.15	.187
NORTH BASIN OUT	POND	5	.463		12.3000	1.21	829.45	.240
NORTH BASIN OUT	POND	10	.558		12.3000	1.49	829.71	.290
NORTH BASIN OUT	POND	25	.693		12.3000	1.81	830.06	.363
NORTH BASIN OUT	POND	50	.807		12.3000	2.31	830.33	.421
NORTH BASIN OUT	POND	100	.926		12.2500	3.26	830.54	.471
POST EAST	AREA	1	.310		12.0000	4.83		
POST EAST	AREA	2	.386		12.0000	5.95		
POST EAST	AREA	5	.497		12.0000	7.53		
POST EAST	AREA	10	.587		12.0000	8.81		
POST EAST	AREA	25	.715		12.0000	10.59		
POST EAST	AREA	50	.821		12.0000	12.07		
POST EAST	AREA	100	.933		12.0000	13.61		
POST NORTH	AREA	1	.270		12.0000	4.39		
POST NORTH	AREA	2	.349		12.0000	5.61		
POST NORTH	AREA	5	.463		12.0000	7.35		
POST NORTH	AREA	10	.558		12.0000	8.78		
POST NORTH	AREA	25	.693		12.0000	10.77		
POST NORTH	AREA	50	.807		12.0000	12.41		
POST NORTH	AREA	100	.926		12.0000	14.13		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
*POST OUT	JCT	1	.826		12.0500	4.65		
*POST OUT	JCT	2	1.085		12.0500	6.57		
*POST OUT	JCT	5	1.471		12.0500	10.22		
*POST OUT	JCT	10	1.799		12.1000	13.40		
*POST OUT	JCT	25	2.270		12.0500	19.30		
*POST OUT	JCT	50	2.668		12.0500	23.22		
*POST OUT	JCT	100	3.092		12.0500	26.74		
POST UNDETAINED	AREA	1	.246		12.0500	3.62		
POST UNDETAINED	AREA	2	.350		12.0500	5.25		
POST UNDETAINED	AREA	5	.512		12.0500	7.73		
POST UNDETAINED	AREA	10	.654		12.0500	9.86		
POST UNDETAINED	AREA	25	.862		12.0000	13.01		
POST UNDETAINED	AREA	50	1.040		12.0000	15.71		
POST UNDETAINED	AREA	100	1.233		12.0000	18.60		
PRE	AREA	1	.746		12.2000	7.16		
PRE	AREA	2	1.005		12.2000	9.74		
PRE	AREA	5	1.391		12.2000	13.56		
PRE	AREA	10	1.720		12.2000	16.76		
PRE	AREA	25	2.194		12.2000	21.31		
PRE	AREA	50	2.594		12.2000	25.10		
PRE	AREA	100	3.020		12.2000	29.10		
*PRE OUT	JCT	1	.746		12.2000	7.16		
*PRE OUT	JCT	2	1.005		12.2000	9.74		
*PRE OUT	JCT	5	1.391		12.2000	13.56		
*PRE OUT	JCT	10	1.720		12.2000	16.76		
*PRE OUT	JCT	25	2.194		12.2000	21.31		
*PRE OUT	JCT	50	2.594		12.2000	25.10		
*PRE OUT	JCT	100	3.020		12.2000	29.10		

Title... Project Date: 3/17/2014
Project Engineer: jmcclory
Project Title: Watershed
Project Comments:

DESIGN STORMS SUMMARY

Design Storm File,ID = CITY OF COLUMBUS

Storm Tag Name = 1

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 1 yr
Total Rainfall Depth= 2.2000 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 2

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 2 yr
Total Rainfall Depth= 2.6300 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 5

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 5 yr
Total Rainfall Depth= 3.2400 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 10

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 10 yr
Total Rainfall Depth= 3.7400 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 25

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 25 yr
Total Rainfall Depth= 4.4400 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Title... Project Date: 3/17/2014
Project Engineer: jmcclory
Project Title: Watershed
Project Comments:

DESIGN STORMS SUMMARY

Design Storm File,ID = CITY OF COLUMBUS

Storm Tag Name = 50

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 50 yr
Total Rainfall Depth= 5.0200 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

Storm Tag Name = 100

Data Type, File, ID = Synthetic Storm TypeII 24hr
Storm Frequency = 100 yr
Total Rainfall Depth= 5.6300 in
Duration Multiplier = 1
Resulting Duration = 24.0000 hrs
Resulting Start Time= .0000 hrs Step= .1000 hrs End= 24.0000 hrs

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: User Defined

Segment #1 Time: .1667 hrs

Total Tc: .1667 hrs

Tc Equations used...

==== User Defined ==========

Tc = Value entered by user

Where: Tc = Time of concentration

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: User Defined

Segment #1 Time: .1667 hrs

Total Tc: .1667 hrs

Tc Equations used...

==== User Defined ==========

Tc = Value entered by user

Where: Tc = Time of concentration

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: TR-55 Sheet

Mannings n	.2400	
Hydraulic Length	100.00	ft
2yr, 24hr P	2.6300	in
Slope	.070000	ft/ft
Avg.Velocity	.17	ft/sec

Segment #1 Time: .1589 hrs

Segment #2: Tc: TR-55 Shallow

Hydraulic Length	401.00	ft
Slope	.014200	ft/ft
Unpaved		
Avg.Velocity	1.92	ft/sec

Segment #2 Time: .0579 hrs

Total Tc: .2169 hrs

Tc Equations used...

==== SCS TR-55 Sheet Flow ==========

Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))

Where: Tc = Time of concentration, hrs
n = Mannings n
Lf = Flow length, ft
P = 2yr, 24hr Rain depth, inches
Sf = Slope, %

==== SCS TR-55 Shallow Concentrated Flow ==========

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

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

Tc = (Lf / V) / (3600sec/hr)

Where: V = Velocity, ft/sec
Sf = Slope, ft/ft
Tc = Time of concentration, hrs
Lf = Flow length, ft

::
TIME OF CONCENTRATION CALCULATOR
::

Segment #1: Tc: TR-55 Sheet

Mannings n	.2400
Hydraulic Length	100.00 ft
2yr, 24hr P	2.6300 in
Slope	.005000 ft/ft

Avg.Velocity .06 ft/sec

Segment #1 Time: .4568 hrs

Segment #2: Tc: TR-55 Shallow

Hydraulic Length	486.00 ft
Slope	.013000 ft/ft

Unpaved

Avg.Velocity 1.84 ft/sec

Segment #2 Time: .0734 hrs

Total Tc: .5302 hrs

Tc Equations used...

