



October 26, 2010

Mr. James Innes

Environmental Quality Analyst
Michigan Department of Natural Resources and Environment
Lansing District Office, 4th Floor North
P.O. Box 30242
Lansing, Michigan 48909-7742

RE: Interim Remedial Action Work Plan
GLTC Land (*a.k.a.*, Die Storage Lot), Flint, Michigan
MERA No. 25000311
FILE: 14774 / 46375 #2

Dear Mr. Innes:

On behalf of Motors Liquidation Company (MLC), O'Brien & Gere is pleased to present this Interim Remedial Action Work Plan (Work Plan) for the Great Lakes Tech Center (GLTC) Land (formerly known as the Die Storage Lot) facility (Figure 1) located in Flint, Michigan. This Work Plan describes the procedures to be followed during the excavation, transportation and disposal of soils from two impacted areas, and subsequent backfilling of the excavations at the GLTC Land facility. These activities are being conducted to remove lead impacted soils, which are outside of the facility's perimeter fence and pose a potential direct contact risk, and volatile organic compound (VOC) impacted soils consisting of benzene, ethylbenzene, toluene, o-xylenes, and p,m-xylenes (BETX) impacted soils that exceed the generic soil saturation (Csat) concentrations (*i.e.*, constitute source material). This Work Plan also documents the verification of soil remediation (VSR) monitoring that will be implemented during the interim remedial action activities.

SITE DESCRIPTION

The GLTC Land facility is located at the northwest corner of the South Saginaw Street and Atherton Avenue intersection at 200 W. Atherton Avenue, Genesee County, Flint, Michigan (Figure 1) within Section 19 of Township 7 North, Range 7 East. The approximate property line of the GLTC Land facility is shown on the Site Features/Utility Map (Figure 2) and the facility is approximately 11.5 acres in size.

The GLTC Land facility is bounded to the north by the former Chesapeake and Ohio Railroad tracks, on the east by a former railroad yard and South Saginaw Street, on the west by undeveloped property (a former railroad spur) and a church, and on the south by Atherton Avenue. The facility is situated in an area with relatively low to moderate relief. The facility is characterized by a generally gently sloping topography toward the north and northeast. The topography of the facility ranges from about 762 ft mean seal level (MSL) near OBG-MW-14 to a low of about 753 ft MSL at the retention basin located at the northern tip of the facility and along the northeast boundary of the facility along the railroad property (Figure 2). Much of the GLTC Land facility is covered with either concrete (northern portion of the facility) or asphalt (southern portion of the facility) pavement. A perimeter fence encloses most of the facility, except along the two former railroads. Figure 2 illustrates the known or suspected utilities at the facility. The northern portion of the facility has a shallow drainage system that collects runoff from the concrete covered area of the facility and conveys it to a concrete retention basin in the northern tip of the site, which overflows to the City of Flint storm water sewer system.

MLC is responsible for the GLTC Land facility following the bankruptcy of Remediation and Liability Management Company, Inc. (REALM), a wholly owned subsidiary of the now bankrupt General Motors Corporation (GM).

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BACKGROUND

The GLTC Land was formerly used as a die storage area and an employee parking lot, from the 1940s until the late 1980s for the adjacent GLTC (formerly known as the GM Flint Body Assembly manufacturing) property (Figure 1). From the late 1980s until the bankruptcy of GM in July 2009, the GLTC Land facility was intermittently leased by GM to others for the storage of new vehicles. The GLTC Land facility has since remained unused (*i.e.*, vacant land).

Several investigations of the facility were conducted from 1987 through 2007 that were documented in the following reports:

- Environmental Site Assessment, Goldberg-Zoino & Associates, Inc. (GZA), report dated April 1988ⁱ
- Environmental Site Assessment - Additional Studies, GZA, report dated January 1989ⁱ.
- Site Investigation, O'Brien & Gere Engineers, Inc. (O'Brien & Gere) report dated May 2006.
- Site Investigation - Additional SI Activities, O'Brien & Gere report dated March 2007.

The locations of the soil borings and monitoring wells installed at the facility are illustrated on Figure 3.

GEOLOGY AND HYDROGEOLOGY

The facility is situated in an area characterized by regional unconsolidated geology consisting of primarily lacustrine clay and silt deposits with interbedded sandy lenses. Generally there is asphalt, concrete or gravel pavement layer, underlain by interbedded silt and clay with sand lenses or fill materials, underlain by glacial till. Most of the site is covered with some thickness of fill material. The asphalt layer typically is about 3 inches thick, where as the concrete layer is about 8 inches thick and the gravel layer can be up to about 2 ft thick. The fill material, some of which consists of cinder or slag, averages approximately 6 ft thick across the facility and varies from about 1 ft thick to greater than 10 ft thick along the northern and west-central portions of the facility where a ravine was formerly present.

The sand lenses are typically fine-grained sands with varying amounts of silt and range in thickness from less than one foot to about 12 ft thick. Typically the silt and clay layers range from about 1 ft thick to about 5 ft thick, but were observed to be up to 16 ft thick at OBG-214. The silt layer was generally described as a moist to wet, moderate yellowish brown to light olive gray, silt with varying amounts of clay and sand. The typical clay layer was described as a soft, moist to wet, medium yellowish brown to light olive gray, silty clay, with trace sand. A glacial till was observed to underlie the lacustrine silt and clay layers at numerous locations. The top of the glacial till was observed at elevations ranging from about 744 ft MSL to about 734 ft MSL (or approximately 8 to 19 feet below grade [fbg]) and were typically described as stiff, moist, light olive gray, silty clay with little gravel and low plasticity.

Drawing C-3 (Exhibit A) provides a cross-section of the OBG-219A area, which indicates sand or fill to about 1 fbg, which may contain slag, sometimes underlain by silty sand to up to 2.5 fbg, underlain by clayey soils. Drawing C-5 (Exhibit A) provides two cross-sections of the OBG-228 area, which indicates the geology consists of a concrete cap followed by gravel down to 1.5 fbg, underlain by moderate yellowish brown, damp, silty sand, some gravel and some cinders and slag to up to 10 fbg. Beneath this layer a 6 inch to 1 foot thick layer of dark brown, moist, sandy clay, with abundant roots (*i.e.*, with high organic content, which was described as a peat layer) at approximately 7 fbg was observed. Underlying the peat seam was a layer of grayish olive, moist, sandy clay, down depths of up to 20 fbg with silt and/or sand seams or lenses of varying thicknesses.

ⁱ These reports are considered privileged and confidential. However, the analytical data provided in the reports has previously been provided to MDNRE. Use of this data is not intended to nor shall be construed as a waiver of the privilege for these documents.

Groundwater was typically observed in the sand lenses within the silt and clay layers during drilling ranging from about 5 fbg to 15 fbg. The highest water level observed in the monitoring wells at the facility was 757.27 ft MSL observed in OBG-MW-14 located in the southeastern corner of the GLTC Land facility (Figure 3), and the lowest water level (741.20 ft MSL) was observed at OBG-MW-22 located in the northern portion of the facility.

Groundwater generally flows from the edges of the site toward the center of the site in the area where thicker fill material and the ravine once existed running south to north. Groundwater in the OBG-228 area is expected to be about 10 to 12 fbg, but could be shallower depending on seasonal rainfall.

RESULTS

Soil analytical results from Phase I & II soil borings (S-26, S-31 and S-32, Figure 3) and monitoring well MW-7 (Figure 3) indicated elevated concentrations of VOCs in the soil samples from S-26 and MW-7 and non-detectable concentrations in the remaining borings. Metals analytical results from the Phase I & II investigation indicated concentrations were below the drinking water (DW) protection criteria, with the exception of arsenic and lead.

Groundwater analytical results show that a single chlorinated hydrocarbon (trans-1,2- dichloroethene detected in MW-7 at a concentration of 0.074 mg/L) was the only VOC detected in the monitoring wells at the facility (*i.e.*, MW-7 and MW-10 through MW-13) during the Phase I & II assessments (*i.e.*, in 1987). Groundwater analytical results show that the detections of dissolved metals were below their respective DW criteria, including arsenic (even at MW-7).

Elevated VOC concentrations were observed in some of the soil samples collected during the Phase III & IV, in particular in SB-108, but also in SB-108-10, SB-112, SB-112-14 and SB-113 located in the north-central portion of the site. Metals concentrations exceeded the DW protection criteria for barium and/or lead at five locations. PCBs were not detected in the soil samples.

Groundwater analytical results from the four perimeter monitoring wells indicated the presence of cis-1,2- dichloroethene at 33 ug/L in MW-7, and acetone at 15 ug/L in MW-7 and 24 ug/L in MW-13, which are below their respective DW criteria.

Table 1 presents the soil analytical results from the SI and additional SI activities. The soil sampling results from the perimeter soil borings collected outside the fenced area but within the fill material indicate no exceedances of the Michigan Department of Natural Resources and Environment (MDNRE) commercial or industrial criteria, with the exception of lead detected at OBG-219A. The detected concentration of lead, which exceeded the residential direct contact criteria, and because it is located outside the perimeter fence poses a potential risk of exposure under a residential or commercial I closure scenario. The samples collected during the SI indicate that soil impacts are contained within the GLTC Land facility property boundary and pose a minimal risk under a commercial or industrial closure scenario.

The soil samples from soil borings OBG-228D and OBG-228G, which are adjacent to previous soil boring OBG-228, contained BETX constituents above MDNRE Csat criteria. The analytical results for the soil samples from OBG-228B, G and I define the extent of impacts above the generic Csat east, west and north, respectively of OBG-228. The sample from OBG-228D contained toluene and xylenes above the generic Csat; however, OBG-226 located about 15 ft southwest of OBG-228D defines the extent of impacts above Csat south of OBG-228. The SI results indicate that the Csat impacted area surrounding boring OBG-228 is isolated to an area of approximately 60 ft by 70 ft in the peat material at depths of approximately 6 to 8 fbg. Samples collected below the peat material define the Csat impacts vertically.

Three of the thirteen monitoring wells (MW-7, SVE-1 and SVE-2) sampled during the SI contained VOCs in groundwater above the DW criteria (see Table 2). The remaining wells either contained no detectable concentrations of VOCs or very low concentrations that were below the DW criteria. However, because of the unique groundwater flow pattern at the site it appears impacted groundwater is unlikely to leave the site except

possibly within an apparent very narrow groundwater flow zone at the northern end of the site. Results from OBG-MW-22, located within this narrow flow zone, indicate that VOCs are not leaving the site in this area.

Groundwater arsenic results indicate that soil impacts have not leached into groundwater at concentrations above the DW criteria. Barium was detected in the groundwater samples at concentrations ranging from 0.024 mg/L at OBG-MW-14 to 3.14 mg/L at SVE-2 with a mean concentration of 0.58mg/L. Barium exceeded the DW criterion of 2 mg/L at monitoring well SVE-2. None of the remaining groundwater wells contained barium above the DW criterion.

Lead was only detected in groundwater at three sampling locations (SVE-1, SVE-2, and OBG-MW-22) at concentrations of 0.003 mg/L for SVE-1 and SVE-2, which is below the DW criterion of 0.004 mg/L and 0.059 mg/L for OBG-MW-22, which is above the DW criterion.

INTERIM REMEDIAL ACTION APPROACH

Mobilization will include both pre-mobilization activities such as preparation of a Job Safety Analysis, training, etc. and the physical mobilization of facilities, equipment, and manpower to the work site. Prior to mobilizing to the work site, a task specific Job Safety Analysis (JSA) will be prepared that will be appended to the existing site-specific Health and Safety Plan (HASP) for the GLTC Land facility. All MLC and O'Brien & Gere employees, the remediation subcontractor and all visitors, including any MDNRE personnel, will be required to meet or exceed the requirements of the HASP. Although, MLC, subcontractor or MDNRE employees must meet or exceed O'Brien & Gere's safety requirements, MLC, subcontractor, or MDNRE are ultimately responsible for the health and safety of their employees.

A Storm Water Pollution Prevention Plan (SWPPP), Soil Erosion and Sedimentation Control permit, or Storm Water Discharge permit are not required for this work because the work area for this scope of work (SOW) will be less than the one (or five) acres required for the submission of these plans/permits. However, storm water pollution prevention measures will be implemented prior to and during the execution of this SOW per the technical specifications and drawings contained in Exhibit A.

The lead impacts observed at OBG-219A will be remediated to address the potential residential direct contact exposure risks at this location. The work will be completed in accordance with the technical specifications and drawings contained in Exhibit A. It is anticipated that soils will be removed by the excavation/remediation subcontractor to a depth of about 1 foot in an area about 40 ft by 40 ft around OBG-219A, which should remove the cinder and slag material observed in this area that appears to be the source of the lead impacts. The removal of cinder and slag material will guide the removal efforts, but is not the sole purpose of the interim remedial action for this area of the facility. Removal activities will begin at the OBG-219A location and will work outward until either the edge of the slag material has been identified or the 40 ft by 40 ft area has been excavated. O'Brien & Gere will then conduct confirmatory samples for lead (fine and coarse fraction) to verify the remediation efforts. It is anticipated that five floor and four wall samples will be collected to verify the remediation of the OBG-219A area per the MDNRE *Sampling Strategies and Statistics Training Materials (S³TM) for Part 201 Cleanup Criteria* (MDNRE, 2002) guidance document for excavations. Additional removal activities and re-sampling may be necessary depending on the confirmatory sample results.

It is anticipated that a section of the perimeter fence may be removed adjacent to the OBG-219A area to help facilitate the soil removal, truck loading, transportation and disposal activities. Temporary fencing will be placed to minimize access during the interim remedial action activities. The fencing will be repaired following the completion of the interim remedial action activities to restore the perimeter fencing (*i.e.*, access barrier).

Pending the results of the confirmatory sampling in the OBG-219A area, the source in the OBG-228 area will be remediated to below Csat criteria. The concrete pad in the working area adjacent to OBG-228 (see the technical specifications and drawings contained in Exhibit A) will be saw cut to gain access to the area to be remediated. The concrete will be removed from a larger area than requires remediation to allow for sloping of the excavation

walls for safety reasons, as needed. The concrete will be crushed to be utilized for backfill just below the final gravel layer that will cap the excavation.

The limits of the excavation are provided on the attached drawings (Exhibit A). The data gathered during the SI indicate that the soils exceeding the Csat criteria are limited to the peat layer and soils directly in contact with this layer. Therefore, the plan is to remove the concrete from the area to be remediated and then remove the shallow soils to a depth of about five feet, which corresponds to about 2 feet above the peat layer (see Drawing C-5). The shallow soils in the OBG-228 area will be considered impacted because of the lack of documentation as to the nature of these soils (*i.e.*, no analytical results are available for these soils). The shallow soils in the OBG-228 area (Area 2) shall be stripped and stockpiled for reuse as backfill adjacent to the excavation but at a safe distance from the edge of the excavation in accordance with OSHA regulations and guidance, industry standards, and Section 02220, Earthwork (Exhibit A).

The soils from approximately 5 to 10 fbg will be removed and disposed of as petroleum impacted soils in accordance with applicable regulations. Excavation, transportation and disposal, and any other handling required for proper management and disposal of impacted soil as non-hazardous industrial waste shall be the subcontractor's responsibility. Disposal of impacted soil shall be at a properly permitted Type II Landfill. Analytical results of previous investigations, summarized in Table 1 will be used to secure approval for disposal of the materials.

Excavation will begin at the location of OBG-228 and move outward utilizing a photoionization (PID) meter, and visual and olfactory evidence of impacts to guide the excavation activities. Headspace PID readings of greater than about 100 parts per million (ppm) will be utilized to evaluate whether additional soils need to be excavated, based on previous PID readings during drilling and corresponding analytical results. Strong odors or visual indications of impacts will also be used to guide the excavation activities.

If materials unsuitable for reuse (such as wet, sloppy soils) are encountered during excavation, such material shall be transported and disposed in accordance with applicable regulations, similar to impacted soils. Upon discovery of these materials, the subcontractor shall notify the O'Brien & Gere inspector.

O'Brien & Gere will collect confirmatory samples for BETX analysis from the side walls and floor of the excavation as the excavation activities proceed to allow the removal of additional soils while the excavation activities are still proceeding. It is anticipated that seven floor and eight wall samples will be collected to verify the remediation of the OBG-228 area per the MDNRE S³TM *for Part 201 Cleanup Criteria* (MDNRE, 2002) guidance document for excavations. Additional removal activities and re-sampling may be necessary depending on the confirmatory sample results.

