### Interim Report—Preliminary Geotechnical Evaluation

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Twin Cities Army Ammunition Plant Redevelopment Northeast of US Highway 10 and Highway 96 Arden Hills, Minnesota

Prepared for

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Ryan Companies US, Inc.

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October 3, 2007

American Engineering and Testing, Inc. Braun Intertec Corporation October 3, 2007

Ms. Genevieve McJilton Ryan Companies US, Inc. 50 South 10<sup>th</sup> Street, Suite 300 Minneapolis, MN 55403

Re: Interim Report—Preliminary Geotechnical Evaluation Twin Cities Army Ammunition Plant Redevelopment Northeast of US Highway 10 and Highway 96 Arden Hills, Minnesota

Dear Ms. McJilton:

The following is a summary of the geotechnical evaluation being conducted by our firms, American Engineering and Testing, Inc. (AET), and Braun Intertec Corporation (Braun). The purpose of this summary is to inform the design team of the subsurface conditions that we found in our borings on the Twin Cities Army Ammunition Plant (TCAAP) site and to provide preliminary geotechnical analyses and general opinions on the suitability of the subsurface conditions for the proposed development.

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#### **Project Background**

TCAAP covers approximately 2,370 acres. The site is bounded by Lexington Avenue on the east, Interstate Highway 35W and US Highway 10 on the west, Highway 96 on the south, and County Road I on the north.

Prior to 1941, this site was used mainly for agricultural purposes. Construction of the TCAAP facility started in August of 1941 by Federal Cartridge Corporation. The facility operated between 1942 and the mid-1970s. Many of the buildings on this site are currently vacant and several of the original buildings have been completely or partially demolished.

In December of 2006, AET and Braun submitted a joint work plan to conduct a preliminary geotechnical evaluation for the proposed TCAAP redevelopment. The geotechnical evaluation was to be performed together with an environmental investigation lead by Tetra Tech EM, Inc. (Tetra Tech), for whom AET and Braun would also be providing drilling services. As such, three types of investigation sites were defined for this project: (a) environmental investigation sites, (b) geotechnical investigation sites, and (c) combined environmental and geotechnical investigation sites. This summary discusses data obtained from the geotechnical sites and combined environmental and geotechnical investigation.

In preparation for our field exploration, we reviewed available geotechnical publications/reports pertinent to the site and the general area around the site, well logs obtained through the Minnesota Department of Health and historical aerial photographs, and noted geotechnical-related site characteristics during site visits. The information gathered from those preparatory efforts helped determine an appropriate soil boring grid spacing for this preliminary geotechnical evaluation, as well as targeting locations believed to be of significance from a geotechnical perspective; for example, where review of historical aerial photographs indicated previous wetland or swampy areas prior to the construction of TCAAP.

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#### **Proposed Development**

Of the 2,370 acres encompassed by TCAAP, approximately 580 acres is slated for future redevelopment. Actual development will be concentrated in a subset of about 385 acres of the available 580 acres. The proposed development will include retail structures, generally one- to two-stories in height, a corporate campus adjacent to Interstate Highway 35W in the northwestern portion of the site, which may include several multi-story structures, residential structures, recreation areas, such as ball fields and parks, and associated infrastructure and roadways. There will be a designated wildlife corridor in the northeastern portion of the redevelopment area and a designated wetland conservation area within the Rice Creek Watershed (north central portion of redevelopment area).

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The development will be completed in several phases over the next 10 to 15 years. However, it is our understanding that you plan to "rough" grade the entire site prior to the first phase of development.

#### **General Overview of Surficial Geology**

Based on our review of the available geotechnical publications/reports that were made available to us prior to beginning our geotechnical investigation, we understood that the surface soils on this site generally consist of outwash and lacustrine sands, surface fill, with some areas of organic soils and wetlands. The upper soil layers, typically referred to in previous studies as "Unit 1," vary in thicknesses from about 10 to 20 feet. Below the upper soil layers in most areas of the site, there is a cohesive and relatively impervious clay till (Unit 2) that varies in thickness from about 20 to 70 feet. Older glacial outwash and valley fill materials (Unit 3) underlie the till, and extend to depths on the order of 100 to 400 feet, or to the top of bedrock. The depth to bedrock varies considerably across the site. The bedrock in this area generally consists of weathered and fractured dolomite of the Prairie du Chien Group overlying Jordan Sandstone.

Perched groundwater is present above the Unit 2 "aquitard," with hydrostatic groundwater present in the Unit 3 glacial outwash above the bedrock. The bedrock also acts as a separate aquifer.

Review of historic aerial photographs indicates that depressions and wetlands existed throughout the site before TCAAP was first constructed. Many of those depressions and wetlands had been filled during the original development of the TCAAP site. Some of the borings drilled for previous environmental studies indicated buried organic soils, which probably represent buried wetland areas.

#### **Summary of Results**

#### **Summary of Borings**

We drilled a total of 219 Standard Penetration test borings at an approximate nominal grid spacing of 500 lineal feet across the site; the grid spacing varied along the perimeter of the site and in areas believed to be of significance from a geotechnical perspective (e.g., previous wetland areas). The approximate boring locations are shown on Figure 1; Westwood Professional Services surveyed the as-drilled boring locations and shot the ground surface elevations at the borings. The planned depth of most borings was 25 feet. However, several of the borings in the southeastern portion of the site (near Building 502) were extended to depths of 40 feet or more based on planned cuts of more than 15 feet shown on the preliminary grading plan. In addition, two borings in the northwestern portion of the site were drilled to a depth of about 100 feet; this is an area where heavily-loaded buildings are anticipated (i.e., mult-story corporate campus office buildings). We backfilled all borings with bentonite grout.

#### Summary of Soils Encountered

The native mineral soils that we found in our borings were generally consistent with the soils identified by previous investigations on this site. As indicated on the attached Subsurface Boring Log/Log of Boring sheets, we generally found varying thicknesses of topsoil, organic deposits and existing fill, overlying glacial and alluvial deposits consisting predominately of poorly graded sand, silty sand, clayey sand, lean clay, and, to a lesser extent, local deposits of sandy silt and silt. As anticipated, we did not encounter bedrock in any of our borings.

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Table 1 provides a boring-by-boring tabulation of the depths and corresponding bottom elevations of topsoil, organic soils (swamp deposits), existing fill, and soft soils encountered in our borings. The topsoil, organic soils and existing fill have been grouped into a general category called "unsuitable soils" on Table 1, representing the greatest depth of topsoil, organic soil, existing fill, and/or soft soils. The estimated depths to unsuitable soils and corresponding bottom elevations are also presented in plan view on Figure 2, including contours of the estimated bottom elevations.

#### **Groundwater Summary**

Our drillers checked for groundwater in the boreholes as the borings were advanced. Based on our observations during and after drilling, the measured moisture content and apparent moisture condition of samples we collected, and soil properties such as color, we developed the groundwater elevation summary presented in Table 1 and on Figure 3.

#### Summary of Preliminary Geotechnical Recommendations

#### **Building Areas—Spread Footings**

The topsoil, swamp deposits, and soft clay are compressible and, in our opinion, are unsuitable for support of the proposed building structures. The existing fill overlying buried organic soils or existing fill containing organic material and debris are also considered to be unsuitable for support of the proposed buildings. For purposes of this preliminary evaluation, we assume that the unsuitable soils summarized in Table 1 will have to be removed from building areas and replaced with suitable, compacted backfill. More detailed supplemental investigations and evaluations will be required to further assess the horizontal and vertical extent of unsuitable soils on this site. As mentioned previously, Table 1 and Figure 2 present approximate excavation depths to remove unsuitable soils, along with corresponding bottom elevations of the unsuitable soils.

Please note that pending the results of further supplemental evaluations performed after building locations have been determined, it is possible that some of the existing fill might be able to be left in place below buildings, depending on the condition of the existing fill and the type of structure.

After necessary earthwork corrections, we estimate buildings on this site can generally be supported on typical concrete spread footings sized for the net allowable bearing capacities presented in Table 2 below.

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Soil Type	Soil Classification	Typical Range of Net Allowable Bearing Pressures (psf)	Typical Ground Improvement to Achieve Higher Limit of Bearing Capacities
Granular Glacial Deposits	SM, SP, <u>SP-SM</u>	2,000 to 4,000	Surface compaction of footing subgrades
Cohesive Glacial Deposits	SC, CL	2,000 to 3,000	Local subexcavation and replacement with aggregate
Granular Lacustrine Deposits	SM, SP, SP-SM	2,000 to 4,000	Surface compaction of footing subgrades
Cohesive Lacustrine Deposits	CL, ML	2,000 to 2,500	Local subexcavation and replacement with aggregate

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Supplemental field explorations with pressuremeter testing and/or CPT soundings could be used to evaluate the feasibility of allowable bearing capacities higher than those summarized above.

#### **Building Areas—Pile Supported**

In the northwestern portion of the site, where heavily loaded office buildings are planned, it might be economical to support those buildings on deep foundations, depending on the structural loads and settlement tolerances of those buildings. Assuming that deep foundations would consist of commonly available 9 5/8-inch or 12 3/4-inch driven steel pipe pile extended to depths on the order of about 90 to 100 feet, we estimate that working capacities ranging from about 50 to 100 tons could be achieved in the northwestern portion of the site, based on data collected from our soil borings.

#### **Parking and Roadway Areas**

#### **Swamp Deposits and Topsoil**

It is our opinion that the swamp deposits encountered on this site are generally unsuitable for direct support of pavements. We recommend removing the organic soils from the upper 5 to 10 feet of pavement subgrades, and replacing them with suitable, compacted backfill. Provided that the surface vegetation and heavy root zone are removed, it is likely that low-organic topsoil materials could be left in place at depths of 3 feet or more below pavement subgrade elevations.

#### **Existing Fill and Native Mineral Soils**

Based on the results of our Standard Penetration tests, the existing fill and native mineral soils are, in our opinion, generally suitable for support of parking lots and roadways provided that pavement subgrades are adequately improved prior to placing pavement materials. We estimate that subgrade improvement methods would range from surface compaction of loose granular soils to subexcavation-and-replacement of soft clayey/silty soils to depths of 2 to 3 feet below proposed pavement subgrade elevations.

#### Preliminary Recommended Pavement Sections

For preliminary planning purposes, we estimate that regular-duty pavement sections, those supporting typical automobile traffic, would typically consist of 3 1/2 to 4 1/2 inches of bituminous over about 6 to 8 inches of aggregate base course. For heavy-duty pavement areas, we estimate that pavement sections will typically consist of 4 to 5 inches of bituminous over 8 to 12 inches of aggregate base course.

For concrete pavements placed over at least 6 inches of aggregate base course, concrete thicknesses will likely range from about 5 inches for regular-duty pavements to 7 inches for heavy-duty pavements.

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Utility Support

#### **Swamp Deposits**

To the extent possible, we recommend routing utilities around swamp deposits. In the event that utilities will run through highly organic swamp deposits, utilities might have to be supported on deep foundations or utility subgrades will have to be corrected (i.e., swamp deposits removed and replaced with new compacted fill), especially if the grade is raised over the utility alignment. In the areas of buried organic soils where the grade will not be raised along the utility alignment, it might be possible to "float" the utilities across the swamp deposits; this would require additional further evaluation. Please note that the organic soils should be considered corrosive to metallic pipe, and all utility pipe material subject to corrosion should be cathodically protected or wrapped with polyethylene sleeves.

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#### **Existing Fill and Native Mineral Soils**

In our opinion, the existing fill and native mineral soils are generally suitable for support of utilities (sanitary sewer, watermain and storm water pipes and associated manholes). Where the utility subgrade consists of clay or silt, granular pipe bedding could be required depending on the size and type of pipe. For larger utility structures, such as lift stations and pump houses, we recommend further geotechnical evaluation on a structure-by-structure basis.

#### **Reuse of On-site Materials and Compaction**

Please note that comments on the reuse of on-site materials as fill are based on geotechnical considerations only. Environmental conditions could also dictate the reuse of on-site materials, as on-site material planned for reuse as fill will be evaluated with respect to plans approved by the United States Environmental Protection Agency (EPA) and the Minnesota Pollution Control Agency (MPCA).

#### **Building Areas**

Materials having an organic content of no more than 3 percent are generally considered suitable for reuse as structural fill and backfill in building areas. You should anticipate that buildings exerting higher bearing pressures will require the use of relatively clean sand as fill below footings.

You should anticipate that most on-site borrow material will have to be moisture conditioned to nearoptimum levels prior to compaction. Please note that soils classified as clayey sand, lean clay, silty sand and silt, and some fine-grained clean sand, will be difficult to compact if wet.

#### **Pavement Areas**

It is our opinion that you could consider placing soils with organic contents between 3 and 7 percent at depths greater than 3 feet below pavement subgrades as long as the overall thickness of this slightly organic material is limited to less than about 4 to 8 feet.

Within the upper 3 feet of pavement subgrades, the soils should consist of mineral soils with an organic content less than 3 percent.

#### **Recycled Material**

If you consider using demolition spoils as recycled aggregate base course or as haul road materials, we recommend that the recycled materials consist of crushed concrete and bituminous. We recommend that the use of recycled aggregate containing bituminous be limited to pavement areas only.

#### Dewatering

Based on the conditions we found in our borings, construction dewatering will be required during the excavation of unsuitable soils in building pad areas, and during excavation of deeper underground utilities such as sanitary sewer. It is our opinion that pumping from open sump pits would be effective as the dewatering method where the excavation terminates in clayey soils. Where the excavation terminates in granular soils, the contractor will likely have to use well points and/or wells, plus pumping from screened sumps at the excavation base ("mop-up sumps").

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Environmental conditions could dictate the discharge and/or disposal of pumped groundwater, and all dewatering plans should be evaluated with respect to plans approved by the EPA and the MPCA.

#### Remarks

This report is for the exclusive use of the parties to which it has been addressed. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses and recommendations may not be appropriate for other parties or projects.

The conclusions contained in this report represent our professional opinions. American Engineering and Testing, Inc., and Braun Intertec Corporation endeavored to perform the engineering services for this project in a manner consistent with that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality under similar budgetary and time constraints. No warranty, express or implied, is made.

If you have any questions regarding this report, please contact Tom Venema at 952.361.3781 or Bob Janssen at 651.487.7017.

