06	13N	01W	Richmond	Wayne	Wayne	Indiana
Section	Township	Range	City	Township	County	State

Indiana 811 — Know what's below. Call before you dig.

1" = 20'
0 20' 40' 60'

Aerial Photography

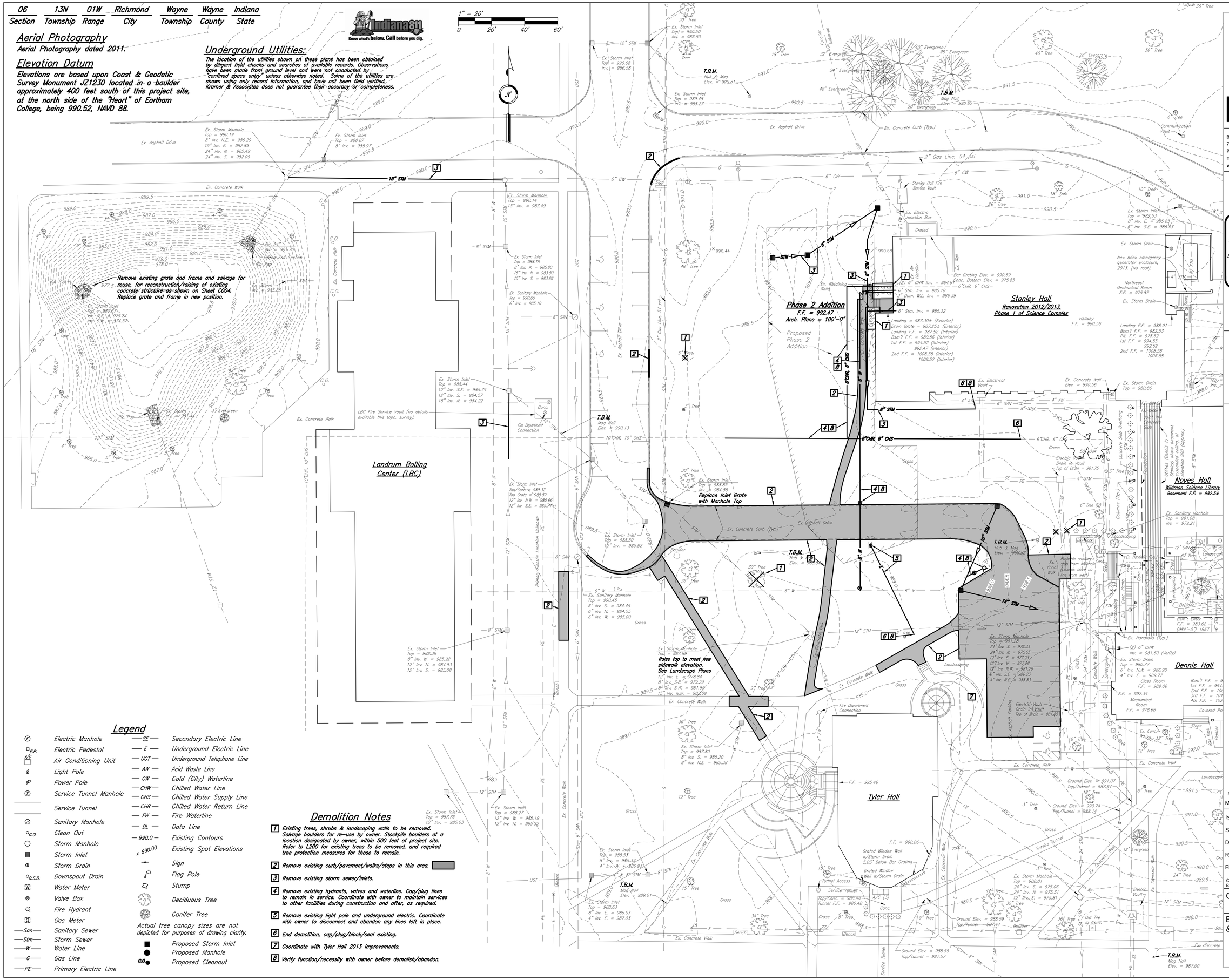
Aerial Photography dated 2011.

Elevation Datum

Elevations are based upon Coast & Geodetic Survey Monument JZ1230 located in a boulder approximately 400 feet south of this project site, at the north side of the "Heart" of Earlham College, being 990.52, NAVD 88.

Underground Utilities:

The location of the utilities shown on these plans has been obtained by diligent field checks and searches of available records. Observations have been made from ground level and were not conducted by "confined space entry" unless otherwise noted. Some of the utilities are shown using only record information, and have not been field verified. Kramer & Associates does not guarantee their accuracy or completeness.



Legend

Electric Manhole	Secondary Electric Line
Electric Pedestal	Underground Electric Line
Air Conditioning Unit	Underground Telephone Line
Light Pole	Acid Waste Line
Power Pole	Cold (City) Waterline
Service Tunnel Manhole	Chilled Water Line
	Chilled Water Supply Line
Service Tunnel	Chilled Water Return Line
	Fire Waterline
Sanitary Manhole	Data Line
Clean Out	Existing Contours
Storm Manhole	Existing Spot Elevations
Storm Inlet	Sign
Storm Drain	Flag Pole
Downspout Drain	Stump
Water Meter	Deciduous Tree
Valve Box	Conifer Tree
Fire Hydrant	
Gas Meter	
Sanitary Sewer	
Storm Sewer	
Water Line	
Gas Line	
Primary Electric Line	

Actual tree canopy sizes are not depicted for purposes of drawing clarity.

Proposed Storm Inlet
Proposed Manhole
Proposed Cleanout

Demolition Notes

1. Existing trees, shrubs & landscaping walls to be removed. Salvage boulders for re-use by owner. Stockpile boulders at a location designated by owner, within 500 feet of project site. Refer to L200 for existing trees to be removed, and required tree protection measures for those to remain.
2. Remove existing curb/pavement/walks/steps in this area.
3. Remove existing storm sewer/inlets.
4. Remove existing hydrants, valves and waterline. Cap/plug lines to remain in service. Coordinate with owner to maintain services to other facilities during construction and after, as required.
5. Remove existing light pole and underground electric. Coordinate with owner to disconnect and abandon any lines left in place.
6. End demolition, cap/plug/block/seal existing.
7. Coordinate with Tyler Hall 2013 improvements.
8. Verify function/necessity with owner before demolish/abandon.

boora

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ROBERT W. WARNER STATE OF INDIANA No. 21264 PROFESSIONAL ENGINEER

Robert W. Warner

Earlham College Science Complex Phase 2

801 National Road West
Richmond, IN 47374-4095

MARK	DATE	DESCRIPTION
1	01.15.14	ADDENDUM 2

Issued:	February 28, 2014
Scale:	1" = 20'
Drawn By:	Kramer & Associates, LLC
Reviewed By:	DEK
File:	File Path

Copyright
Boora Project Number: 12009

CONFORMED SET

EXISTING TOPOGRAPHY & DEMOLITION PLAN

C001

06	13N	01W	Richmond	Wayne	Wayne	Indiana
Section	Township	Range	City	Township	County	State

Indiana 811 — Know what's below. Call before you dig.

1" = 20'
0 20' 40' 60'