The excavation will be backfilled in accordance with the technical specifications and drawings contained in Exhibit A once confirmatory sampling indicates that the source has been removed. O'Brien & Gere will expedite (24-hour turnaround) the last batch of confirmatory samples to minimize delays with the backfilling of the excavation. Stockpiled soils will be placed in lifts above the floor of the excavation and will be compacted in accordance with Section 02220, Earthwork and Drawings C-4 through C-6. The remainder of the excavation in the OBG-228 area (Area 2) and the excavation in the OBG-219 area (Area 1) will be backfilled with clean fill in accordance with Section 02220, Earthwork, Section 02230, Select Fill and Drawings C-2 through C-6. The clean fill soils will be required to be certified clean by the subcontractor, and will meet the MDNRE inert material rules (r299.4114). The backfill material (whether unimpacted soil or clean fill) shall be constructed using sequential lifts from the lowest elevation to the highest elevation. The required lift thicknesses are specified in the specifications and the drawings. Each lift will be inspected and accepted by the O'Brien & Gere inspector before the next lift is placed and compacted. The additional clean soils in the OBG-228 area will be placed in lifts and compacted to backfill the remainder of the excavation to about 1.5 feet below grade. The crushed concrete will then be placed and compacted to about 14 inches below grade, where clean gravel will be utilized to complete the backfilling and capping of the excavation.

It is not anticipated that groundwater will be present in the proposed excavations based on the depth to water and groundwater elevation data available for the site (approximately 10 to 12 fbg). However, if water accumulates in the excavation and hinders remedial activities, then the water will be removed and properly disposed.

The subcontractor will decontaminate equipment that came in contact with impacted environmental media prior to completing the final restoration of the surface materials in the OBG-228 area. The subcontractor will decontaminate the equipment by steam cleaning the equipment within the OBG-228 area before the final lifts of the clean fill are placed and will allow the decontamination water and residuals to infiltrate into the OBG-228 area. The remainder of the fill above this layer will act as a soil cover above any impacts in this area.

The subcontractor shall restore the surface materials that were disturbed during the performance of this SOW following completion of final lift of clean fill placement and compaction in accordance with Section 02220, Earthwork, Section 02230, Select Fill and Drawings C-2 through C-6 (Exhibit A). Surface restoration will include either placement of topsoil and re-establishment of vegetation in Area 1 and placement of stone or gravel in Area 2. The O'Brien & Gere inspector will inspect the placement, and as appropriate compaction, of topsoil and/or gravel before surface restoration work is implemented.

O'Brien & Gere will prepare a brief technical memorandum to summarize and document the interim remedial action activities and findings ascertained during the implementation of this SOW, documenting that the remedial objectives outlined in this SOW were achieved.

We would appreciate your expedited review of this SOW, so we can perform the field activities by the end of the year, if possible. Please call me at 248-477-5701 if you have any questions. We anticipate submitting a RAP for the facility following completion of the remediation activities outlined in this SOW, per our previous discussions with the MDRNE.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.



Clifford Yantz
Technical Associate

Enclosures

cc: Mr. David Favero – Motors Liquidation Co.

REFERENCES:

Goldberg, Zoino & Associates (GZA). 1988. General Motors Corporation Environmental Site Assessment; Buick – Oldsmobile – Cadillac, Flint Body Assembly Plant; Argonaut AEC Project No. 6736. Flint, Michigan. April.

Goldberg, Zoino & Associates (GZA). 1989. General Motors Corporation Environmental Site Assessment; Additional Studies; Volume I; Buick – Oldsmobile – Cadillac, Flint Body Assembly Plant; Argonaut AEC Project No. 6736. Flint, Michigan. January.

O'Brien & Gere Engineers, Inc. 2006. Site Investigation Great Lakes Tech. Center Die Storage Lot. May.

O'Brien & Gere Engineers, Inc. 2007. Amendment to Die Storage Lot Site Investigation Report Great Lakes Tech. Center Die Storage Lot. March 13.

TABLES

Table 1
MLC
GLTC Land
Soil Analytical Results

Boring ID/ Sample Depth		MDNRE Part 201 Generic Cleanup Criteria - Statewide Default Background Levels	MDNRE Part 201 Generic Cleanup Criteria - Industrial Drinking Water Protection Criteria	MDNRE Part 201 Generic Cleanup Criteria GSI Protection Criteria	MDNRE Part 201 Generic Cleanup Criteria - Industrial Soil Direct Contact Criteria	MDNRE Part 201 Generic Cleanup Criteria - Res. Soil Volatilization to Indoor Air Criteria	MDNRE Part 201 Generic Cleanup Criteria - Ind. Soil Volatilization to Indoor Air Criteria	Maximum Concentration Detected	OBG-200 8-10'	OBG-201 3-5'	OBG-202 2-4'	OBG-203 2-4'	OBG-204 5-7'	OBG-205 7-9'	OBG-206 8-10'	OBG-207 8-10'	OBG-208 5-7'	OBG-208A 3-4'	OBG-209 5-7'	OBG-209A 3-4'	OBG-210 4-6'	OBG-210A 2-3'	OBG-211 4-6'	OBG- 211A 3-4'	OBG-212 4-6'	OBG- 212A 2-3'	OBG-213 4-6'	OBG-214 4-6'	
Sample Date	Units								4/12/2005	4/12/2005	4/12/2005	4/12/2005	4/12/2005	4/12/2005	4/12/2005	4/13/2005	4/13/2005	4/13/2005	1/17/2007	4/13/2005	1/17/2007	4/13/2005	1/17/2007	4/13/2005	1/17/2007	4/13/2005	1/17/2007	4/13/2005	
Benzene	ug/kg	NC	100	4,000 (X)	400,000 (C)	1,600	8,400	3,000	<50	<60	<50	<70	<60	<60	<50	<60	<60	NA	<50	NA	<50	NA	<60	NA	<60	NA	<50	<50	
Cyclohexane	ug/kg	NC	NC	NC	NC	NC	NC	130	--	--	--	--	--	--	--	--	--	NA	--	NA	--	NA	--	NA	--	NA	--	--	
Methyl cyclohexan	ug/kg	NC	NC	NC	NC	NC	NC	900	--	--	--	--	--	--	--	--	--	NA	--	NA	--	NA	--	NA	--	NA	--	--	
Methyl acetate	ug/kg	NC	NC	NC	NC	NC	NC	500	--	--	--	--	--	--	--	--	--	NA	--	NA	--	NA	--	NA	--	NA	--	--	
Ethylbenzene	ug/kg	NC	1,500	360	140,000 (C)	87,000	140,000 (C)	113,000	<50	<60	<50	10	<60	<60	<50	<60	<60	NA	<50	NA	<50	NA	<60	NA	<60	NA	<50	<50	
Isopropylbenzene	ug/kg	NC	260,000	ID	390,000 (C)	390,000 (C)	390,000 (C)	19,000	<50	<60	<50	<70	<60	<60	<50	<60	<60	NA	<50	NA	<50	NA	<60	NA	<60	NA	<50	<50	
4-Methyl-2-pentanone (MIBK)	ug/kg	NC	100,000	ID	2,700,000 (C)	2,700,000 (C)	2,700,000 (C)	2,000	<3,000	<3,000	<3,000	<3,000	<3,000	<3,000	<3,000	<3,000	<3,000	NA	<3,000	NA	<3,000	NA	<3,000	NA	<3,000	NA	<3,000	<3,000	
Toluene	ug/kg	NC	16,000	2,800	250,000 (C)	250,000 (C)	250,000 (C)	3,020,000	<50	<60	<50	90	<60	<70	<50	<60	290	NA	<50	NA	<50	NA	<60	NA	<60	NA	<50	200	
1,2,4-Trimethylbenzene	ug/kg	NC	4,200	1,800	1,100,000 (C, DD)	1,100,000 (C)	110,000 (C)	40	<100	<100	<100	<100	<100	<100	<100	<100	<100	NA	40	NA	<100	NA	<100	NA	<100	NA	<100	<100	
Naphthalene	ug/kg	NC	35,000	870	52,000,000	250,000	470,000	70	<300	<400	<400	<400	<400	<400	<400	<400	<400	NA	70	NA	<300	NA	<400	NA	<400	NA	<300	<300	
o-xylenes	ug/kg	NC	5,600	700	150,000 (C)	150,000 (C)	150,000 (C)	125,000	<50	<60	<50	30	<60	<60	<50	<60	<60	NA	40	NA	<50	NA	<60	NA	<60	NA	<50	<50	
p,m-xylenes	ug/kg	NC	5,600	700	150,000 (C)	150,000 (C)	150,000 (C)	366,000	<50	<60	<50	60	<60	<60	<50	<60	40	NA	60	NA	<50	NA	<60	NA	<60	NA	<50	<50	
Barium	mg/kg	75	1,300	140 (G, X)	130,000	NLV	NLV	292	22.0	75.8	41.5	101.0	41.4	39.5	29.4	61.0	20.9	17.2	27.8	16.8	75.7	29.7	76.1	21.0	53.5	67.9	8.7	35.3	
Lead - fine	mg/kg	21	700	840 (G, X)	900 (DD)	NLV	NLV	2,120	20.3	26.0	20.5	208.0	35.5	44.2	21.4	16.7	10.3	26.9	11.1	29.2	17.4	33.5	27.6	63.2	30.9	161.0	11.1	11.4	
Lead - coarse	mg/kg	21	700	840 (G, X)	900 (DD)	NLV	NLV	149	4.5	10.0	5.3	102.0	5.1	26.7	5.9	5.3	4.1	8.0	5.5	7.3	7.2	18.1	9.7	21.3	6.7	94.1	2.9	5.7	
Boring ID/ Sample Depth		MDNRE Part 201 Generic Cleanup Criteria - Statewide Default Background Levels	MDNRE Part 201 Generic Cleanup Criteria - Industrial Drinking Water Protection Criteria	MDNRE Part 201 Generic Cleanup Criteria GSI Protection Criteria	MDNRE Part 201 Generic Cleanup Criteria - Industrial Soil Direct Contact Criteria	MDNRE Part 201 Generic Cleanup Criteria - Res. Soil Volatilization to Indoor Air Criteria	MDNRE Part 201 Generic Cleanup Criteria - Ind. Soil Volatilization to Indoor Air Criteria	Maximum Concentration Detected	OBG-214A 1-2'	OBG-215 4-6'	OBG-215A 2-3'	OBG-216 8-10'	OBG-216A 1-2'	OBG-217 6-8'	OBG-217A 1-2'	OBG-218 3-5'	OBG-219 3-5'	OBG-219A 1-2'	OBG-220 5-7'	OBG-220A 2-3'	OBG-221 5-7'	OBG-221A 1-2'	OBG-222 3-5'	OBG-223 6-8'	OBG-224 6-8'	OBG-225 8-10'	OBG-226 8-10'	OBG-226 18-20'	
Sample Date	Units								1/17/2007	4/14/2005	1/17/2007	4/14/2005	1/17/2007	4/14/2005	1/17/2007	4/14/2005	4/14/2005	1/17/2007	4/14/2005	1/17/2007	4/14/2005	1/17/2007	4/15/2005	4/15/2005	4/15/2005	4/15/2005	9/19/2005	9/19/2005	
Benzene	ug/kg	NC	100	4,000 (X)	400,000 (C)	1,600	8,400	3,000	NA	<50	NA	<60	NA	<60	NA	<60	<60	NA	<60	NA	<70	NA	<50	<60	<60	<60	200	360	
Cyclohexane	ug/kg	NC	NC	NC	NC	NC	NC	130	NA	--	NA	--	NA	--	NA	--	--	NA	--	NA	--	NA	--	--	--	--	60	<50	
Methyl cyclohexan	ug/kg	NC	NC	NC	NC	NC	NC	900	NA	--	NA	--	NA	--	NA	--	--	NA	--	NA	--	NA	--	--	--	--	340	<50	
Methyl acetate	ug/kg	NC	NC	NC	NC	NC	NC	500	NA	--	NA	--	NA	--	NA	--	--	NA	--	NA	--	NA	--	--	--	--	<3000	<3000	
Ethylbenzene	ug/kg	NC	1,500	360	140,000 (C)	87,000	140,000 (C)	113,000	NA	<50	NA	<60	NA	<60	NA	<60	<60	NA	<60	NA	<70	NA	<50	<60	<60	<60	4,970	<50	
Isopropylbenzene	ug/kg	NC	260,000	ID	390,000 (C)	390,000 (C)	390,000 (C)	19,000	NA	<50	NA	<60	NA	<60	NA	<60	<60	NA	<60	NA	<70	NA	<50	<60	<60	<60	1,300	<50	
4-Methyl-2-pentanone (MIBK)	ug/kg	NC	100,000	ID	2,700,000 (C)	2,700,000 (C)	2,700,000 (C)	2,000	NA	<3,000	NA	<3,000	NA	<3,000	NA	<3,000	<3,000	NA	<3,000	NA	<3,000	NA	<3,000	<3,000	<3,000	<3,000	2,000	900	
Toluene	ug/kg	NC	16,000	2,800	250,000 (C)	250,000 (C)	250,000 (C)	3,020,000	NA	10	NA	<60	NA	50	NA	<60	80	NA	20	NA	<70	NA	<50	<60	<60	520	4,130	760	
1,2,4-Trimethylbenzene	ug/kg	NC	4,200	1,800	1,100,000 (C, DD)	1,100,000 (C)	110,000 (C)	40	NA	<100	NA	<100	NA	<100	NA	<100	<100	NA	<100	NA	<100	NA	<100	<100	<100	<100	--	--	
Naphthalene	ug/kg	NC	35,000	870	52,000,000	250,000	470,000	70	NA	<400	NA	<400	NA	<400	NA	<400	<400	NA	<400	NA	<400	NA	<300	<400	<400	<400	--	--	
o-xylenes	ug/kg	NC	5,600	700	150,000 (C)	150,000 (C)	150,000 (C)	125,000	NA	<50	NA	<60	NA	<60	NA	<60	<60	NA	<60	NA	<70	NA	<50	<60	<60	<60	2,200	20	
p,m-xylenes	ug/kg	NC	5,600	700	150,000 (C)	150,000 (C)	150,000 (C)	366,000	NA	<50	NA	<60	NA	<60	NA	<60	<60	NA	<60	NA	<70	NA	<50	<60	<60	<60	70	19,500	
Barium	mg/kg	75	1,300	140 (G, X)	130,000	NLV	NLV	292	84.3	44.0	25.3	48.9	48.0	47.5	10.4	48.0	40.0	73.8	55.5	60.6	96.3	27.3	46.1	60.9	79.3	10.5	76.5	33.4	
Lead - fine	mg/kg	21	700	840 (G, X)	900 (DD)	NLV	NLV	2,120	296.0	17.1	37.6	27.1	45.6	34.9	97.3	29.8	27.5	483.0	23.9	53.2	62.2	56.4	22.2	27.2	30.4	19.7	23.7	12.8	
Lead - coarse	mg/kg	21	700	840 (G, X)	900 (DD)	NLV	NLV	149	192.0	4.8	13.3	5.4	8.1	6.8	11.4	8.5	5.6	262.0	5.7	23.0	13.2	26.8	6.8	6.0	16.9	3.7	14.3	4.8	
Boring ID/ Sample Depth		MDNRE Part 201 Generic Cleanup Criteria - Statewide Default Background Levels	MDNRE Part 201 Generic Cleanup Criteria - Industrial Drinking Water Protection Criteria	MDNRE Part 201 Generic Cleanup Criteria GSI Protection Criteria	MDNRE Part 201 Generic Cleanup Criteria - Industrial Soil Direct Contact Criteria	MDNRE Part 201 Generic Cleanup Criteria - Res. Soil Volatilization to Indoor Air Criteria	MDNRE Part 201 Generic Cleanup Criteria - Ind. Soil Volatilization to Indoor Air Criteria	Maximum Concentration Detected	OBG-227 2-4'	OBG-227 8-10'	OBG-228 8-10'	OBG-228 18-20'	OBG-228B 7-8'	OBG-228D 7-8'	OBG-228D 19-20'	OBG-228G 6-7'	OBG-228G 16-17'	OBG-228I 7-8'	OBG-229 6-8'	OBG-229 10-12'	OBG-230 6-8'	OBG-230 10-12'	OBG-231 3-5'	OBG-231 6-8'	HA-1 0-1'	HA-1 4-5'			
Sample Date	Units								9/19/2005	9/19/2005	9/19/2005	9/19/2005	1/15/2007	1/15/2007	1/15/2007	1/15/2007	1/15/2007	1/15/2007	9/19/2005	9/19/2005	9/20/2005	9/20/2005	9/20/2005	9/20/2005	10/27/2005	10/27/2005			
Benzene	ug/kg	NC	100	4,000 (X)	400,000 (C)	1,600	8,400	3,000	60	280	3,000	220	<60	3,800	<50	500	<50	<60	600	200	<60	<60	<60	<50	<60	<60			
Cyclohexane	ug/kg	NC	NC	NC	NC	NC	NC	130	<60	130	<6000	<50	NA	NA	NA	NA	NA	NA	<600	<600	<60	<60	<60	<50	<60	<60			
Methyl cyclohexan	ug/kg	NC	NC	NC	NC	NC	NC	900	100	370	4,000	<50	NA	NA	NA	NA	NA	NA	900	300	20	20	<60	<50	<60	<60			
Methyl acetate	ug/kg	NC	NC	NC	NC	NC	NC	500	<3000	<3000	<3000	<3000	NA	NA	NA	NA	NA	NA	<3000	<3000	300	<3000	<3000	500	400	<3,000			
Ethylbenzene	ug/kg	NC	1,500	360	140,000 (C)	87,000	140,000 (C)	113,000	1,910	40	113,000	100	<60	56,300	<50	1,700	<50	30	220	600	<60	<60	<60	7	7	<60			
Isopropylbenzene	ug/kg	NC	260,000	ID	390,000 (C)	390,000 (C)	390,000 (C)	19,000	570	730	19,000	20	NA	NA	NA	NA	NA	NA	16,200	2,000	20	60	<60	<50	<60	<60			
4-Methyl-2-pentanone (MIBK)	ug/kg	NC	100,000	ID	2,700,000 (C)	2,700,000 (C)	2,700,000 (C)	2,000	100	90	<1,000,000	400	NA	NA	NA	NA	NA	NA	<3,000	<30,000	<3,000	<3,000	<3,000	<3,000	<3,000	<3,000	<3,000		
Toluene	ug/kg	NC	16,000	2,800	250,000 (C)	250,000 (C)	250,000 (C)	3,020,000	290	<50	3,020,000	2,000	<60	1,900,000	<70	<600	<50	<60	300	600	<60	<60	<60	<50	10	<60			
1,2,4-Trimethylbenzene	ug/kg	NC	4,200	1,800	1,100,000 (C, DD)	1,100,000 (C)	110,000 (C)	40	--	--	--	--	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--			
Naphthalene	ug/kg	NC	35,000	870	52,000,000	250,000	470,000	70	--	--	--	--	NA	NA	NA	NA	NA	NA	--	--	--								