==== SCS TR-55 Sheet Flow ==========

Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))

Where: Tc = Time of concentration, hrs
n = Mannings n
Lf = Flow length, ft
P = 2yr, 24hr Rain depth, inches
Sf = Slope, %

==== SCS TR-55 Shallow Concentrated Flow ==========

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

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

Tc = (Lf / V) / (3600sec/hr)

Where: V = Velocity, ft/sec
Sf = Slope, ft/ft
Tc = Time of concentration, hrs
Lf = Flow length, ft

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
Impervious Areas - Paved parking lo	98	1.810			98.00
Open space (Lawns,parks etc.) - Goo	80	.410			80.00
COMPOSITE AREA & WEIGHTED CN --->		2.220			94.68 (95)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
Impervious Areas - Paved parking lo	98	1.542			98.00
Open space (Lawns,parks etc.) - Goo	80	.877			80.00
COMPOSITE AREA & WEIGHTED CN --->		2.419			91.47 (91)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
Open space (Lawns,parks etc.) - Goo	80	4.171			80.00
Impervious Areas - Paved parking lo	98	.118			98.00
COMPOSITE AREA & WEIGHTED CN --->		4.289			80.50 (80)

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
Impervious Areas - Paved parking lo	98	2.769			98.00
Open space (Lawns,parks etc.) - Goo	80	6.160			80.00
COMPOSITE AREA & WEIGHTED CN --->		8.929			85.58 (86)

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 1 year storm
Duration = 24.0000 hrs Rain Depth = 2.2000 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST EAST 1
Tc = .1667 hrs
Drainage Area = 2.220 acres Runoff CN= 95

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 4.89 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 4.83 cfs
==========

DRAINAGE AREA

ID:POST EAST
CN = 95
Area = 2.220 acres
S = .5263 in
0.2S = .1053 in

Cumulative Runoff

1.6741 in
.310 ac-ft

HYG Volume... .310 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST EAST)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 15.09 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = 2.6300 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST EAST 2
Tc = .1667 hrs
Drainage Area = 2.220 acres Runoff CN= 95

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 6.03 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 5.95 cfs
==========

DRAINAGE AREA

ID:POST EAST
CN = 95
Area = 2.220 acres
S = .5263 in
0.2S = .1053 in

Cumulative Runoff

2.0892 in
.387 ac-ft

HYG Volume... .386 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST EAST)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 15.09 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 5 year storm
Duration = 24.0000 hrs Rain Depth = 3.2400 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST EAST 5
Tc = .1667 hrs
Drainage Area = 2.220 acres Runoff CN= 95

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 7.64 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 7.53 cfs
==========

DRAINAGE AREA

ID:POST EAST
CN = 95
Area = 2.220 acres
S = .5263 in
0.2S = .1053 in

Cumulative Runoff

2.6841 in
.497 ac-ft

HYG Volume... .497 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST EAST)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 15.09 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 3.7400 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST EAST 10
Tc = .1667 hrs
Drainage Area = 2.220 acres Runoff CN= 95

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 8.95 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 8.81 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
==========

DRAINAGE AREA

ID:POST EAST
CN = 95
Area = 2.220 acres
S = .5263 in
0.2S = .1053 in

Cumulative Runoff

3.1750 in
.587 ac-ft

HYG Volume... .587 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST EAST)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 15.09 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 25 year storm
Duration = 24.0000 hrs Rain Depth = 4.4400 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST EAST 25
Tc = .1667 hrs
Drainage Area = 2.220 acres Runoff CN= 95

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 10.77 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 10.59 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
==========

DRAINAGE AREA

ID:POST EAST
CN = 95
Area = 2.220 acres
S = .5263 in
0.2S = .1053 in

Cumulative Runoff

3.8654 in
.715 ac-ft

HYG Volume... .715 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST EAST)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 15.09 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 50 year storm
Duration = 24.0000 hrs Rain Depth = 5.0200 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST EAST 50
Tc = .1667 hrs
Drainage Area = 2.220 acres Runoff CN= 95

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 12.27 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 12.07 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
==========

DRAINAGE AREA

ID:POST EAST
CN = 95
Area = 2.220 acres
S = .5263 in
0.2S = .1053 in

Cumulative Runoff

4.4393 in
.821 ac-ft

HYG Volume... .821 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST EAST)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 15.09 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 5.6300 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST EAST 100
Tc = .1667 hrs
Drainage Area = 2.220 acres Runoff CN= 95

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 13.84 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 13.61 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
==========

DRAINAGE AREA

ID:POST EAST
CN = 95
Area = 2.220 acres
S = .5263 in
0.2S = .1053 in

Cumulative Runoff

5.0442 in
.933 ac-ft

HYG Volume... .933 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST EAST)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 15.09 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 1 year storm
Duration = 24.0000 hrs Rain Depth = 2.2000 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST NORTH 1
Tc = .1667 hrs
Drainage Area = 2.419 acres Runoff CN= 91

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 4.41 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 4.39 cfs
==========

DRAINAGE AREA

ID:POST NORTH
CN = 91
Area = 2.419 acres
S = .9890 in
0.2S = .1978 in

Cumulative Runoff

1.3402 in
.270 ac-ft

HYG Volume... .270 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST NORTH)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 16.44 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = 2.6300 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST NORTH 2
Tc = .1667 hrs
Drainage Area = 2.419 acres Runoff CN= 91

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 5.65 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 5.61 cfs
==========

DRAINAGE AREA

ID:POST NORTH
CN = 91
Area = 2.419 acres
S = .9890 in
0.2S = .1978 in

Cumulative Runoff

1.7291 in
.349 ac-ft

HYG Volume... .349 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST NORTH)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 16.44 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 5 year storm
Duration = 24.0000 hrs Rain Depth = 3.2400 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST NORTH 5
Tc = .1667 hrs
Drainage Area = 2.419 acres Runoff CN= 91

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 7.42 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 7.35 cfs
==========

DRAINAGE AREA

ID:POST NORTH
CN = 91
Area = 2.419 acres
S = .9890 in
0.2S = .1978 in

Cumulative Runoff

2.2958 in
.463 ac-ft

HYG Volume... .463 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST NORTH)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 16.44 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 3.7400 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST NORTH 10
Tc = .1667 hrs
Drainage Area = 2.419 acres Runoff CN= 91

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 8.88 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 8.78 cfs
==========

DRAINAGE AREA

ID:POST NORTH
CN = 91
Area = 2.419 acres
S = .9890 in
0.2S = .1978 in

Cumulative Runoff

2.7691 in
.558 ac-ft

HYG Volume... .558 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST NORTH)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 16.44 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 25 year storm
Duration = 24.0000 hrs Rain Depth = 4.4400 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST NORTH 25
Tc = .1667 hrs
Drainage Area = 2.419 acres Runoff CN= 91

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 10.90 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 10.77 cfs
==========

DRAINAGE AREA

ID:POST NORTH
CN = 91
Area = 2.419 acres
S = .9890 in
0.2S = .1978 in

Cumulative Runoff

3.4402 in
.693 ac-ft

HYG Volume... .693 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST NORTH)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 16.44 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 50 year storm
Duration = 24.0000 hrs Rain Depth = 5.0200 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST NORTH 50
Tc = .1667 hrs
Drainage Area = 2.419 acres Runoff CN= 91