Aerial Photography

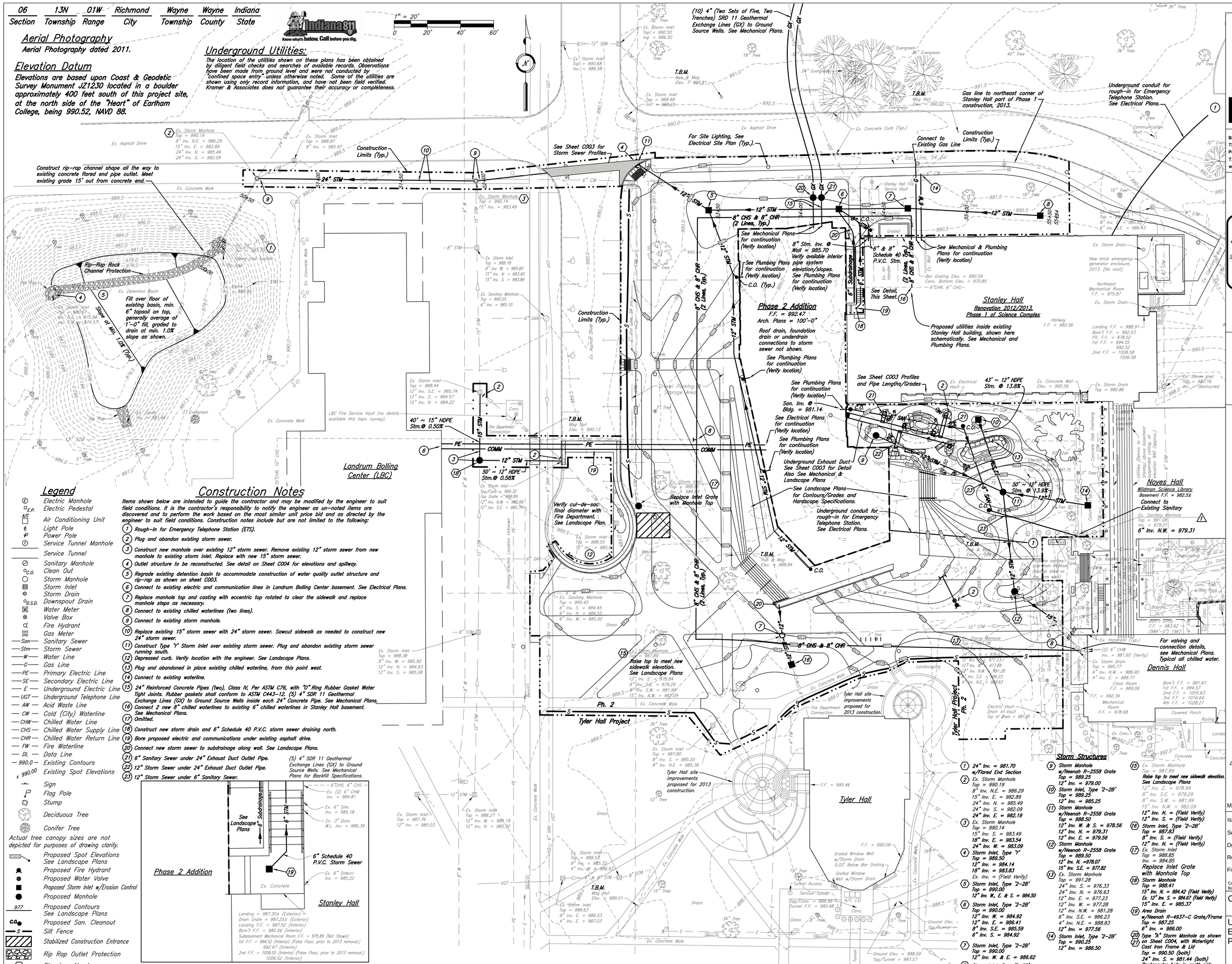
Aerial Photography dated 2011.

Elevation Datum

Elevations are based upon Coast & Geodetic Survey Monument JZ1230 located in a boulder approximately 400 feet south of this project site, at the north side of the "Heart" of Earlham College, being 990.52, NAVD 88.

Underground Utilities:

The location of the utilities shown on these plans has been obtained by diligent field checks and searches of available records. Observations have been made from ground level and were not conducted by "confined space entry" unless otherwise noted. Some of the utilities are shown using only record information, and have not been field verified. Kramer & Associates does not guarantee their accuracy or completeness.



Legend

- Electric Manhole
- E.P. Electric Pedestal
- A/C Air Conditioning Unit
- Light Pole
- Power Pole
- Service Tunnel Manhole
- Service Tunnel
- Sanitary Manhole
- C.O. Clean Out
- Storm Manhole
- Storm Inlet
- Storm Drain
- D.S.D. Downspout Drain
- W Water Meter
- Valve Box
- Fire Hydrant
- G Gas Meter
- —San— Sanitary Sewer
- —Stm— Storm Sewer
- —W— Water Line
- —G— Gas Line
- —PE— Primary Electric Line
- —SE— Secondary Electric Line
- —E— Underground Electric Line
- —UGT— Underground Telephone Line
- —AW— Acid Waste Line
- —CW— Cold (City) Waterline
- —CHW— Chilled Water Line
- —CHS— Chilled Water Supply Line
- —CHR— Chilled Water Return Line
- —FW— Fire Waterline
- —DL— Data Line
- —990.0— Existing Contours
- x 990.00 Existing Spot Elevations
- Sign
- Flag Pole
- Stump
- Deciduous Tree
- Conifer Tree

Actual tree canopy sizes are not depicted for purposes of drawing clarity.

- 990.00 Proposed Spot Elevations See Landscape Plans
- Proposed Fire Hydrant
- Proposed Water Valve
- Proposed Storm Inlet w/Erosion Control
- Proposed Manhole
- 977 Proposed Contours See Landscape Plans
- C.O. Proposed San. Cleanout
- S Silt Fence
- Stabilized Construction Entrance
- Rip Rap Outlet Protection
- (X) Structure Numbers
- Drainage Flow Arrow

Construction Notes

Items shown below are intended to guide the contractor and may be modified by the engineer to suit field conditions. It is the contractor's responsibility to notify the engineer as un-noted items are discovered and to perform the work based on the most similar unit price bid and as directed by the engineer to suit field conditions. Construction notes include but are not limited to the following:

1. Rough-In for Emergency Telephone Station (ETS).
2. Plug and abandon existing storm sewer.
3. Construct new manhole over existing 12" storm sewer. Remove existing 12" storm sewer from new manhole to existing storm inlet. Replace with new 15" storm sewer.
4. Outlet structure to be reconstructed. See detail on Sheet C004 for elevations and spillway.
5. Regrade existing detention basin to accommodate construction of water quality outlet structure and rip-rap as shown on sheet C003.
6. Connect to existing electric and communication lines in Landrum Bolling Center basement. See Electrical Plans.
7. Replace manhole top and casting with eccentric top rotated to clear the sidewalk and replace manhole steps as necessary.
8. Connect to existing chilled waterlines (two lines).
9. Connect to existing storm manhole.
10. Replace existing 15" storm sewer with 24" storm sewer. Sawcut sidewalk as needed to construct new 24" storm sewer.
11. Construct Type 'Y' Storm Inlet over existing storm sewer. Plug and abandon existing storm sewer running south.
12. Depressed curb. Verify location with the engineer. See Landscape Plans.
13. Plug and abandoned in place existing chilled waterline, from this point west.
14. Connect to existing waterline.
15. 24" Reinforced Concrete Pipes (two), Class IV, Per ASTM C76, with "O" Ring Rubber Gasket Water Tight Joints. Rubber gaskets shall conform to ASTM C443-12. (5) 4" SDR 11 Geothermal Exchange Lines (GX) to Ground Source Wells inside each 24" Concrete Pipe. See Mechanical Plans.
16. Connect 2 new 8" chilled waterlines to existing 6" chilled waterlines in Stanley Hall basement. See Mechanical Plans.
17. Omitted.
18. Construct new storm drain and 6" Schedule 40 P.V.C. storm sewer draining north.
19. Bore proposed electric and communications under existing asphalt drive.
20. Connect new storm sewer to subdrainage along wall. See Landscape Plans.
21. 6" Sanitary Sewer under 24" Exhaust Duct Outlet Pipe.
22. 12" Storm Sewer under 24" Exhaust Duct Outlet Pipe.
23. 12" Storm Sewer under 6" Sanitary Sewer.

(5) 4" SDR 11 Geothermal Exchange Lines (GX) to Ground Source Wells. See Mechanical Plans for Backfill Specifications.

Storm Structures

1. 24" Inv. = 981.70 w/Flared End Section
2. Ex. Storm Manhole Top = 990.19 8" Inv. N.E. = 986.29 15" Inv. E. = 982.89 24" Inv. N. = 985.49 24" Inv. S. = 982.09 24" Inv. E. = 982.19
3. Ex. Storm Manhole Top = 990.14 15" Inv. S. = 983.49 18" Inv. E. = 983.54 24" Inv. W. = 983.09
4. Storm Inlet, Type 'Y' Top = 989.50 12" Inv. = 984.14 18" Inv. = 983.83 Ex. Inv. = (Field Verify)
5. Storm Inlet, Type '2-2B' Top = 990.00 12" Inv. W., E. & S. = 984.50
6. Storm Inlet, Type '2-2B' Top = 990.00 12" Inv. W. = 984.92 12" Inv. E. = 986.41 8" Inv. S.E. = 985.59 6" Inv. S. = 984.92
7. Storm Inlet, Type '2-2B' Top = 990.00 12" Inv. W. & E. = 986.62
8. Storm Inlet, Type '2-2B' Top = 990.00 12" Inv. = 987.08
9. Storm Manhole w/Neenah R-2558 Grate Top = 989.25 12" Inv. = 979.00
10. Storm Inlet, Type '2-2B' Top = 989.25 12" Inv. = 985.25
11. Storm Manhole w/Neenah R-2558 Grate Top = 988.50 12" Inv. W. & S. = 978.56 12" Inv. N. = 979.31 12" Inv. E. = 979.56
12. Storm Manhole w/Neenah R-2558 Grate Top = 989.50 12" Inv. N. =978.07 15" Inv. S.E. = 977.82
13. Ex. Storm Manhole Top = 991.28 24" Inv. S. = 976.33 24" Inv. N. = 976.63 12" Inv. E. = 977.23 12" Inv. W. = 977.28 12" Inv. N.W. = 981.28 6" Inv. S.E. = 986.23 4" Inv. N.E. = 988.83 12" Inv. = 977.56
14. Storm Inlet, Type '2-2B' Top = 990.25 12" Inv. = 986.50
15. Ex. Storm Manhole Top = 987.89 Raise top to meet new sidewalk elevation. See Landscape Plans 12" Inv. E. = 978.84 8" Inv. S.E. = 979.29 8" Inv. S.W. = 981.99 15" Inv. N.W. = 982.09 12" Inv. N. = (Field Verify) 12" Inv. S. = (Field Verify)
16. Storm Inlet, Type '2-2B' Top = 987.83 8" Inv. S. = (Field Verify) 12" Inv. N. = (Field Verify)
17. Ex. Storm Inlet Top = 988.85 Inv. = 984.85 Replace Inlet Grate with Manhole Top
18. Storm Manhole Top = 988.41 15" Inv. N. = 984.42 (Field Verify) Ex. 12" Inv. S. = 984.67 (Field Verify) 15" Inv. E. = 985.37
19. Area Drain w/Neenah R-4937-C Grate/Frame Top = 987.25 6" Inv. = 986.00
20. Type "A" Storm Manhole as shown on Sheet C004, with Watertight Cast Iron Frame & Lid Top = 990.50 (both) 24" Inv. S. = 981.44 (both) Rectangular hole in north side, rough opening 10" high x 28" wide, Inv. = 982.27
21. Ex. Storm Manhole Top = 991.08 Inv. = 979.21 6" Inv. N.W. = 979.31