Table 2
MLC
GLTC Land
Groundwater Analytical Results

Well ID		MDNRE Part 201 Generic Cleanup Criteria - Industrial Drinking Water Criteria	MDNRE Part 201 Generic Cleanup Criteria - GSI Criteria	MDNRE Part 201 Generic Cleanup Criteria - Ground Water Contact Criteria	MDNRE Part 201 Generic Cleanup Criteria - Res. GW Volatilization to Indoor Air Criteria	Maximum Concentration Detected	MW-7	MW-12	SVE-1	SVE-2	OBG- MW-14	OBG- MW-15	OBG- MW-16	OBG- MW-17	OBG- MW-18	OBG- MW-19	OBG- MW-20	OBG- MW-21	OBG- MW-22
Sample Date	Units						5/12/2005	5/12/2005	5/12/2005	5/12/2005	5/12/2005	5/12/2005	5/12/2005	5/12/2005	5/12/2005	5/12/2005	5/12/2005	5/12/2005	10/11/2005
Acetone	ug/L	2100	1,700	31,000,000	1,000,000,000 (D,S)	4	<30	<30	<60,000	<100	<30	<30	<30	<30	<30	<30	<30	<30	4
Benzene	ug/L	5 (A)	200 (X)	11,000	5,600	1,000	0.6	<1	1,000	267	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-Butanone	ug/L	38,000	2,200	240,000,000 (S)	240,000,000 (S)	9,000	<30	<30	9,000	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
n-Butylbenzene	ug/L	230	ID	5,900	ID	6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	--
sec-Butylbenzene	ug/L	230	ID	4,400	ID	4	<1	<1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	--
tert-Butylbenzene	ug/L	230	ID	8,900	ID	0.9	0.9	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	--
Chloromethane	ug/L	1,100	ID	490,000	8,600	1	<5	<5	<10,000	<30	1	<5	<5	1	<5	<5	<5	<5	<5
Cyclohexane	ug/L	NC	NC	NC	NC	0.6	--	--	--	--	--	--	--	--	--	--	--	--	0.6
Chlorobenzene	ug/L	100 (A)	47	86,000	210,000	0.7	<1	<1	<3000	<5	<1	<1	<1	<1	<1	<1	<1	<1	0.7
1,1-Dichloroethane	ug/L	2,500	740	2,400,000	100,000	0.5	<1	<1	<3000	<5	<1	<1	<1	<1	<1	<1	<1	<1	0.5
cis-1,2-Dichloroethene	ug/L	70 (A)	620	200,000	93,000	30	30	<1	<1	<1	<1	0.5	<1	<1	<1	<1	<1	<1	2
trans-1,2-Dichloroethene	ug/L	100 (A)	1,500	220,000	85,000	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.3
Ethylbenzene	ug/L	74 (E)	18	170,000 (S)	110,000	2,000	26	<1	2,000	9	<1	<1	<1	<1	<1	<1	<1	<1	0.1
Isopropyl benzene	ug/L	2,300	ID	56,000 (S)	56,000 (S)	66	27	<1	<1	66	<1	<1	<1	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	ug/L	NC	NC	NC	NC	4	3	<1	<1	4	<1	<1	<1	<1	<1	<1	<1	<1	--
2-Methylnaphthalene	ug/L	750	ID	25,000 (S)	ID	3	3	<5	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	--
4-Methyl-2-pentanone	ug/L	5,200	ID	13,000,000	20,000,000 (S)	300,000	<50	<50	300,000	20	<50	<50	<50	<50	<50	<50	<50	<50	<1
Methylene Chloride	ug/L	5.0 (A)	940 (X)	220,000	220,000	1	<5	<5	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methyl Cyclohexane	ug/L	NC	NC	NC	NC	0.6	--	--	--	--	--	--	--	--	--	--	--	--	0.6
Naphthalene	ug/L	1,500	13	31,000 (S)	31,000 (S)	48	48	<5	<1	20	<5	1	<5	<5	<5	<5	<5	<5	--
n-Propylbenzene	ug/L	230	ID	15,000	ID	27	27	<1	<1	24	<1	<1	<1	<1	<1	<1	<1	<1	--
Toluene	ug/L	790 (E)	140	530,000 (S)	530,000 (S)	134,000	<1	<1	134,000	149	<1	0.4	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	ug/L	63 (E)	17	56,000 (S)	56,000 (S)	160	160	<1	<1	120	<1	<1	<1	<1	<1	<1	<1	<1	--
1,3,5-Trimethylbenzene	ug/L	72 (E)	45	61,000 (S)	61,000 (S)	39	33	<1	<1	39	<1	<1	<1	<1	<1	<1	<1	<1	--
Vinyl Chloride	ug/L	2.0 (A)	15	1,000	1,100	2	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2
o-xylenes	ug/L	280 (E)	35	190,000 (S)	190,000 (S)	3,000	<1	<1	3,000	5	<1	<1	<1	<1	<1	<1	<1	<1	<1
p,m-xylenes	ug/L	280 (E)	35	190,000 (S)	190,000 (S)	6,000	3	<2	6,000	1,090	<2	<2	<2	<2	<2	<2	<2	<2	<1
Barium	mg/L	2.0 (A)	(G,X)	14,000,000	NLV	3.14	0.42	1.00	1.84	3.14	0.024	0.092	0.166	0.057	0.021	0.087	0.095	0.144	0.4
Lead	mg/L	0.004 (L)	(G,X)	ID	NLV	0.059	<0.003	<0.003	0.003	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.059

Notes:

Exceeds GSI criteria only.

Exceeds industrial drinking water criteria or both GSI and drinking water criteria.

Only detected analytes shown.

(A) Criteria is the state of Michigan drinking water standard.

(E) Criteria is the aesthetic drinking water value.

(G) Ground water surface water interface criterion depends on the pH or water hardness, or both of the receiving water.

(L) Criteria for lead are derived using a biologically based model, and are not calculated using the algorithms and assumptions specified in pathway-specific rules.

(S) Criterion defaults to the hazardous substance-specific water solubility limit.

(X) The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source.

ID Means insufficient data to develop criterion.

NLV Means hazardous substance is not likely to volatilize under most conditions.

NC No criteria listed.

-- Not analyzed

FIGURES

FIGURE 1



MLC
GLTC LAND
FLINT, MICHIGAN

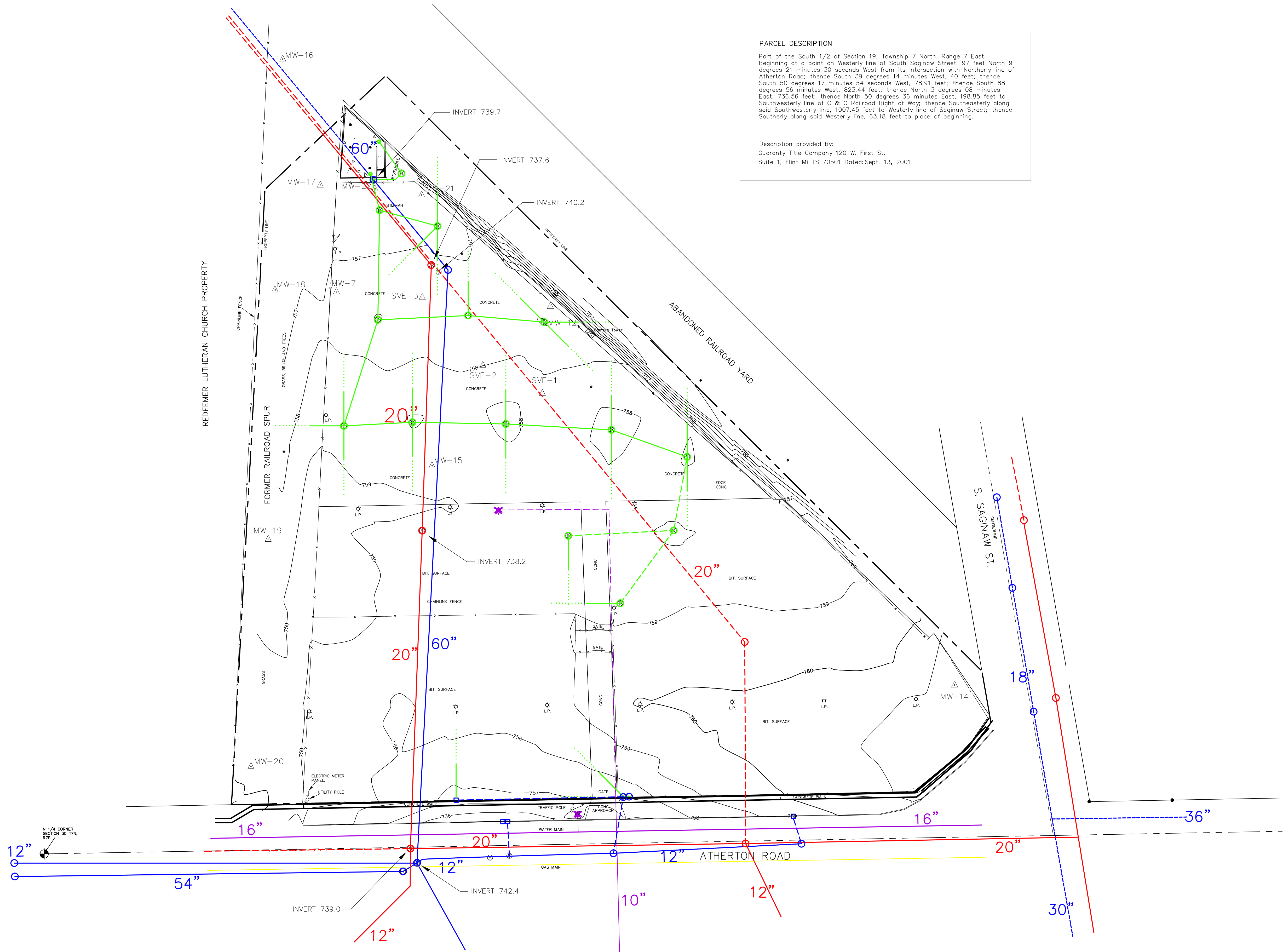
SITE LOCATION MAP



0 500 1,000 2,000 3,000 4,000

Feet





- LEGEND**
- CLEAN OUT
 - ELEC. RISER
 - FIRE HYDRANT
 - ELEC. TRANSFORMER
 - GUY ANCHOR
 - VENT
 - LIGHT POLE
 - WATER STOP BOX
 - WATER VALVE
 - SPEAKER BOX
 - POWER POLE
 - ROUND CATCH BASIN
 - SIGN
 - SQUARE CATCH BASIN
 - TELEPHONE RISER
 - SET IRON
 - FOUND IRON
 - ELECTRIC
 - GAS
 - FENCE
 - MONITORING WELL
 - SURVEYED STM. MANHOLE
 - SURVEYED SAN. MANHOLE
 - PRIVATE DRAINAGE MANHOLE
 - STORM SEWER MANHOLE
 - SANITARY SEWER MANHOLE
 - PRIVATE DRAINAGE LINE
 - STORM SEWER
 - SANITARY SEWER
 - WATER LINE
 - APPROXIMATE PROPERTY LINE

NOTE:
1. DASHED UTILITY INDICATES INFERRED OR APPROXIMATE LOCATION.

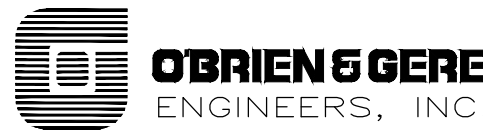
MLC
GLTC LAND
FLINT, MICHIGAN

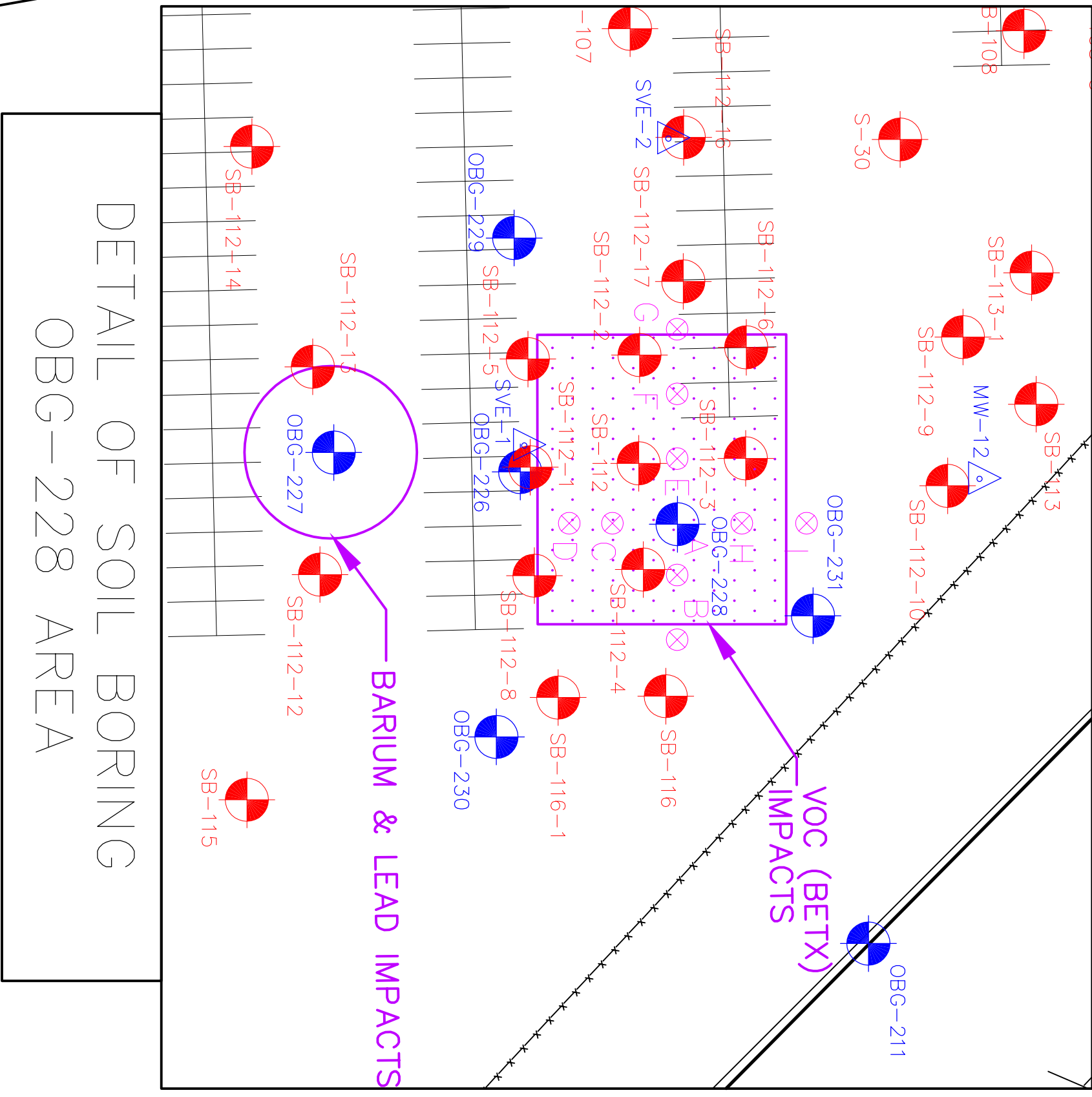
SITE FEATURES/
UTILITY MAP

FIGURE 2



FILE NO. 14774.43375.008
SEPTEMBER 2010





EXHIBITS

TECHNICAL SPECIFICATIONS

Great Lakes Tech Center Land Interim Remedial Action

**Motors Liquidation Company
Detroit, Michigan**

October 2010



O'BRIEN & GERE
www.obg.com

TECHNICAL SPECIFICATIONS

DIVISION 2 – SITE CONSTRUCTION

- 02220 Earthwork
- 02230 Select Fill
- 02502 Restoration of Surfaces
- 02980 Topsoil and Seeding

SECTION 02220

EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes excavation and backfilling including the loosening, removing, refilling, transporting, storage and disposal of all materials classified as "earth" necessary to be removed for the construction and completion of all work under the Contract, and as shown on the Contract Drawings, specified or directed.