Sincerely,

Prepared By:

Chad A. Underwood, PE, PG<sup>2</sup> American Engineering and Testing, Inc. Senior Geotechnical Engineer

Reviewed By:

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Thomas P. Venema, PE American Engineering and Testing, Inc. Principal Engineer

Attachments: Table 1 Figure 1 Figure 2 Figure 3 Subsurface Boring Log/Log of Boring Sheets Prepared By:

Joel C./Kurpius, PÉ

Braun Intertec Corporation Project Engineer

Reviewed By: Robert J. Jansson ΈF

Robert J. Janssen, PE Braun Intertec Corporation Principal Engineer

Table 1

	-T			Topsoil / C	Oros	ainic Soils		Existin	na Fill	Soft Clay	s and	d Silts	Unsui	table	Soil					undwa			
Boring		Surface	F	Approximate Depth		Estimated Bottom	1	Approximate Depth	Estimated Bottom Elevation	Approximate Depth (ft)	E	Estimated Bottom Elevation	proximate Depth (ft)		Estimated Bottom Elevation		Measured Depth (ft)	G	Measured roundwate Elevation		Estimated Depth (ft)		Estimated Elevation
Number ST-1 ST-2 ST-3		Elevation 908.1 901.3 902.4		(ft) 0.5 0.5 0.5		Elevation 907 900 901		(ft)	Elevation	(1)			0.5 0.5 0.5		907 900 901		23.0		879		23.0 23.0		879 880
ST-11	I	901.0		0.5	İ	900	1	l	I	1	1		 0.5	ł	900	I	24.4	l	877		24.4	-	877
ST-19 ST-20 ST-21		898.1 900.8 900.6		1 0.5 0.5		897 900 900							1.0 0.5 0.5		897 900 900		18.0 22.0 24.0		881 879 877		18.0 22.0 24.0	-	881 879 877
ST-25 ST-26 ST-27		895.9 896.2 893.3		1 0.5 1		894 895 892							1.0 0.5 1.0		894 895 892		17.0 19.0 12.0		879 878 882		17.0 19.0 12.0		879 878 882
ST-31 ST-32 ST-33 ST-34 ST-35		892.9 893.5 895.7 894.3 896.0		0.5 1 1 0.5		892 892 894 893 895							0.5 1.0 1.0 1.0 0.5		892 892 894 893 895		11.0 13.0 14.0 14.0 16.0		882 881 882 881 881		11.0 13.0 14.0 14.0 16.0		882 881 882 881 881
ST-40 ST-41	1	893.7 892.5		0.5 0.7	ļ	893 891							0.5 0.7		893 891		13.0 12.0		881 881		13.0 12.0		881 881

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### Table 1

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		Topsoil / Or	gainic Soils	Existin	na Fill	Soft Clays	and Silts	Unsuita	ble Soil	· · · · · · · · · · · · · · · · · · ·	Ground		
			Estimated	Approximate	Estimated	Approximate	Estimated	Approximate	Estimated	Measured	Measured	Estimated	
<b>D</b> .	0	Approximate	Bottom	Depth	Bottom	Depth	Bottom	Depth	Bottom	Depth	Groundwater	Depth	Estimated
Boring	Surface	Depth		(ft)	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation
Number	Elevation	(ft)	Elevation		876			11.5	873	10.1	876	10.1	876
ST-42	885.3	11.5	873	9	886			4.0	886	6.8	884	7.0	884
ST-43	890.2			4	886			2.0	886			7.0	882
ST-44	888.6			2				8.5	883	6.5	886	7.0	886
ST-45	892.4			8.5	883			22.0	873	11.0	885	11.0	885
ST-46	895.4	22	873	12	883			4.0	889	14.4	879	11.5	882
ST-47	893.3			4	889			1.5	889	11.0	880	11.0	880
ST-48	890.9			1.5	889			12.0	870	11.0	872	11.0	872
ST-50	882.8	12	870	7	875			1	869	9.0	873	9.0	873
ST-51	881.2	12	869	7	874			12.0		10.9	876	10.9	876
ST-52	885.9			12	873			12.0	873	i i i i i i i i i i i i i i i i i i i	876	10.3	876
ST-53	885.5			7	878			7.0	878	10.3	889	4.5	885
ST-54	888.9			4.5	884	6	882	6.0	882	0.0		9.5	883
ST-55	892.4			2	890			2.0	890	0.0	893		872
ST-57	893.6	23.5	870	22	871			23.5	870	22.5	872	22.0	873
ST-59	884.4	12	872	11	873			12.0	872	12.1	873	12.1	
ST-60	883.9	16.5	867	14	869			16.5	867	8.0	876	8.0	876
ST-61	885.9	8	877	7	878			8.0	877	9.4	877	9.4	877
ST-62	884.3	14	870	12	872			14.0	870	12.0	873	12.0	873
ST-62 ST-63	886.1	, · ·		9	877			9.0	877	14.0	873	14.0	873
		10.5	872	9	874			10.5	872	10.2	874	10.2	874
ST-64	883.5	10.5	012	2.5	883			2.5	883	10.0	877	10.0	877
ST-65	886.2			2.0	886			2.0	886	10.0	879	10.0	879
ST-66	888.9			3	885			3.0	885	6.0	883	6.0	883
ST-67	888.7		0.05		887			9.0	885	5.2	890	5.2	890
ST-68	895.0	9	885		893			1.0	893	4.0	891	4.0	891
ST-69	894.8				093			1.5	883	7.0	878	7.0	878
ST-70	885.0	1.5	883	4.5	005			1.5	885	7.0	881	7.0	881
ST-71	887.3			1.5	885			7.0	880	4.8	883	4.8	883
ST-72	887.4		1		880			6.5	884	9.0	883	9.0	883
ST-73	891.3	6.5	884	4	887				886	6.4	886	6.4	886
ST-74	891.8			5	886			5.0	894	4.3	895	4.3	895
ST-75	898.8			4	894		1	4.0	1	4.5	0000	14.0	893
ST-76	907.0			7	899			7.0	899	11.0	882	11.0	882
ST-77	892.4			7	885			7.0	885	11.0	873	7.0	880
ST-78	886.1	14	872	7	879			14.0	872	14.0	882	7.0	882
ST-79	888.9	0.5	888		· ·			0.5	888	7.0	002	12.0	880
ST-80	891.1		1	2	889	1		2.0	889				886
ST-81	895.1	1	894		1	1		1.0	894			9.5	885
ST-82	898.6	8.5	890	7	891			8.5	890			14.5	
ST-83	903.0			4.5	898			4.5	898	ļ		9.5	894
ST-84	911.0	1		4.5	906			4.5	906	1		12.0	900
ST-85	892.1			2	890	7	885	7.0	885			9.5	883

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#### Table 1

		Topsoil / Or	aginic Soils	Existir	na Fill	Soft Clays	and Silts	Unsuita	ble Soil		Ground		
			Estimated	Approximate	Estimated	Approximate	Estimated	Approximate	Estimated	Measured	Measured	Estimated	
<b>n</b> .	Quefess	Approximate	Bottom	Depth	Bottom	Depth	Bottom	Depth	Bottom	Depth	Groundwater	Depth	Estimated
Boring	Surface	Depth	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation
Number	Elevation	(ft)		(10)	Lievadon		Lioranon	0.5	896	8.1	889	8.1	889
ST-86	897.0	0.5	896		896			2.0	896			12.0	887
ST-87	898.3			2	883			6.0	883	8.0	882	8.0	882
ST-88	889.7			6	883			7.0	883	7.0	884	7.0	884
ST-89	890.4			7	000			2.0	888	6.0	885	6.0	885
ST-90	891.0	2	888		004			13.5	879	12.0	882	12.0	882
ST-91	893.1	13.5	879	8.5	884			7.0	891			18.0	881
ST-92	898.4	7	891	2	896			3.5	897			18.0	884
ST-93	901.2			3.5	897			3.0	919			18.0	905
ST-94	922.9	3	919					9.0	914	13.0	911	13.0	911
ST-95	924.0	9	914	7	916				883	9.0	884	9.0	884
ST-96	892.3	9	883	4	888			9.0		6.1	885	6.1	885
ST-97	891.0			2.5	888			2.5	888		885	8.0	885
ST-98	892.3	9	883	7	885			9.0	883	8.0	881	12.0	881
ST-99	892.8	18	874	12	880	22	870	22.0	870	12.0	887	9.0	887
ST-100	895.7	9	886	6	889			9.0	886	9.0	1	7.0	891
ST-101	897.9	7	890	4.5	893	11	886	11.0	886	10.4	888		896
ST-102	902.2			7	895			7.0	895			7.0	907
ST-102	924.9			4	920			4.0	920			18.0	
ST-103	934.9	12	922	7	927			12.0	. 922			23.0	912
ST-104 ST-105	899.1			7	892			7.0	892	9.0	891	9.0	891
ST-105 ST-106	903.4	7	896	5	898			7.0	896	12.2	892	12.2	892
	903.4		901	Ť				1.0	901	12.1	891	12.1	891
ST-107	1 C		001	4	902			4.0	902	12.5	895	12.5	895
ST-108	906.6			7	897			7.0	897			12.0	893
ST-109	904.5		912	1 '			1	1.0	912			9.0	905
ST-110	913.2		912	4	918			4.0	918			14.0	909
ST-111	922.1			4	935			1.0	935				
ST-112	936.8		000	1	900			2.3	939				
ST-113	941.8	2.3	939	0.5	910	5	908	5.0	908	5.2	908	5.2	908
ST-114	913.1	4.5	908	2.5			000	4.5	903			12.0	897
ST-115	908.2			4.5	903			0.5	912			9.5	904
ST-116	913.0			0.5	912			2.5	911	3.6	911	9.5	905
ST-117	914.4			2.5	911	1		14.0	900	6.0	909	6.0	909
ST-118	914.9	14	900	_			1		920	0.0		22.0	908
ST-119	929.7			9	920			9.0	940				
ST-120	940.8	0.5	940					0.5	932				
ST-121	944.6			4	940	12	932	12.0					
ST-122	959.5			2	957	7	952	7.0	952	25.0	889	25.0	889
ST-123	913.4			6	907			6.0	907	20.0	009	14.0	910
ST-124	923.8	14	909	9	914			14.0	909		1	14.0	1 310
ST-125	932.7			9.5	923			9.5	923	40.0	0.45	12.0	945
ST-126	957.0	12	944	7	949			12.0	944	12.0	945	1 12.0	945

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### Twin Cities Army Ammunition Plant (TCAAP) Redevelopment Northeast of Highway 96 and US Highway 10

Arden Hills, Minnesota

#### Table 1

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I		Topsoil / Or	gainic Soils	Existi	ng Fill	Soft Clays	and Silts	Unsuita		
<u> </u>		Approximate	Estimated	Approximate	Estimated	Approximate	Estimated	Approximate	Estimated	Measured
Boring	Surface	Depth	Bottom	Depth	Bottom	Depth	Bottom	Depth	Bottom	Depth
Number	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)
ST-127	952.8	(19		6	946	12	940	12.0	940	
ST-128	954.1			7	947	12	942	12.0	942	
ST-120	915.9			4.5	911			4.5	911	
ST-130	915.1			7	908		-	7.0	908	
ST-130	926.9			9.5	917			9.5	917	
ST-132	936.0			3	933			3.0	933	
ST-132	945.0			12	932	18	926	18.0	926	
ST-135 ST-134	949.0			7	942	12	937	12.0	937	24.0
ST-134 ST-135	950.5			4.5	946			4.5	946	
ST-135 ST-136	956.7	9	947	7	949			9.0	947	
ST-130 ST-137	956.0	9	947	7	949			9.0	947	
ST-137 ST-138	955.9	22	933	14.5	941	26	929	26.0	929	24.3
	951.8	12	939	9.5	942	14.5	937	14.5	937	9.6
ST-139 ST-140	962.9	1	961					1.0	961	
	913.3	1 '		7	906			7.0	906	26.5
ST-141	933.7	19.5	914	15	918			19.5	914	23.7
ST-142	949.9	10.0		4	945			4.0	945	
ST-143	949.9 955.0			4.5	950			4.5	950	
ST-144	955.0			0.5	954			0.5	954	
ST-145	966.0			0.5	965	9	957	9.0	957	
ST-146	958.6	0.5	958					0.5	958	
ST-147	958.0	16	941	6	951		]	16.0	941	7.3
ST-148			0-71	22	968			22.0	968	19.0
ST-149	990.9	7	919	4.5	922		1	7.0	919	ļ
ST-150	927.0	1 '	515	2	920			2.0	920	5.1
ST-151	922.3			12	929			12.0	929	12.3
ST-152	942.0			4.5	946	7	944	7.0	944	
ST-153	951.2			16	940			16.0	940	
ST-154	956.7							0.0		
ST-155	959.9							0.0		
ST-156	959.8			14	981			14.0	981	
ST-157	995.9			21.5	934			21.5	934	
ST-158	955.5			25	934			25.0	934	18.0
ST-159	959.4	0.5	911	7	913	12	908	12.0	908	11.8
ST-160	920.2	8.5	911	4.5	922			4.5	922	
ST-161	926.7			1	955			1.0	955	
ST-162	956.7	47	932	14.5	934		1	17.0	932	
ST-163	949.2	17	932	2	949			2.0	949	
ST-164	951.0			2	951			2.0	951	
ST-165	953.1			2	952			2.0	952	21.2
ST-166	955.0			4.5	940	12	932	12.0	932	21.2
ST-167	945.0	<u> </u>	<u> </u>	4.0		,***				

Groundwater Measured Estimated Depth Estimated Groundwater Elevation (ft) Elevation 935 18.0 11.5 905 902 14.0 909 18.0 926 24.0 926 942 932 14.5 943 9.5 943 896 18.0 887 919 15.0 910 951 951 7.3 972 19.0 972 918 918 5.1 930 930 12.3 23.0 929 22.0 934 942 942 18.0 909 11.8 909 909 18.0 17.0 933 929 23.0

21.2

21.2

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### Table 1

·····		Topsoil / Or	mainic Soils	Existin	na Fill	Soft Clays	and Silts	Unsuita	ble Soil		Ground		
			Estimated	Approximate	Estimated	Approximate	Estimated	Approximate	Estimated	Measured	Measured	Estimated	
	0.4.4.4	Approximate Depth	Bottom	Depth	Bottom	Depth	Bottom	Depth	Bottom	Depth	Groundwater	Depth	Estimated
Boring	Surface	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation
imber	Elevation	(10)	CIEVALION	3	944			3.0	944				
-168	947.2	10.5	935	10.5	937			12.5	935			12.5	936
-169	948.1	12.5	937	10.5	939			12.0	937	12.6	938	12.6	938
T-170	949.7	12		9.5	905			12.0	903	8.6	907	8.6	907
T-171	915.0	12	903	9.5	918	24	901	24.0	901	6.0	920	6.0	920
T-172	925.1	17	908	'	910	24	001	1.0	941				943
T-173	942.9	1	941		940			4.0	940				945
T-174	944.9			4	945			3.0	945	15.1	934	15.1	934
T-175	948.1			3				12.5	938			16.0	936
Г-176	951.0	12.5	938	10	941			14.5	939				
°-177	953.6	14.5	939	13	940			10.0	938			18.0	931
Г-178	948.4	10	938	9.5	938			0.5	928			14.0	916
r-179	929.3	0.5	928					1.0	934			12.0	924
Г-180	935.9	1	934						933				
Г-181	935.0	1	933					1.0	933		1		
Г-182	941.8	0.5	941					0.5		18.0	916	18.0	916
T-183	933.7	0.5	933					0.5	933	10.0	310	12.0	931
-184	942.1			4.5	937			4.5	937			12.0	
-185	901.0							0.0	900			14.0	912
Г-186	925.2	9	916	7	918			9.0	916			12.0	903
Г-187	914.2	1	913					1.0	913	10.0	916	19.0	916
T-188	934.5			4	930			4.0	930	19.0	910	19.0	1 510
T-189	952.2	0.7	951					0.7	951				
T-190	952.8			2	950			2.0	950				
T-191	956.3			4	952			4.0	952				
T-192	959.1							0.0	959				
T-192	961.9			4	957			4.0	957				
T-195	942.2			4.5	937	9	933	9.0	933			100	000
T-195	943.4			7	936	12	931	12.0	931	18.0	926	18.0	926
T-190 T-197	944.3	9	935	7	937	18	926	18.0	926	9.0	936	9.0	936
T-197 T-198	944.3	19	925	14	930	22	922	22.0	922			19.0	926
	944.4	10	020	7	937	Í		7.0	937				
T-199				14	935	22	927	22.0	927	20.0	930	20.0	930
T-200	949.2			4.5	952			4.5	952				
T-201	956.8			2.5	952			2.5	952				
T-202	955.0			4.5	949			4.5	949				
T-203	954.4			4.5	949			18.0	920				
T-204	938.6				932		1	4.5	932	1			
T-205	937.1			4.5	932			4.0	912			12.0	905
ST-206	916.0			4.0				4.5	904			9.0	900
ST-207	908.5			4.5	904			4.5	909			12.0	903
ST-208	914.5			4.5	909			7.0	885	9.1	884	9.1	884
ST-209	892.8			7.0	885	1		1.0				-m/m-	

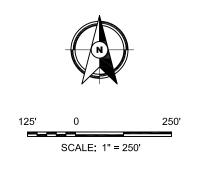
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### Table 1