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ROBERT W. WARNER — REGISTERED No. 21264 STATE OF INDIANA PROFESSIONAL ENGINEER

Earlham College Science Complex Phase 2

801 National Road West
Richmond, IN 47374-4095

MARK	DATE	DESCRIPTION
2	01.15.14	ADDENDUM 2
1	01.06.14	PER CITY OF RICHMOND REVISIONS INCLUDE: ADDED TEMP. PARKING & STORAGE AREA

Issued: February 28, 2014
Scale: 1" = 20'
Drawn By: Kramer & Associates, LLC
Reviewed By: DEK
File: File Path

Copyright
Boora Project Number: 12009

CONFORMED SET

UTILITY, SITE AND EROSION CONTROL PLAN (SWP3)

C002

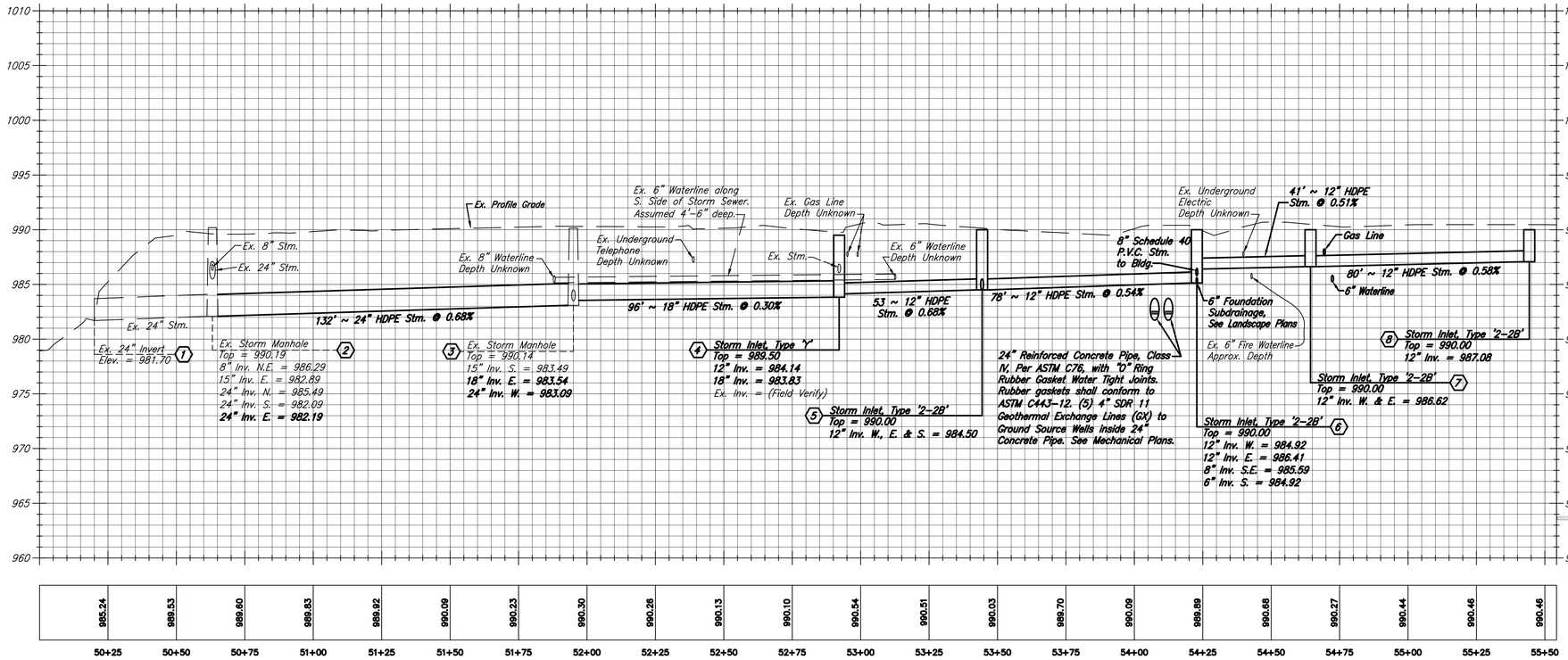
06	13N	01W	Richmond	Wayne	Wayne	Indiana
Section	Township	Range	City	Township	County	State

Elevation Datum

Elevations are based upon Coast & Geodetic Survey Monument JZ1230 located in a boulder approximately 400 feet south of this project site, at the north side of the "Heart" of Earlham College, being 990.52, NAVD 88.

Horizontal: 1" = 20' (0, 20', 40', 60')

Vertical: 1" = 5' (0, 5', 10', 15')



ACREAGE SUMMARY		
Impervious Area	0.8 Ac.±	44%
Seeded Area	1.0 Ac.±	56%
Total Disturbed	1.8 Ac.±	100%

GENERAL EROSION NOTES:

1. The Stormwater Pollution Plan is comprised of this drawing, the standard details, the plan narrative, attachments included in specifications, plus the permit and all subsequent reports and related documents.
2. All contractors and subcontractors involved with storm water pollution prevention shall obtain a copy of the Storm Water Pollution Prevention Plan and the State of Indiana National Pollutant Discharge Elimination System General Permit (NPDES Permit) and become familiar with their contents.
3. Contractor shall implement Best Management Practices as required by the SWPP. Additional Best Management Practices shall be implemented as dictated by conditions at no additional cost of owner throughout all phases of construction.
4. Best Management Practices (BMP'S) and controls shall conform to federal, state, or local requirements or manual of practice, as applicable contractor shall implement additional controls as directed by permitting agency or owner.
5. Permits for any construction activity impacting state waters or regulated wetlands must be maintained on site at all times.
6. Contractor shall minimize clearing to the maximum extent practical or as required by the general permit.
7. General Contractor shall denote on plan the temporary parking and storage area which shall also be used as the equipment fueling, maintenance and cleaning area, employee parking area, and area for locating portable facilities, office trailers, and toilet facilities.
8. Silt fences shall be constructed prior to any other construction on this project.
9. See silt fence details for construction uses and methods.
10. Any areas of future fill placement shall have silt fence barrier erected and maintained on the downslope side until satisfactory grass is established on the fill material.
11. All wash water (concrete trucks, vehicle cleaning, equipment cleaning, etc.) shall be detained and properly treated or disposed.
12. Sufficient oil and grease absorbing materials and flotation booms shall be maintained on site or readily available to contain and clean-up fuel or chemical spills and leaks.
13. Dust on the site shall be controlled. The use of motor oils and other petroleum based or toxic liquids for dust suppression operations is prohibited.
14. Rubbish, trash, garbage, litter, or other such materials shall be deposited into sealed containers. Materials shall be prevented from leaving the premises through the action of wind or storm water discharge into drainage ditches or waters of the state.
15. All storm water pollution prevention measures presented on these plan, and in the Storm Water Pollution Prevention Plan, shall be initiated as soon as practicable.
16. Disturbed portion of the site where construction activity has stopped for at least 15 days, shall be temporarily seeded. These areas shall be seeded no later than 7 days from the last construction activity occurring in these areas. Temporary or permanent surface stabilization is required on any bare or thinly vegetated area that is scheduled or likely to remain inactive for a period of 15 days or more. The seed mixture shall be used to establish a temporary cover for disturbed soil during the construction operations. It shall be placed when directed. Seed mixture shall also be used for late season soil stabilization and temporary ground cover. This mixture is not intended to be used as a permanent seed mixture. The method of planting shall be with a rangeland no-till drill or approved equal. An alternate method of planting shall be by means of hydro-seeding with mulch applied in a separate operation. The mix shall be mulched with a method approved by the engineer. Fertilizer shall be applied at the rate of 200 pounds per acre (224 kg/hectare). The seed mixture shall be applied at the rate of 80 pounds per acre (90 kg/hectare). The mix shall consist of 40 pounds (18 kg) Kentucky 31 Fescue or approved equal, and 40 pounds (18 kg) perennial ryegrass.
17. If the action of vehicles traveling over the gravel construction entrances is not sufficient to remove the majority of dirt or mud, then the tires must be washed before the vehicles enter a public road. If washing is used, provisions must be made to intercept the wash water and trap the sediment before it is carried off the site.
18. All Materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately.
19. Contractors or subcontractors will be responsible for removing sediment in the adjacent detention pond and any sediment that may have collected in the storm sewer drainage systems in conjunction with the stabilization of the site.
20. On-site and off-site soil stockpile and borrow areas shall be protected from erosion and sedimentation through implementation of Best Management Practices. Stockpile and borrow area locations shall be noted on the sited map and permitted in accordance with general permit requirements.
21. Slopes shall be left in a roughened condition during the grading phase to reduce runoff velocities and erosion.
22. Due to the grade changes during the development of the project, the contractor shall be responsible for adjusting the erosion control measures to prevent erosion.
23. All construction shall be stabilized at the end of each working day, this includes backfilling of trenches for utility construction and placement of gravel or bituminous paving for road construction.
24. All construction and demolition debris (C&DD) waste shall be disposed of in an I.D.E.M. approved C&DD landfill.
25. Soils contaminated by petroleum or other chemical spills shall be treated and/or disposed on in an I.D.E.M. approved solid waste management facility or hazardous waste treatment, storage or disposal facility. In the event of a spill the I.D.E.M. (1-888-233-7745), the local fire department, and the local emergency planning committee shall be contacted within 30 minutes.
26. Disturbed portions of the site where construction activity has permanently stopped shall be permanently seeded. These areas shall be seeded no later than 7 days after the last construction activity occurring in these areas. The area to be seeded shall be made smooth and uniform and shall be in accordance with the finished grade and cross section shown on the plans or as otherwise designated. The seed bed, if not loose, shall be loosened to a minimum depth of 3 inches (76 mm) before fertilizer or seed is applied. In areas of excessive vehicular traffic, such as parking of construction equipment, the soil shall be loosened to a minimum depth of 6 inches (152 mm). Fertilizer with a mixture of 12-12-12 shall be spread uniformly over the area to be seeded. Fertilizer shall be spread at the rate of 800 pounds per acre (897 kilogram per hectare) unless otherwise specified. Seed may be drilled in or mixed with water, but shall not be covered more than 1/2 of an inch (12.5 mm). The mixture shall be sprayed over the area to be seeded. An approved mechanical method which shall place the seed in direct contact with the soil may be used. In places inaccessible to mechanical equipment, or where the area to be seeded is small, a hand operated cyclone seeder or other approved equipment may be used. Leguminous seeds, unless otherwise specified, shall be inoculated. The culture shall be mixed with sufficient water to distribute it thoroughly. The seed shall be wetted thoroughly with the solution and allowed to dry sufficiently to be in condition for sowing. Inoculated seed shall be sown within 30 hours after the treatment. Where seeding is to be done by hydraulic methods, the inoculate may be added to the water in the spray tank. The seed mixture shall be applied at specific locations. Seed Mixture Grass Type 2: This seed mixture shall be placed at the rate of 124 kg/ha (110 lb/acre). The mixture shall consist of 7 kg (15 lb) of Smooth Brome grass, 4.5 kg (10 lb) of Orchard grass, 18 kg (40 lb) of Certified Common Kentucky Bluegrass, 14 kg (30lb) of Creeping Red Fescue, and 7 kg (15 lb) of Perennial Rye Grass. Mulching material shall be applied uniformly in a continuous blanket at the rate of 2 tons per acre (4.5 mega-grams/hectare).
Seed Mixture Grass Type: See Landscape Plans & Specifications. Mulch shall be placed within 24 hours after seeding. Mulch shall be secured in a method approved by the engineer.
27. All existing field tiles encountered during construction shall be repaired or connected to a new storm water system.
28. Erosion outlet protection shall be placed at all outlets from a drainage structure or swale. All outlets shall have a 12" Rip Rap bedding placed over a nonwoven geotextile membrane with specifications of 20 - 60 mills, grab strength of 90 - 120 lbs, and adheres to ASTM D-1777 and D-1682 tests, unless otherwise noted.

Stockpile - Topsoil

Verify with College Maintenance Staff for exact topsoil stockpile location.

Soil Description

UoA - Urban land-Miami complex, gravelly substratum, 0 to 2 percent slopes.

14-Digit Hydrologic Unit Code

05080003070070

Flood Zone

The subject tract of this survey lies within "Flood Zone C" (areas of minimal flooding) as defined by the Federal Emergency Management Agency on Flood Insurance Rate Map Community Panel Number 180287 0015 C effective date, August 16, 1982.

Utilities

The location of the utilities shown on this survey has been obtained by diligent field checks and searches of available records. Observations have been made from ground level and were not conducted by "confined space entry" unless otherwise noted. Some of the utilities are shown using only record information, and have not been field verified. It is believed that they are essentially correct, but Kramer & Associates does not guarantee their accuracy or completeness.

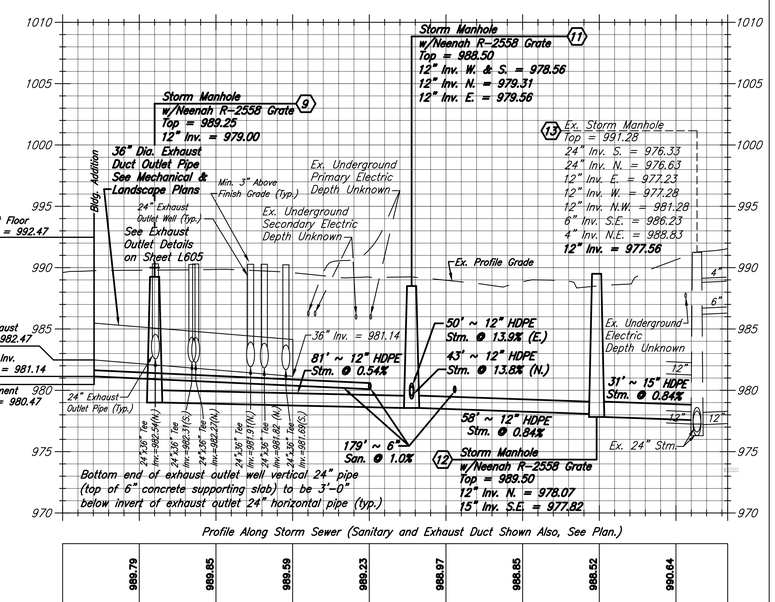
SEQUENCE OF CONST.

1. Install stabilized construction entrances.
2. Prepare temporary parking and storage area. (See Sheet C002 for location, size and material type.)
3. Construct the silt fences on the site.
4. Clear and grub the site.
5. Start construction of building pad and structures.
5. Begin grading the site.
6. Temporarily seed denuded areas.
7. Install utilities, underdrains, storm sewers and curbs.
8. Install rip-rap around outlet structures.
9. Install inlet protection around all storm sewer structures.
10. Prepare site for paving.
11. Pave Site.
12. Complete grading and install permanent seeding and planting.
13. Remove all temporary erosion and sediment control devices (only if site is stabilized).

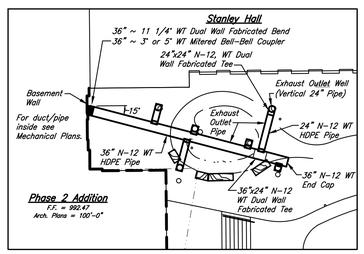
MAINTENANCE NOTES:

All measures stated on this Erosion and Sediment Control Plan, and in the Stormwater Pollution Prevention Plan, shall be maintained in fully functional condition until no longer required for a completed phase of work or final stabilization of the site. All erosion and sedimentation control measures shall be checked by a qualified person at least once every seven calendar days and within 24 hours of the end of a 0.5" rainfall event, and cleaned and repaired in accordance with the following:

1. Inlet protection devices and barriers shall be repaired or replaced if they show signs of undermining or deterioration.
2. All seeded areas shall be checked regularly to see that a good stand is maintained. Areas should be fertilized, watered, and reseeded as needed.
3. Silt fences shall be repaired to their original conditions if damaged. Sediment shall be removed from the silt fences when it reaches one-half the height of the silt fence.
4. The construction entrances shall be maintained in a condition which will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing of the construction entrances as conditions demand.
5. All temporary parking and storage areas shall be kept in good condition (suitable for parking and storage). This may require periodic top dressing of the temporary parking as conditions demand.
6. Outlet structures in the sedimentation basins shall be maintained in operational conditions at all times. Sediment shall be removed from sediment basins or traps when the design capacity has been reduced by 40%.