1.2 REFERENCES

- A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards, and specifications, except where more stringent requirements have been specified herein:

- 1. American Society for Testing and Materials (ASTM)
 - a. A328 Specification for Steel Sheet Piling
 - b. D698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³)
 - c. D1556 Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
 - d. D1760 Specification for Pressure Treatment of Timber Products
 - e. D2922 Test Methods for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)

1.3 DEFINITIONS

- A. Excavation

- 1. Grubbing, stripping, removing, storing and rehandling of all materials of every name and nature necessary to be removed for all purposes incidental to the construction and completion of all the work under construction.
- 3. All pumping, bailing, draining, or otherwise disposing of water.
- 4. The removing and disposing of all surplus materials from the excavations in the manner specified.
- 6. The supporting and protecting of all tracks, rails, buildings, curbs, sidewalks, pavements, overhead wires, poles, trees, vines, shrubbery, pipes,

sewers, conduits or other structures or property in the vicinity of the work, whether over- or underground or which appear within or adjacent to the excavations, and the restoration of the same in case of settlement or other injury.

7. All temporary bridging and fencing and the removing of same.

B. Earth

1. All materials such as sand, gravel, clay, loam, ashes, cinders, pavements, muck, roots or pieces of timber, soft or disintegrated rock, not requiring blasting, barring, or wedging from their original beds, and specifically excluding all ledge or bedrock and individual boulders or masonry larger than one-half cubic yard in volume.

C. Backfill

1. The refilling of excavation to the line of filling indicated on the Contract Drawings or as directed using materials suitable for refilling of excavations; and the compacting of all materials used in filling or refilling by rolling, ramming, watering, puddling, etc., as may be required.

D. Spoil

1. Surplus excavated materials not required or not suitable for backfills or embankments.

E. Embankments

1. Fills constructed above the original surface of the ground or such other elevation as specified or directed.

F. Limiting Subgrade

1. The underside of the pipe barrel for pipelines
2. The underside of footing lines for structures

G. Excavation Below Subgrade

1. Excavation below the limiting subgrades of structures or pipelines.
2. Where materials encountered at the limiting subgrades are not suitable for proper support of structures or pipelines, the Contractor shall excavate to such new lines and grades as required.

PART 2 PRODUCTS

- 2.1 Not used.

PART 3 EXECUTION

- 3.1 UNAUTHORIZED EXCAVATION

- A. Whenever excavations are carried beyond or below the lines and grades shown on the Contract Drawings, or as given or directed by the Engineer, all such excavated space shall be refilled with special granular materials, concrete or other materials as the Engineer may direct. All refilling of unauthorized excavations shall be at the Contractor's expense.
- B. All material which slides, falls or caves into the established limits of excavations due to any cause whatsoever, shall be removed and disposed of at the Contractor's expense and no extra compensation will be paid the Contractor for any materials ordered for refilling the void areas left by the slide, fall or cave-in.

3.2 REMOVAL OF WATER

A. General

- 1. The Contractor shall at all times provide and maintain proper and satisfactory means and devices for the removal of all water entering the excavations, and shall remove all such water as fast as it may collect, in such manner as shall not interfere with the prosecution of the work.
- 2. Unless otherwise specified, all excavations which extend down to or below the static groundwater elevations shall be dewatered by lowering and maintaining the groundwater beneath such excavations at all times when work thereon is in progress.
- 3. Water pumped or drained from excavations, or any sewers, drains or water courses encountered in the work, shall be disposed of in a suitable manner without injury to adjacent property, the work under construction, or to pavements, roads, drives, and water courses. Water shall be contained in frac tank(s) or vacuum truck(s), analyzed for waste characterization, and disposed of off-site per waste characterization requirements. No water shall be discharged on site.
- 4. Any damage caused by or resulting from dewatering operations shall be the sole responsibility of the Contractor.

B. Work Included

- 1. The excavation areas for removal of impacted soils or groundwater.
- 2. The furnishing and operation of pumps and appliances needed to maintain thorough drainage of the work in a satisfactory manner.

3.3 STORAGE OF MATERIALS

A. Excavated Materials

- 1. All excavated materials shall be stored in the designated Staging Area, so as not to endanger the work, and so that easy access may be had at all times to all parts of the excavation. Stored materials shall be kept neatly piled and

trimmed, so as to cause as little inconvenience as possible to public travel or to adjoining property holders.

2. Special precautions must be taken to permit access at all times to fire hydrants, fire alarm boxes, police and fire department driveways, and other points where access may involve the safety and welfare of the general public.
3. Excavated materials shall be stockpiled on 10 mil polyethylene sheeting and covered with 10 mil polyethylene sheeting within the Staging Area to avoid runoff from the stockpile during precipitation events.

3.4 DISPOSAL OF MATERIALS

A. Spoil Material

1. All spoil materials shall be disposed of as required by the local, state or federal regulations pertaining to the area.

3.5 BACKFILLING

A. General

1. All excavations shall be backfilled to the original surface of the ground or to such other grades as may be shown, specified or directed.
2. Backfilling shall be done with suitable excavated materials which can be satisfactorily compacted during refilling of the excavation. In the event the excavated materials are not suitable, certified clean fill, or Special Fill as specified or ordered by the Engineer shall be used for backfilling.
3. Any settlement occurring in the backfilled excavations shall be refilled and compacted.

B. Unsuitable Materials

1. Stones, pieces of rock or pieces of pavement greater than 1 cubic foot in volume or greater than 1.5 feet in any single dimension shall not be used in any portion of the backfill.
2. All stones, pieces of rock or pavement shall be distributed through the backfill and alternated with earth backfill in such a manner that all interstices between them shall be filled with earth.
3. Frozen earth shall not be used for backfilling.

C. Compaction and Density Control

1. The compaction shall be as specified for the type of earthwork, i.e., structural, trenching or embankment.
 - a. The compaction specified shall be the percent of maximum dry density.

- b. The compaction equipment shall be suitable for the material encountered.
- 2. Where required, to assure adequate compaction, in-place density test shall at the expense of the Contractor be made by an approved testing laboratory.
 - a. The moisture-density relationship of the backfill material shall be determined by ASTM D698, Method D.
 - 1) Compaction curves for the full range of materials used shall be developed.
 - b. In-place density shall be determined by the methods of ASTM D1556 or ASTM D2922 and shall be expressed as a percentage of maximum dry density.
- 3. Where required, to obtain the optimum moisture content, the Contractor shall add, at his expense, sufficient water during compaction to assure the specified maximum density of the backfill. If, due to rain or other causes, the material exceeds the optimum moisture content, it shall be allowed to dry, assisted if necessary, before resuming compaction or filling efforts.
- 4. The Contractor shall be responsible for all damage or injury done to pipes, structures, property or persons due to improper placing or compacting of backfill.
- 5. Four in-place density tests shall be completed for Area 2 after placement and compaction of the two 4" lifts. Four in-place density tests shall be completed per lift for Area 2. Locations for testing shall be designated by the Engineer.

3.7 OTHER REQUIREMENTS

A. Drainage

- 1. All material deposited in roadway ditches or other water courses shall be removed immediately after backfilling is completed and the section, grades and contours of such ditches or water courses restored to their original condition, in order that surface drainage will be obstructed no longer than necessary.

B. Unfinished Work

- 1. When, for any reason, the work is to be left unfinished, all trenches and excavations shall be filled and all roadways, sidewalks and watercourses left unobstructed with their surfaces in a safe and satisfactory condition. The surface of all roadways and sidewalks shall have a temporary pavement.

C. Hauling Material on Streets

1. When it is necessary to haul material over the streets or pavements, the Contractor shall provide suitable tight vehicles so as to prevent deposits on the streets or pavements. In all cases where any materials are dropped from the vehicles, the Contractor shall clean up the same as often as required to keep the crosswalks, streets and pavements clean and free from dirt, mud, stone and other hauled material.

D. Dust Control

1. It shall be the sole responsibility of the Contractor to control the dust created by any and all of his operations to such a degree that it will not endanger the safety and welfare of the general public.
2. Calcium chloride and petroleum products shall not to be used for dust control.

E. Test Pits

1. For the purpose of obtaining detail locations of underground obstructions, the Contractor shall make excavations in advance of the work.

* * * * *

SECTION 02230

SELECT FILL

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes select fill materials used in special backfill, as specified or as directed by the Engineer.

1.2 REFERENCES

- A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards, and specifications, except where more stringent requirements have been specified herein:
 - 1. American Society for Testing and Materials (ASTM)
 - a. D422 - Method for Particle-Size Analysis of Soil

1.3 SUBMITTALS

- A. The following items shall be submitted:
 - 1. The name and location of the source of the material.
 - 2. Samples and test reports of the material.

1.4 DEFINITIONS

- A. Special Granular Material or backfill
 - 1. Special granular material shall mean any of the granular materials listed below or other materials ordered by the Engineer.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Type E
 - 1. Run-of-Bank Gravel
 - a. Run-of-bank gravel or other acceptable granular material free from organic matter with a gradation by weight of 100% passing a 1½-inch square opening, 30 to 65% passing a 1/4-inch square opening and not more than 10% passing a No. 200 mesh sieve as determined by washing through the sieve in accordance with ASTM D422.

B. Type F

1. Run-of-crusher Stone

- a. Run-of-crusher hard durable limestone or approved equal having the following gradation by weight:

<u>% Passing</u>	<u>Sieve</u>
100	1½- inch
95 – 100	1
65 – 80	½
40 – 60	¼
0 – 10	#200 Sieve

C. Clean Fill

1. At a minimum, clean fill shall fulfill the gradation requirements of Type E Select Fill.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Special backfill where specified or directed shall be placed in accordance with the backfilling provisions of Section entitled "Earthwork".

3.2 DISPOSAL OF DISPLACED MATERIALS

- A. Materials displaced through the use of SELECT fill shall be wasted or disposed of by the Contractor and the cost of such disposal shall be included in the unit price bid for each of the materials.

3.3 SETTLEMENTS

- A. Any settlements in the finished work shall be made good by the Contractor.

* * * * *

SECTION 02502

RESTORATION OF SURFACES

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes restoration and maintenance of all types of surfaces disturbed, damaged or destroyed during the performance of the work under or as a result of the operations of the Contract.
- B. The quality of materials and the performance of work used in the restoration shall produce a surface or feature equal to the condition of each before the work began.

1.2 REFERENCES

- A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:
 - 1. American Society for Testing and Materials (ASTM)
 - a. D698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³)

1.3 SUBMITTALS

- A. The following items shall be submitted:
 - 1. A schedule of restoration operations. After an accepted schedule has been agreed upon it shall be adhered to unless otherwise revised with the approval of the Engineer.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 GENERAL

- A. The replacement of surfaces at any time, as scheduled or as directed, shall not relieve the Contractor of responsibility to repair damages by settlement or other failures.

3.2 LAWNS AND IMPROVED AREAS

- A. The area to receive topsoil shall be graded to a depth of not less than 4 inches or as specified, below the proposed finished surface.

- B. The furnishing and placing of topsoil, seed and mulch shall be in accordance with the Section entitled "Topsoil and Seeding".
- C. When required to obtain germination, the seeded areas shall be watered in such a manner as to prevent washing out of the seed.
- D. Any washout or damage which occurs shall be regraded and reseeded until a good sod is established.
- E. The Contractor shall maintain the newly seeded areas, including regrading, reseeding, watering and mowing, in good condition.

3.4 MAINTENANCE

- A. The finished products of restoration shall be maintained in an acceptable condition for and during a period of six months following the date of Substantial Completion or other such date as set forth elsewhere in the Contract Documents.

* * * * *

SECTION 02980

TOPSOIL AND SEEDING

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes topsoil, fertilizer, seed, mulch anchorage, and associated work.

1.2 SUBMITTALS

- A. The following items shall be submitted:
1. The location of source and data for off-site topsoil.
 2. Analysis of the seed.
 3. Should hydroseeder be used, the Contractor shall submit all data including material and application rates.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Topsoil shall be unfrozen friable clayey loam free from clay lumps, stones, roots, sticks, stumps, brush or foreign objects.
- B. Fertilizer shall be a standard quality commercial carrier of available plant food elements. A complete prepared and packaged material containing a minimum of 10 percent nitrogen, 10 percent phosphoric acid and 10 percent potash.
1. Each bag of fertilizer shall bear the manufacturer's guaranteed statement of analysis.
- C. Seed mixtures shall be of commercial stock of the current season's crop and shall be delivered in unopened containers bearing the guaranteed analysis of the mix.
1. All seed shall meet the standards of germination and purity set by the State or the Association of Official Seed Certifying Agencies (AOSCA).
- D. Seed Mixtures:

<u>Special Mix</u>	<u>Lawn Areas*</u>
Creeping Red Fescue	30
Manhattan or Pennfine Ryegrass	70

* % by weight

- E. Mulch shall be stalks of oats, wheat, rye or other approved crops which are free from noxious weeds.