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 12.58 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 12.41 cfs
==========

DRAINAGE AREA

ID:POST NORTH
CN = 91
Area = 2.419 acres
S = .9890 in
0.2S = .1978 in

Cumulative Runoff

4.0015 in
.807 ac-ft

HYG Volume... .807 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST NORTH)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 16.44 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 5.6300 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST NORTH 100
Tc = .1667 hrs
Drainage Area = 2.419 acres Runoff CN= 91

==========
Computational Time Increment = .02223 hrs
Computed Peak Time = 11.9802 hrs
Computed Peak Flow = 14.33 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 14.13 cfs
==========

DRAINAGE AREA

ID:POST NORTH
CN = 91
Area = 2.419 acres
S = .9890 in
0.2S = .1978 in

Cumulative Runoff

4.5955 in
.926 ac-ft

HYG Volume... .926 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .16670 hrs (ID: POST NORTH)
Computational Incr, Tm = .02223 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 16.44 cfs
Unit peak time Tp = .11113 hrs
Unit receding limb, Tr = .44453 hrs
Total unit time, Tb = .55567 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 1 year storm
Duration = 24.0000 hrs Rain Depth = 2.2000 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST UNDETAINED 1
Tc = .2169 hrs
Drainage Area = 4.289 acres Runoff CN= 80

==========
Computational Time Increment = .02892 hrs
Computed Peak Time = 12.0297 hrs
Computed Peak Flow = 3.63 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0500 hrs
Peak Flow, Interpolated Output = 3.62 cfs
==========

DRAINAGE AREA

ID:POST UNDETAINED
CN = 80
Area = 4.289 acres
S = 2.5000 in
0.2S = .5000 in

Cumulative Runoff

.6881 in
.246 ac-ft

HYG Volume... .246 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .21688 hrs (ID: POST UNDETAINED)
Computational Incr, Tm = .02892 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 22.41 cfs
Unit peak time Tp = .14459 hrs
Unit receding limb, Tr = .57835 hrs
Total unit time, Tb = .72294 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = 2.6300 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST UNDETAINED 2
Tc = .2169 hrs
Drainage Area = 4.289 acres Runoff CN= 80

==========
Computational Time Increment = .02892 hrs
Computed Peak Time = 12.0297 hrs
Computed Peak Flow = 5.30 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0500 hrs
Peak Flow, Interpolated Output = 5.25 cfs
==========

DRAINAGE AREA

ID:POST UNDETAINED
CN = 80
Area = 4.289 acres
S = 2.5000 in
0.2S = .5000 in

Cumulative Runoff

.9799 in
.350 ac-ft

HYG Volume... .350 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .21688 hrs (ID: POST UNDETAINED)
Computational Incr, Tm = .02892 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 22.41 cfs
Unit peak time Tp = .14459 hrs
Unit receding limb, Tr = .57835 hrs
Total unit time, Tb = .72294 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 5 year storm
Duration = 24.0000 hrs Rain Depth = 3.2400 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST UNDETAINED 5
Tc = .2169 hrs
Drainage Area = 4.289 acres Runoff CN= 80

==========
Computational Time Increment = .02892 hrs
Computed Peak Time = 12.0297 hrs
Computed Peak Flow = 7.85 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0500 hrs
Peak Flow, Interpolated Output = 7.73 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
==========

DRAINAGE AREA

ID:POST UNDETAINED
CN = 80
Area = 4.289 acres
S = 2.5000 in
0.2S = .5000 in

Cumulative Runoff

1.4327 in
.512 ac-ft

HYG Volume... .512 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .21688 hrs (ID: POST UNDETAINED)
Computational Incr, Tm = .02892 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 22.41 cfs
Unit peak time Tp = .14459 hrs
Unit receding limb, Tr = .57835 hrs
Total unit time, Tb = .72294 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 3.7400 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST UNDETAINED 10
Tc = .2169 hrs
Drainage Area = 4.289 acres Runoff CN= 80

==========
Computational Time Increment = .02892 hrs
Computed Peak Time = 12.0297 hrs
Computed Peak Flow = 10.05 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0500 hrs
Peak Flow, Interpolated Output = 9.86 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
==========

DRAINAGE AREA

ID:POST UNDETAINED
CN = 80
Area = 4.289 acres
S = 2.5000 in
0.2S = .5000 in

Cumulative Runoff

1.8289 in
.654 ac-ft

HYG Volume... .654 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .21688 hrs (ID: POST UNDETAINED)
Computational Incr, Tm = .02892 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 22.41 cfs
Unit peak time Tp = .14459 hrs
Unit receding limb, Tr = .57835 hrs
Total unit time, Tb = .72294 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 25 year storm
Duration = 24.0000 hrs Rain Depth = 4.4400 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST UNDETAINED 25
Tc = .2169 hrs
Drainage Area = 4.289 acres Runoff CN= 80

==========
Computational Time Increment = .02892 hrs
Computed Peak Time = 12.0297 hrs
Computed Peak Flow = 13.23 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 13.01 cfs
WARNING: The difference between calculated peak flow
and interpolated peak flow is greater than 1.50%
==========

DRAINAGE AREA

ID:POST UNDETAINED
CN = 80
Area = 4.289 acres
S = 2.5000 in
0.2S = .5000 in

Cumulative Runoff

2.4105 in
.862 ac-ft

HYG Volume... .862 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .21688 hrs (ID: POST UNDETAINED)
Computational Incr, Tm = .02892 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 22.41 cfs
Unit peak time Tp = .14459 hrs
Unit receding limb, Tr = .57835 hrs
Total unit time, Tb = .72294 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 50 year storm
Duration = 24.0000 hrs Rain Depth = 5.0200 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST UNDETAINED 50
Tc = .2169 hrs
Drainage Area = 4.289 acres Runoff CN= 80

==========
Computational Time Increment = .02892 hrs
Computed Peak Time = 12.0297 hrs
Computed Peak Flow = 15.93 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 15.71 cfs
==========

DRAINAGE AREA

ID:POST UNDETAINED
CN = 80
Area = 4.289 acres
S = 2.5000 in
0.2S = .5000 in

Cumulative Runoff

2.9103 in
1.040 ac-ft

HYG Volume... 1.040 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .21688 hrs (ID: POST UNDETAINED)
Computational Incr, Tm = .02892 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 22.41 cfs
Unit peak time Tp = .14459 hrs
Unit receding limb, Tr = .57835 hrs
Total unit time, Tb = .72294 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 5.6300 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - POST UNDETAINED 100
Tc = .2169 hrs
Drainage Area = 4.289 acres Runoff CN= 80

==========
Computational Time Increment = .02892 hrs
Computed Peak Time = 12.0297 hrs
Computed Peak Flow = 18.79 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.0000 hrs
Peak Flow, Interpolated Output = 18.60 cfs
==========