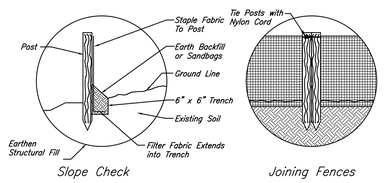


Profile Along Storm Sewer (Sanitary and Exhaust Duct Shown Also, See Plan.)



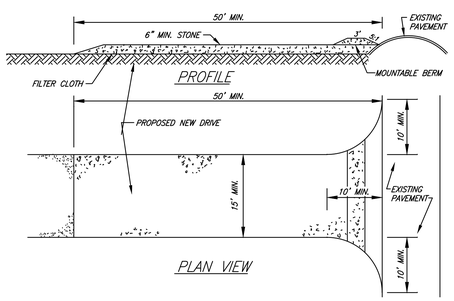
EXHAUST OUTLET PIPE SYSTEM DETAIL

All pipe and fittings ADS HDPE N-12 WT (watertight) IB or equivalent.
Scale ~ 1" = 20'



Slope Check — Joining Fences

SILT FENCE DETAILS

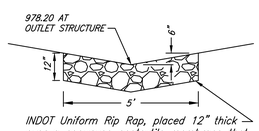


STABILIZED CONSTRUCTION ENTRANCE

1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - AS REQUIRED, BUT NOT LESS THAN 50 FEET.
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - FIFTEEN (15) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STABILIZED CONSTRUCTION ENTRANCE

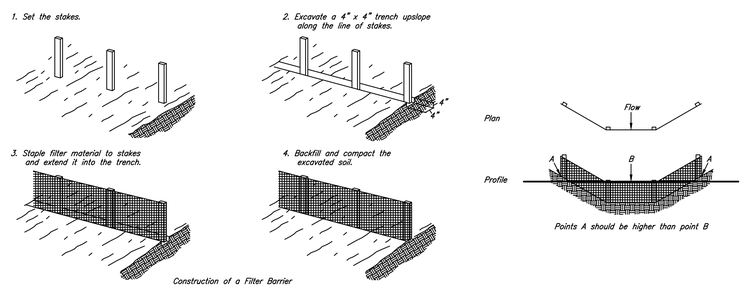
NO SCALE



INDOT Uniform Rip Rap, placed 12" thick over a nonwoven geotextile membrane that has a thickness of 20 - 60 mills, a grab strength of 90 - 120 lbs., and adheres to ASTM D-1777 and D-1682 tests.

Rip Rap Detail

Not to Scale



PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY

boora
Boora Architects Inc.
720 SW Washington Suite 800
Portland, OR 97205
T. 503.226.1575 F. 503.241.7429
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KRAMER & ASSOCIATES, LLC
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101 N. Barron St. Eaton, Ohio (937) 456-1332
2009 Chester Blvd. Richmond, Indiana (765) 935-2696
FAX (937) 456-6912

ROBERT W. WARNER SURVEYOR No. 21264 STATE OF INDIANA PROFESSIONAL ENGINEER

Robert W Warner

Earlham College Science Complex Phase 2
801 National Road West
Richmond, IN 47374-4095

MARK	DATE	DESCRIPTION
2	01.15.14	ADDENDUM 2
1	01.06.14	PER CITY OF RICHMOND REVISIONS INCLUDE: SEQUENCE OF CONST., NOTE 2. GENERAL EROSION NOTES, NOTE 16.

Issued:	February 28, 2014
Scale:	1" = 20'
Drawn By:	Kramer & Associates, LLC
Reviewed By:	DEK
File:	File Path

Copyright
Boora Project Number: 12009

CONFORMED SET

EROSION CONTROL PLAN (SWP3) DETAILS & UTILITY PROFILES

C003

GENERAL NOTES

ELEVATION DATUM

Elevations are based upon Coast & Geodetic Survey Monument JZ1230 located in a boulder approximately 400 feet south of this project site, at the north side of the "Heart" of Earlham College, being 990.52, NAVD 88.

UTILITIES

The contractor shall, at least two working days prior to starting work, notify the Indiana Underground Plant Protection Service, 811, and the owners of utilities having wires, poles, pipes, conduits, manholes or other structures that may be affected by this operation, including all structures which are affected and not shown on these plans, of his intent to start construction operations. After commencing construction, the Contractor shall report immediately to the owner or operator of the utility any break in its lines or any dent, gouge, groove, or other damage to the lines or their coating or cathodic protection. The Contractor must also alert the nearby occupants of any emergency he may create or discover in connection with excavation in and around the utilities.

UNDERGROUND UTILITIES

The location of the underground utilities shown on these plans has been obtained by diligent field checks and searches of available records. Observations have been made from ground level and were not conducted by "confined space entry" unless otherwise noted. It is believed that they are essentially correct, but Kramer & Associates, its engineer or surveyor, does not guarantee their accuracy or completeness.

The contractor shall be aware that, due to lack of adequate information, all existing utilities may not be reflected on these plans. It shall be the contractor's responsibility to field verify and locate any and all existing utilities prior to construction. Any utility, including field tiles and drains, damaged during construction shall be repaired or replaced in kind at the contractor's expense.

The contractor shall coordinate with the owner regarding locations, demolition or preservation of electrical conduits and lawn irrigation system.

UTILITY OWNERS:

CAMPUS

Earlham College
801 National Road West
Richmond, Indiana 47374
Phone: 765-983-1354
Attn: Ian Smith
Phone: 765-983-1678
Attn: Cindy Callahan

COMMUNICATIONS:

WECI, Earlham College
801 National Road West
Richmond, Indiana 47374
Phone: 765-983-1437
Attn: Kevin Wogoman

PUBLIC

ELECTRIC:

Richmond Power & Light
2000 U.S. 27 South
P.O. Box 908
Richmond, Indiana 47374
Phone: 765-973-7302
Attn: Skip Moore

SANITARY:

Richmond Sanitary District
2380 Liberty Avenue
Richmond, Indiana 47374
Phone: 765-983-7483
Attn: Elijah Welch

STREETS:

City of Richmond
700 Richmond Avenue
Richmond, Indiana 47374
Phone: 765-983-7225
Attn: T.L. Bosell

GAS:

Vectren Energy Delivery of Indiana
3421 Chester Boulevard
Richmond, Indiana 47374
Phone: 765-939-4607
Attn: Fred Sherrow

TELEPHONE:

Frontier
1191 Rich Road
Richmond, Indiana 47374
Phone: 765-983-4506
Attn: JoAnn Anthony

STORM SEWERS:

Richmond Storm Water Utility Department
2380 Liberty Avenue
Richmond, Indiana 47374
Phone: 765-983-7483
Attn: Elijah Welch

CABLE T.V.:

Comcast
9750 E. 150th Street, Suite #1600
Noblesville, Indiana 46060
Phone: 317-774-3397
Attn: Ray Neal

WATER:

Indiana-American Water Co., Inc.
Richmond District
1730 Sylvan Nook Dr.
Richmond, Indiana 47374
Phone: 765-962-0470
Attn: John Barr

ALL UTILITIES (GENERAL)

Indiana Underground Plant Protection Service
Phone: 1-800-382-5544

CROSSING AND CONNECTIONS TO EXISTING PIPES AND UTILITIES

Where the plans provide for proposed storm sewer to be connected to, or to cross either over or under, an existing underground utility, it shall be the responsibility of the contractor to locate the existing pipes or utilities both as to line and grade before he starts to lay the proposed storm sewer.

If it is determined that the elevation of the existing conduit or existing appurtenance to be connected to differs from the plan elevation or results in a change in the plan conduit slope, the Project Engineer shall be notified before construction of any of the proposed conduit which will be affected by the variance in the existing elevations.

Upon excavation, replacement and/or re-alignment of existing lines for cross connections will be chosen as directed by the engineer.

CROSSINGS

Whenever a sanitary sewer and water main must cross, the sewer shall be at such an elevation that the crown of the sewer is at least 18 inches measured between the outside pipe walls, below the bottom of the water main.

If it is absolutely impossible to maintain the 18 inch vertical separation, the water main shall be relocated or the sewer shall be relocated or the sewer shall be constructed as follows:

A. A sewer passing over or under the water main shall be encased or constructed of materials that are equivalent to water main standards of construction for a minimum distance of 10 feet on each side of the water main.

B. The sewer crossing shall be constructed so that the sewer joints will be equidistant and as far as possible from the water main joints.

C. Where a water main passes under a sewer, adequate structural support shall be provided for the sewer to prevent damage to the water main.

CLEAN WATER CONNECTIONS

Roof drains, foundation drains and all other clean water connections to new sanitary sewers are prohibited.

CROSS CONNECTIONS

There shall be no physical connection between a public or private potable water supply system and a sewer, or appurtenance thereto.

REPLACEMENT

The Contractor shall replace at his own expense any item not specifically listed for removal that is damaged or destroyed by his operations.