PART 3 EXECUTION

3.1 INSTALLATION

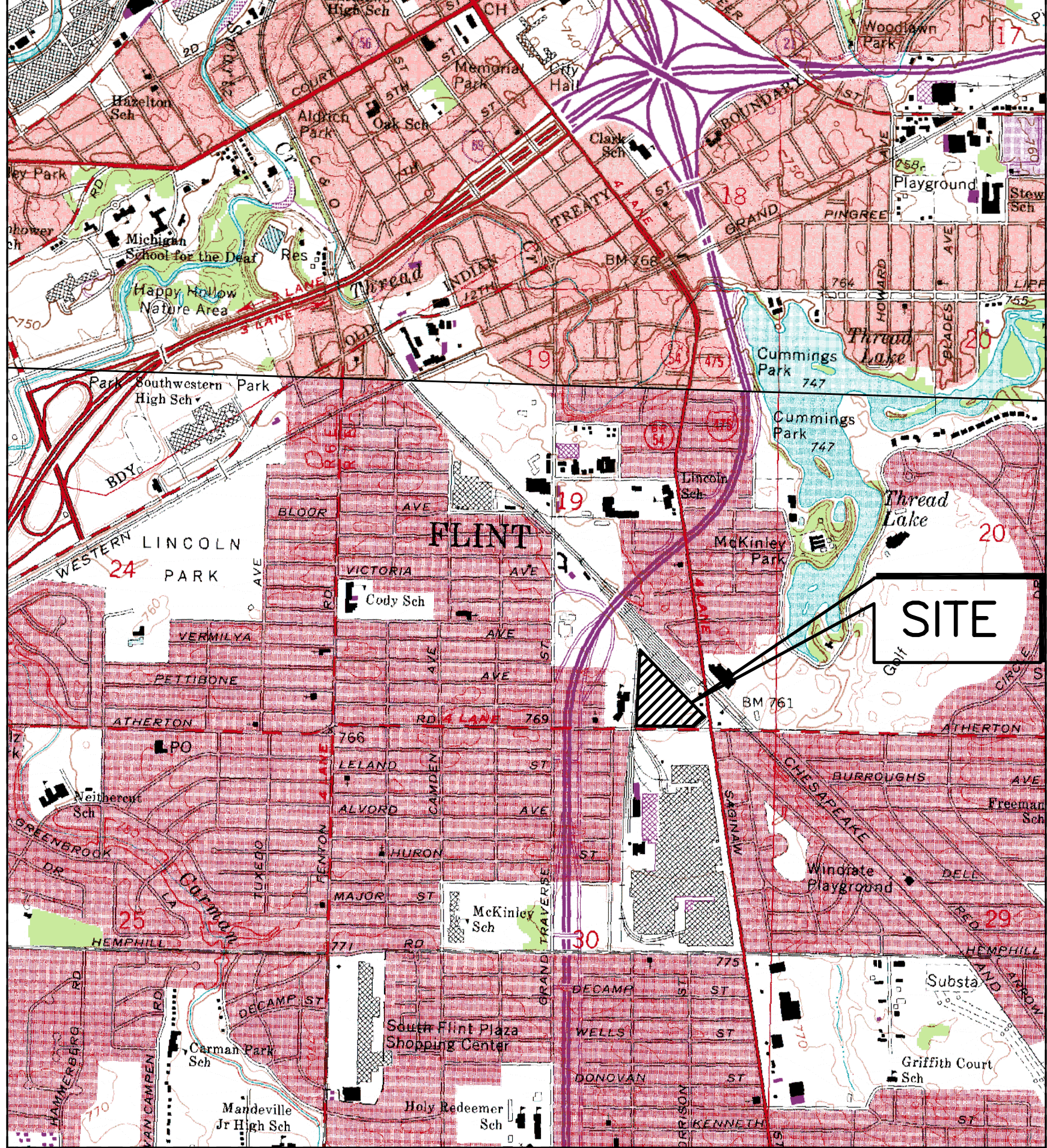
- A. The area to receive topsoil shall be graded to a depth of not less than 4 inches or as specified, below the proposed finished surface.
 - 1. All debris and inorganic material shall be removed and the surface loosened for a depth of 2 inches prior to the placing of the topsoil.
 - 2. The topsoil shall not be placed until the subgrade is in suitable condition and shall be free of excessive moisture and frost.
- B. Topsoil shall be placed on the prepared subgrade to the depth required. Excavated topsoil shall not be reused.
 - 1. All topsoil shall be free from stones, roots, sticks and other foreign substances and shall not be placed in a frozen or muddy condition.
 - 2. The finished surface shall conform to the lines and grades of the area before disturbed or as shown on the Contract Drawings. Any irregularities shall be corrected before the placement of fertilizer and seed.
- C. The fertilizer shall be applied uniformly at the rate of 20 pounds per 1000 square feet.
 - 1. Following the application of the fertilizer and prior to application of the seed, the topsoil shall be scarified to a depth of at least 2 inches with a disc or other suitable method traveling across the slope if possible.
- D. When the topsoil surface has been fine graded, the seed mixture shall be uniformly applied upon the prepared surface with a mechanical spreader at a rate of not less than 10 pounds per 1000 square feet.
 - 1. The seed shall be raked lightly into the surface and rolled with a light hand lawn roller.
 - 2. Seeding and mulching shall not be done during windy weather.
- E. The mulch shall be hand or machine spread to form a continuous blanket over the seed bed, approximately 2 inches uniform thickness at loose measurement. Excessive amounts or bunching of mulch will not be permitted.
 - 1. Mulch shall be anchored by an acceptable method.
 - 2. Unless otherwise specified, mulch shall be left in place and allowed to disintegrate.
 - 3. Any anchorage or mulch that has not disintegrated at time of first mowing, shall be removed. Anchors may be removed or driven flush with ground surface.

- F. Seeded areas shall be watered as often as required to obtain germination and to obtain and maintain a satisfactory sod growth. Watering shall be in such a manner as to prevent washing out of seed.
- G. Hydroseeding may be accepted as an alternative method of applying fertilizer, seed and mulch. The Contractor shall submit all data regarding materials and application rates to the Engineer for review.

3.2 MAINTENANCE

- A. All lawn areas shall be mowed by the Contractor before the new grass reaches a height of 4 inches.
 - a. The Contractor shall maintain the newly seeded areas in good condition until acceptance, including regular mowing to a height of 2 inches.

* * * * *



LOCATION PLAN
NOT TO SCALE

MOTORS LIQUIDATION COMPANY DETROIT, MICHIGAN

SEPTEMBER 2010



O'BRIEN & GERE

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SUITE 260
FARMINGTON HILLS, MI 48335
PHONE: 248-477-5701

IT IS A VIOLATION OF LAW FOR ANY
PERSON UNLESS ACTING UNDER THE
DIRECTION OF A LICENSED PROFESSIONAL
ENGINEER TO ALTER THIS DOCUMENT.

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INDEX TO DRAWINGS

TITLE SHEET

- G-1 GENERAL NOTES, SYMBOLS & ABBREVIATIONS
- C-1 SITE LAYOUT AND STAGING PLAN
- C-2 SOIL EROSION AND SEDIMENT CONTROL PLAN
- C-3 AREA 1 - REMEDIAL PLAN & SECTIONS
- C-4 AREA 2 - REMEDIAL PLAN & SECTIONS
- C-5 MISCELLANEOUS DETAILS

GENERAL NOTES:

- PROJECT WORK GENERALLY INCLUDES EXCAVATION OF SOIL IN TWO SEPARATE AREAS AT GREAT LAKES TECH CENTER LAND (FORMERLY "DIE STORAGE LOT") LOCATED AT 200 W. ATHERTON ROAD, FLINT, GENESEE COUNTY, MICHIGAN (SITE). SOILS IN AREA 1 ARE IMPACTED WITH LEAD ABOVE RESIDENTIAL DIRECT CONTACT CRITERIA AT A DEPTH OF 0-1 FOOT BELOW GRADE. SOILS IN AREA 2 ARE IMPACTED WITH TOLUENE AND XYLENE ABOVE CHEMICAL-SPECIFIC GENERIC SOIL SATURATION CONCENTRATIONS WITHIN A LENS OF PEAT SOIL THAT IS 8-10 FEET BELOW GRADE. SOILS EXCAVATION ACTIVITIES SHALL INCLUDE SOIL REMOVAL, EXCAVATION, MANAGEMENT, AIR MONITORING, AND PROPER WASTE DISPOSAL.
- THE ENGINEER WILL BE ON SITE DURING FIELD ACTIVATES TO OBSERVE AND MONITOR SOIL REMOVAL. ADDITIONALLY, THE ENGINEER WILL COLLECT VERIFICATION OF SOIL REMEDIATION SAMPLES SUBSEQUENT TO SOIL REMOVAL ACTIVITY. SEE "REMEDIAL ACTION WORK PLAN" (DATED SEPTEMBER 2010) FOR ADDITIONAL DETAILS RELATING TO SOIL REMOVAL AND SAMPLING ACTIVITIES.
- THE LIMITS OF IMPACTED SOILS ARE DEPICTED FOR EACH AREA. EXCAVATION WORK SHALL BE COMPLETED IN ACCORDANCE WITH OSHA STANDARDS.
- THE CONTRACTOR WILL BE REQUIRED TO PERFORM WORK UNDER A SITE-SPECIFIC JOB SAFETY ANALYSIS PLAN (JSA) (TO BE PROVIDED BY ENGINEER). THE CONTRACTOR SHALL ALSO PREPARE A SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP). THE HASP SHALL MEET THE REQUIREMENTS OF OSHA'S REGULATIONS CONTAINED IN 29 CODE OF FEDERAL REGULATIONS (CFR) 1910 AND 29 CFR 1926.
- THE CONTRACTOR SHALL PERFORM AIR MONITORING AT THE PERIMETER OF THE EXCAVATION (DOWN WIND) AND AT THE BREATHING ZONE(S) PER OSHA STANDARDS, THE SITE-SPECIFIC JSA, AND THE CONTRACTOR'S HASP. CONSTITUENTS TO BE MONITORED SHALL INCLUDE, AT A MINIMUM, BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENE (BTX), LEAD, AND PARTICULATE. THE PERIMETER MONITORING STATION SHALL BE LOCATED 50' AWAY FROM THE WORK AREA OR AT THE PERIMETER FENCE, WHICHEVER IS CLOSER TO THE EXCAVATION. IF PERIMETER MONITORING INDICATES READINGS ABOVE THE PERMISSIBLE EXPOSURE LEVELS, THEN EXCAVATION ACTIVITIES SHALL BE HALTED AND THE EXPOSED WORKING FACE OF THE EXCAVATION SHALL BE COVERED WITH PLASTIC, IF NECESSARY, TO REDUCE DOWNWIND CONCENTRATIONS.
- ANTICIPATED GROUND WATER TABLE IS ESTIMATED TO BE APPROXIMATELY 10 FEET BELOW GRADE.
- REPORT TO ENGINEER ANY CONDITION WHICH PREVENTS THE WORK FROM BEING COMPLETE ACCORDING TO THE PLANS AND SPECIFICATIONS.
- CONTRACTOR SHALL ERECT AND MAINTAIN SAFETY BARRICADES MEETING OR EXCEEDING OSHA REQUIREMENTS AROUND THE PROJECT AREA AT ALL TIMES. THE CONTRACTOR SHALL AT ALL TIMES WORK IN COMPLIANCE WITH THEIR SITE-SPECIFIC SAFETY SPECIFICATIONS.
- EACH DAY WORK DEBRIS MUST BE CLEANED UP BEFORE THE END OF THE SHIFT. UNLESS OTHERWISE STATED, CONSTRUCTION DEBRIS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT A STATE-APPROVED LANDFILL IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.
- ALL WORK SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER AND SHALL BE IN ACCORDANCE WITH CURRENT GENERALLY ACCEPTED PRACTICES WITHIN THE INDUSTRY.
- CONTRACTOR SHALL PRESERVE MONITORING WELLS, SOIL VAPOR EXTRACTION WELLS, LIGHT POLES, BOLLARDS, UTILITIES, FENCING, AND ROADWAYS DURING CONSTRUCTION ACTIVITIES.
- THE SITE IS A SECURED FACILITY. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER FOR ACCESS. SITE ACCESS IS ANTICIPATED TO BE DURING NORMAL WORKING HOURS; HOWEVER, ACCESS MAY BE PROVIDED FOR EVENING AND WEEKEND WORK.
- ALL FACILITIES WHICH ARE TO REMAIN OR TO BE MODIFIED FOR REUSE SHALL BE FIELD VERIFIED AS TO ACTUAL LOCATION, ELEVATION, SIZE, TYPE AND CONDITION. ANY DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND THE PLANS SHALL BE REPORTED TO THE ENGINEER WHO SHALL DETERMINE IF ANY MODIFICATIONS TO THE PLANS ARE REQUIRED.
- PROJECT SITE IS ACCESSED BY A PRIVATE DRIVE AT THE SOUTH-CENTRAL PORTION OF THE FACILITY. A MAJORITY OF THE SITE IS DEVELOPED WITH ASPHALT-PAVED OR CONCRETE SURFACES.
- THE SITE IS LOCATED TO THE NORTH OF THE FORMER GENERAL MOTOR'S GREAT LAKES TECH CENTER FACILITY. NO WATERWAYS, STREAMS, RIVERS, LAKES, RETENTION BASINS OR RESERVOIRS ARE LOCATED IN IMMEDIATE PROXIMITY TO THE PROJECT SITE.
- GENERAL SOIL TYPES WITHIN EACH EXCAVATION AREA ARE DEPICTED HERE-IN.
- THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS REQUIRED FOR THE INTENDED WORK.
- THE CONTRACTOR SHALL PROVIDE MAINTENANCE AND PROTECTION OF VEHICULAR, PUBLIC AND PEDESTRIAN TRAFFIC AT THE ENTRANCE TO THE SITE FOR THE DURATION OF THE INTENDED WORK.
- SOIL BORING AND HISTORIC ANALYTICAL RESULTS (SOIL AND GROUNDWATER) INFORMATION IS AVAILABLE FROM THE ENGINEER.

SURVEY AND MAPPING:

- EXISTING TOPOGRAPHIC FEATURES, BOUNDARY INFORMATION, AND EXISTING UTILITY LOCATIONS TAKEN FROM A TOPOGRAPHIC MAP PREPARED BY BARTOW & KING ENGINEERS, DATED OCTOBER 18, 2005. IT SHOULD BE ASSUMED THAT OTHER UTILITIES MAY EXIST IN WORK AREA. CONTRACTOR IS RESPONSIBLE FOR VERIFYING UTILITY LOCATIONS DURING FIELD WORK. ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH LIKE MATERIAL. ALL COSTS FOR REPAIRS, LOCATING, REMOVING AND REPLACING WITH LIKE MATERIALS TO UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

GENERAL UTILITY:

- PLANS SHOW APPROXIMATE LOCATIONS OF KNOWN UTILITIES ONLY.
- THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY MISS DIG (AT 800-482-7171 OR 811) 72 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- THE CONTRACTOR SHALL COORDINATE ALL WORK AFFECTING UTILITIES WITHIN THE RESPECTIVE UTILITY OWNER. EXTREME CARE SHALL BE TAKEN WHILE WORKING AROUND EXISTING UTILITIES AND ELECTRICAL POWER LINES.
- EXISTING FENCING SHALL BE PROTECTED. IF FENCING REQUIRES REMOVAL FOR EXCAVATION ACTIVITIES, THE FENCING SHALL BE REMOVED AND REPLACED IMMEDIATELY UPON COMPLETION OF CONSTRUCTION ACTIVITIES.

DRAINAGE:

- ALL EXISTING DRAINAGE FACILITIES TO REMAIN SHALL BE MAINTAINED FREE OF DEBRIS AND FOREIGN MATTER AND OPERATIONAL THROUGHOUT THE DURATION OF THE CONTRACT.
- UPON COMPLETION OF THE CONTRACT WORK, ALL PROPOSED DRAINAGE SYSTEMS AND EXISTING DRAINAGE SYSTEMS TO REMAIN WITHIN THE LIMITS OF THIS CONTRACT SHALL BE CLEANED AS REQUIRED TO ATTAIN THEIR FULL FLOW CAPACITIES.

WASTE FILL/SOIL REMOVAL:

- REMOVAL SHALL INCLUDE EXCAVATION OF LEAD OR BTX-IMPACTED MATERIAL AND REPLACEMENT WITH CLEAN BACKFILL MATERIAL TO THE LIMITS SHOWN.
- LONGITUDINAL AND LATITUDINAL COORDINATES FOR THE EXTENT OF IMPACTED SOILS SHALL BE RELATIVE TO LOCAL SOIL BORING OR MONITORING WELL LOCATIONS. THE ENGINEER WILL PROVIDE THE LOCATIONS FOR THE SOIL BORING AND MONITORING WELL LOCATIONS DURING PROJECT KICK-OFF.

RESTORATION OF SURFACES:

- RESTORE AREAS TO EXISTING GRADE.
- CONTRACTOR IS RESPONSIBLE FOR RESTORATION AND MAINTENANCE OF SURFACES AFFECTED BY THIS PROJECT AS OUTLINED IN THE TECHNICAL SPECIFICATIONS.
- ALL AREAS THAT HAVE BEEN DISTURBED SHALL BE TOPSOILED AND SEEDED OR HAVE THE APPROPRIATE SURFACE FINISH AS SHOWN OR SPECIFIED IN THE CONTRACT DRAWINGS OR SPECIFICATIONS.