DRAINAGE AREA

ID:POST UNDETAINED
CN = 80
Area = 4.289 acres
S = 2.5000 in
0.2S = .5000 in

Cumulative Runoff

3.4491 in
1.233 ac-ft

HYG Volume... 1.233 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .21688 hrs (ID: POST UNDETAINED)
Computational Incr, Tm = .02892 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 22.41 cfs
Unit peak time Tp = .14459 hrs
Unit receding limb, Tr = .57835 hrs
Total unit time, Tb = .72294 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 1 year storm
Duration = 24.0000 hrs Rain Depth = 2.2000 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - PRE 1
Tc = .5302 hrs
Drainage Area = 8.929 acres Runoff CN= 86

==========
Computational Time Increment = .07069 hrs
Computed Peak Time = 12.2290 hrs
Computed Peak Flow = 7.23 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.2000 hrs
Peak Flow, Interpolated Output = 7.16 cfs
==========

DRAINAGE AREA

ID:PRE
CN = 86
Area = 8.929 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

1.0032 in
.746 ac-ft

HYG Volume... .746 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .53016 hrs (ID: PRE)
Computational Incr, Tm = .07069 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 19.08 cfs
Unit peak time Tp = .35344 hrs
Unit receding limb, Tr = 1.41376 hrs
Total unit time, Tb = 1.76720 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 2 year storm
Duration = 24.0000 hrs Rain Depth = 2.6300 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - PRE 2
Tc = .5302 hrs
Drainage Area = 8.929 acres Runoff CN= 86

==========
Computational Time Increment = .07069 hrs
Computed Peak Time = 12.2290 hrs
Computed Peak Flow = 9.81 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.2000 hrs
Peak Flow, Interpolated Output = 9.74 cfs
==========

DRAINAGE AREA

ID:PRE
CN = 86
Area = 8.929 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

1.3504 in
1.005 ac-ft

HYG Volume... 1.005 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .53016 hrs (ID: PRE)
Computational Incr, Tm = .07069 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 19.08 cfs
Unit peak time Tp = .35344 hrs
Unit receding limb, Tr = 1.41376 hrs
Total unit time, Tb = 1.76720 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 5 year storm
Duration = 24.0000 hrs Rain Depth = 3.2400 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - PRE 5
Tc = .5302 hrs
Drainage Area = 8.929 acres Runoff CN= 86

==========
Computational Time Increment = .07069 hrs
Computed Peak Time = 12.2290 hrs
Computed Peak Flow = 13.61 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.2000 hrs
Peak Flow, Interpolated Output = 13.56 cfs
==========

DRAINAGE AREA

ID:PRE
CN = 86
Area = 8.929 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

1.8699 in
1.391 ac-ft

HYG Volume... 1.391 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .53016 hrs (ID: PRE)
Computational Incr, Tm = .07069 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 19.08 cfs
Unit peak time Tp = .35344 hrs
Unit receding limb, Tr = 1.41376 hrs
Total unit time, Tb = 1.76720 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 10 year storm
Duration = 24.0000 hrs Rain Depth = 3.7400 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - PRE 10
Tc = .5302 hrs
Drainage Area = 8.929 acres Runoff CN= 86

==========
Computational Time Increment = .07069 hrs
Computed Peak Time = 12.2290 hrs
Computed Peak Flow = 16.79 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.2000 hrs
Peak Flow, Interpolated Output = 16.76 cfs
==========

DRAINAGE AREA

ID:PRE
CN = 86
Area = 8.929 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

2.3121 in
1.720 ac-ft

HYG Volume... 1.720 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .53016 hrs (ID: PRE)
Computational Incr, Tm = .07069 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 19.08 cfs
Unit peak time Tp = .35344 hrs
Unit receding limb, Tr = 1.41376 hrs
Total unit time, Tb = 1.76720 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 25 year storm
Duration = 24.0000 hrs Rain Depth = 4.4400 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - PRE 25
Tc = .5302 hrs
Drainage Area = 8.929 acres Runoff CN= 86

==========
Computational Time Increment = .07069 hrs
Computed Peak Time = 12.2290 hrs
Computed Peak Flow = 21.31 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.2000 hrs
Peak Flow, Interpolated Output = 21.31 cfs
==========

DRAINAGE AREA

ID:PRE
CN = 86
Area = 8.929 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

2.9480 in
2.194 ac-ft

HYG Volume... 2.194 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .53016 hrs (ID: PRE)
Computational Incr, Tm = .07069 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 19.08 cfs
Unit peak time Tp = .35344 hrs
Unit receding limb, Tr = 1.41376 hrs
Total unit time, Tb = 1.76720 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 50 year storm
Duration = 24.0000 hrs Rain Depth = 5.0200 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - PRE 50
Tc = .5302 hrs
Drainage Area = 8.929 acres Runoff CN= 86

==========
Computational Time Increment = .07069 hrs
Computed Peak Time = 12.1583 hrs
Computed Peak Flow = 25.14 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.2000 hrs
Peak Flow, Interpolated Output = 25.10 cfs
==========

DRAINAGE AREA

ID:PRE
CN = 86
Area = 8.929 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

3.4857 in
2.594 ac-ft

HYG Volume... 2.594 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .53016 hrs (ID: PRE)
Computational Incr, Tm = .07069 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 19.08 cfs
Unit peak time Tp = .35344 hrs
Unit receding limb, Tr = 1.41376 hrs
Total unit time, Tb = 1.76720 hrs

SCS UNIT HYDROGRAPH METHOD

STORM EVENT: 100 year storm
Duration = 24.0000 hrs Rain Depth = 5.6300 in
Rain Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Rain File -ID = - TypeII 24hr
Unit Hyd Type = Default Curvilinear
HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
HYG File - ID = - PRE 100
Tc = .5302 hrs
Drainage Area = 8.929 acres Runoff CN= 86

==========
Computational Time Increment = .07069 hrs
Computed Peak Time = 12.1583 hrs
Computed Peak Flow = 29.18 cfs

Time Increment for HYG File = .0500 hrs
Peak Time, Interpolated Output = 12.2000 hrs
Peak Flow, Interpolated Output = 29.10 cfs
==========

DRAINAGE AREA

ID:PRE
CN = 86
Area = 8.929 acres
S = 1.6279 in
0.2S = .3256 in

Cumulative Runoff

4.0588 in
3.020 ac-ft

HYG Volume... 3.020 ac-ft (area under HYG curve)

***** SCS UNIT HYDROGRAPH PARAMETERS *****

Time Concentration, Tc = .53016 hrs (ID: PRE)
Computational Incr, Tm = .07069 hrs = 0.20000 Tp

Unit Hyd. Shape Factor = 483.432 (37.46% under rising limb)
K = 483.43/645.333, K = .7491 (also, K = 2/(1+(Tr/Tp))
Receding/Rising, Tr/Tp = 1.6698 (solved from K = .7491)