	<b>F</b>	Tanasil/Or	nainia Saila	Existi	na Fill	Soft Clays	and Silts	Unsuita	ble Soil		Ground	dwater	
Boring	Surface	Topsoil / Or Approximate Depth	Estimated Bottom	Approximate Depth	Estimated Bottom	Approximate Depth	Estimated Bottom	Approximate Depth	Estimated Bottom	Measured Depth	Measured Groundwater	Estimated Depth	Estimated Elevation
Number	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation	(ft)	Elevation	(ft) 12.0	887
ST-210	898.8	6.0	892	4.5	894			6.0	892 883	7.6	885	7.6	885
ST-211	892.3			8.5	883			8.5 13.0	882	7.3	888	7.3	888
ST-212	895.1	13.0	882	9.5	885 884			5.5	884	7.1	884	7.1	884
ST-213	890.2		890	5.5 9.5	875			9.5	875	12.7	873	12.7	873
ST-214	884.9	44.0	884 883	9.0	885			11.0	883	9.3	886	9.3	886
ST-215	894.5	11.0 13.5	881	11.5	883			13.5	881			13.5	882
ST-216 ST-217	895.0 889.3	1.0	888	11.0	889			1.0	888	3.3	887	3.0	887 874
ST-217 ST-218	885.7	1.0	885	7.0	878			7.0	878	150	077	12.0 15.0	874
ST-219	891.3	1.0	890		891		-	1.0	890	15.0 17.8	877 880	17.8	880
ST-220	897.0	2.0	894		896			2.0	894 897	18.3	881	18.3	881
ST-221	899.0	2.0	897		899			2.0 9.5	889	18.9	880	18.9	880
ST-222	898.6		898	9.5	889			9.5	898	28.9	880	28.9	880
ST-223	908.4		908	9.5	898 934			6.0	932				
ST-224	938.6	6.0	932	4.0	934	<u></u>	L	0.0		L		·	

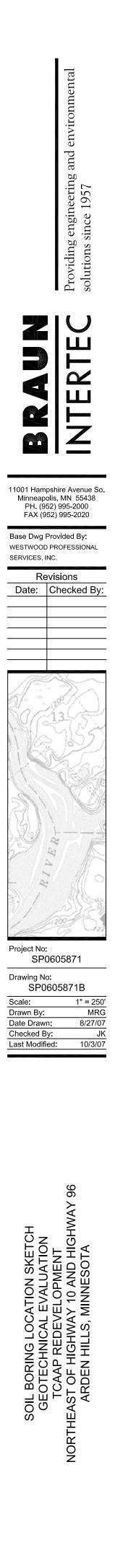
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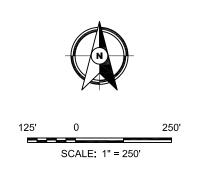
DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING





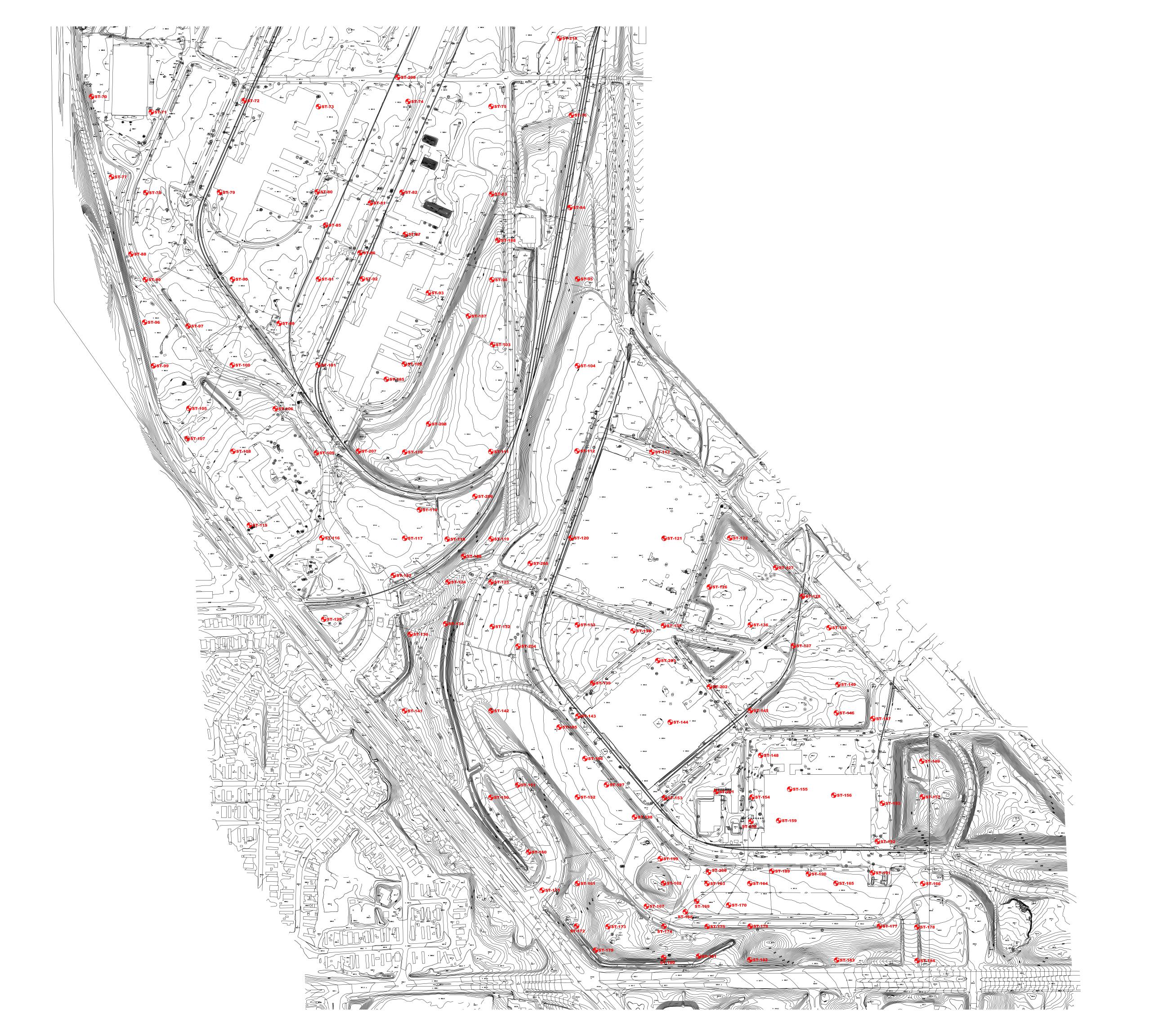


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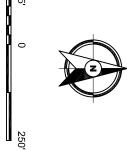


DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING











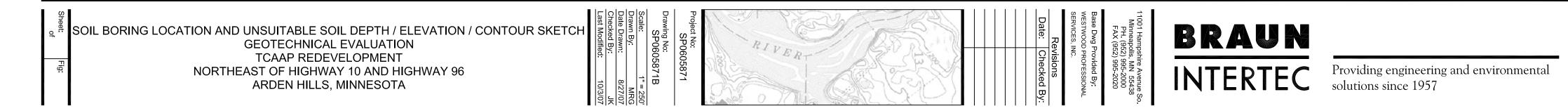
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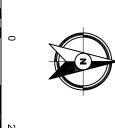
DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING UNSUITABLE SOIL DEPTH / UNSUITABLE SOIL ELEVA

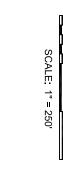
NSUITABLE SOIL DEPTH / UNSUITABLE SOIL ELEVATION (FT.) NSUITABLE SOIL ELEVATION CONTOUR (FT.)









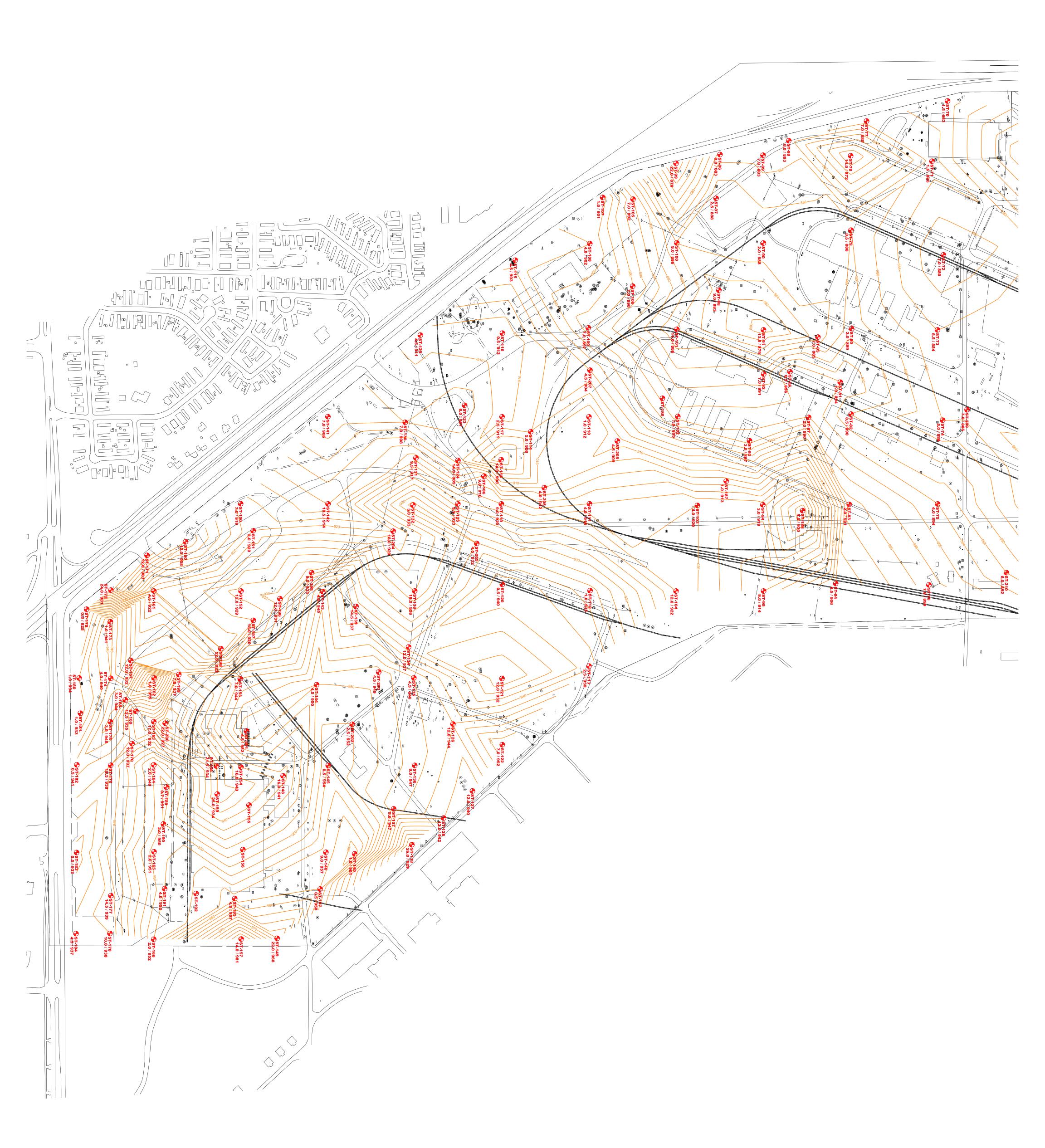


DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

 $\mathbf{\mathbf{O}}$ 

INSUITABLE SOIL DEPTH / UNSUITABLE SOIL ELEVATION (FT.) INSUITABLE SOIL ELEVATION CONTOUR (FT.)

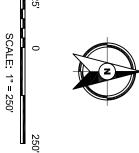




Soil BORING LOCATION AND UNSUITABLE SOIL DEPTH / ELEVATION / CONTOUR SKETCH GEOTECHNICAL EVALUATION TCAAP REDEVELOPMENT NORTHEAST OF HIGHWAY 10 AND HIGHWAY 96 ARDEN HILLS, MINNESOTA

BRAUN INTERTEC

Providing engineering and environmental solutions since 1957

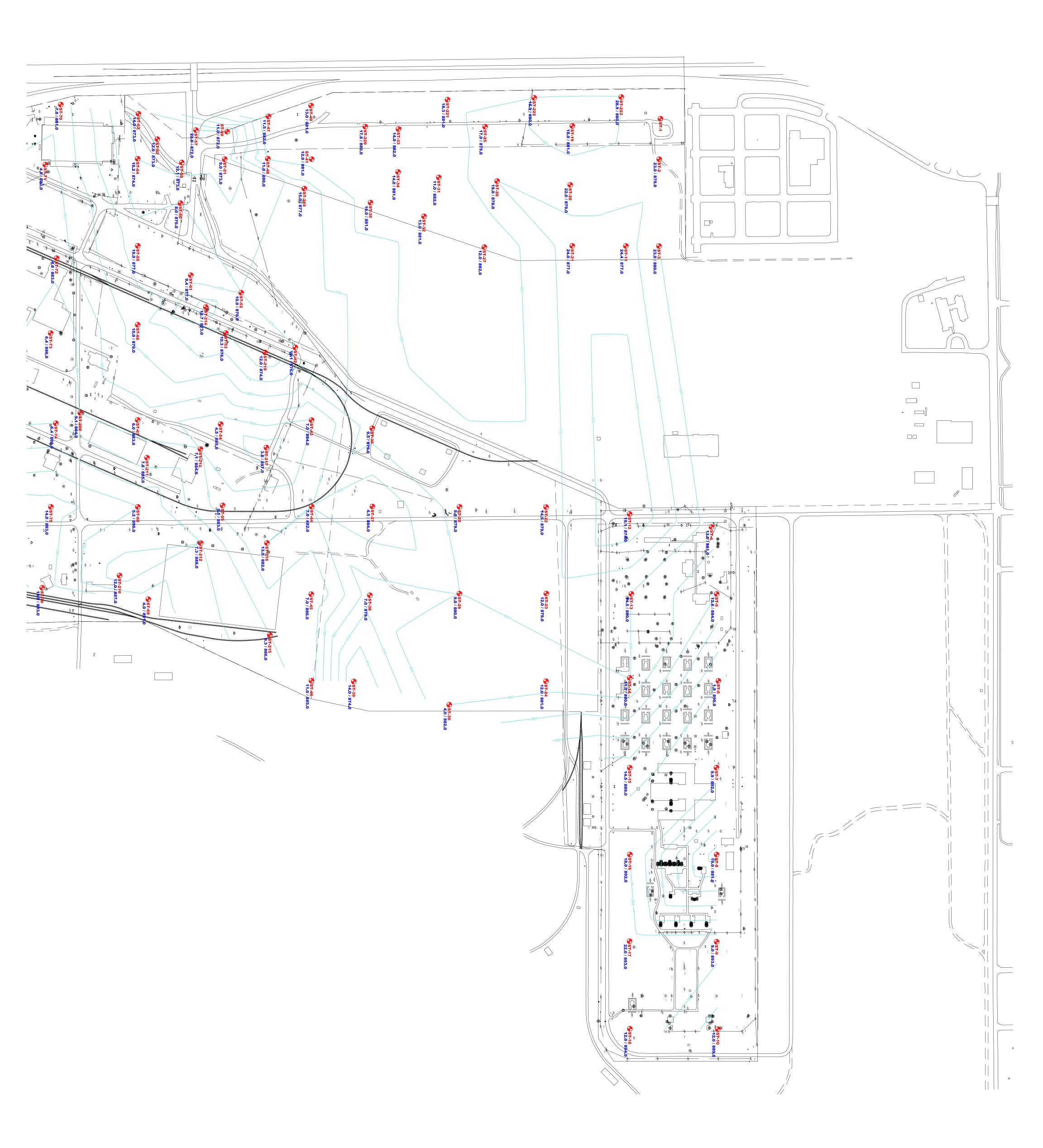




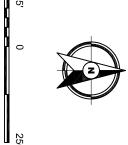
Ð

NATER DEPTH / GROUNDWATER EL ATER ELEVATION CONTOUR (FT.) 0N (FT.)