SYMBOL LEGEND

	IMPACTED SOIL
	AREA TO BE EXCAVATED
	APPROX. LIMITS OF EXCAVATION SIDE WALLS
	APPROX. SOIL CHANGE STRATUM
	UNKNOWN SOIL CHANGE STRATUM
	HISTORIC SOIL BORING LOCATION
	CLEAN OUT
	ELEC. RISER
	FIRE HYDRANT
	ELEC. TRANSFORMER
	GUY ANCHOR
	VENT
	LIGHT POLE
	WATER STOP BOX
	WATER VALVE
	SPEAKER BOX
	POWER POLE
	ROUND CATCH BASIN
	SIGN
	SQUARE CATCH BASIN
	TELEPHONE RISER
	SET IRON
	FOUND IRON
	ELECTRIC
	GAS
	FENCE
	MONITORING WELL
	SURVEYED STM. MANHOLE
	SURVEYED SAN. MANHOLE
	PRIVATE DRAINAGE MANHOLE
	STORM SEWER MANHOLE
	SANITARY SEWER MANHOLE
	PRIVATE DRAINAGE LINE
	STORM SEWER
	SANITARY SEWER
	WATER LINE
 OBG-228	SOIL BORING
 D	SOIL BORING - DELINEATION
 V-164	VAPOR PROBE
 MW-14	MONITORING OR SOIL VAPOR EXTRACTION (SVE) WELL (ACTIVE)
 MW-13	MONITORING WELL (ABANDONED)
	SILT FENCE

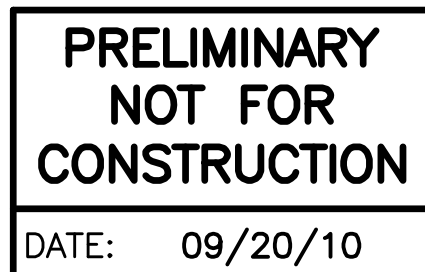
ABBREVIATIONS

CL	SANDY CLAY
E.O.B.	END OF BORING
GM	SILTY GRAVEL
GP	GRAVEL
ML	SANDY SILT
SC	CLAYEY SAND (PEAT)
SM	SILTY SAND
SP	SAND

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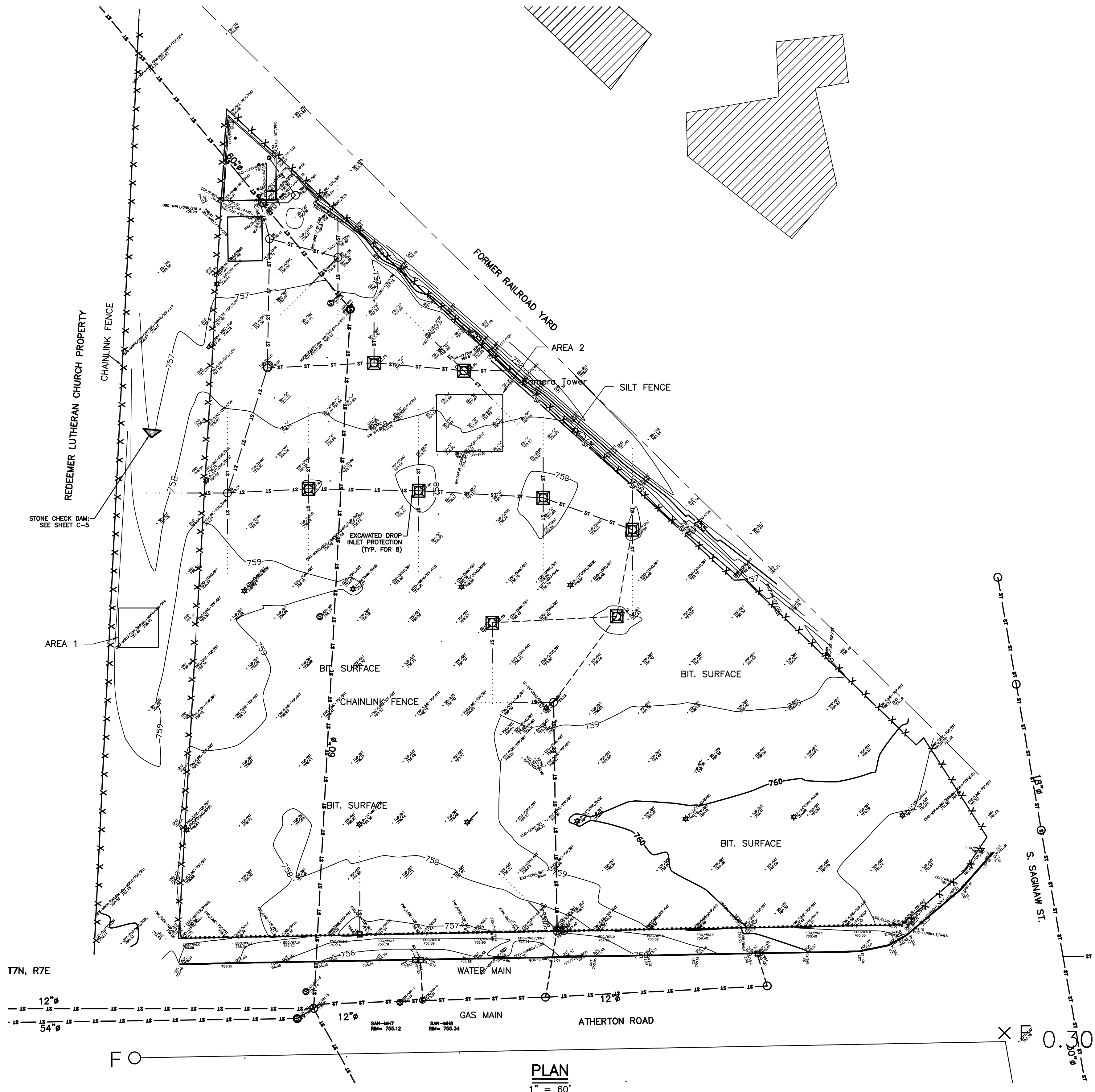
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IN CHARGE OF <u>SCOTT L. CORMIER</u>	NOT TO SCALE					 O'BRIEN & GERE 2010 © O'BRIEN & GERE, INC.	GREAT LAKES TECH CENTER LAND 200 WEST ATHERTON AVE. FLINT, MICHIGAN	GENERAL	FILE NO. 14774.46375-G001	G-1
DESIGNED BY <u>LAT</u> CHECKED BY <u>BJP/MR</u>									DATE	
DRAWN BY <u>LAT</u>		A	9/20/10	CLIENT REVIEW - DRAFT	SLC				SEPTEMBER 2010	
		NO.	DATE	REVISION	INIT.					
GENERAL NOTES, SYMBOLS AND ABBREVIATIONS										



PLAN
1" = 60'

C-1



EROSION AND SEDIMENT CONTROL SEQUENCE OF OPERATIONS:

1. EROSION & SEDIMENT CONTROL FACILITIES SHALL BE INSTALLED IN ACCORDANCE WITH STATE OR LOCAL GUIDELINES.
2. DURING THE LAND DISTURBANCE LIFE OF THIS PROJECT, THE FOLLOWING SEQUENCE FOR THE INSTALLATION OF EROSION AND SEDIMENTATION CONTROLS SHALL BE ADHERED TO:
 - A. CLEARING AND GRUBBING FOR THOSE AREAS NECESSARY FOR INSTALLATION OF PERIMETER CONTROLS.
 - B. CONSTRUCTION OF PERIMETER CONTROLS INCLUDING, BUT NOT NECESSARILY LIMITED TO, THE INSTALLATION AND MAINTENANCE OF SILT FENCING ALONG THE ENTIRE DOWN GRADIENT PERIMETER BEYOND THE OUTER LIMITS OF POTENTIAL SETUP AND WORK AREAS.
 - C. REMAINING CLEARING AND GRUBBING.
 - D. EXCAVATION. PROVIDE TEMPORARY STABILIZATION CONTROLS AS REQUIRED.
 - E. FINAL GRADING.
 - F. RESTORATION OF SURFACES.
 - G. REMOVAL OF PERIMETER CONTROLS.
3. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES MAY INCLUDE SILT FENCES, STONE CHECK DAMS, CATCH BASIN INLET PROTECTION, AND OR OTHER MEASURES AS REQUIRED.
4. SOIL EROSION AND SEDIMENTATION CONTROL MEASURE SHALL PROPERLY INSPECTED, MAINTAINED AND ADEQUATELY FUNCTIONING. ANY EXISTING MEASURES THAT ARE DAMAGED SHALL BE IMMEDIATELY REPAIRED.
5. EXCAVATED MATERIAL SHALL BE PROTECTED FROM EROSION BY USING APPROPRIATE DEVICES OR STABILIZED.
6. TRAPPED SEDIMENT SHALL BE REMOVED FROM THE AREA OF DEPOSITION AND DISPOSED OF AS IMPACTED SURFACE SOIL.
7. AS SOON AS POSSIBLE AFTER DISTURBANCE OF GRADED AREA, SLOPE STABILIZATION THROUGH THE USE OF MULCHES (WOOD CHIPS OR STRAW ANCHORED APPROPRIATELY) OR MATTING SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.

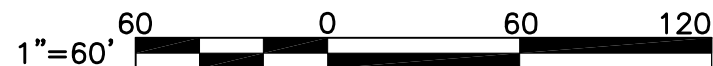
EROSION AND SEDIMENT CONTROL:

1. ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY OF FLINT.
2. DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR TO DETERMINE EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES AND ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
3. EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDED BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
4. EROSION AND SEDIMENTATION CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS FIRST STEP IN CONSTRUCTION. SEDIMENTATION CONTROL PRACTICES SHALL BE APPLIED AS PERIMETER DEFENSE AGAINST ANY TRANSPORT OF SILT OR SOILS OFF THE SITE.
5. CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS REQUIRED AND AS DIRECTED ON THESE PLANS. HE SHALL REMOVE TEMPORARY MEASURE AS SOON AS PERMANENT STABILIZATION OF SLOPES HAVE BEEN ACCOMPLISHED.
6. ALL MUD/DIRT TRACKED ONTO EXISTING CITY/COUNTY ROADS FROM THIS SITE DUE TO CONSTRUCTION SHALL BE REMOVED BY THE CONTRACTOR.
7. ALL MUD/DIRTY TRACED OR SPILLED ON PAVED ROADS/SURFACES WITHIN THE SITE SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
8. ALL ON-SITE AND OFF-SITE AREAS DISTURBED BY CONSTRUCTION SHALL BE REPAIRED TO EQUAL OR BETTER THAN ORIGINAL EXISTING CONDITIONS.
9. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING EXISTING WATER FLOWS DURING WORK ACTIVITIES.
10. IF PRECIPITATION OCCURS DURING WORK ACTIVITIES, CONTRACTOR IS RESPONSIBLE FOR DIVERTING SURFACE WATER FLOWS ONTO THE EXCAVATION AND STAGING AREAS TO PREVENT SOIL EROSION AND MAINTAIN SEDIMENT CONTROL.

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER THIS DOCUMENT.

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IN CHARGE OF	SCOTT L. CORMIER
DESIGNED BY	LAT
CHECKED BY	BJP/MMW
DRAWN BY	LAT



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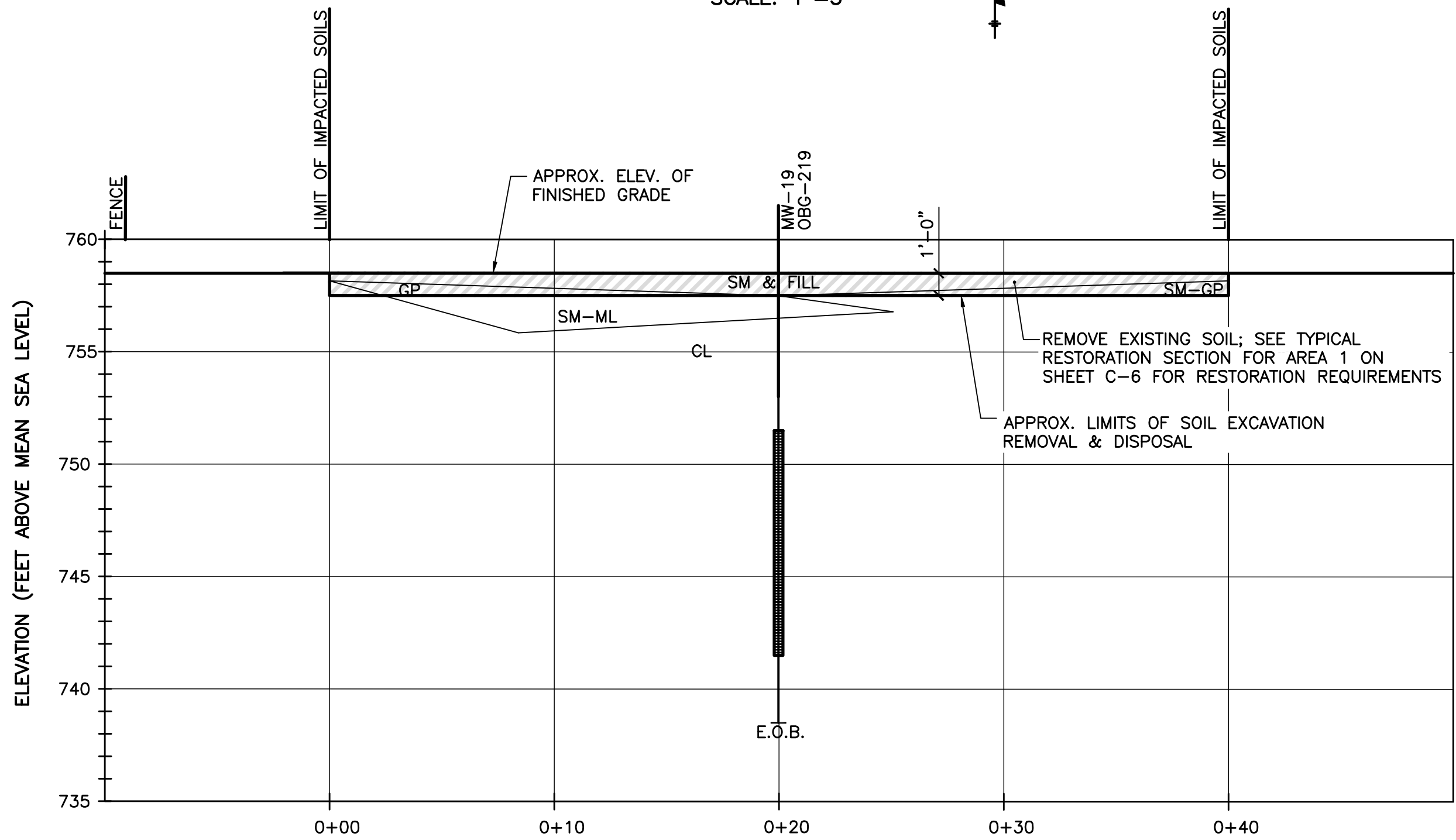
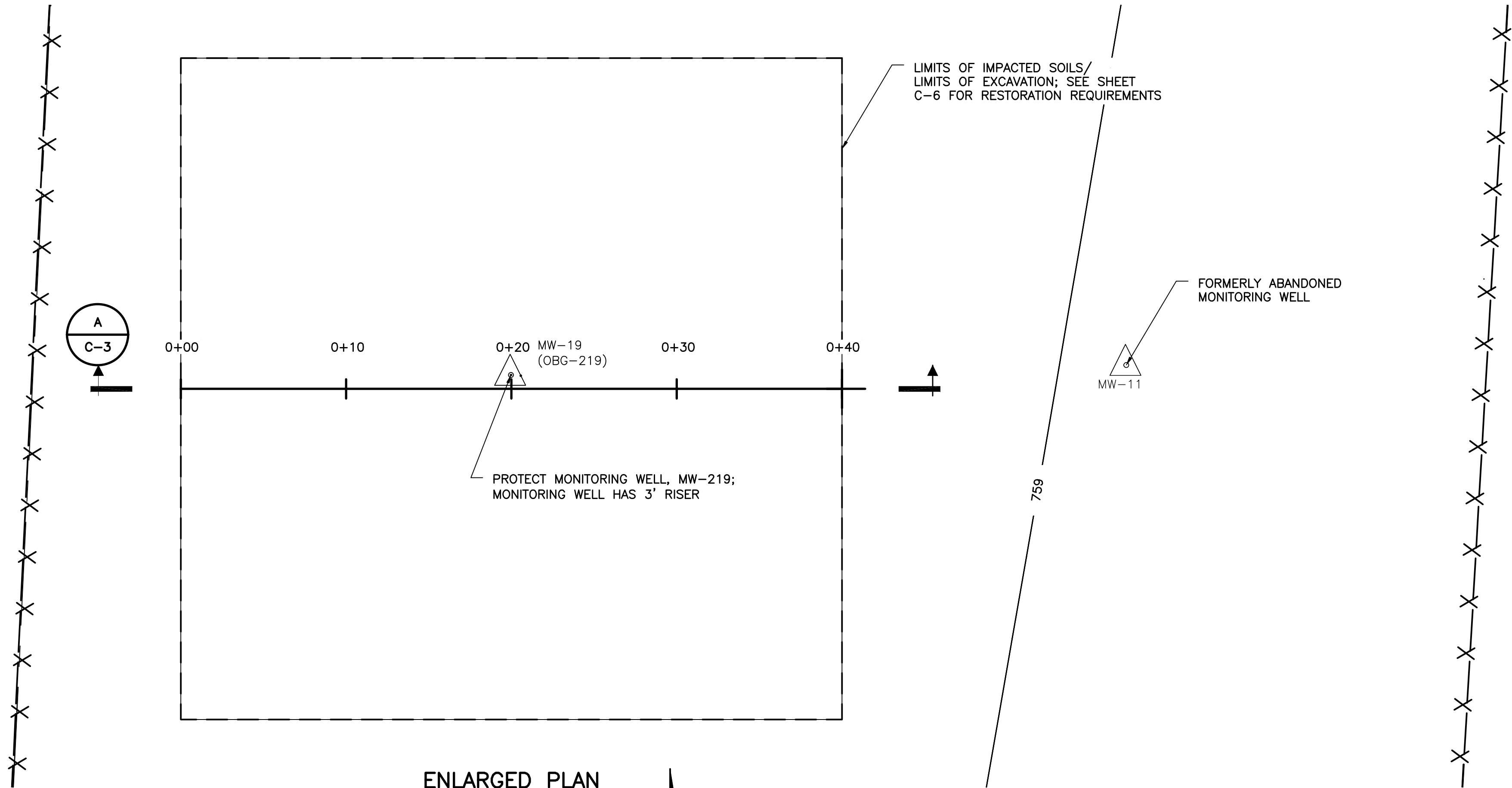