Unit peak, qp = 19.08 cfs
Unit peak time Tp = .35344 hrs
Unit receding limb, Tr = 1.41376 hrs
Total unit time, Tb = 1.76720 hrs

Elevation (ft)	Planimeter (sq.in)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	Volume (ac-ft)	Volume Sum (ac-ft)
827.25	-----	2	0	.000	.000
828.30	-----	3284	3367	.027	.027
831.00	-----	7432	15656	.323	.351

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

Elevation (ft)	Planimeter (sq.in)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	Volume (ac-ft)	Volume Sum (ac-ft)
827.00	-----	2	0	.000	.000
828.00	-----	2473	2545	.019	.019
828.10	-----	5624	11826	.009	.029
831.10	-----	11701	25437	.584	.612

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 827.25 ft
Increment = .10 ft
Max. Elev.= 831.00 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Orifice-Circular	O0	--->	C0	827.250	831.000
Orifice-Area	O1	--->	C0	829.270	831.000
Orifice-Area	O2	--->	C0	829.730	831.000
Culvert-Circular	C0	--->	TW	827.200	831.000

TW SETUP, DS Channel

OUTLET STRUCTURE INPUT DATA

Structure ID	= O0	
Structure Type	= Orifice-Circular	
# of Openings	=	1
Invert Elev.	=	827.25 ft
Diameter	=	.5000 ft
Orifice Coeff.	=	.600

Structure ID	= O1	
Structure Type	= Orifice-Area	
# of Openings	=	1
Invert Elev.	=	829.27 ft
Area	=	.5000 sq.ft
Top of Orifice	=	829.77 ft
Datum Elev.	=	829.52 ft
Orifice Coeff.	=	.600

Structure ID	= O2	
Structure Type	= Orifice-Area	
# of Openings	=	2
Invert Elev.	=	829.73 ft
Area	=	1.0000 sq.ft
Top of Orifice	=	830.23 ft
Datum Elev.	=	829.98 ft
Orifice Coeff.	=	.600

OUTLET STRUCTURE INPUT DATA

Structure ID = C0
Structure Type = Culvert-Circular

No. Barrels	=	1
Barrel Diameter	=	1.0000 ft
Upstream Invert	=	827.20 ft
Dnstream Invert	=	827.07 ft
Horiz. Length	=	26.00 ft
Barrel Length	=	26.00 ft
Barrel Slope	=	.00500 ft/ft

OUTLET CONTROL DATA...

Mannings n	=	.0130	
Ke	=	.2000	(forward entrance loss)
Kb	=	.031274	(per ft of full flow)
Kr	=	.2000	(reverse entrance loss)
HW Convergence	=	.001	+/- ft

INLET CONTROL DATA...

Equation form	=	1
Inlet Control K	=	.0018
Inlet Control M	=	2.0000
Inlet Control c	=	.02920
Inlet Control Y	=	.7400
T1 ratio (HW/D)	=	1.060
T2 ratio (HW/D)	=	1.205
Slope Factor	=	-.500

Use unsubmerged inlet control Form 1 equ. below T1 elev.
Use submerged inlet control Form 1 equ. above T2 elev.

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...
At T1 Elev = 828.26 ft ---> Flow = 2.75 cfs
At T2 Elev = 828.40 ft ---> Flow = 3.14 cfs

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...

Maximum Iterations	=	40
Min. TW tolerance	=	.01 ft
Max. TW tolerance	=	.01 ft
Min. HW tolerance	=	.01 ft
Max. HW tolerance	=	.01 ft
Min. Q tolerance	=	.00 cfs
Max. Q tolerance	=	.00 cfs

REQUESTED POND WS ELEVATIONS:

Min. Elev.= 827.00 ft
Increment = .10 ft
Max. Elev.= 831.10 ft

****
OUTLET CONNECTIVITY
****

---> Forward Flow Only (UpStream to DnStream)
<--- Reverse Flow Only (DnStream to UpStream)
<---> Forward and Reverse Both Allowed

Structure	No.		Outfall	E1, ft	E2, ft
Orifice-Circular	O0	--->	C0	827.000	831.100
Orifice-Circular	O1	--->	C0	828.620	831.100
Orifice-Area	O2	--->	C0	830.250	831.100
Culvert-Circular	C0	--->	TW	826.720	831.100

TW SETUP, DS Channel

OUTLET STRUCTURE INPUT DATA

Structure ID = O0
Structure Type = Orifice-Circular

# of Openings	=	1
Invert Elev.	=	827.00 ft
Diameter	=	.0765 ft
Orifice Coeff.	=	.600

Structure ID = O1
Structure Type = Orifice-Circular

# of Openings	=	1
Invert Elev.	=	828.62 ft
Diameter	=	.6670 ft
Orifice Coeff.	=	.600

Structure ID = O2
Structure Type = Orifice-Area

# of Openings	=	1
Invert Elev.	=	830.25 ft
Area	=	.5000 sq.ft
Top of Orifice	=	830.50 ft
Datum Elev.	=	830.33 ft
Orifice Coeff.	=	.600

OUTLET STRUCTURE INPUT DATA

Structure ID = C0
Structure Type = Culvert-Circular

No. Barrels	=	1	
Barrel Diameter	=	1.0000	ft
Upstream Invert	=	826.72	ft
Dnstream Invert	=	824.30	ft
Horiz. Length	=	110.77	ft
Barrel Length	=	110.80	ft
Barrel Slope	=	.02185	ft/ft

OUTLET CONTROL DATA...

Mannings n	=	.0130	
Ke	=	.2000	(forward entrance loss)
Kb	=	.031274	(per ft of full flow)
Kr	=	.2000	(reverse entrance loss)
HW Convergence	=	.001	+/- ft

INLET CONTROL DATA...

Equation form	=	1	
Inlet Control K	=	.0018	
Inlet Control M	=	2.0000	
Inlet Control c	=	.02920	
Inlet Control Y	=	.7400	
T1 ratio (HW/D)	=	1.051	
T2 ratio (HW/D)	=	1.196	
Slope Factor	=	-.500	

Use unsubmerged inlet control Form 1 equ. below T1 elev.
Use submerged inlet control Form 1 equ. above T2 elev.

In transition zone between unsubmerged and submerged inlet control,
interpolate between flows at T1 & T2...
At T1 Elev = 827.77 ft ---> Flow = 2.75 cfs
At T2 Elev = 827.92 ft ---> Flow = 3.14 cfs

Structure ID = TW
Structure Type = TW SETUP, DS Channel

FREE OUTFALL CONDITIONS SPECIFIED

CONVERGENCE TOLERANCES...