**BRAUN INTERTEC** Providing engineering and environmental solutions since 1957 SOIL BORING LOCATION AND GROUNDWATER DEPTH / ELEVATION / CONTOUR SKETCH GEOTECHNICAL EVALUATION TCAAP REDEVELOPMENT NORTHEAST OF HIGHWAY 10 AND HIGHWAY 96 ARDEN HILLS, MINNESOTA Ainneapolis, MN 55438 PH. (952) 995-2000 FAX (952) 995-2020 of ing No: SP0605871 RIVE 05871 Fig ₿

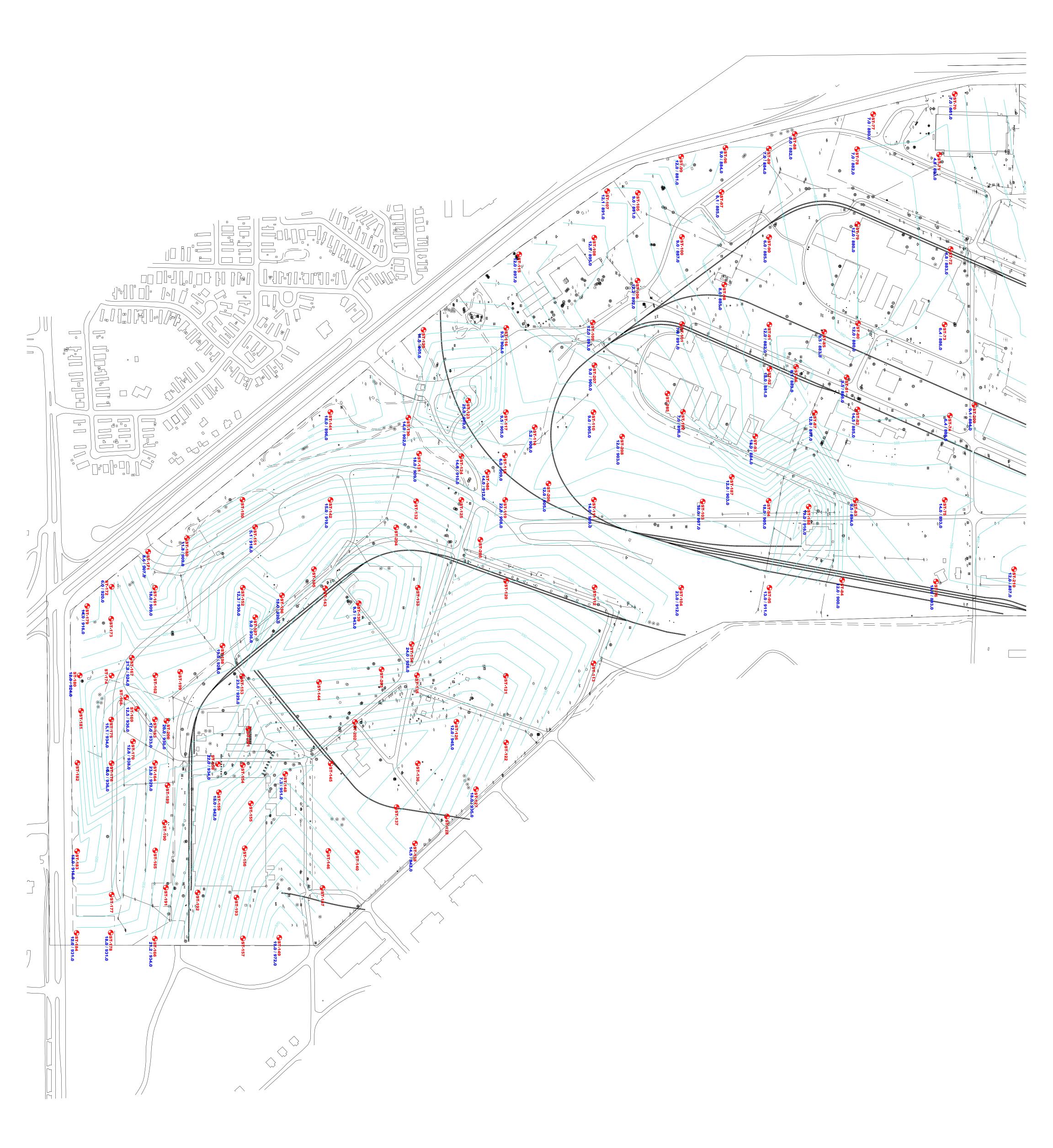




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DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING GROUNDWATER DEPTH / GROUNDWATER ELEVATION (FT.) GROUNDWATER ELEVATION CONTOUR (FT.)





SOIL BORING LOCATION AND GROUNDWATER DEPTH / ELEVATION / CONTOUR SKETCH GEOTECHNICAL EVALUATION TCAAP REDEVELOPMENT NORTHEAST OF HIGHWAY 10 AND HIGHWAY 96 ARDEN HILLS, MINNESOTA



Providing engineering and environmental solutions since 1957

TCAA NE of I Arden	nical E P Rede Highwa	valu: velop vy 10	ation omen and	it Highway 96	BORING LOCATI attached	ON: N	: 21369	<b>ST-1</b> 0.577, E: 55066	55.094 See
DRILLE		Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	6/1	9/07	SCALE:	1'' = 4'
Elev. feet 908.1	Depth feet 0.0	Syn		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
	0.5	SM SP- SM		SILTY SAND, trace of Roots, dark brown, wet. (Topsoil) POORLY GRADED SAND with SILT, fine-gra brown to light brown, moist, loose. (Lacustrine) POORLY GRADED SAND with SILT, fine-gra brown, loose to medium dense. (Glaciofluvium)		4 3 5 5 6 13			
890.1	18.0	MT			-				
886.1	22.0	MIL SP- SM		SANDY SILT, Sand seams, brown, wet, medium (Glaciofluvium) POORLY GRADED SAND with SILT, fine-grai medium dense. (Glaciofluvium)		19			
882.1	26.0			END OF BORING. Water not observed with 24 feet of hollow-stem a		15			

ŝ.

Geote TCAA	cnical E P Redev	valuation velopmen	t	BORING LOCATIC attached s	ON: N	: 21368	<b>ST-2</b> 3.523, E: 55089	8.513 See
Arden	Hills, N	linnesota				· · ·		
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	2/07	SCALE:	1'' = 4
Elev. feet 901.3	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
	9.0	SM SM SP- SM	SILTY SAND, trace of Roots, dark brown, mo (Topsoil) SILTY SAND, fine-grained, reddish-brown to moist, loose to medium dense. (Glaciofluvium) POORLY GRADED SAND with SILT, fine-gr brown, moist, loose to medium dense. (Glaciofluvium)	/ brown, 	8 16 13 11 9 7			
<u>878.3</u> 875.3	23.0	SM	SILTY SAND, fine-grained, gray, waterbearing END OF BORING.		21	Ţ		
			Water observed at 23 feet while drilling. Boring then grouted.	-				



AMERICAN ENGINEERING TESTING, INC.

### SUBSURFACE BORING LOG

AET JOB NO: 22-000												- 3	(p. 1	of 1	)
PROJECT: TCAA	P Redevelopn	nent; A1	den H	lills,	MN				<del></del>				···		<u> </u>
DEPTH SURFACE ELEV.	ATION:902.	.4		GI	EOLOGY		1	s	AMPLE	REC	FIELI	) & LA	BORA	TORY	TESTS
	ATERIAL DESCRIPT				201001	N	MC		TYPE	IN.	wc	DEN	LL	PL	<b>%-#200</b>
SILTY SAND, tr	ace roots, dark bro M)	own, moist	, /		PSOIL ARSE	1.,		$\mathbb{N}$		1.7					-
SAND WITH SII	LT, fine grained, th	race roots,	/ :		LUVIUM	11	M	Ņ	SS	17					
\orown, moist, me	dium dense (SP-S LT, fine grained, b	<u>M)</u>	/					$\nabla$							
loose (SP-SM)						9	M	Ň	SS	14					
SILTY SAND, fin 5 - brown, moist, me	ne grained, brown	, light gray	ish [					R							
sand with silt (SM	f)	ations of				13	М	X	SS	19					
								Д							
								$\left[ \right]$							
8 -						16	M	ľÅ	SS	19					
9 – 10 – SAND WITH SIL	T fine grained li	abt anavial						B							
brown, a little bro	wn. moist. mediur	n dense,				15	м	M	SS	19					
11 – laminations of silt	y sand (SP-SM)							Д							
12 SAND WITH SIL	T, fine grained, li	ght browni	sh 🔅					M							
<ul> <li>13 – gray, a little brown silty sand (SP-SM</li> </ul>	n, moist, loose, lar )	ninations c	of []			10	М	X	SS	17					
14 -	· · · · · · · · · · · · · · · · · · ·							A							
15 – SILTY SAND, fin moist, loose (SM)	e grained, light br	ownish gra	ay,			7	м	М	SS	18					
16						'	141	Μ	55	10					
17 -								H							
18 SAND WITH SIL	T, fine grained, lig	ht browni	sh					Ł							
19 – gray, a little brown silty sand (SP-SM)	i, moist, dense, lar	ninations o	of [					뷥							
20 -	,					24		M	60	10					
21 -						34	М	M	SS	17					
22 -								3							
23 SILT, gray, wet, de	ense (ML)			FINE		1		Ł							
24 -	·/				UVIUM			ł							
25 -								$\square$							
26 -						32	M/W	Ň	SS	16	25				i
END OF BORING Northing=213682.3	G														
Easting=551397.5	,														
DEPTH: DRILLING MET	THOP														
		770 ~~	SAMPL		VEL MEA CASING DEPTH	r			יאוז		W/ A TTT		OTE: 1		
0-24 <sup>1</sup> / <sub>2</sub> ' 3.25" HSA	0-24 <sup>1</sup> / <sub>2</sub> ' 3.25" HSA					CAV DEP		FLU	RILLIN ЛD LEV	ĔL	WATEF LEVEL		HE AT		
	6/20/07	2:15	26.5	; 	24.5	24.	.6				None		HEETS		1
BORING													(PLAN PMIN		
COMPLETED:         6/20/07           DR:         SG         LG:         SB         Rig:         91			<u> </u>										RMIN( THI	SLOG	
DR: SG LG: SB Rig: 91		<u> </u>	L												

06/04



AMERICAN ENGINEERING TESTING, INC.

# SUBSURFACE BORING LOG

AET J(	OB NO: <u>22-00081</u>	_		1	LOGIC	)F R(	ORING N	JO	ST	-11	(n 1	of /	<u> </u>		
PROJE	CT: TCAAP Re	develop	<u>ment; A</u>	rden Hil	lls, MN							<u></u>	(þ. 1	014	9
DEPTH IN FEET	SURFACE ELEVATION	: <u> </u>	1.0		GEOLOGY	,	1	-			FIELD	)& LA	BORA	TORY	TESTS
FËET		AL DESCRIP			GEOLOGI	N	M		AMPLE TYPE	REC	wc	DEN	LL	T	<b>%-#20</b>
1-	SILTY SAND, surface brown, moist, loose (SN	roots, trace	e roots, dar		TOPSOIL		-	$\overline{\mathbf{n}}$	1	<u> </u>					10
2	SAND WITH SILT, tra	ce roots, li	ght brown,	—/[]]]	COARSE ALLUVIUM	1 8	M	٢X	SS	14					
3-	(moist, loose (SP-SM)			/1711				Ħ							
	SILTY SAND, fine grai brown, moist, medium of	lied, brown lense, lami	n, a little light	ght ::::		15	M	٢X	SS	18					
	sand with silt (SM)							ਸ਼							
5-						20	М	$\cdot$ M	SS	18					
6-						20		$\square$	00	10					
	SAND WITH SILT, find	e grained, l	ight grayis	h []]				R							
8 -	brown to light brownish dense to loose (SP-SM)	gray, mois	t, medium			15	М	X	SS	16		ĺ			
9-	. ,							F							
10 -						11		$\square$		17					
11 -						11	M	Μ	SS	17					
12 —								B							
13 —						6	М	X	SS	17				1	
14 -	0.43 m 11 m 21 a 2							H							
i i i	SAND WITH SILT, fine gray, a little brown, mois	t medium	ght browni dense	ish :				М							
16	laminations of sandy silt	(SP-SM)	dono0,			18	M	Ŵ	SS	20					
17								Ħ							
18 -	SAND WITH SILT, fine	grained, li	eht grav a					H							
19 – 1	little gray, moist, dense, 1 (SP-SM)	aminations	of silt					H							
20 - `	(01 0.0.1)							M						·	
21 -						33	M	M	SS	17					
22 -								Æ							
23 5	SAND WITH SILT, fine	grained, lig	ht browni	sh i li				ł							
24 – ខ	ray, waterbearing, mediu	um dense (S	SP-SM)				▼	H							
25 -								M							
26 -						16	M/W	Ň	SS	19					
27 -								$\sum$							
28 -				TI	LL			$\rangle$							
DEPTH:	DRILLING METHOD		<u></u>		LEVEL MEA	SUIPE	MENIT					┯┸			
0-24½	2 75H TIC 4	DATE	TIME	SAMPLED	· ····	CAV			RILLING ID LEVI	;   v	VATER			EFER	
0-2472 241/2'-991/2'		6/20/07	8:55	26.5		·		FLU	ID LEVI	EL İ	VATER LEVEL			TACHE	
		5,20,01	0.33	20.5	24.5	24	. <b>.</b>				24.4			FOR A	
BORING COMPLET	ED: 6/20/07									_				LOGY	- 1
DR: SG	LG: SB Rig: 91C											-	THIS		

06/04



# SUBSURFACE BORING LOG

PROJE DEPTH IN FEET		-								[ <b>]</b> . 4	014	• •
DEPTH IN FEET		IIIS, IVIIN							-11 (			
FEET		GEOLOGY	1		6414		DEC	FIELI	) & LA	BORA	TORY	TEST
1			N	MC	SAM TYI	PE	REC IN.		DEN			<b>%-#</b> 2
30 -	SANDY LEAN CLAY, a little gravel, gray, firm to stiff (CL) (continued)	TILL (continued)			R					,		<u> -</u>
31 -			6	M	X  s	ss	24	17				
32 -					Н							
33 –					IS I							
34 -					151							
35 -					H							
36 -			7	М	X  s	S	24	17				
37					6							
38 -					$\left  \right\rangle$						:	
39 —					$\rangle$							
40 —					$\nabla$							
41 —			10	М	X s	S	24	20				
42 –					7							
43 -					$\rangle$							
44 –			-		$\rangle$							
45			10		$\overline{V}$							
46 -			10	М	X ss		24	17				
47 -					7							
48 49												
50 -												
51 -			11	м	ss 🖉		24	19			-	
52 -				ľ	<u> </u>			17				
53 -				K	' (							
54				K	1							
5				Ľ	4							
6 -			10	м	(  ss	2	24	20				
7 -				K	<u> </u>							
8				K	<pre></pre>							
9 –				K	(							
0 -				K	{							
1 –			10	м	ss	2	2	18				
2 -				b b	Y							
3				ß	1							

06/04



AMERICAN ENGINEERING TESTING, INC.