GREAT LAKES TECH CENTER LAND
200 WEST ATHERTON AVE.
FLINT, MICHIGAN

CIVIL
**SOIL EROSION AND
SEDIMENT CONTROL PLAN**

**PRELIMINARY
NOT FOR
CONSTRUCTION**
DATE: 09/20/10

FILE NO.
14774.46375-C002
DATE
SEPTEMBER 2010



- GENERAL NOTES FOR AREA 1:**
- REMEDIAL ACTIVITIES FOR AREA 1 INCLUDES THE REMOVAL OF 1 FOOT OF LEAD-IMPACTED SOIL FROM THE SURFACE OF THE DEPICTED AREA.
 - APPROXIMATE TOTAL IN PLACE QUANTITY OF SOIL TO BE REMOVED IS 60 CUBIC YARDS. THE QUANTITY OF SOIL TO BE REMOVED IS APPROXIMATE. SHOULD ADDITIONAL SOIL BE EXCAVATED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOADING, TRANSPORT, AND DISPOSAL. SEE 'REMEDIAL ACTION WORK PLAN' (DATED SEPTEMBER 2010) FOR ADDITIONAL DETAILS RELATING TO EXTENT OF SOIL REMOVAL.
 - IMPACTED SOIL SHALL BE DISPOSED OF AS REQUIRED BY THE ANALYTICAL RESULTS PROVIDED IN THE BID PACKAGE. THE CONTRACTOR IS RESPONSIBLE FOR WASTE PROFILING IMPACTED SOILS AND TRANSPORTATION IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. WASTE SHALL BE LOADED DIRECTLY INTO HAUL TRUCKS.
 - ON-SITE STORM WATER 'SITE DRAINAGE SYSTEM' COMPONENTS MAY BE CUT AND CAPPED AT THE LIMITS OF THE EXCAVATION. NEW COMPONENTS SHALL BE OF LIKE MATERIAL OF EXISTING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL OTHER EXISTING UTILITIES AS REQUIRED TO PERFORM THE WORK.
 - BACKFILL VOID SPACE FROM IMPACTED-SOILS WITH ENGINEER-APPROVED CERTIFIED CLEAN FILL. CONTRACTOR SHALL PROVIDE THE FOLLOWING INFORMATION PRIOR TO TRANSPORT OF CLEAN FILL ON SITE:
 - THE NAME AND LOCATION OF THE SOURCE OF THE MATERIAL.
 - SAMPLES AND TEST REPORTS OF THE MATERIAL INDICATING THE MATERIAL IS SUITABLE FOR USE AS INERT MATERIAL AS DEFINED BY MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT SOLID WASTE MANAGEMENT RULES (r299.4114) IN PART 115 OF THE NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, 1994 PA 451, AS AMENDED, MCL 324.11501 ET SEQ.
 - ALL FILL SHALL BE PLACED AND COMPACTED TO 95% MODIFIED PROCTOR IN LAYERS NOT TO EXCEED 4 INCHES IN THICKNESS.
 - FILL MATERIAL SHALL BE FREE OF BRUSH, RUBBISH, ROCKS, LOGS, STUMPS, BUILDING DEBRIS AND OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL OBJECTIONABLE MATERIAL IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REQUIREMENTS.

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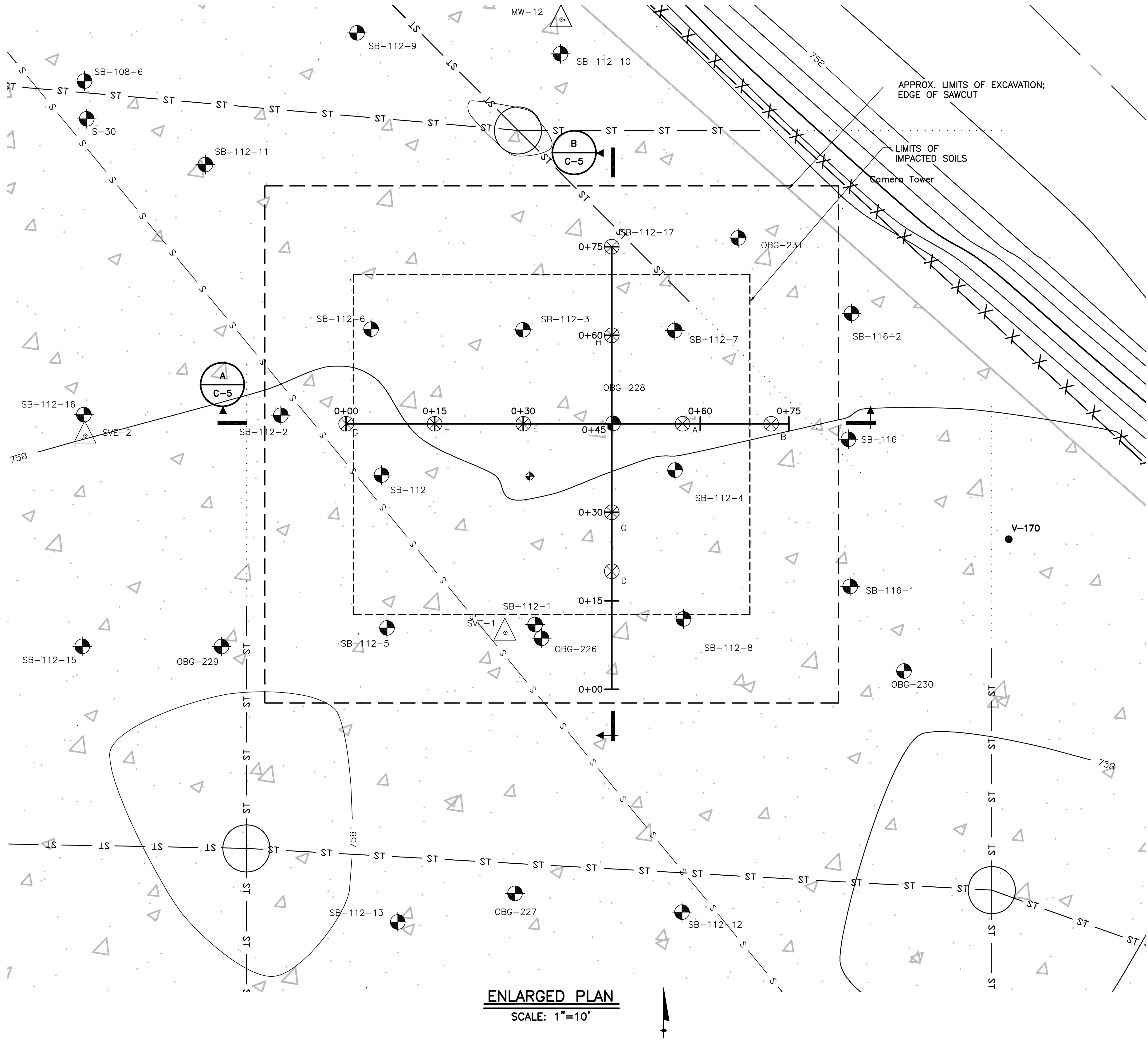
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IN CHARGE OF SCOTT L. CORMIER					GREAT LAKES TECH CENTER LAND 200 WEST ATHERTON AVE. FLINT, MICHIGAN	CIVIL	FILE NO. 14774.46375-C004	C-3		
DESIGNED BY LAT CHECKED BYBJP/MM		A	09/24/10				CLIENT REVIEW -- DRAFT		SLC	DATE SEPTEMBER 2010
DRAWN BY LAT		NO.	DATE				REVISION		INIT.	

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GENERAL NOTES FOR AREA 2:

1. REMEDIATION ACTIVITIES FOR AREA 2 INCLUDES THE REMOVAL OF BTEX-IMPACTED SOIL AND THE SOIL LOCATED 2 FEET ABOVE AND BELOW THE LIMITS OF THE IMPACTED SOIL. APPROXIMATE LIMITS OF THE EXCAVATION AREA ARE DEPICTED.
2. APPROXIMATE TOTAL IN PLACE QUANTITY OF SOIL TO BE REMOVED IS 725 CUBIC YARDS. THE QUANTITY OF SOIL TO BE REMOVED IS APPROXIMATE. SHOULD ADDITIONAL SOIL BE EXCAVATED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOADING, TRANSPORT, AND DISPOSAL. SEE "REMEDIAL ACTION WORK PLAN" (DATED SEPTEMBER 2010) FOR ADDITIONAL DETAILS RELATING TO EXTENT OF SOIL REMOVAL.
3. APPROXIMATE LIMITS OF EXCAVATION ARE DEPICTED. WHERE PRESENTED, LIMITS OF EXCAVATION SHALL BE WITHIN OSHA SIDE-SLOPE REQUIREMENTS FOR THE DEPTH OF EXCAVATION. THE LIMITS OF DEMOLITION SHALL BE TO EDGE OF EXISTING CONCRETE JOINTS AND/OR SAWCUT EDGE.
4. CONCRETE, NON-IMPACTED SOILS, AND IMPACTED SOILS (INCLUDES 2' OF SOIL ABOVE AND BELOW IMPACTED SOILS) SHALL BE SEGREGATED.
5. CONCRETE AND NON-IMPACTED SOIL SHALL BE USED AS BACKFILL. CONCRETE SHALL BE CRUSHED PRIOR TO BACKFILLING. SEE SPECIFICATION SECTION 02220 FOR UNSUITABLE BACKFILL MATERIAL.
6. IMPACTED SOIL SHALL BE DISPOSED OF AS REQUIRED BY THE ANALYTICAL RESULTS PROVIDED IN THE BID PACKAGE. THE CONTRACTOR IS RESPONSIBLE FOR WASTE PROFILING IMPACTED SOILS AND TRANSPORTATION IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. WASTE SHALL BE LOADED DIRECTLY INTO HAUL TRUCKS.
7. BACKFILL VOID SPACE FROM IMPACTED-SOILS WITH ENGINEER-APPROVED CERTIFIED CLEAN FILL OR SELECT FILL (SEE SPECIFICATION SECTION 02230). CERTIFIED CLEAN FILL SHALL, AT A MINIMUM, MEET THE REQUIREMENTS OF SELECT FILL TYPE E. CONTRACTOR SHALL PROVIDE THE FOLLOWING INFORMATION PRIOR TO TRANSPORT OF CLEAN FILL ON SITE:
 - A. THE NAME AND LOCATION OF THE SOURCE OF THE MATERIAL.
 - B. SAMPLES AND TEST REPORTS OF THE MATERIAL INDICATING THE MATERIAL IS SUITABLE FOR USE AS INERT MATERIAL AS DEFINED BY MICHIGAN DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT SOLID WASTE MANAGEMENT RULES (r299.4114) IN PART 115 OF THE NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, 1994 PA 451, AS AMENDED, MCL 324.11501 ET SEQ.
8. ALL FILL SHALL BE PLACED AND COMPACTED TO 95% MODIFIED PROCTOR IN LAYERS NOT TO EXCEED 12 INCHES IN THICKNESS.
9. FILL MATERIAL SHALL BE FREE OF BRUSH, RUBBISH, ROCKS, LOGS, STUMPS, BUILDING DEBRIS AND OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL OBJECTIONABLE MATERIAL IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REQUIREMENTS.
10. ON-SITE STORM WATER "SITE DRAINAGE SYSTEM" COMPONENTS MAY BE CUT AND CAPPED AT THE LIMITS OF THE EXCAVATION. NEW COMPONENTS SHALL BE OF LIKE MATERIAL OF EXISTING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL OTHER EXISTING UTILITIES AS REQUIRED TO PERFORM THE WORK.

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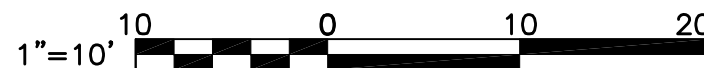
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IN CHARGE OF SCOTT L. CORMIER