Maximum Iterations=	40	
Min. TW tolerance =	.01	ft
Max. TW tolerance =	.01	ft
Min. HW tolerance =	.01	ft
Max. HW tolerance =	.01	ft
Min. Q tolerance =	.00	cfs
Max. Q tolerance =	.00	cfs

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - EAST BASIN IN 1
Outflow HYG file = NONE STORED - EAST BASIN OUT 1

Pond Node Data = EAST BASIN
Pond Volume Data = EAST BASIN
Pond Outlet Data = East Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.25 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	4.83 cfs	at	12.0000 hrs
Peak Outflow	=	1.08 cfs	at	12.2000 hrs
Peak Elevation	=	829.14 ft		
Peak Storage	=	.101 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.310
- Infiltration	=	.000
- HYG Vol OUT	=	.310
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.001% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - EAST BASIN IN 2
Outflow HYG file = NONE STORED - EAST BASIN OUT 2

Pond Node Data = EAST BASIN
Pond Volume Data = EAST BASIN
Pond Outlet Data = East Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.25 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	5.95 cfs	at	12.0000 hrs
Peak Outflow	=	1.46 cfs	at	12.2500 hrs
Peak Elevation	=	829.40 ft		
Peak Storage	=	.129 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.386
- Infiltration	=	.000
- HYG Vol OUT	=	.386
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.000% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - EAST BASIN IN 5
Outflow HYG file = NONE STORED - EAST BASIN OUT 5

Pond Node Data = EAST BASIN
Pond Volume Data = EAST BASIN
Pond Outlet Data = East Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.25 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	7.53 cfs	at	12.0000 hrs
Peak Outflow	=	2.23 cfs	at	12.2000 hrs
Peak Elevation	=	829.71 ft		
Peak Storage	=	.164 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.497
- Infiltration	=	.000
- HYG Vol OUT	=	.497
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.000% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - EAST BASIN IN 10
Outflow HYG file = NONE STORED - EAST BASIN OUT 10

Pond Node Data = EAST BASIN
Pond Volume Data = EAST BASIN
Pond Outlet Data = East Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.25 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	8.81 cfs	at	12.0000 hrs
Peak Outflow	=	3.87 cfs	at	12.1500 hrs
Peak Elevation	=	829.88 ft		
Peak Storage	=	.185 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.587
- Infiltration	=	.000
- HYG Vol OUT	=	.587
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.000% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - EAST BASIN IN 25
Outflow HYG file = NONE STORED - EAST BASIN OUT 25

Pond Node Data = EAST BASIN
Pond Volume Data = EAST BASIN
Pond Outlet Data = East Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.25 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	10.59 cfs	at	12.0000 hrs
Peak Outflow	=	5.53 cfs	at	12.1500 hrs
Peak Elevation	=	830.07 ft		
Peak Storage	=	.209 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.715
- Infiltration	=	.000
- HYG Vol OUT	=	.715
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.000% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - EAST BASIN IN 50
Outflow HYG file = NONE STORED - EAST BASIN OUT 50

Pond Node Data = EAST BASIN
Pond Volume Data = EAST BASIN
Pond Outlet Data = East Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.25 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	12.07 cfs	at	12.0000 hrs
Peak Outflow	=	6.23 cfs	at	12.1500 hrs
Peak Elevation	=	830.25 ft		
Peak Storage	=	.234 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.821
- Infiltration	=	.000
- HYG Vol OUT	=	.821
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.000% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - EAST BASIN IN 100
Outflow HYG file = NONE STORED - EAST BASIN OUT 100

Pond Node Data = EAST BASIN
Pond Volume Data = EAST BASIN
Pond Outlet Data = East Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.25 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	13.61 cfs	at	12.0000 hrs
Peak Outflow	=	6.52 cfs	at	12.1500 hrs
Peak Elevation	=	830.47 ft		
Peak Storage	=	.266 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.933
- Infiltration	=	.000
- HYG Vol OUT	=	.933
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.000% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - NORTH BASIN IN 1
Outflow HYG file = NONE STORED - NORTH BASIN OUT 1

Pond Node Data = NORTH BASIN
Pond Volume Data = NORTH BASIN
Pond Outlet Data = North Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.00 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	4.39 cfs	at	12.0000 hrs
Peak Outflow	=	.31 cfs	at	12.8000 hrs
Peak Elevation	=	828.95 ft		
Peak Storage	=	.153 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.270
- Infiltration	=	.000
- HYG Vol OUT	=	.270
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.003% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - NORTH BASIN IN 2
Outflow HYG file = NONE STORED - NORTH BASIN OUT 2

Pond Node Data = NORTH BASIN
Pond Volume Data = NORTH BASIN
Pond Outlet Data = North Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.00 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	5.61 cfs	at	12.0000 hrs
Peak Outflow	=	.68 cfs	at	12.4500 hrs
Peak Elevation	=	829.15 ft		
Peak Storage	=	.187 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.349
- Infiltration	=	.000
- HYG Vol OUT	=	.349
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.003% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - NORTH BASIN IN 5
Outflow HYG file = NONE STORED - NORTH BASIN OUT 5

Pond Node Data = NORTH BASIN
Pond Volume Data = NORTH BASIN
Pond Outlet Data = North Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.00 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	7.35 cfs	at	12.0000 hrs
Peak Outflow	=	1.22 cfs	at	12.3000 hrs
Peak Elevation	=	829.45 ft		
Peak Storage	=	.240 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.463
- Infiltration	=	.000
- HYG Vol OUT	=	.463
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.002% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - NORTH BASIN IN 10
Outflow HYG file = NONE STORED - NORTH BASIN OUT 10

Pond Node Data = NORTH BASIN
Pond Volume Data = NORTH BASIN
Pond Outlet Data = North Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.00 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	8.78 cfs	at	12.0000 hrs
Peak Outflow	=	1.49 cfs	at	12.3000 hrs
Peak Elevation	=	829.71 ft		
Peak Storage	=	.290 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.558
- Infiltration	=	.000
- HYG Vol OUT	=	.558
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.001% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - NORTH BASIN IN 25
Outflow HYG file = NONE STORED - NORTH BASIN OUT 25

Pond Node Data = NORTH BASIN
Pond Volume Data = NORTH BASIN
Pond Outlet Data = North Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.00 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	10.77 cfs	at	12.0000 hrs
Peak Outflow	=	1.81 cfs	at	12.3000 hrs
Peak Elevation	=	830.06 ft		
Peak Storage	=	.363 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.693
- Infiltration	=	.000
- HYG Vol OUT	=	.693
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.001% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - NORTH BASIN IN 50
Outflow HYG file = NONE STORED - NORTH BASIN OUT 50

Pond Node Data = NORTH BASIN
Pond Volume Data = NORTH BASIN
Pond Outlet Data = North Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.00 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	12.41 cfs	at	12.0000 hrs
Peak Outflow	=	2.31 cfs	at	12.3000 hrs
Peak Elevation	=	830.33 ft		
Peak Storage	=	.421 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.807
- Infiltration	=	.000
- HYG Vol OUT	=	.807
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.001% of Inflow Volume)

LEVEL POOL ROUTING SUMMARY

HYG Dir = H:\Columbus\P\120157\Design\Storm Drainage\
Inflow HYG file = NONE STORED - NORTH BASIN IN 100
Outflow HYG file = NONE STORED - NORTH BASIN OUT 100