# SUBSURFACE BORING LOG

PROJE	DB NO: <u>22-00081</u> CT: <u>TCAAP Redevelopment; Arde</u>	n TT	11. B. T. T.	I	.OG OF	7 BO	RING 1	NO	ST	<u>'-11</u>	<u>(p. 3</u>	<u>6 of 4</u>	<u>)</u>
	Ardevelopment; Arde		<u>IIIS, IVIN</u>										<u>.                                    </u>
DEPTH IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SĄ	MPLE YPE	REC IN		D & LA	r	T	
64 -	SANDY LEAN CLAY a little group from		TILL			<u>bт</u>			wc	DEN	LL	PL	<b>%-</b> #2(
65 -	to stiff (CL) (continued)		(continued)			Ц							
66 -				5	м	M	SS	24	19				
67 –						Щ							
68 -	CIL TV CAND. C					K			1				
69 -	SILTY SAND, fine to medium grained, brownish gray, wet, loose (SM)		COARSE ALLUVIUM			K							
70 -						Ц							
71				5	Μ	X	SS	2	23				
72						5							
73 —	LEAN CLAY WITH SAND, brown, hard (CL)					$\left\{ \right\}$							
74 -	DELINCELAT WITH SAND, brown, hard (CL)		FINE ALLUVIUM			$\left\{ \right\}$							
75 -													
76 –				36	М	XI	SS	24	17				
77 -						(ל							
78 +-	FAT CLAY, brown, hard to very stiff												
'9 – I	FAT CLAY, brown, hard to very stiff, laminations of silty sand (CH)												
0 -													
1 -				43	М	XI.	SS	24	33				
32 -						Л							
83 –						)]							
84 -						)							
85 -				27	$\sim$	7.		~					
86 -				21	м	$\langle \rangle$	SS	24	25				
87 -					2	7							
88 - C 89 - C	LAYEY SAND, a little gravel, possible	Т	TLL		2								
89 - CO 90 -	obbles, brown, hard (SC)				2	4							
90 - 91 -				62	м	1.	ss	21	13				
2					<u> </u>	Į.		~1	10				
3 -					K								-
, 					R								
5					Ľ								
6 -				70	м	/  s	s 2	21	11				
7 -					Ķ	Y.							



AMERICAN ENGINEERING TESTING, INC.

### SUBSURFACE BORING LOG

AETI	OB NO: <u>22-00081</u>			I	.0G C	)F E	ORING	NO.	SJ	[-11	(p. 4	4 of 4	Ð
PROJ	ECT: <u>TCAAP Redevelopment; Are</u>	<u>len H</u>	ills, MN										-*
DEPTH IN FEET			GEOLOGY				SAMPI I	EREC	FIEL	.D & L.	ABORA	TORY	TESTS
i		·		N	M		SAMPLI TYPE	ÎN.	wc	DEN	I LL	PL	<b>%-</b> #200
98 -	CLAYEY SAND, a little gravel, possible cobbles, brown, hard (SC) (continued)		TILL (continued)			2	'					+	
99 -						$ \rangle$							
100 -				98	M	$\sum$	ss	26	10	[			
101 -	END OF BORING						1 33	20	10		ĺ		
	Northing=213491.7					1							
	Easting=551397.2												
		İ											
										ĺ			
											ĺ		
							-	i					
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BRAUN	-					L	)G (	OF BORING
INTERTE Braun Pro Geotecnical I TCAAP Red NE of Highw Arden Hills,	ject SP-0 Evaluation evelopmen ay 10 and	t Highway 96	BORING: LOCATIC attached si	)N: N:	2131		<b>Γ-19</b> 70, Ε: :	550706.966 See
	. Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/1	9/07		SCAL	.E: 1'' = 4'
Elev. Depth feet feet 898.1 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Notes
897.1 1.0 	SM SP- SM SM	SILTY SAND, trace of Roots, dark brown, mois (Topsoil) POORLY GRADED SAND with SILT, fine-grabrown, moist. (Lacustrine) SILTY SAND, fine-grained, brown, wet, medium (Lacustrine) POORLY GRADED SAND with SILT, fine-grabrown, moist, loose to medium dense. (Lacustrine) SILTY SAND, light brown, moist, medium dens (Glacial Outwash)	ined, light n dense ined, light	9 11 11 9 6 15		6	6	
- <u>880.1 18.0</u> - <u>18.0</u> - <u>18.</u>	SM	SILTY SAND, fine-grained, light brown, to gray waterbearing, medium dense to very dense. (Glacial Outwash) END OF BORING. Water observed at 18 feet while drilling. Boring then grouted.		35 60	Ţ			

SP-06-05871

		ect SP-0	6-05871	BORING			S	T-20	
TCAA NE of	P Rede Highwa	valuation velopmen y 10 and /linnesota	Highway 96	LOCATIC attached s		: 213	171.7	42, E: 5	551046.195 See
DRILLE	"	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	1/07		SCAL	.E: 1" = 4'
Elev. feet 900.8	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Note
-900.3	0.5	SM SP- SM	SILTY SAND, trace of Roots, dark brown, moi (Topsoil) POORLY GRADED SAND with SILT, fine-gra brown, rust at 2' sample depth, moist, loose to n dense. (Lacustrine)	//////	15 10 V 8				
891.8	9.0	ML	SANDY SILT, light brown, wet, loose. (Lacustrine)		6		17	62	
886.8	14.0	SP- SM	POORLY GRADED SAND with SILT, fine-gra brown, moist, medium dense. (Lacustrine)	ained, light 	28		4	7	
_		SP- SM	POORLY GRADED SAND with SILT, fine-gra brown, moist, dense. (Lacustrine)	iined, light 	34				
878.8	22.0	SP- SM	POORLY GRADED SAND with SILT, fine-gra gray, waterbearing, loose. (Lacustrine)		V 10	Ţ			
-	26.0		END OF BORING. Water observed at 22 feet while drilling. Boring then grouted.						

Geote TCAA NE of	cnical E P Rede Highwa	valuation velopmen	t Highway 96	BORING LOCATIC attached s	ON: N		<b>ST-21</b> 3.350, E: 55319	6.596 See
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	1/07	SCALE:	1'' = 4'
Elev. feet 900.6	Depth feet 0.0	1	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
	0.5	SM SP- SM	SILTY SAND, trace of Roots, brown, moist. (Topsoil) POORLY GRADED SAND with SILT, fine-gr brown, moist, very loose to medium dense. (Lacustrine)		7 13 8 6			
886.6	14.0	SM	SILTY SAND, fine-grained, light brown, moist (Lacustrine)	, loose	9			
876.6	24.0	SP-	POORLY GRADED SAND with SILT, fine-gra		10	₽		
874.6	26.0	SM	brownish-gray, waterbearing, medium dense. (Lacustrine) END OF BORING. Water observed at 24 feet while drilling. Boring then grouted.		11			

Geote TCAA NE of	cnical E P Rede	valuz velop y 10	ntion men and ]	6-05871 t Highway 96	BORING LOCATIC attached s	ON: N	: 212		<b>T-25</b> 66, E:	550711.506 See
DRILLI		Keck	.5014	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/1	9/07		SCAI	LE: 1"=4'
Elev. feet 895.9	Depth feet 0.0			Description of Materials (ASTM D2488 or D2487)	1	BPF	WL	MC %		Tests or Note:
894.9	1.0	SM SP- SM		SILTY SAND, trace of Roots, dark brown, mo (Topsoil) POORLY GRADED SAND with SILT, fine-gr brown, moist, loose.	~					
<u>881.9</u> - 878.9	14.0	ML SM		SANDY SILT, gray with bands of orangish-bro loose. (Lacustrine) SILTY SAND, fine-grained, Silt laminations, b dark brown, wet, medium dense. (Glaciofluvium)		6 18				
	22.0	SP- SM		POORLY GRADED SAND with SILT, fine-gr brown, waterbearing, medium dense. (Glaciofluvium)	ained, light 	6				
-		SC		CLAYEY SAND, trace of Gravel, gray, wet, m dense. (Glacial Till)	edium	V 6		13	42	LL = 23%
869.9	26.0			END OF BORING. Water observed at 17 feet while drilling. Boring then grouted.						PI = 12%

BRAUN

LOG OF BORING

Geot	ecnical E	ect SP-0 valuation velopmen		BORING	ON: N		<b>ST-26</b> 1.010, E: 55102	4.200 Se
NE of	f Highwa	y 10 and Iinnesota	Highway 96	attached s	ketch.			
DRILI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	1/07	SCALE:	1''=4
Elev. feet 896.2	Depth feet 0.0		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
erminology sheet for explanation of abbreviations)	0.5	SM SP- SM	SILTY SAND, trace of Roots, dark brown, moi (Topsoil) POORLY GRADED SAND with SILT, fine-gra brown to brown, rust at 15' sample depth, moist medium dense. (Lacustrine)		10 12 12 12 10 10			
	19.0	ML	SANDY SILT, gray, waterbearing, medium den (Glaciofluvium)		11	Σ		
	26.0		END OF BORING. Water observed at 19 feet while drilling. Boring then grouted.		15			

			6-05871	BORING	<u>:</u>		S	<b>T-2</b> 7	,
TCAA NE of	AP Rede Highwa	valuation velopmen vy 10 and /Iinnesota	t Highway 96	LOCATIC attached s		2126	577.1	65, E: :	551403.522 Se
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	1/07		SCAL	E: 1" = 4
Elev. feet 893.3	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Not
892.3     	1.0	SM SP- SM	SILTY SAND, very fine- to fine-grained, dark moist. (Topsoil) POORLY GRADED SAND with SILT, fine-gra brown, moist, very loose to medium dense. (Lacustrine)	T	¥ 4 9 10		4	5	
881.3	12.0	SP- SM	POORLY GRADED SAND with SILT, fine-gra brown to light brown, waterbearing, loose. (Lacustrine)	iined,	8	₽	22	11	
876.3	17.0	ML	SILT with SAND, grayish-brown to gray, wet, I medium dense. (Glaciofluvium)	loose to	9				
866.3	27.0	SP-	POORLY GRADED SAND with SILT, fine-gra	ined,	24		24	82	
		SM	gray, waterbearing, medium dense. (Glaciofluvium)		28				

Geote TCAA NE of	cnical E AP Ređev Highwa	valuation velopmen	t Highway 96	BORING:         ST-27 (cont.)           LOCATION:         N: 212677.165, E: 551403.522           attached sketch.         DATE:           DATE:         6/21/07         SCALE:         1" =							
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	1/07		SCAI	LE: <b>1''</b> = 4		
Elev. feet 861.3	Depth feet 32.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Not		
- - 856.3	<u> </u>	CL SC CL	SANDY LEAN CLAY, trace of Gravel, gray, we stiff. (Glacial Till) CLAYEY SAND, trace of Gravel, gray, wet, rath (Glacial Till) SANDY LEAN CLAY, trace of Gravel, wet, rath (Glacial Till)		9		15	46	·		
					9		18	51			

Geoted TCAA NE of	nical É P Rede Highwa	ect SP-0 valuation velopmen y 10 and Jinnesota	t Highway 96	BORING LOCATIC attached s	DN: N:			<b>(co</b> ) 55, E: 5:	nt.) 51403.522 See
DRILLE		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/21	1/07		SCALE	E: 1'' = 4'
Elev. feet 829.3	Depth feet 64.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %		Tests or Note:
			SANDY LEAN CLAY, trace of Gravel, wet, ra (Glacial Till) (continued)	ather stiff	9				
816.3	77.0	CL	SANDY LEAN CLAY, trace of Gravel, reddisl wet, very stiff to hard. (Glacial Till)	h-brown,	21		14	62	
801.3	92.0	CL	LEAN CLAY, reddish-brown to grayish-brown laminatios of brown, very stiff to hard. (Glaciofluvium)	with	41				
-					22				

BRAUN"

### LOG OF BORING

# BRAUN INTERTEC

## LOG OF BORING

Geote TCAA	cnical E P Redev	valuation velopmen	t	BORING LOCATIC attached s	DN: N			7 (con 65, E: 55	nt.) 1403.522 See
NE of Arden	Highwa Hills, N	y 10 and . Iinnesota	The second						
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	1/07		SCALE	: 1'' = 4'
Elev. feet 797.3	Depth feet 96.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Notes
792.3	101.0		LEAN CLAY, reddish-brown to grayish-brown laminatios of brown, very stiff to hard. (Glaciofluvium) (continued) END OF BORING. Water observed at 12 feet while drilling. Boring then grouted.	with	30				
-				-					

Braun Project SP-06-05871 Geotecnical Evaluation TCAAP Redevelopment NE of Highway 10 and Highway 96 Arden Hills, Minnesota					BORING:         ST-31           LOCATION:         N: 212415.495, E: 551003.074           attached sketch.			
DRILLE	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	1/07	SCALE:	1" = 4'
Elev. feet 892.9	Depth feet ASTM 0.0 Symbol		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
892.4 888.9 - 880.9	<u>4.0</u> <u>12.0</u>		SILTY SAND, trace of Roots, dark brown, moist (Topsoil) POORLY GRADED SAND with SILT, fine-grai brown, moist, medium dense. (Lacustrine) POORLY GRADED SAND with SILT, fine-grai orange-brown to grayish-brown with rust at 7' sat depth, loose to medium dense. (Lacustrine) POORLY GRADED SAND with SILT, fine-grai grayish-brown, waterbearing, medium dense. (Glaciofluvium)		11 9 15 12 22 23	Ÿ		
	23.0	ML	SANDY SILT, gray, wet, medium dense. (Glaciofluvium) END OF BORING. Water observed at 11 feet while drilling. Boring then grouted.		<u>7</u> 16		·	

Braun Geoteci				6-05871	BORING				Т-32	
TCAAF	<sup>9</sup> Ređev lighwa	velop y 10 :	men and	t Highway 96	LOCATI attached	ON: N: sketch.	: 212:	330.3	33, E:	551226.541 See
DRILLEI		Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	0/07		SCA	LE: <b>1'' = 4'</b>
Elev. feet 893.5	Depth feet 0.0	AS Sym		Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Note
892.5	1.0	SM		SILTY SAND, trace of Roots, dark brown, moi	st.			10	70	
- 886.5	7.0	SP- SM		(Topsoil) POORLY GRADED SAND with SILT, fine-gr light brown, moist, very loose to loose. (Lacustrine)	ained,	2		5	5	
		SP- SM		POORLY GRADED SAND with SILT, fine-gr orange-brown, moist to wet, loose to medium d (Lacustrine)	ained, ense 	- 11 - 11 - 9				
-	12.0	SM		SILTY SAND, fine-grained, grayish-brown, wa very loose to medium dense. (Lacustrine)	terbearing, - - - - -		₽	23	29	
	23.0	CL- ML		SILTY CLAY, gray, wet, loose. (Glaciofluvium)	-  - -	12				
-	26.0			END OF BORING. Water observed at 13 feet while drilling. Boring then grouted.	 - - -	9		23	96	LL = 27 PI = 6

BRAUN™

LOG OF BORING

Geote	cnical E	valua	tion	6-05871	BORING		6.919		T-33	550725.056 See
NE of	AP Rede <sup>.</sup> Highwa 1 Hills, N	y 10 e	nd l	t Highway 96	attached			165.0	55, E: 5	550725.056 See
DRILL	ER: K.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	6/1	9/07		SCAL	.E: 1" = 4'
Elev. feet 895.7	Depth feet 0.0	AST Syml	ļ	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Note
894.7	1.0	SM		SILTY SAND, trace of Roots, dark brown, m	noist.	<u> </u>		1		
		SP- SM		(Topsoil) POORLY GRADED SAND with SILT, fine- brown to light brown, moist, very loose to loo (Lacustrine)	grained, ose - - -					
886.7	9.0	SM				-				
		.51/1		SILTY SAND, fine-grained, brown to grayisł moist, medium dense. (Głaciofluvium)	n-brown,	13				
881.7	14.0				-	11	Į			
		SM		SILTY SAND, fine-grained, grayish-brown, v medium dense. (Glaciofluvium)	waterbearing, — -	14				
877.7	18.0	ML		SANDY SILT, gray, wet, medium dense. (Glaciofluvium)						
873.7	22.0					14		22	55	
<u> </u>	22.0	SP- SM		POORLY GRADED SAND with SILT, fine-g gray, waterbearing, loose. (Glaciofluvium)	grained, -					
869.7	26.0			END OF BORING.		7				
				Water observed at 14 feet while drilling.	. <del>.</del>					
				Boring then grouted.						
-										