EXISTING TILE HOOKUPS

Any drainage tile damaged by the Contractor shall be replaced by the Contractor to a condition equal to or better than its original condition. All tiles shall be noted on the record drawing and shall be inspected by the Owner before they are covered.

INLETS OR OTHER STRUCTURES REMOVED OR ABANDONED

Unneeded inlet castings, parts or similar items shall be carefully removed and hauled to an Earlham College storage yard as designated by the College.

GRAVITY SANITARY SEWER

J-M Ring-Tite P.V.C. Gravity Sewer Pipe SDR 35 ASTM D3034 & ASTM D3212.

SANITARY LATERALS

All Sanitary Laterals shall be sloped at 1/4" per foot min.

WATERLINE

All waterline and fittings shall conform to the standards of the AWWA.

Pipe shall be PVC C-900 DR-18.

Fittings shall be Ductile Iron conforming to ANSI/AWWA C110/A21.10, with mechanical joints.

STORM SEWER

All storm pipe shall be High Density Polyethylene Smooth Wall Pipe unless otherwise noted.

All new storm sewer ties to ends of existing storm sewer pipes to be made with "Fernco" or equal coupling. Bends in storm sewers, where required to tie to existing, shall be made up from prefabricated fittings (11 1/4°, 22 1/2° etc.) to form sweeping bend, smooth inside, as directed by the engineer. Bend areas to be backfilled with concrete, min. 6" thick over pipe, and extending to undisturbed soil at sides.

New storm sewer ties to existing structures shall be made with new pipe extending into the side at least half the thickness of the side material, into a new or existing opening, but no further in than flush with the inside of the structure. Joint shall be sealed with concrete all around, min. 8" thick, and also sealed smoothly inside with non-shrink grout.

BEDDING

Bedding for all conduits shall be granular unless otherwise noted. See trench details on this sheet.

BACKFILL

Backfill within pavement or curb areas shall be flowable mortar. All other locations shall be best excavated material free from rubbish and frozen material. See trench detail this sheet.

DUMP SITE

Material from excavation or clearing operations to be disposed of by the contractor at a suitable off-site dump site.

TREES

The contractor is to exercise extreme caution and care when working near the existing trees that are not to be removed. Any damage to the trees by the contractor, his employees, subcontractors, or equipment shall be repaired immediately to the satisfaction of the engineer. Refer to Landscape drawings for specific protection measures above and beyond typical tree protection.

ROCK EXCAVATION

Rock excavation shall consist of igneous, metamorphic, and sedimentary rock which cannot be excavated without blasting; the use of a power shovel of not less than 1 cu yd capacity, properly used, having adequate power and in satisfactory running condition; or the use of other equivalent powered equipment. Rock excavation shall also include all boulders or other detached stones each having a volume of ½ cu yd or more.

Do not use blasting for rock excavation on this project.

In the instance where the CONTRACTOR encounters rock excavation, the excavation shall include the removal, hauling, stockpiling and/or proper disposal of material required to be excavated. No Payment will be made for rock removal unless the CONTRACTOR gives prompt notice to the ENGINEER upon encountering such material and prior to its removal. The ENGINEER'S determination as to whether the material meets the definition of rock and ENGINEER'S measurement of the volume of rock removal for which the CONTRACTOR is entitled to payment will be final and conclusive. Where excavation is made in rock the trench shall be excavated 8 inches below the pipe barrel. All looses material shall be removed from the trench bottom; a pipe bed shall be prepared using bedding material as specified.

Rock excavation payment lines will be based upon dimensions of actual rock removed, from the top surface of the rock to the required depth below the pipe and trench width as noted herein. Rock excavation payment will be made per cubic yard of rock removed. Utility trench payment will be carried through the rock area at the full unit bid per lineal foot of utility installed.

EXPANSION MATERIALS

1/2" Preformed expansion material shall be supplied wherever proposed concrete meets existing structures.

GENERAL

1. *The consultant or engineer will not be responsible for means, methods, procedures, techniques, or sequences of construction that are not specified herein. The consultant or engineer will not be responsible for safety on the job site, or for failure by the contractor to perform work according to contract documents.*
2. *The contractor shall notify Earlham College in writing at least 3 working days in advance of the start of construction.*
3. *The contractor shall comply with all laws, ordinances, rules, orders, and regulations relating to the performance of the work required by contract.*
4. *The contractor shall be required to maintain a set of construction record drawings on site during the project.*
5. *The contractor shall plan his operations so that disruption of existing facilities is at a minimum. The contractor shall be required to prepare a schedule of construction, prior to the start of actual construction for the approval of Earlham College or their designated representative.*
6. *The contractor shall restrict construction activities to reasonable limits of construction around the building/drives and/or within the limits of construction shown on the plans.*
7. *The contractor shall carefully preserve bench marks, property corners, reference points, stakes and other survey reference monuments or markers. In cases of willful or careless destruction, the contractor shall be responsible for restoration of markers. Resetting of markers shall be performed by an Indiana professional surveyor at the approval of Earlham College.*
8. *Non-rubber tired vehicles shall not be moved on or across streets, drives or parking areas without permission of Earlham College.*
9. *The contractor shall restore all disturbed areas, to an equal or better condition than existed prior to construction. Drainage ditches or water courses which are disturbed by construction shall be restored to the grades and cross-sections which existed prior to construction.*
10. *Waste asphalt, concrete, debris, and excess excavation material shall be disposed of offsite in a proper manner by the contractor.*
11. *The contractor and subcontractor shall be solely responsible for complying with all federal, state and local safety requirements, exercising precautions at all times for the protection of persons (including employees) and property. It is also the sole responsibility of the contractor and subcontractor to initiate maintain and supervise all safety requirements, precautions and programs in connection with the work.*

TRACER WIRE AND WARNING TAPE

A. The contractor will furnish and install a Solid Copper Tracer Wire with 30-mil polyethylene jacket on all non-conductive utility mains and services. Wire color will be blue for water.

B. Tracer Wire must be 12 gauge minimum and run on top of the waterline continuously without splices for the full length of the pipe. The tracer wire shall be fastened to the top of the pipe with 1 1/2" polyethylene tape wrapped around twice at every fitting and valve and at all bends and at a maximum distance of 6' intervals.

C. If splicing is necessary, all splicing shall be made with 3M Type DBR, or Klick-It II Model CB816 by Absolute Automation, or Copperhead Snakebite splicer with filled Moisture Displacement Silicone for Corrosion Resistant Protection, part #SBC-DL Direct Bury Splice Kits or approved equal.

D. Tracer wire will be installed on all new Mains and Service Laterals and will come to the surface at every meter pit, valve box, and similar structure.

E. The wire shall be protected from damage during the excavation or backfilling. No breaks or cuts in the tracer wire or tracer wire insulation shall be permitted during installation or backfill.

F. At service saddles, the tracer wire shall not be allowed to be placed between the saddle and the main.

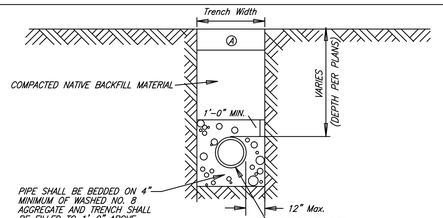
G. Wire ends that will be used for connecting the tracing device shall be stripped of insulation and have waterproof caps installed.

H. Contractor shall schedule a Conductivity/Locate Test (witnessed by the Owner's Maintenance Department) upon completion.

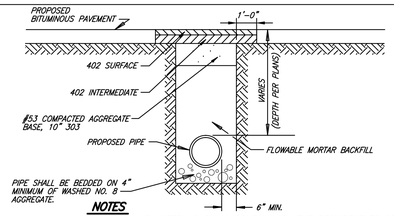
I. Connect service line tracer wire to metallic main line or main line tracer wire, and terminate at meter location.

J. Warning tape to be placed over all main and service lines per the Warning Tape Location Detail. Tape to be bonded layer plastic with metalized foil core, 6 inches wide, resistant to alkalis, acids and other destructive chemical components encountered in soils; APWA Uniform Color Code, brightly colored; imprinted indicating pipe type; Griffolyn Company Terra Tape.

All the above shall be included in the unit price bid for the pertinent utility item.



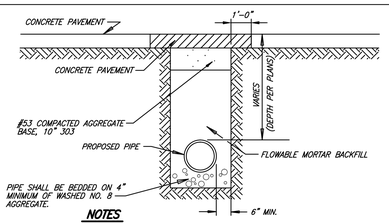
TRENCH BACKFILL DETAIL IN LAWN AREAS



NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF INDIANA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS".
2. ALL EXCAVATED AND UNUSED MATERIAL TO BE REMOVED FROM JOB SITE.
3. ALL UTILITY TRENCHES WITHIN 5' OF CURB OR PAVEMENT TO HAVE COMPACTED GRANULAR BACKFILL.