Pond Node Data = NORTH BASIN
Pond Volume Data = NORTH BASIN
Pond Outlet Data = North Outlet

No Infiltration

INITIAL CONDITIONS

Starting WS Elev	=	827.00 ft
Starting Volume	=	.000 ac-ft
Starting Outflow	=	.00 cfs
Starting Infiltr.	=	.00 cfs
Starting Total Qout	=	.00 cfs
Time Increment	=	.0500 hrs

INFLOW/OUTFLOW HYDROGRAPH SUMMARY

Peak Inflow	=	14.13 cfs	at	12.0000 hrs
Peak Outflow	=	3.26 cfs	at	12.2500 hrs
Peak Elevation	=	830.54 ft		
Peak Storage	=	.471 ac-ft		

MASS BALANCE (ac-ft)

+ Initial Vol	=	.000
+ HYG Vol IN	=	.926
- Infiltration	=	.000
- HYG Vol OUT	=	.926
- Retained Vol	=	.000
Unrouted Vol	=	-.000 ac-ft (.000% of Inflow Volume)

Index of Starting Page Numbers for ID Names

Hydrologic Soil Group—Franklin County, Ohio
(Richard Avenue Elementary)

MAP LEGEND

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

Soils
- Soil Map Units

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

Political Features
- Cities

Water Features
- Streams and Canals

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

MAP INFORMATION

Map Scale: 1:2,020 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

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 accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 17N NAD83

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 10, Mar 16, 2012

Date(s) aerial images were photographed: 6/23/2004

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
CsA	Crosby-Urban land complex, 0 to 2 percent slopes	C/D	13.7	86.8%
CsB	Crosby-Urban land complex, 2 to 6 percent slopes	C/D	2.1	13.2%
Totals for Area of Interest			**15.7**	**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: All Components

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "All Components" returns the lowest or highest attribute value among all components of the map unit, depending on the corresponding "tie-break" rule. In this case, the "tie-break" rule indicates whether the lowest or highest value among all components should be returned. For this aggregation method, percent composition ties cannot occur.

The result returned by this aggregation method represents either the minimum or maximum value of the corresponding attribute throughout the map unit. The result may well be based on a map unit component of very minor extent.

Component Percent Cutoff: None Specified

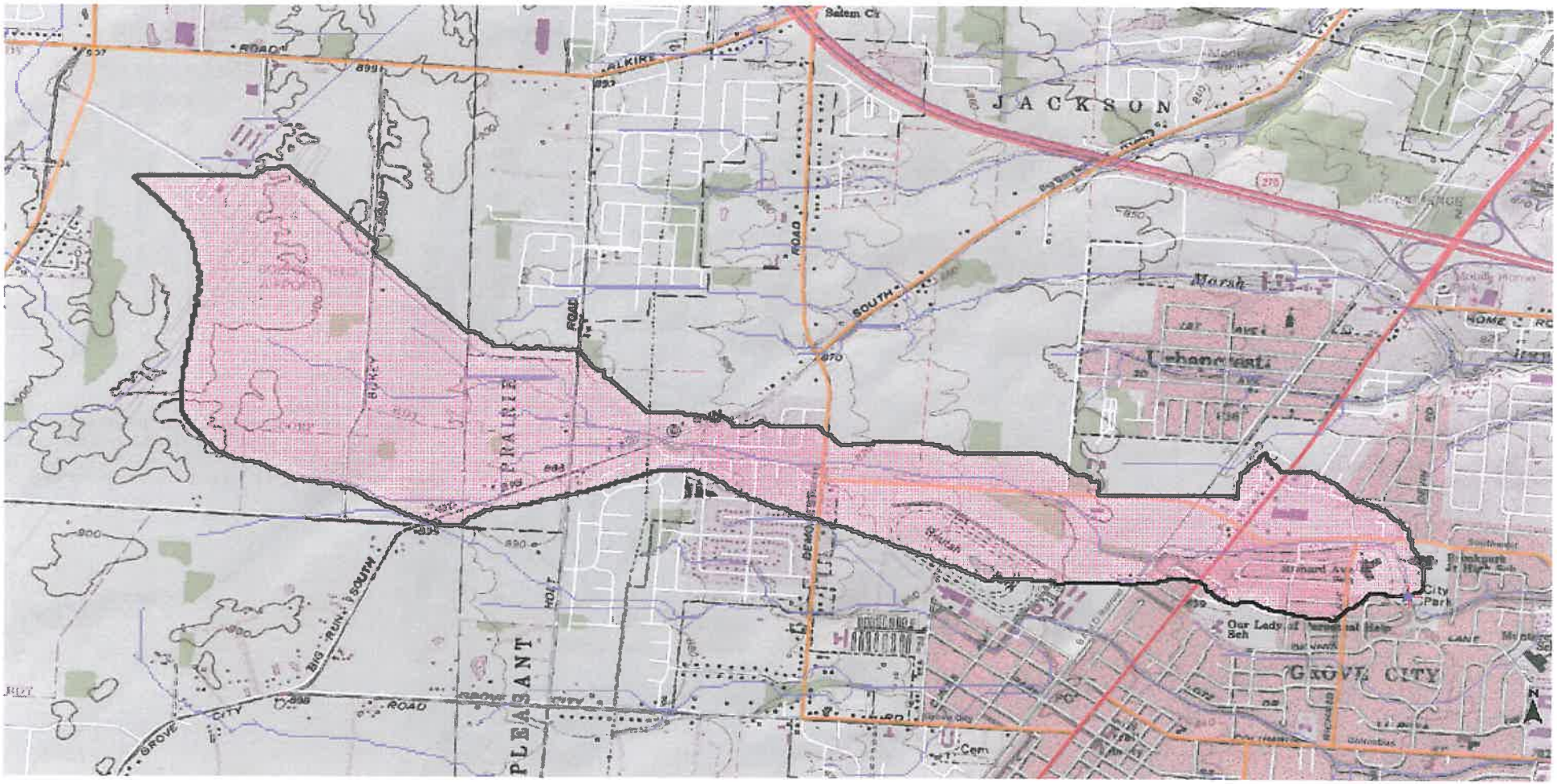
Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

USGS
Ohio StreamStats

StreamStats Print Page



Explanation

- NHDHGage2
- NHDHDam2
- GlobalWatershedPoint
- Centroid
- Gaging Station, Continuous Record
- Low Flow, Partial Record
- Peak Flow, Partial Record
- Peak and Low Flow, Partial Record
- Stage Only


Slp1085Point
LongestFlowPath3D
StreamCells
GlobalWatershed
ExcludePoly
Stage Only
Low Flow, Partial Record, Stage
Miscellaneous Record
Unknown