LOG OF BORING

BRAUN™

		ect SP-0 valuation	6-05871	BORING				<b>T-3</b> 4	
TCAA NE of	AP Rede Highwa	velopmen	t Highway 96	LOCATIC attached s	ON: N: ketch.	: 212	181.2	05, E: :	550971629 See
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	1/07		SCAI	.E: 1'' = 4'
Elev. feet 894.3	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	-	BPF	WL	MC %	P200	Tests or Note
893.3	1.0	SM	SILTY SAND, dark brown, moist. (Topsoil)				70	70	
-		SP- SM	POORLY GRADED SAND with SILT, fine-gr light brown to brown, moist, loose to medium d (Lacustrine)	ained, ense    	5 12 11		11	6	
885.3	9.0	SP- SM	POORLY GRADED SAND with SILT, fine-gra orange-brown, moist to wet, medium dense. (Lacustrine)	iined,	11 11				
880.3	14.0	SP- SM	POORLY GRADED SAND with SILT, fine-gra grayish-brown, waterbearing, very loose. (Lacustrine)	iined,	4	Ţ			
		SM	SILTY SAND, fine-grained, grayish-brown, waterbearing, medium dense. (Lacustrine)		13				
868.3	26.0		END OF BORING. Water observed at 14 feet while drilling.		13				

**BRAUN**<sup>34</sup>

LOG OF BORING

Braun Pr Geotecnica TCAAP Re NE of High Arden Hill:	l Evaluatio developmo way 10 an	n nt I Highway 96	BORING LOCATIC attached s	DN: N	: 21202:	<b>ST-35</b> 2.662, E: 55114	7.722 S
DRILLER:	K. Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	0/07	SCALE:	1" = 4
Elev. Dep feet fee 896.0	th t ASTM 0.0 Symbo	Description of Materials (ASTM D2488 or D2487)	<b>A</b>	BPF	WL	Tests or	Notes
	0 SM		/_ ned, light 	3 7 10 10 8 8 8 13	$\nabla$		

Geote	cnical E	ect SP-0 valuation velopmen		BORING LOCATIC attached s	ON: N		<b>ST-40</b> 0.392, E: 550589.817 Se
NE of	Highwa		Highway 96	attached s	sketch.		
DRILL		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	2/07	SCALE: 1'' = 4
Elev. feet 893.7	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or Notes
<u>893.2</u> 	0.5	SM SM	SILTY SAND, trace of Roots, dark brown, moi (Topsoil) SILTY SAND, fine-grained, dark brown, moist, loose. (Lacustrine)	Ĺ	2		
889.7 (su	4.0	SP- SM	POORLY GRADED SAND with SILT, fine-gra brown to grayish-brown with rust at 10' sample moist, very loose to medium dense. (Lacustrine)	ained, light depth,	3	Sand 0' t	- 4
See Descriptive Terminology sheet for explanation of abbreviations)	14.0	SP- SM	POORLY GRADED SAND with SILT, fine-gr grayish-brown to gray, waterbearing, loose to m dense. (Lacustrine)	edium	Poort 8 9 111 6	⊊	d Sand w Silt 4' to 26'
8871.GPJ BRAUN.GDT 10/2/07 14:45					V 16 V 24		
N BASIC LOG OF BORING SP060587	26.0		END OF BORING. Water observed at 13 feet while drilling. Boring then grouted.				

TC-AAP Redevelopment NE of Highway 10 and Highway 96 Arden Hills, Minnesota       Dispersive of the second se	Braun Project SP-06 Geotecnical Evaluation	5-05871	BORING:		ST-41	
Elev. Depth feet ASTM Description of Materials BPF WL Tests or Notes 891.8 0.7 SM   SILTY SAND, trace of Roots, dark brown, moist. (Topsoil) SM POORLY GRADED SAND with SILT, fine-grained, BBF VL Tests or Notes SM POORLY GRADED SAND with SILT, fine-grained, (Lacustrine) SM SILTY SAND, fine-grained, brownish-gray, waterbearing, loose to medium dense. (Lacustrine) SM SILTY SAND, fine-grained, brownish-gray, waterbearing, loose to medium dense. (Lacustrine)	TCAAP Redevelopment NE of Highway 10 and H				1684.376. E: 5508	97.834 See
feet 892.5     0.0     Symbol     Description of Materials (ASTM D2488 or D2487)     BPF     WL     Tests or Notes       g91.8     0.7     SM     SILTY SAND, frace of Roots, dark brown, moist. (Topsoil)     15     15        -     SM     POORLY GRADED SAND with SILT, frac-grained, light brown to brown, moist, losse to medium dense. (Lacustrine)     15        -     -     15        -     12       880.5     12.0       SM     SILTY SAND, fine-grained, brownish-gray, waterbearing, loose to medium dense. (Lacustrine)     10        -     11        -     10        -     16       870.5     22.0       SP-     POORLY GRADED SAND with SILT, frae-grained, gray, waterbearing, loose. (Lacustrine)     16	DRILLER: K. Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/21/0	7 SCALE:	1'' = 4'
SP.     (Topsoil)       POORLY GRADED SAND with SILT, fine-grained, light       IS       SM       POORLY GRADED SAND with SILT, fine-grained, light       IS       Poorty Graded Sand w Sit C       Sitt TY SAND, fine-grained, brownish-gray,       Waterbearing, loose to medium dense.       (Lacustrine)       II       II       SM       SIL TY SAND, fine-grained, brownish-gray,       Waterbearing, loose to medium dense.       (Lacustrine)       II       II       II       II       SM       SIL TY SAND, fine-grained, brownish-gray,       III       III       III       III       III       III       III       IIII       IIII       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	feetfeetASTM892.50.0Symbol	(ASTM D2488 or D2487)		BPF W	L Tests of	Notes
870.5 22.0 SP- SM POORLY GRADED SAND with SILT, fine-grained, gray, waterbearing, loose. (Lacustrine)	SP-SM SM SM SM SM SM SM SM SM SM SM SM SM S	(Topsoil) POORLY GRADED SAND with SILT, fine-gra brown to brown, moist, loose to medium dense. (Lacustrine)	A	8 12 12 10	Silty Sand 12' to 22'	d w Silt 0.7' to
866.5       26.0       1         END OF BORING.	866.5 26.0 SP- SM	gray, waterbearing, loose. (Lacustrine) END OF BORING. Water observed at 12 feet while drilling.	ined,			

**BRAUN**"

LOG OF BORING



### SUBSURFACE BORING LOG

AET JO	DB NO: 22-00081						 T	06.0				C'T	12	(n 1		<u> </u>
PROJE		- developi	ment; A	rden	Hi	lls, MN		.000	л ВI	ORING	NU		-42	<u>(p. 1</u>	t <b>01</b> .	<u>.)                                    </u>
DEPTH IN FEET	SURFACE ELEVATION	. 885	5.3			GEOLOGY				AMPLE	REC	FIEL	D & LA	BORA	TORY	TESTS
FEET		L DESCRIP					N	M		TYPE	IN.		DEN	LL	PL	%-#20
- 1 -	FILL, mixture of sandy gravel, surface roots, tra	silt and silt ice roots, b	ty sand, wit rown and d	th lark		FILL	29	M	$\overline{\mathbf{N}}$	ss	14			1		
2 -	brown FILL, mixture of sand w	vith cilt cil		-			2,		$\Delta$	33	14					
3 –	clayey sand, a little grav brownish gray and gray	el, brown,	a little	1			23	М	$\mathbb{N}$	ss	8	-				
4	or ownish gray and gray										Ĩ					
5 -							10		$\mathbb{N}$		-					
6 -							10	M	$\square$	SS	7					
7 -									R							
a							20	M	X	SS	16					
10	SAND WITH SILT, fine to gray and black, mediu	m dense lø	mean and	ay		COARSE ALLUVIUM	-1		. (P)							
11 -	laminations of organic si	lt (SP-SM)	)			OR TOPSOIL	17	_ <u>▼</u> M	۰Ŋ	SS	19					
12 -	SAND, medium to fine g	rained, bro	wn and gra	ay, [ ]		COARSE	-		B							
13	waterbearing, loose, lens	es of sandy	/ silt (SP)			ALLUVIUM	5	w	M	SS	4					
14 -									Д	00	7					
15 —	SANDY LEAN CLAY, a to stiff (CL)	a little grav	el, gray, fi	rm	Ŵ	FILL			М	•						
16 -	、 <i>,</i>						7	M	Ŵ	SS	8	22				
17 - 18 -									$\overline{\mathcal{A}}$							
18									RI							
20 -									Ц							
21 -							8	М	M	ss	15	16				
22 -									Ĥ							
23 -									SI							
24 -									51							
25 -									M							
26 -		<u></u>					13	М	Ň	SS	18	16				
N	END OF BORING lorthing=211590.1															
	asting=551980.4															
DEPTH:	DRILLING METHOD			WAT	ER	LEVEL MEA	SUREI	MENI	S							
0-9½	3.25" HSA	DATE	TIME	SAMP DEP	LEC TH	CASING DEPTH	CAVI	E-IN TH	DI FL I	RILLIN(	G V	WATER		DTE: F HE AT		
1/2'-241/2'	RD w/DM	6/21/07	11:45	11.		9.5	10.					10.1		HEETS		
ORING OMPLETI	CD. 6/21/07									- <u></u>				PLAN		1
	ED: 6/21/07 LG: SB Rig: 91C	·····		<u>.</u>					-				TER	MINO		' ON
A													1	THIS	LOG	



AET JO PROJEC		-		.)		L	OG OF	BORING	NO	ST	-43	(p. 1	of 1	)
———	CT: TCAAP Re	developi	nent; Ar	den Hi	ills, MN							<u> </u>	<b></b>	
DEPTH	SURFACE ELEVATION MATERIA	1: <b>890</b> AL DESCRIP			GEOLOGY	N	MC	SAMPLE TYPE	REC		) & LA		r	
1 -	FILL, mixture of clayey trace roots, brown and c	/ sand and s								wc	DEN		PL	<b>1</b> /0-1
2						11	M	X ss	16	13				
3 -	SAND WITH SILT, tra to grayish brown, moist laminations of organic s	dense len	ses and	d	COARSE ALLUVIUM OR FILL	31	М	ss	14			,		
4	fill) SAND WITH SILT, lig			_/	COARSE	-		시 ਸ਼						
5	mottled, waterbearing, n	nt brown ar nedium den	id gray ise (SP-SM)	)	ALLUVIUM	22	w	ss 🕅	16	20				
7 -	SILTY SAND, a little g	roval grou					Ţ	/\ 관						
8 -	dense (SM)	iavei, giay,	medium		TILL	25	м	Ss	14	11				
9 <del>-</del> 10	SANDY LEAN CLAY, to stiff (CL)	a little grav	el, gray, fir	m				R						
11 -						8	М	x ss	15	18				
12 -								Д Д						
13 14						6	м	X ss	21	17				
15 —							Ĩ	Ţ						
16 —						9	М	X ss	20	18				
17 - 18 -							K							, 
18 -							K							
20 -							K			1.5				
21 -						8	м	ss	22	15				
22 23							R							
24 -							ß							
25										23				
26 -	END OF BORING					6	м	ss	21	23				
N	orthing=211683.6 asting=552398.6													
DEPTH:	DRILLING METHOD	T	<u> </u>	WATER	LEVEL MEA	SURFA	/FNTS							
0-9½'	3.25" HSA	DATE	TIME	SAMPLE DEPTH		CAVE		DRILLIN	<u>Ģ</u> v	VATER LEVEL		DTE: R IE ATT		
1/2'-241/2'		6/25/07	8:15	6.5	4.5	5.5				None		IEETS		
ORING OMPLETI		6/25/07	8:20	9.0	7.0	7.6				6.8		PLANA		
OMPLET	ED: 6/25/07								1		TER	MINO	LOGY	í Oì



#### SUBSURFACE BORING LOG

AET JC	DB NO: <b>22-00081</b>	<u> </u>				LC	G OF	BO	RING N	o	ST	-44	(p. 1	of 1	)
PROJE	CT: TCAAP Rede	velopme	ent; Ard	en Hi	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION: MATERIAL	888.6 DESCRIPTIO	 DN		GEOLOGY	N	мс	SA T	MPLE YPE	REC IN.	FIELE WC	D&LA	BORA		TESTS 1⁄6-#20
1 -	FILL, mixture of sand with a little gravel, trace roots, plastic and concrete, brown	surface root	ts, pieces o		FILL	5	м	М	SS	16	9 13				-
2 — 3 —	SANDY LEAN CLAY, a brown mottled, firm, lamin (CL)	little gravel	l, gray and		TILL	- 8	м	$\square$	SS	7	16				
4	SANDY LEAN CLAY, a brown, a little brown, stiff sand (CL)	little grave , lamination	l, grayish ns of silty			11	м	R	SS	19	17				
7 — 8 —	SANDY LEAN CLAY, a a little brown, stiff, lamina (CL)	little grave tions of silt	l, dark gray ty sand	, //		9	М	R	SS	18	15				
9 - 10 -						10	м	स X	SS	16	16				
11 - 12 - 13 -	SANDY LEAN CLAY, a firm to stiff (CL)	little grave	l, dark gray	,		9	M	R	SS	3	17				
14 – 15 –	、 /							// स्र //	SS	21	15				
16 17						8	M	$\bigwedge$	55	21	15				
18 19 20															
20 21 22						9	M	X Ł	SS	21	14				
23 – 24 –								7777							
25 - 26 -	END OF BORING					11	м	M	SS	20	15		 		
	Northing=211684.3 Easting=552896.6														
DEPT	TH: DRILLING METHOD			WAT	ER LEVEL ME	,							NOTE:	REFE	ER TO
0-24	"⁄2' 3.25" HSA	DATE	TIME	SAMPI DEP1		+	/E-IN PTH	FL	DRILLII UID LE	NG VEL	WATI LEVI		THE A		
		6/22/07	11:45	26.	5 24.5	20	6.5				Non		SHEE'		
BORINO	3 5 5750. 6/33/07							$\vdash$					EXPLA ERMIN		
DR: SG								-			·			IS LO	