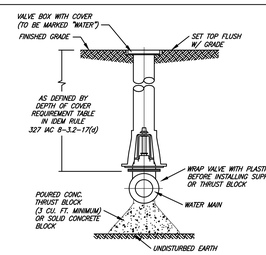
TRENCH BACKFILL DETAIL PAVEMENT AREAS



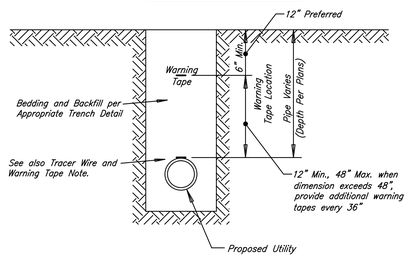
NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF INDIANA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS".

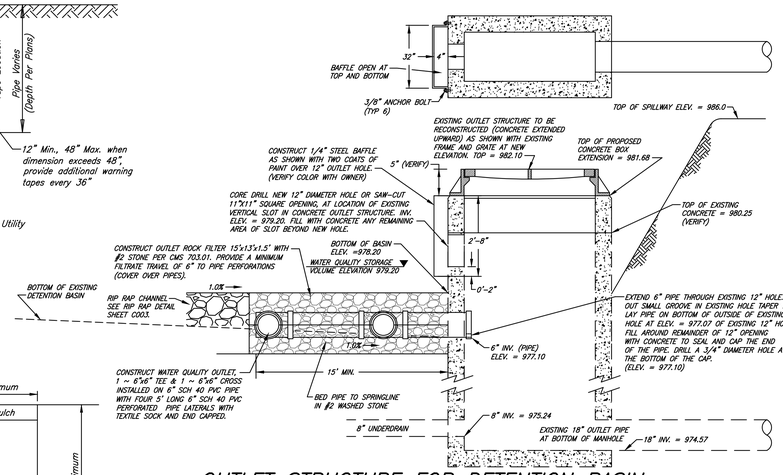
TRENCH BACKFILL DETAIL CONCRETE PAVEMENT AREAS



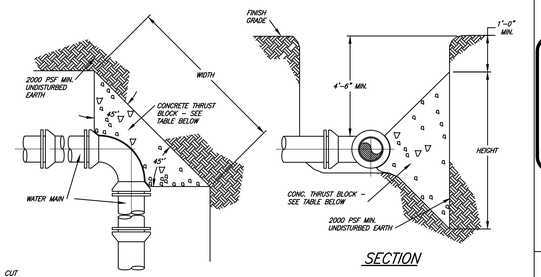
GATE VALVE INSTALLATION DETAIL



WARNING TAPE LOCATION DETAIL



OUTLET STRUCTURE FOR DETENTION BASIN



PLAN VIEW

SECTION

WATERLINE THRUST BLOCK DETAILS

THRUST BLOCK REQUIREMENTS

FITTING	TOTAL POUNDS THRUST	TOTAL BEARING AREA (S.F.)	THRUST BLOCK HEIGHT (FT.)	THRUST BLOCK WIDTH (FT.)
6" 90° BEND	12,000	6	2.5	2.5
6" 45° BEND	6,700	3.5	1.75	2
6" TEE OR PLUG	8,400	4	2	2
8" 90° BEND	19,000	9	3	3
8" 45° BEND	10,500	5	2.5	2
8" TEE OR PLUG	13,500	6.5	2.75	2.5
10" 90° BEND	28,000	14	4	3.5
10" 45° BEND	15,500	8	2.75	3
10" TEE OR PLUG	19,500	10	3.5	3
12" 90° BEND	41,000	20	4	5
12" 45° BEND	23,000	12	3	4
12" TEE OR PLUG	28,000	14	3.5	4
16" 90° BEND	70,000	35	6	6
16" 45° BEND	38,000	19	4	5
16" TEE OR PLUG	50,000	25	5	5

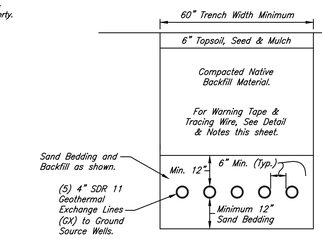
THRUST BLOCK DESIGN DATA

MAXIMUM OPERATING PRESSURE: 85 P.S.I.
SURGE ALLOWANCE 100 P.S.I.
THRUST DESIGN PRESSURE: 185 P.S.I.
BASE ON 2000 P.S.F. SOIL

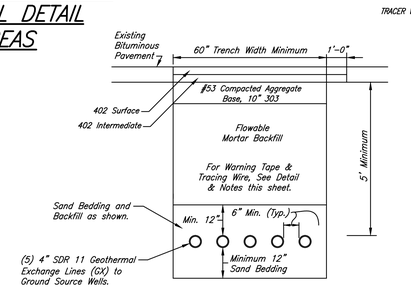
THRUST BLOCK NOTES:

1. PIPE JOINT AND BOLTS MUST BE ACCESSIBLE.
2. CONCRETE SHALL BE CURED FOR MINIMUM OF 7 DAYS AND SHALL HAVE A COMPRESSION STRENGTH OF 3000 P.S.I. @ 28 DAYS.
3. THRUST BLOCKS SHALL BE POSITIONED TO COUNTERACT THE DIRECTION OF THE RESULTANT THRUST FORCE.
4. CONTRACTOR SHALL NOTIFY ENGINEER IF SOIL OF LESS THAN 2000 P.S.F. IS ENCOUNTERED.
5. FIVE (5) MIL POLYETHYLENE PLASTIC SHALL BE USED TO COVER FITTINGS PRIOR TO POURING THE THRUST BLOCK.

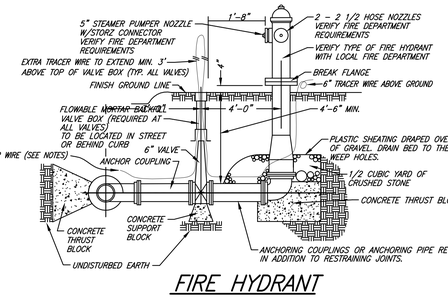
NOTE:
BOTH RESTRAINING JOINTS AND CONCRETE BLOCKING TO BE USED.



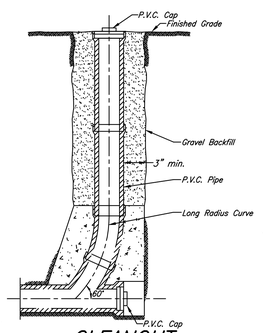
GEOTHERMAL EXCHANGE LINES TRENCH BACKFILL DETAIL IN LAWN AREAS



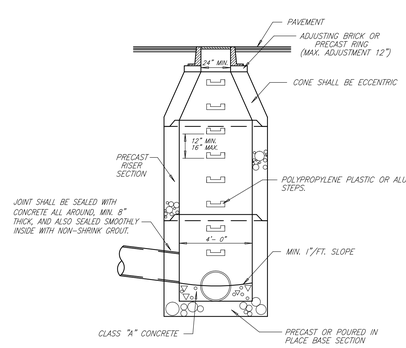
GEOTHERMAL EXCHANGE LINES TRENCH BACKFILL DETAIL IN PAVEMENT AREAS

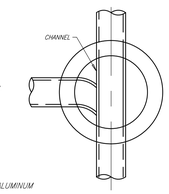


FIRE HYDRANT

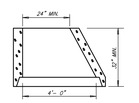


CLEANOUT





SECTIONAL PLAN



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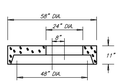
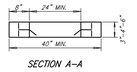


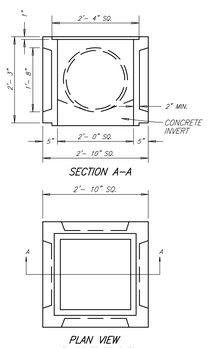
FLAT SLAB MANHOLE TOP

TYPE "A" STORM MANHOLE

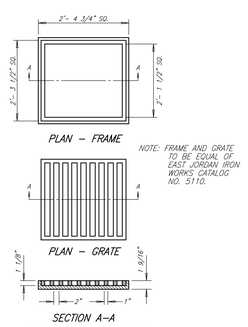


SECTION A-A

PRECAST ADJUSTING RING

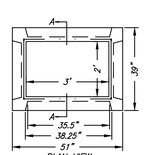


INLET TYPE 2-2B

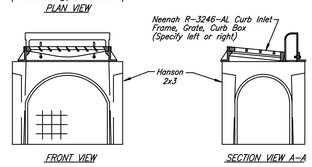


INLET TYPE 2-2B

NOTE: NEENAH R-4859 GRATE MAY BE SUBSTITUTED FOR FRAME AND GRATE SHOWN ABOVE.