USGS Ohio StreamStats

Basin Characteristics Report

Date: Fri Jan 10 2014 13:24:52 Mountain Standard Time
NAD27 Latitude: 39.8883 (39 53 18)
NAD27 Longitude: -83.0777 (-83 04 40)
NAD83 Latitude: 39.8883 (39 53 18)
NAD83 Longitude: -83.0776 (-83 04 39)

Parameter	Value
Region A indicator for Ohio Peak Flows	1
Region C indicator for Ohio Peak Flows	0
Area in square miles	1.42
Y coordinate (latitude) of the centroid, in decimal degrees	39.8948
10-85 slope, in feet per mile	22.6
X coordinate (longitude) of the centroid, in decimal degrees	83.1144
Mean annual precipitation at basin centroid, in inches	37.9
Streamflow variability index at the outlet	0.611
Area Covered by forest, in percent	2.76
Area Covered by water and wetlands, in percent	0.59

WQv CALCULATOR - 6/4/2014
H:\Columbus\P\120157\Design\Storm Drainage\2014-06-04 120157 WQv North Basin.txt

Project Number: 120157
Project Name: Richard Ave ES
Description: WQv calcs for treatment in the north basin
Date: 6/4/2014
Designed By: MSM
Checked By:

Detention Description: Dry Basin

Development Type: Single Family Residential, TND

WQv RESULTS

Calculated WQv: 0.08 ac ft
Add 20% for Dry Detention: 0.016 ac ft
Total WQv Required: 0.096 ac ft

Elev Equal to 100% WQv: 828.52 ft
100% WQv Drawdown: 58.11 hrs

Elev Equal to 50% WQv: 828.29 ft
50% WQv Drawdown: 38.17 hrs

Total Pond Drawdown: 171.64 hrs

WATERSHED DATA

Watershed Area: 2.34 ac
Runoff Coefficient: .55
Rainfall Depth: .75 in

OUTLET DATA

Elev (ft)	Dia (ft)	Number
827	0.0765	1

BASIN DATA

Elev (ft)	Area (sq ft)
827	2
828	2473
828.1	5624
831.1	11701

100% WQv DRAWDOWN

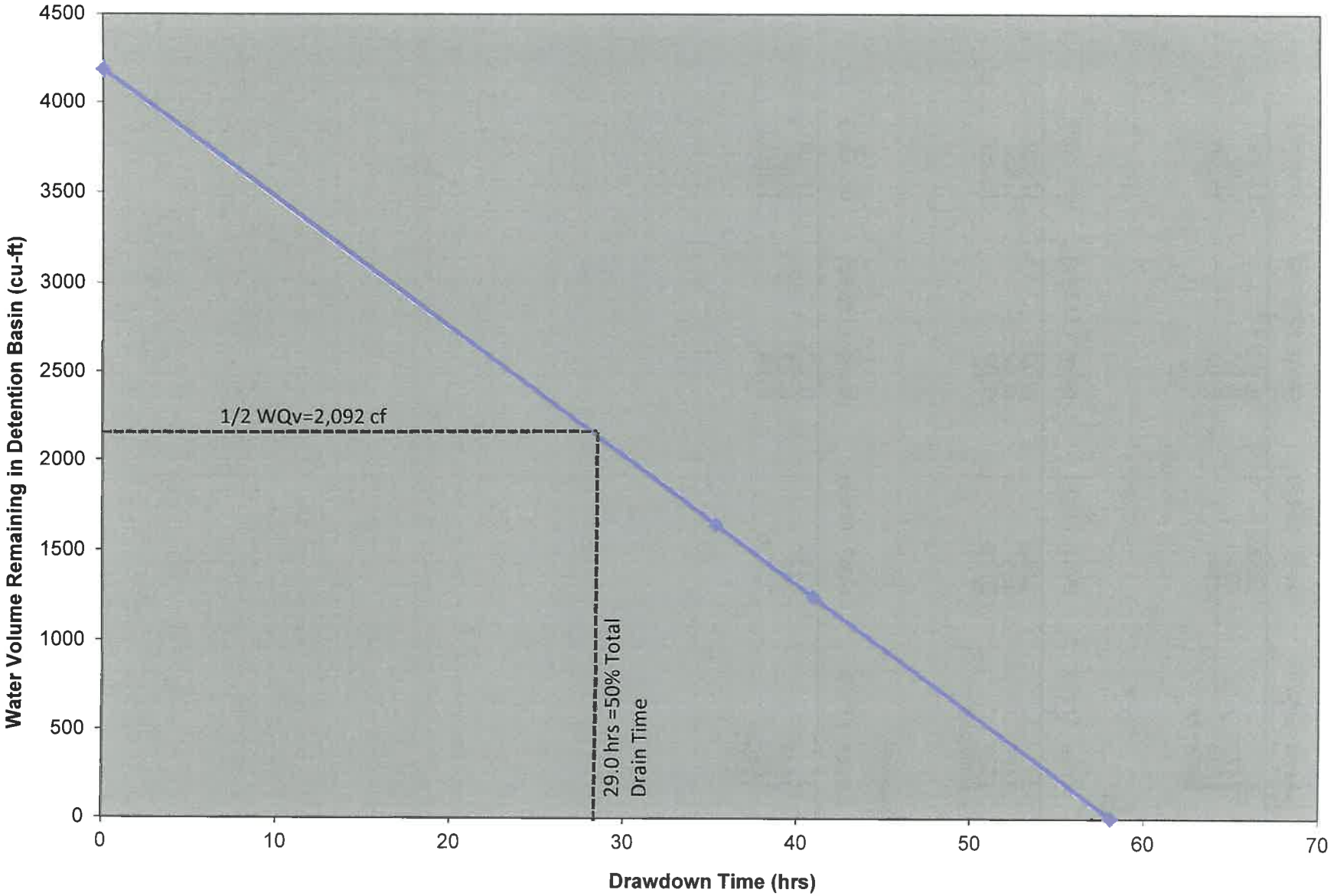
Elev (ft)	Area (ft2)	dVol (ft3)	Qavg (ft3/s)	dt (hr)
827	2	1238	0.02	17.19
828	2473	405	0.02	5.62
828.1	5624	2541	0.02	35.29
828.52	6474.78			

50% WQv DRAWDOWN

Elev (ft)	Area (ft2)	dVol (ft3)	Qavg (ft3/s)	dt (hr)
827	2	1238	0.02	17.19
828	2473	405	0.02	5.62
828.1	5624	1105	0.02	15.35
828.29	6008.88			

TOTAL BASIN DRAWDOWN

Elev (ft)	Area (ft2)	dVol (ft3)	Qavg (ft3/s)	dt (hr)
827	2	1238	0.02	17.19
828	2473	405	0.02	5.62
828.1	5624	21430	0.04	148.82
831.1	11701			


4500
4000
3500
3000
2500
2000
1500
1000
500
0
Water Volume Remaining in Detention Basin (cu-ft)
1/2 WQv=2,092 cf
29.0 hrs =50% Total Drain Time
0
10
20
30
40
50
60
70
Drawdown Time (hrs)