DESIGNED BY LAT CHECKED BYBJP/MM

DRAWN BY LAT



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CIVIL

AREA 2 -
REMEDIAL PLAN

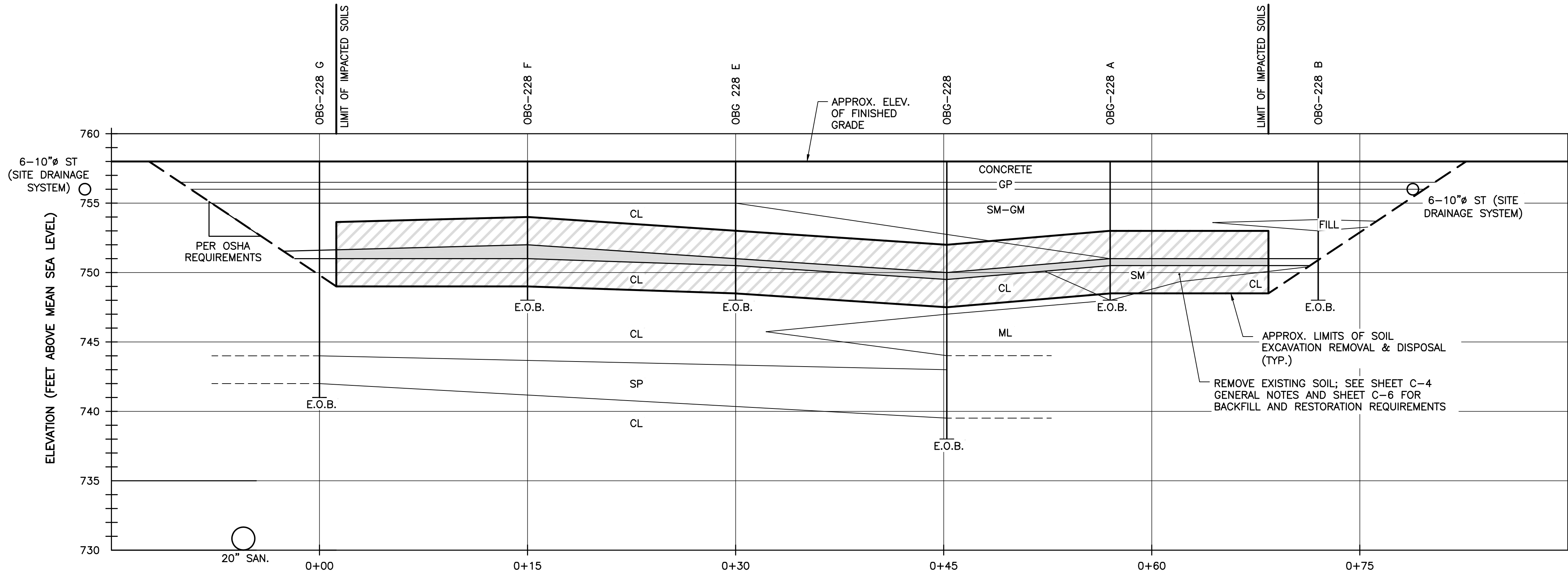
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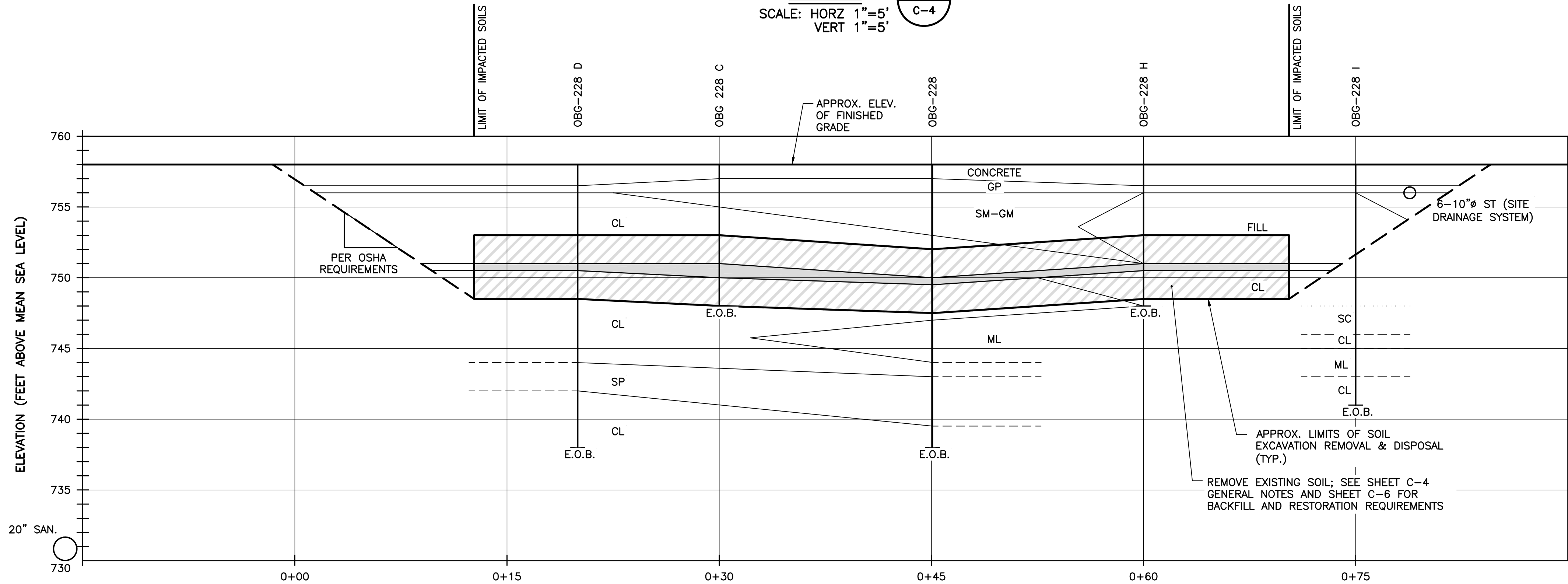
DATE

SEPTEMBER 2010

C-4



SECTION A
SCALE: HORZ 1"=5'
VERT 1"=5'

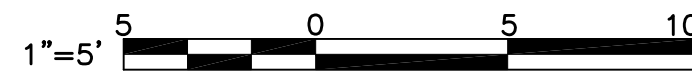


SECTION B
SCALE: HORZ 1"=5'
VERT 1"=5'

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FLINT, MICHIGAN

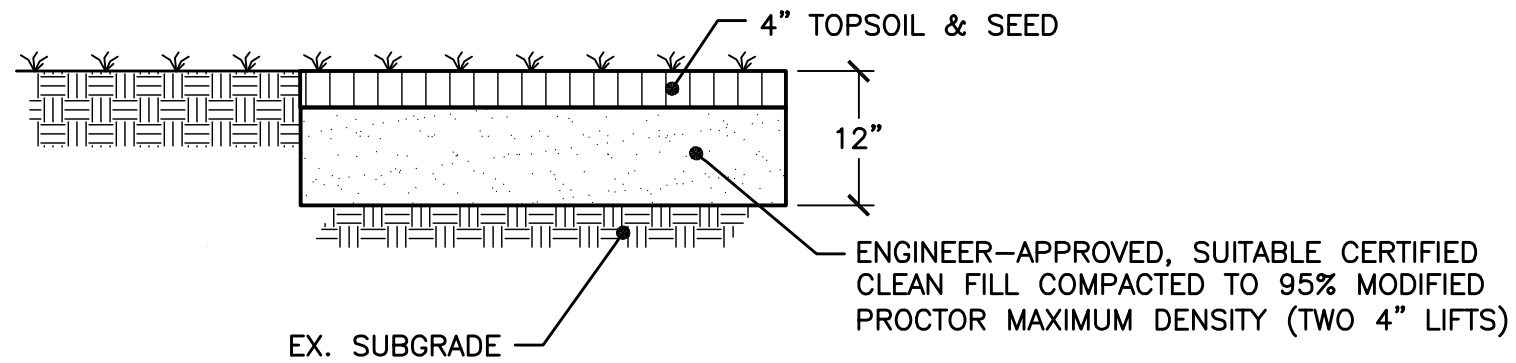
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AREA 2 -
SECTIONS

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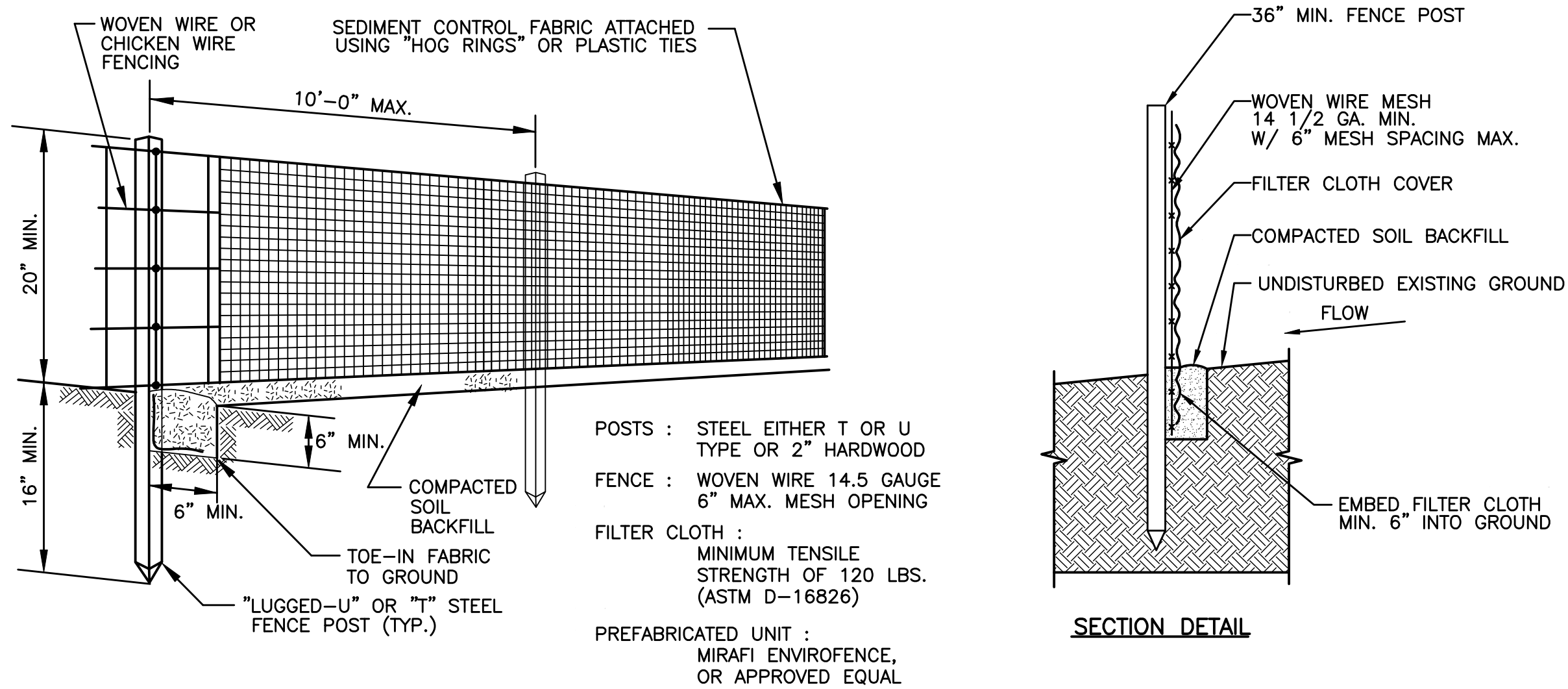


NOTES:

1. EXISTING GRADE TO BE MAINTAINED.

TYPICAL RESTORATION SECTION FOR AREA 1

NOT TO SCALE

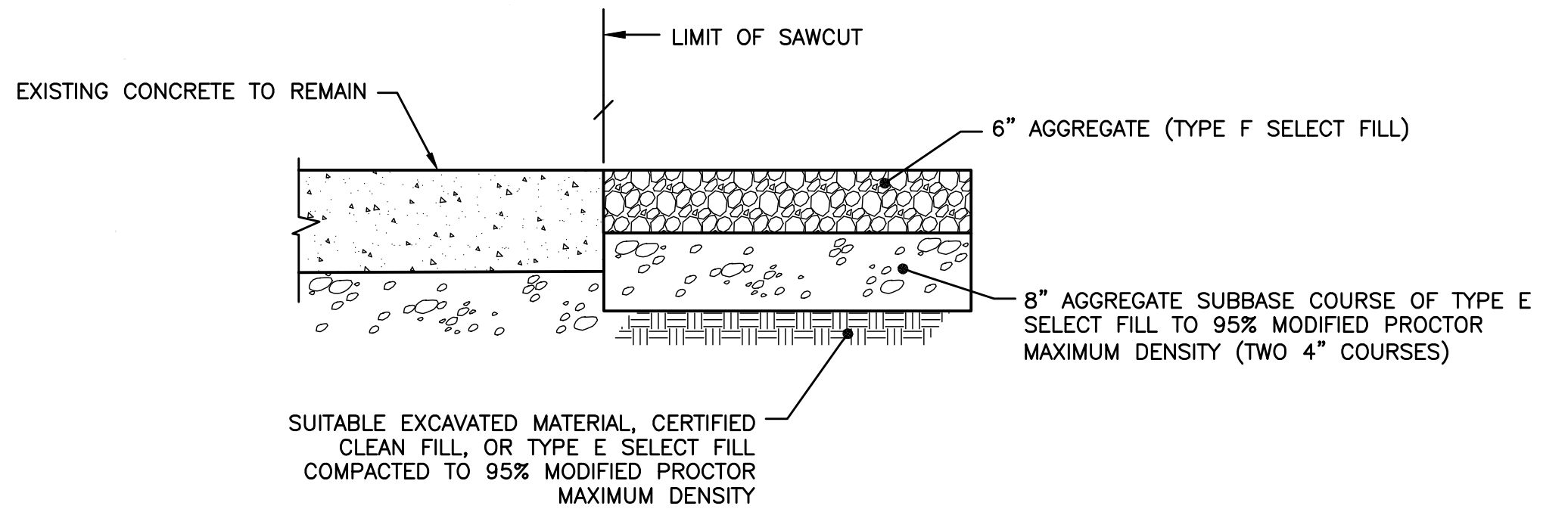


NOTES:

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
5. FENCE TO BE ALIGNED ALONG CONTOUR AS CLOSELY AS POSSIBLE.
6. FILTER FABRIC FENCE MUST BE INSTALLED AT LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST EXTEND AT LEAST 10 FEET UP SLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
7. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.

SILT FENCE DETAIL

NOT TO SCALE

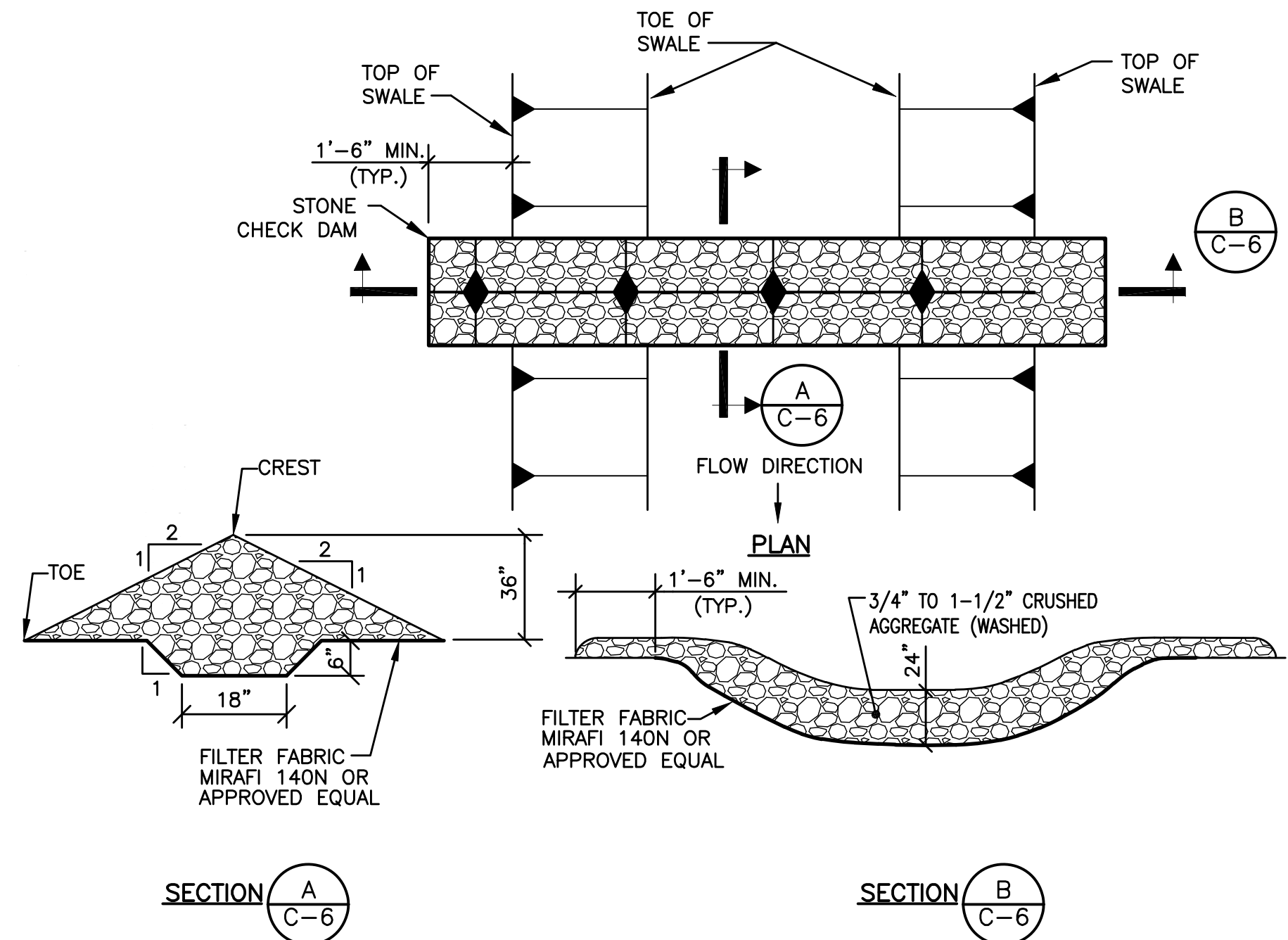


NOTES:

1. SAWCUT AND REMOVE EXISTING CONCRETE TO LIMITS OF EXCAVATION OR WHERE EXISTING PAVEMENT DAMAGE OR UNDERMINING OCCURRED FROM LIMITS OF EXCAVATION TO PROVIDE A STRAIGHT LINE TRANSITION BETWEEN PROPOSED GRAVEL AND EXISTING CONCRETE.
2. EXISTING GRADE TO BE MAINTAINED.

TYPICAL RESTORATION SECTION FOR AREA 2

NOT TO SCALE



NOTES:

1. STONE SHALL BE PLACED ON A FILTER FABRIC FOUNDATION.
2. EXTEND THE STONE A MINIMUM OF 1.5' BEYOND THE SWALE BANKS TO PREVENT CUTTING AROUND THE DAM.

STONE CHECK DAM DETAIL

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DESIGNED BY	LAT
CHECKED BY	BJP/MM
DRAWN BY	LAT

1"=5'

1"=20'

5

0

5

10

20

0

20

40

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