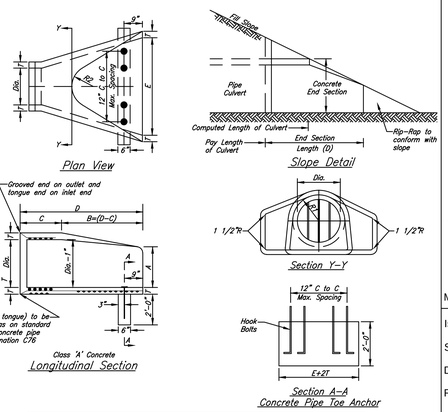
PLAN VIEW



FRONT VIEW

SECTION VIEW A-A

PRECAST CONCRETE TYPE Y INLET



Plan View

Slope Detail

Section Y-Y

Longitudinal Section

Section A-A
Concrete Pipe Toe Anchor

DIMENSIONS OF CONCRETE END SECTIONS FOR ROUND PIPE

DIA	T (MIN)	A*	C*	D*	E*	K	R1	R2	APPROX. WEIGHT
12"	2"	5"	4'-3"	6'-2"	2'-0"	1.3	10 1/8"	9"	800
15"	2 1/4"	7"	4'-0"	6'-3"	2'-6"	1.5	12 1/2"	11"	1,100
18"	2 1/2"	11"	4'-1"	6'-2"	3'-0"	1.8	15 1/2"	12"	1,300
21"	2 3/4"	11"	4'-2"	6'-3"	3'-6"	2.1	16 1/8"	13"	1,500
24"	3"	1'-0"	2'-8"	6'-3"	4'-0"	2.3	16 3/16"	14"	1,800
27"	3 1/4"	1'-1"	2'-8"	6'-3"	4'-6"	2.6	18 1/2"	14 1/2"	2,100
30"	3 1/2"	1'-2"	1'-10"	6'-3"	5'-0"	2.9	18 3/16"	15"	2,400
33"	3 3/4"	1'-3"	3'-6"	8'-3"	5'-6"	3.1	18 1/2"	17 1/2"	4,100
36"	4"	1'-5"	3'-1"	8'-3"	6'-0"	3.4	23 3/4"	20"	4,200

* Tolerance ± 1"

PRECAST CONCRETE FLARED END SECTION

boora

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ROBERT W. WARNER STATE OF INDIANA No. 21264 PROFESSIONAL ENGINEER

Robert W Warner

Earlham College Science Complex Phase 2
801 National Road West
Richmond, IN 47374-4095

MARK	DATE	DESCRIPTION
2	01.15.14	ADDENDUM 2
1	01.06.14	PER CITY OF RICHMOND REVISIONS INCLUDE: UTILITY OWNERS

Issued:	February 28, 2014
Scale:	1" = 20'
Drawn By:	Kramer & Associates, LLC
Reviewed By:	DEK
File:	File Path

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Boora Project Number: 12009

CONFORMED SET

GENERAL NOTES & DETAILS

C004

E-360

Z:\12073 Earlham Science Phs 2 & 3 Design\12073 Utility Design Phs 2\dwg\ C004- General Notes & Details PHASE 2, 2-24-2014 8:13:27 AM, Tim Davis

06	13N	01W	Richmond	Wayne	Wayne	Indiana
Section	Township	Range	City	Township	County	State

Indiana 811 — Know what's below. Call before you dig.

1" = 20'
0 20' 40' 60'

Aerial Photography

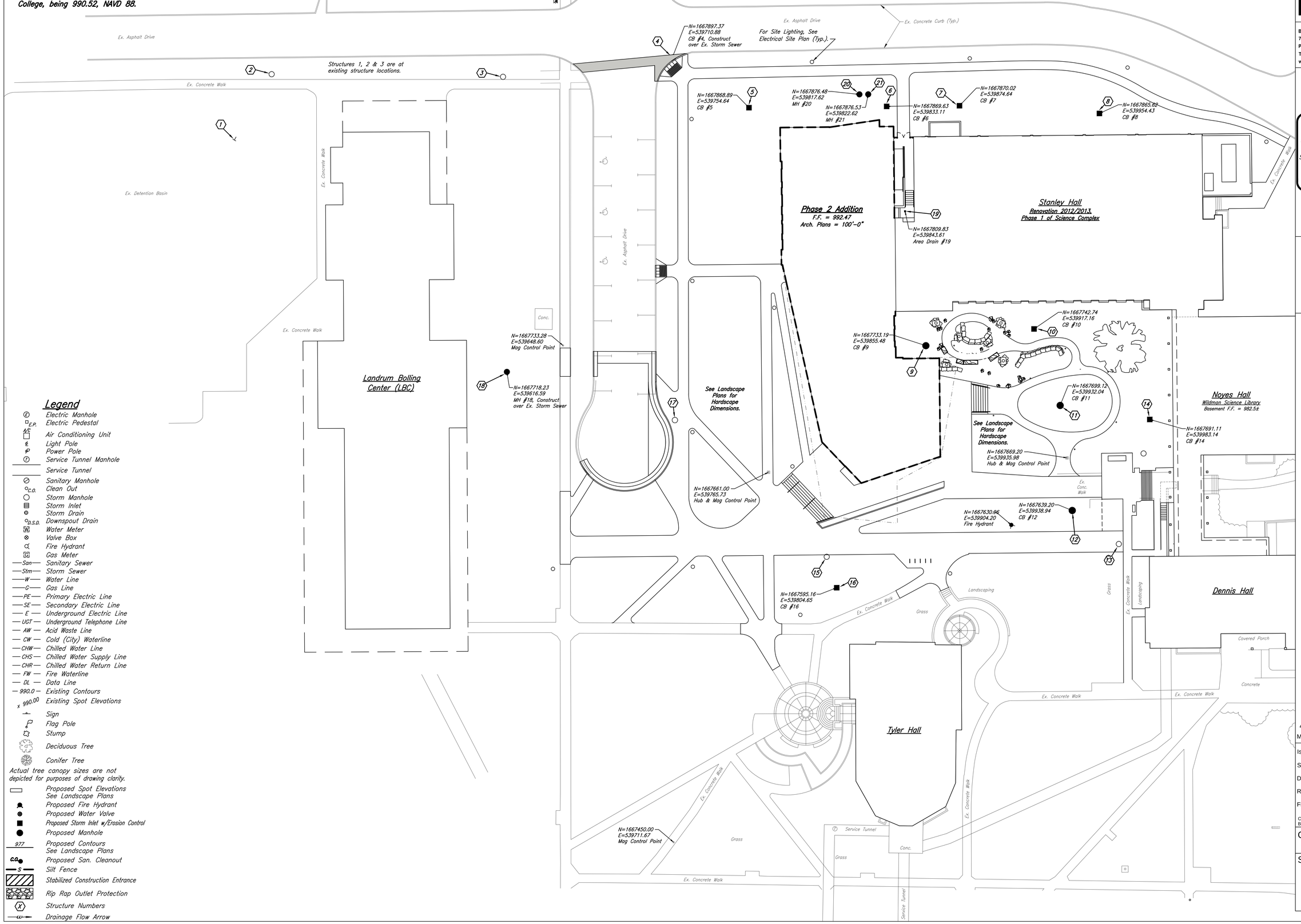
Aerial Photography dated 2011.

Elevation Datum

Elevations are based upon Coast & Geodetic Survey Monument JZ1230 located in a boulder approximately 400 feet south of this project site, at the north side of the "Heart" of Earlham College, being 990.52, NAVD 88.

Underground Utilities:

The location of the utilities shown on these plans has been obtained by diligent field checks and searches of available records. Observations have been made from ground level and were not conducted by "confined space entry" unless otherwise noted. Some of the utilities are shown using only record information, and have not been field verified. Kramer & Associates does not guarantee their accuracy or completeness.



Legend

- Electric Manhole
- E.P. Electric Pedestal
- A/C Air Conditioning Unit
- Light Pole
- Power Pole
- Service Tunnel Manhole
- Service Tunnel
- Sanitary Manhole
- C.O. Clean Out
- Storm Manhole
- Storm Inlet
- Storm Drain
- D.S.D. Downspout Drain
- Water Meter
- Valve Box
- Fire Hydrant
- Gas Meter
- San — Sanitary Sewer
- Stm — Storm Sewer
- W — Water Line
- G — Gas Line
- PE — Primary Electric Line
- SE — Secondary Electric Line
- E — Underground Electric Line
- UGT — Underground Telephone Line
- AW — Acid Waste Line
- CW — Cold (City) Waterline
- CHW — Chilled Water Line
- CHS — Chilled Water Supply Line
- CHR — Chilled Water Return Line
- FW — Fire Waterline
- DL — Data Line
- 990.0 — Existing Contours
- 990.00 Existing Spot Elevations
- Sign
- Flag Pole
- Stump
- Deciduous Tree
- Conifer Tree

Actual tree canopy sizes are not depicted for purposes of drawing clarity.

- Proposed Spot Elevations See Landscape Plans
- Proposed Fire Hydrant
- Proposed Water Valve
- Proposed Storm Inlet w/Erosion Control
- Proposed Manhole
- 977 Proposed Contours See Landscape Plans
- C.O. Proposed San. Cleanout
- S Silt Fence
- Stabilized Construction Entrance
- Rip Rap Outlet Protection
- X Structure Numbers
- Drainage Flow Arrow

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SITE DIMENSION PLAN

C005