INTERTEC Braun Project SP-06-05871 Geotecnical Evaluation TCAAP Redevelopment Not of Highway 10 and Highway 96 Arden Hills, Minnesota PRILLER: K keek METHOD: 314" IISA, Aucdam Rev. Dept. ASTM CASTM Description of Materials R92.4 0.0 Symbol TIL. Silty Sand, fine- to medium-gmined, trace of Gravel, moist.  FIL: Clayey Sand, trace of Roots, brown to dark gray.  R85.4 7.0 FILL TIL: Silty Sand, fine-grained, waterbearing, medium dense.  FIL: Silty Sand, fine-grained, waterbearing, medium area.  FIL: Silty Sand,	BRA		-					LOG OF BORIN
DRILLER:       K. Keck       METHOD:       3 1/4" HSA, Autohmr       DATE:       7/18/07       SCALE:       1" = 4         Elev.       Depth       feet       ASTM       Description of Materials       BPF       WL       Tests or Notes         892.4       0.0       Symbol       (ASTM D2488 or D2487)       BPF       WL       Tests or Notes         -       FILL       Silty Sand, fine- to medium-grained, trace of Gravel, moist.       -       26       -       26         888.4       4.0       FILL       FILL: Clayey Sand, trace of Roots, brown to dark gray.       12       Fuel Odor	Brau Geote TCAA NE of	n Proj cnical E AP Rede Highwa	ect SP-0 valuation velopment vy 10 and 3		LOCATIO	DN: N		
feetfeetASTMDescription of Materials (ASTM D2488 or D2487)BPFWLTests or Notes892.40.0Symbol(ASTM D2488 or D2487)BPFWLTests or Notes-FILLFILL: Silty Sand, fine- to medium-grained, trace of Gravel, moist26888.44.0FILL: Clayey Sand, trace of Roots, brown to dark gray.12Full:Full:12Full:Full:12Full:-885.47.012-FILLFILL: Silty Sand, fine-grained, waterbearing, medium dense12END OF BORING. (Per Tetra Tech)12Water observed at 6 1/2 feet while drilling12				METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	8/07	SCALE: 1'' = 4'
-       Gravel, moist.       -       -       -       -       -       -       -       26       -       -       26       -       -       -       -       -       -       -       26       -	feet	feet			I <u>.</u>	BPF	WL	Tests or Notes
883.4       7.0       FILL: Silty Sand, fine-grained, waterbearing, medium dense.       12         883.9       8.5       END OF BORING. (Per Tetra Tech).       12         Water observed at 6 1/2 feet while drilling.       12		4.0		Gravel, moist.				Fuel Odor
883.9     8.5     XXX       -     END OF BORING. (Per Tetra Tech).	- <u>885.4</u>	7.0	FILL		- edium		Ţ	
— Water observed at 6 1/2 feet while drilling.	883.9	8.5				12		
	-							
Image: state	-			Boring then grouted.	-			
	- -							
		-						
	_							
	_							

		ect SP-0 valuation	6-05871	BORING		. 01170	ST-46	7 0 7 0
TCAA NE of	P Rede Highwa	velopmen	t Highway 96	attached :	ON: N sketch.	: 21168	3.156, E: 55389	7.273 See
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	1/07	SCALE:	1'' = 4'
Elev. feet 895.4	Depth feet 0.0	-	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or 1	Notes
<u>894.4</u> <u>883.4</u> <u>883.4</u>	1.0	FILL         FILL         FILL         FILL         PT         2      <	FILL: Silty Sand, trace of Roots, dark brown, FILL: Silty Sand, fine- to medium-grained, tra Gravel with Wood fragments at 8' sample dept brown to gray moist to wet. PEAT, dark gray, wet. (Swamp Deposit) POORLY GRADED SAND with SILT, fine- t medium-grained, waterbearing, medium dense	ice of h, reddish       _		Ţ		
869.4	26.0		(Glacial Outwash)		]   11			
_	- - - - - - - - - - - 		END OF BORING. Water observed at 11 feet while drilling. Boring then grouted.	· · · · · · · · · · · · · · · · · · ·				



### SUBSURFACE BORING LOG

AET JO	DB NO: <b>22-00081</b>			<del></del>	<b></b>	L	OG OI	7 BO	RINGN	10.	ST	-47	(p. 1	of 1	)
PROJE	CT: TCAAP Ree	developn	nent; Ar	den Hi	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION				GEOLOGY	N	мс	SA	MPLE TYPE	REC	FIELE	<b>D &amp; L</b> A	BORA	FORY	TEST
FEET		L DESCRIP					INIC		ГҮРЕ	IN.	wc	DEN	LL	PL	<b>%-</b> #2
	SAND WITH SILT, sur fine grained, brown, a livery loose (SP-SM) (pos	ttle dark bro ssible fill)	own, moist	, /[ ]]]	COARSE ALLUVIUM OR FILL	4	м	$\mathbb{M}$	SS	13					
3	SAND WITH SILT, trac light brown and brown r (SP-SM) (possible fill)	nottled, mo	ist, very lo	ose		7	М	$\mathbb{N}$	SS	15					
5	SAND WITH SILT, trac light brown and brown n lenses and laminations o (possible fill)	nottled, mo	ist. loose.		COARSE ALLUVIUM	8	м	R	SS	17					
7 -	SILTY SAND, fine grain (SM) (possible fill)							R							
8	SAND WITH SILT, fine brown, a little brown mo (SP-SM)	ttled, moist	, loose			10	М	N R	SS	16					
· 11 –	SAND WITH SILT, trac light grayish brown, a lit laminations of silty sand	tle brown. 1 (SP-SM)	noist, loos			9	M	$\square$	SS	17					
12 - 13 -	SAND WITH SILT, fine brown, waterbearing, loo	grained, li se to dense	ght grayish (SP-SM)			9	w	Ħ	SS	16					
14 —							W	Д	00	10					
15 -							<b></b>	H							
16 -						11	М	X	SS	15					
17 -								Ы							
18 -								$\mathbb{S}^{\mathbb{C}}$							
19								$\mathbb{S}$			[				
20 -								4							
21 -						41	М	X	SS	18					
22 -								5							
23 -	AND MUCH OIL TO							$\left\{ \right\}$							
24 - 8	SAND WITH SILT, a litt gray, waterbearing, loose	le gravel, fi (SP-SM)	ine grained	,	,			$\left\{ \right\}$							
75	-	```						4						ľ	
26	CLAYEY SAND, a little	gravel, gray	y, stiff (SC	) // T	ILL	10	М	XI	ss	18	17				
1	END OF BORING Northing=211436.0 Easting=550652.0							/\							
 DEPTH	DRILLING METHOD	<u> </u>	·		T PAPER										
				SAMPLE	CASING					- I			OTE: F	REFER	ιтο
0-14½		DATE	TIME	DEPTH	DEPTH	CAV DEP	TH	FLU	RILLING ID LEV	EL 1	VATER LEVEL	<u>к</u> п	HE AT	TACH	ED
41/2'-241/2'	' RD w/DM	6/19/07	10:30	14.0	12.0	12			<del></del>		None		HEETS		
BORING COMPLET		6/19/07	10:35	16.5	14.5	14	.5			_ _	14.4		PLAN.		
COMPLEI DR: <b>SG</b>													MINC		
04	LG: SB Rig: 91C					. <u> </u>							THIS	LOG	

Geotecnica TCAAP Re	Evan develo way 10	tation pmen and	t Highway 96	BORING: LOCATIC attached s	DN: N:	2114		<b>T-48</b> 25, E: 5	50895.208 See
DRILLER:	K. Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	1/07		SCAL	E: 1'' = 4'
Elev. Dep feet fee 890.9 (	A	STM mbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Note
889.4	FIL 5	L	FILL: Silty Sand, trace of Roots and concrete de brown, moist.	bris, dark —					
-	SP SN	-	POORLY GRADED SAND with SILT, fine-grai orange-brown to light brown, moist, loose. (Lacustrine)	ned,	5 Sand) 0	' to 1.	.5'		
				Poorly G Silty San	raded S	Sand v	w Silt	1.5' to 18	3'
				-	10				
879.9 11	.0		POORLY GRADED SAND with SILT, fine-grai	ned	10	⊻			
	SN		brown to gray, waterbearing, very loose to loose. (Lacustrine)		6				
872.9 18	0				4		22	11	
_	SM		SILTY SAND, fine-grained, grayish-brown to gra waterbearing, medium dense. (Lacustrine)	ay,	₹ 8				
						-			
864.9 26.	0		END OF BORING.		14				
			Water observed at 11 feet while drilling. Boring then grouted.						

Geote TCAA NE of	cnical E AP Rede Highwa	ect SP-0 valuation velopmen vy 10 and 2 Ainnesota		BORING LOCATIO attached s	ON: N	: 211		<b>T-5</b> 79, E:	0 550740.041 See
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	2/07		SCA	LE: 1" = 4'
Elev. feet 882.8	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Note
<u>881.8</u> 878.8	<u>1.0</u> 4.0	FILL	FILL: Silty Sand, very fine- to fine-grained, track Roots, dark brown, moist. FILL: Clayey Sand, asphalt and concrete debris, Roots, dark gray, moist.	~	15		8	16	OC = 2%
- 875.8	7.0	FILL	FILL: Poorly Graded Sand with Silt, very fine- to fine-grained, brown, moist.	-	11			de la constante de la constante de la constante de la constante de la constante de la constante de la constante	
		SM	SILTY SAND, slightly Organic, dark gray, wet, v loose. (Swamp Deposit)	very – –	3		39	34	OC = 4
870.8	12.0	CL	SANDY LEAN CLAY, trace of Gravel, gray, we soft to rather stiff. (Glacial Till)	- t, rather -	4	Σ			LL = 34 PI = 1
-					10				
					5				
856.8	26.0		END OF BORING.		7	-			
			Water observed at 11 feet while drilling. Boring then grouted.						

Geote TCAA NE of	cnical E P Rede	valua velopi iy 10 a	tion nen Ind	t Highway 96	BORING LOCATI attached	ON: N	: 211		<b>T-51</b> 41, E: 5	50897.404 See
DRILLI	1	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	1/07		SCAL	E: 1" = 4'
Elev. feet 881.2	Depth feet 0.0	AST Sym		Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Note
880.4	0.8	FILL FILL SM		FILL: Silty Sand, very fine- to fine-grained, trac Roots, dark brown, moist. FILL: Silty Sand, very fine- to fine-grained, mix brown to brown, moist. SILTY SAND, fine-grained, trace of fibers, dark moist, very loose.	/			13		DC = 2% DC = 3
	12.0	SM		(Swamp Deposit) SILTY SAND, fine-grained, dark gray, waterber loose. (Lacustrine)		4	Σ.			
-	17.0	CL		SANDY LEAN CLAY, trace of Gravel, gray, we medium. (Glacial Till)		6				
855.2	26.0			END OF BORING. Water observed at 9 feet while drilling. Boring then grouted.		<b>X</b> 6				



### SUBSURFACE BORING LOG

AET J	OB NO: 22-00081					L	OG OF	BC	RING N	10	ST	-52	(p. 1	of 1	)
PROJE	ECT: TCAAP Red	evelopm	ent; Ard	len Hi	lls, MN										
DEPTH	SURFACE ELEVATION: .	885.9	)		GEOLOG		мс	s	AMPLE TYPE	REC	FIELI	D&L/	ABORA	TORY	TESTS
FEET	MATERIAL		ION			IN	MC			IN.	wc	DEN	u rr	PL	<b>%-#</b> 200
1 -	4.5" Bituminous Pavemen FILL, mixture of clayey s gravel, trace roots, brown	and and sil	ty sand, wi	th	FILL	12	М	$\left  \right\rangle$	SU SS	12	10				
2 -	gray	U						$\square$							ļ
3 - 4 -	FILL, mixture of sand, si sand, a little gravel, piece brown, light brownish gra	s of wood a	at about 5',			18	М	Ň	SS	19					
5 -		-				41	M	$\nabla$	SS	19					
6 —						41	M	$\square$	33	19					
7 -							<u>⊥</u> ⊻	K							
8 9						14	W	M	SS	17					
9 – 10 –								R							
11 -						16	Ţ	X	SS	17					
12 -	SAND WITH SILT, fine	grained, gr	ay, a little		COARSE			R							
13	black, waterbearing, very $\gamma$ silty sand (SP-SM)	loose, lami	inations of		ALLUVIUN	4	w	X	SS	14	10				
14	CLAYEY SAND, a little	gravel, dar	k gray, soft		TILL			Þ			19				
15 — 16 —	CLAYEY SAND, gray, a	little brow	n, soft,			4	М	X	SS	19	20				
17 -	laminations of silty sand (	SC)						Б							
18	SANDY LEAN CLAY, a	little grave	l grav cof					$\left \right\rangle$				ĺ			
19 -	to firm (CL)	nuie grave	a, gray, sor	' <i>  </i>				$\left \right\rangle$							
20 -						4	м	$\square$	SS	19	20				
21	~							Д	00	17	20				
22								K							
23								K							
25 -								H							
26 -						7	M	М	SS	17	19				
	END OF BORING Northing=211278.6 Easting=551665.8														
 DEPT	TH: DRILLING METHOD		<u></u>	WATE	R LEVEL M	 EASURI	 EMEN	L TS			<u> </u>	<u> </u>			
0-14		DATE	TIME	SAMPLI DEPTI		· · · · ·	VE-IN PTH	<del></del>	DRILLIN UID LE	IG.	WATE		NOTE: THE A		
<u>0-14</u> 14½'-24		6/21/07	10:45	14.0	1 DEPTH 12.0		2.4	rL.		VEL	10.9		SHEET		
													EXPLA	NATIO	N OF
BORING												Т	ERMIN		
DR: SG	LG: SB Rig: 91C					<u> </u>		<u> </u>	· .				нг ——	IS LOC	j 



### SUBSURFACE BORING LOG

AET J	OB NO: <b>22-00081</b>						LC	og of	BC	RINGN	10.	ST	-53	(p. 1	of 1	)
PROJ	ECT: TCAAP Red	levelopn	ient; Ard	en H	ills, MN	1										<u> </u>
DEPTH IN FEET	SURFACE ELEVATION:	885.	5	•	GEOLO	). GY	N	мс	s/	MPLE	REC	FIELI	) & LA	BORA	TORY	TESTS
FÉET		L DESCRIPT					N	MC		AMPLE TYPE	ĪN.	wc	DEN	LL	PL	<b>%-#20</b> (
1 -	FILL, mostly sand with s roots, trace roots, dark bi	silt, with gr own and b	avel, surface rown	*	FILL		13	м	M	SS	12					
2 -	THE PROPERTY OF THE	·	· · · · · · · · · · · · · · · · · · ·		ļ				Δ	00	12					
3	FILL, mixture of silty sat trace roots, brown, light l	nd and sand brown, a lit	l with silt, tle black				9	м	M	SS	13					
4	4								Д	55						
5									$\square$							
6 -							16	M	Ň	SS	8					
7 -	SILTY SAND, fine grain	ed, brown.	moist to	-   	COARSI	?	-		দ্র							
8		ium dense.	lenses and		ALLUVI		21	W/M	X	SS	17					
9-		SHL (SWI)							H							
10 -							18	<b>T</b>	$\mathbb{N}$	SS	19					
11 –						10		Д	55	15						
12 -	CLAYEY SAND, a little	wnish gray,		TILL		-		M								
13 14	13 – firm (SC)						6	Μ	M	SS	24	19				
14	SANDY LEAN CLAY, a	little grave	- brownish						٢J							
16	gray, stiff (CL)	indie grave	, 010 whish				13	м	M	SS	23	19				
17 -									Д							
18 -									$\left\{ \right\}$							
19									$\{$						1	
20 -									$\mathcal{A}$							
21 -							10	Μ	XI	SS	21	16				
22 -																
23 -									$\left \right $							
24 -									$\rangle$							
25 -							10		$\overline{\mathbf{N}}$							
26 -							12	М	$\mathbb{N}$	SS	24	17				
	END OF BORING Northing=211190.3															
	Easting=551897.8															
DEPT	H: DRILLING METHOD		WATE	R LEVEL	MEA:	SUREI	MENT	<u> </u>	I				IOTE: :			
0-91	4' 3.25" HSA	TIME S	SAMPLI DEPTI	ED CASI	NG TH	CAVI DEP	E-IN TH	D FLI	RILLIN JID LEV	G	WATEI LEVEI		THE AT			
9½'-24½		1:00	11.5	9.5		10.			,		10.3		SHEETS			
BORING												E	XPLAN	ATIO	V OF	
BORING COMPLE													TE	RMIN		
DR: SG	LG: SB Rig: 91C												THI	S LOG		



### SUBSURFACE BORING LOG

AET JO	DB NO: 22-00081					LO	DG OF	во	RING N	10	ST	-54	(p. 1	of 1	)
PROJE	CT: TCAAP Red	evelopm	ent; Ardo	en Hi	lls, MN							<u></u>			
DEPTH IN	SURFACE ELEVATION: _	888.9			GEOLOGY	N	мс	SA	MPLE	REC	FIELD	) & LA	BORA	r	1
FËÈT	MATERIAL						INIC		rype	IN.	wc	DEN	LL	PL.	<b>%-</b> #20
1 - 2 -	FILL, mixture of silty sar little gravel, trace roots, d pieces of brick	id and claye ark brown :	ey sand, a and brown,		FILL	18	М	M	SS	16					
3 -						56	W/M	ſX	SS	1	19				
4 -								षि							
5 6	CLAYEY SAND, brown soft, laminations of silty s (SC)	and gray m and and sai	nd with silt		WEATHEREI TILL	4	W/M	ſŊ	SS	17					
7 -	SANDY LEAN CLAY, a	little grave	el, gray, soft		TILL			E			22				
8 -	to stiff (CL)					5	м	M	SS	19	18				
9 - 10 -								E							
10 -						15	М	X	SS	19	16				
12 -								R	:				:		
13 -						8	M	X	SS	24	17				
14 -								þ							
15 - 16 -					2	9	м	X	SS	23	14				
17 -								Н							
18 -								$\mathbb{S}$							:
19 -								$\left \right\rangle$					•		
20 –								М			19		ļ		
21 -						10	M	М	SS	24					
22 –								[7]							
23 –								$\left \right\rangle$							
24 -								2							
25						10	м	M	SS	24	16				
26 -	END OF BORING Northing=211160.7 Easting=552421.7														
DEPT	H: DRILLING METHOD			WATE	R LEVEL MEA	SIDE	IMENT	 FS			<u> </u>	L			
		DATE	TIME	SAMPL DEPT		-	/E-IN PTH		ORILLIN UID LE	IG	WATE LEVE		NOTE: THE A		
0-24	4' 3.25" HSA	6/25/07	9:30	DEPT 9.0	H DEPTH 7.0		ртн . <b>5</b>	FL	UIDLE	VEL	LEVE Non		SHEET		
		0,20,07	2.00	2.0	7.0	0		-			1101	•	XPLA		
BORING COMPLE	ETED: 6/25/07											Т	ERMIN	IOLOC	JY ON
DR: <b>SG</b>				· · ·									TH	IS LOO	3



### SUBSURFACE BORING LOG

AET JC	DB NO: 22-00081					LC	og of	во	RING N	10	ST	-55	(p. 1	of 1	.)
PROJE	CT: TCAAP Red	evelopm	ent; Arc	len Hi	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION:	892.4	t	•	GEOLOGY	N	мс	SA	MPLE	REC	FIELI	)&L/	BORA	TORY	TESTS
FÊÊT		DESCRIPT					IVIC	1	MPLE TYPE	ĪN.	wc	DEN	LL	PL	<b>%-#</b> 20
1	FILL, mixture of clayey s little gravel, trace roots, p brown, gray and black	sand and sil pieces of bit	ty sand, a tuminous,		FILL	12	м	M	SS	13	10				
2	SANDY LEAN CLAY, a brown mottled, firm, lam and silt (CL)	a little grave inations of	el, gray and silty sand	1	WEATHEREI TILL	7	м	M	SS	14	18				
4 -	SANDY LEAN CLAY, a	little grave	el, light		TILL	-		图							
6 -	brownish gray, a little bro laminations of silty sand (	own, stiff to	very stiff,			9	м	X	SS	22	17				
7						16	м	M	SS	22	16				
9	SANDY LEAN CLAY, a	little grave	el, dark gra	y,											
11 12	a little brown, stiff to firm sand (CL)	ns of silfy			14	М	X	SS	18	16					
13					11	м	M	SS	20						
14 -								Щ			16				
15 -								$\mathbb{N}$							1
16 -						10	М	Ŵ	SS	21	17				
17 —								Į.							
18 —								ţ]							
19 -								ᆀ							
20 – 21 –						8	м	X	SS	19	15				
21 -								/\/ ਸ							
23 -								ţĮ.							
24 -								圳							
25 -								Ч							
26 -						13	М	Ň	SS	24	15				
	END OF BORING Northin=211171.6 Easting=552889.1											<u> </u>			
DEPTH	H: DRILLING METHOD			WATE	R LEVEL MEA	SUPE	MENT	 ```							L
		DATE	TIME	SAMPL DEPTI		CAV			RILLIN JID LEV	G	WATE LEVE		NOTE: THE A'		
0-241/	2' 3.25" HSA	6/22/07	11:00	DEPTI 26.5		DEF 25		FLU	JID LEV	VEL	LEVE Non		SHEET		
	· · · · ·					<u></u>					11010	~	XPLAN		
BORING COMPLE	TED: 6/22/07		·····									T	ERMIN	OLOG	Y ON
DR: <b>SG</b>	LG: SB Rig: 91C												THI	S LOC	3



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AMERICAN ENGINEERING TESTING, INC.

#### SUBSURFACE BORING LOG

AET J	OB NO:	22-00081					LC	OG OF	BO	RING N	10	ST	-57	(p. 1	of 2	)
PROJE	ECT:	TCAAP Rede	velopme	nt; Ard	en Hi	lls, MN										
DEPTH IN FEET	SURI	FACE ELEVATION:	893.6			GEOLOGY	N	мс	SA	MPLE	REC	I	) & LA	BORAT	TORY '	TESTS
FÉET		MATERIAL I		DN	. <u> </u>					TYPE	IN.	WC	DEN	LL	PL	<b>%-#</b> 200
1 -		Bituminous Pavemer mixture of sand with		Ity sand	-/	FILL		М	<b>\$</b> {	SU						
2 -	light b	rown and brown	i sint und si	ity build,					I							
3							67	М	М	SS	18					
4 -									Д							
5 -	-								M							
6 -							44	M	IXI	SS	18		1			
7	FILL,	mixture of sand with	silt and si	lty sand, a					团							
8 ~~	little g black	ravel, brown, dark b	rownish gr	ay and			64	М	M	SS	23					
9 -	4								Д							
10 -	-								$\square$						1	
11	-						78	Μ	Ň	SS	17					
12 -	-								षि							
13 -		-					5	М	X	SS	14					
14 -	-															
15 -							10		$\overline{\mathbb{N}}$		17	-				
16 -	-						12	М	М	SS	17					
17 -	-								E							
18 -	-						38	W/M	ŧΧ	SS	19					
19 -					-				E							
20 -	-						14	М	$\mathbb{N}$	SS	17					
21 -					-		14	IVI	$\square$	33	11					
22 -	SAND	WITH SILT, trace	roots, fine	grained.		TOPSOIL O	R	V	R							
23 –	brown	ish gray, a little blac m dense, lamination	k, waterbea	aring,		COARSE ALLUVIUM	19	W/M	¢χ	ss	19					
24	\(SP-SI	(I)	•	e ont	] ::	COARSE ALLUVIUM	-1		B							
25 -	SAND waterb	, fine grained, brow earing, medium den	nish gray, se, lense of	f fine to		101	14	w	M	SS	22					
26 -	mediu	m grained sand (SP)	-			ŤILL			$\mathbb{A}$			15				
27 –	gray, s	Y LEAN CLAY, a tiff (CL)	nue grave	i, orownisr	'				K							
- 28 —	1								K							
DEF	I PTH: D	RILLING METHOD			<u>////</u> WAT	I ER LEVEL M	EASUR	EMEN	LL ITS	I	1	_ <b>_</b>	<u>'</u>	NOTE	REF	ER TO
	44	268 TTO 4	TIME	SAMPI DEPT	ED CASING	GA CA	VE-IN EPTH	F	DRILLI LUID LI	NG	WAT		THE A			
	0-24½ 3.25" HSA					$\frac{11}{22.0}$		2.4				Nor		SHEE	TS FO	R AN
2-1/2-2	<u>4½'-29½' RD w/DM</u> 6/19/07 12:1 6/19/07 12:2					5 24.5		24.1	$\uparrow$			22.	— I.	EXPLA	NATI	ON OF
BORIN COMP	IG LETED:	6/19/07				·····							]1			GY ON
DR: S												Tł	IIS LO	G		



AET JO	OB NO: 22-00081		,	LO	G OF	BO	RING N	10	ST	<u>-57 (</u>	р. 2	<u>of 2</u> )	
PROJE	TCAAP Redevelopment; Arde	n Hi	lls, MN							·			
DEPTH IN FEET			GEOLOGY	N	мс	SA	MPLE YPE	REC	· · · · ·	& LAI			r
FÉET		<u></u>					YPE	IN.	WC	DEN	LL	PL	%-#200
30	SANDY LEAN CLAY, a little gravel, brownish gray, stiff (CL) (continued)		TILL (continued)			$\bigwedge$							
31 -				9	М	M	SS	24	15				
	END OF BORING			-			<u> </u>						
	Northing=211018.6 Easting=550730.8												
		[											



### SUBSURFACE BORING LOG

AET JC			<b>4</b> . <b>4</b> •	· · · · · · · · · · · · · · · · · · ·	11	LC	)G OF	BO	RING N	10	ST	-59	(p. 1	<u>of 1</u>	)
PROJE	CT: TCAAP Rede	velopme	ent; Ard	en Hi	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION: _	884.4			GEOLOGY	N	мс		MPLE TYPE	REC IN.	<u> </u>	0 & LA	· · · ·	T	
FEET	MATERIAL				FIT T	ļ				111.	wc	DEN	LL	PL	<b>%-#</b> 2
1 -	FILL, mostly silty sand, a bituminous, surface roots, dark brown	trace roots	, pieces of , brown and	1	FILL	10	М	X	SS	14					
2 — 3 —	FILL, mixture of sand with little gravel, trace roots, br					26	М	$\left[ \right]$	SS	16					
4 -								Д							
5			Fill (silty sa	and) 0' te	0.2'			M	90	10					
6 -			Fill (sand v Fill (organi	v siĺt) 2'	to 9'	28	М	М	SS	19					
7 -		K	topsoil 11' Sand 12' to	to 12'				日							
8 –			Sand w sil	t 18' to 2	23'	23	М	M	SS	17					
9 +	FILL, mixture of organic of trace roots, black and brow				দ্র										
			13	М	X	SS	17	17							
12	LEAN CLAY WITH ORC black, a little gray, stiff, la				TOPSOIL		T	Ш			24				
13 -	(CL) SAND, fine grained, light			/	COARSE ALLUVIUM	11	w	М	SS	17					
14	waterbearing, medium den	ise (SP)						Д							
- 15 -	SAND, a little gravel, fine gray, a little black, waterbe	earing, very	rownish y loose,					М							
16 -	laminations of organic silt	(SP)				4	W	М	SS	16					
17 -								R							
18 +	SAND WITH SILT, fine g	rained, ligh	ht brownish					K							ŀ
19 -	gray, waterbearing, dense	(SP-SM)						Ц							
20 21						37	w	X	SS	18					
22 -								Ы							
23								$\mathbb{S}$							
24 -	SILTY SAND, fine graine wet, dense (SM)	a, light bro	ownish gray	, <u></u>				$\left \right\rangle$							
25 -					-			$\square$		1.0					
26 -						31	W	$\mathbb{N}$	SS	18					
	END OF BORING Northing=210936.8														
	Easting=550917.0														
DEPT	H: DRILLING METHOD			WATE	ER LEVEL MEA	SURE	MEN	TS				1	NOTE:	REFF	ER TO
0-14 <sup>1</sup>	½' 3.25" HSA	DATE	ED CASING H DEPTH	CAV DE	Æ-IN PTH	FL	DRILLI UID LE	NG VEL	WAT LEVI	ER EL	THE A	TTAC	THED		
41/2'-20		6/19/07	1:40	14.0	) 12.0	12	2.2				12.		SHEET	rs foi	R AN
DODING													EXPLA		
BORING COMPLI								<u> </u>				T	ERMIN TU	IOLO IS LO	
$\frac{DR}{OA}$	LG: SB Rig: 91C										11	us LU	<u> </u>		



AET JO	DB NO: 22-00081	_			2	 I	.OG OF	BORING	NO	ST	-60	(n 1		1
PROJE	CT: TCAAP R	edevelop	ment; A	rden Hi	ills, MN	-		201010			-00 (	լի, լ	01 ]	<u> </u>
DEPTH IN FEET	SURFACE ELEVATIO	N:88.	3.9		GEOLOGY	,	1	64367-		FIELI	) & LA	BOR 4'	TORV	 TF'
FEET		AL DESCRIF				N	MC	SAMPLE TYPE	REC IN.	wc	DEN	LL	PL	16.
1	FILL, mixture of silty organic silt, a little gra dark brown and black	vel, trace ro	ots, brown,		FILL	10	М	X ss	14					
3 - 4	FILL, mixture of sand clayey sand, a little gra roots, brown, a little lig	vel organic	clay trace			16	М	ss	14					
5 - 6 -						4	W/M	면 V ss	14			3		
7 -								य ज	17					
8 - 9 -			nd) 0' to 14' t 14' to 16.5' to 26'			3	-M-	SS B	14					
10 - 11 - 12						5	w	ss	17					
12 - 13 - 14 -						13	w	∑ ∕ ss	12					
	SAPRIC PEAT, black, I waterbearing sand (PT)	aminations	of		SWAMP DEPOSIT	WH	w	ss	19	48			-	
17 - 5	SAND, fine grained, gra	y to browni	sh grav			-	Ķ	4						
18 - V 19 -	vaterbearing, medium d	ense (SP)				12	w	ss	16					
20 - 21 -						22	w	ss	19					
22 -							Ľ		.,					
23 -							K							
24 -							K				1			
25 – 26 –						28	w X	ss	21					
N	ND OF BORING orthing=210929.3 asting=551151.1	······												
DEPTH:	DRILLING METHOD	1		WATER	LEVEL MEAS	SURFA	TENTS	L						
0-91/2'	3.25" HSA	DATE	TIME	SAMPLED	T	CAVE	<u> </u>	DRILLING	i w	ATER		fe: Ri		
/2'-24 <sup>1</sup> /2'	RD w/DM	6/19/07	2:45	9.0	DEPTH 7.0	DEP1 7.0	·	UID LEV		ATER EVEL	_	E ATT. EETS I		
		6/19/07	2:50	11.5	9.5			<u>.</u>		lone 8.0	_	LANA		
	D: 6/19/07				<u> </u>				_ <b> </b>	0.0		AINOL		
ર <b>SG</b> ા	LG: SB Rig: 91C				╏━─────┤				_		1	THISI		211



AET J	OB NO: <b>22-00081</b>					LC	DG OF	во	RING N	10	ST	-61	(p. 1	of 1	)
PROJ	ECT: TCAAP Red	evelopm	ent; Ard	len Hi	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION:	885.9	)		GEOLOGY			SA	MPLE	REC	FIELI	) & L/	BORA	TORY	TESTS
FEET		DESCRIPT	ION			N	MC	7	MPLE FYPE	ÎN.	wc	DEN	LL	PL	<b>%-#20</b> 0
1-	5" Bituminous Pavement FILL, mixture of silty sar	d and sond	l with ailt a		FILL			Ł	SU						
2 -	little gravel, trace roots, b	rown and g	gray			20	M	M	SS	14					
3						20		$\mathbb{M}$	00	17					
4 -						32	M	Μ	SS	17					
5 -								R							
6-						39	M	X	SS	19					
7-		*****						团团							
8-	CLAYEY SAND, black, laminations of sand with	a little gray silt (SC)	, hard,		TOPSOIL	38	м	М	SS	20	13	-			
9-	SILTY SAND, fine grain moist, dense (SM)	ed, light br	ownish gra	y,	COARSE ALLUVIUM			Д							
10 -	SILTY SAND, fine graine	ed, gray, w	et, loose	-			<u> </u>	M							
11	(SM)				8	W	M	SS	18		5				
12 -	SAND WITH SILT, trace	orained					团								
13 -	gray, a little black, waterb laminations of clayey sand	earing, me	dium dense	,		12	w	X	SS	14					
14 -	autoris of claycy same	1 (31-314)						Н							
15 —						11	w	$\mathbb{M}$	SS	10					
16 -								Д	00	10					
17 –								Н							
18 -						10	W	XI	SS	15					-
19 -	SAND WITH SILT, fine g waterbearing, medium der	grained, gra	ay,					「日							
20 -	water bearing, medium der	ise (SP-SIV	1)			21	w	M	SS	17					
21 – 22 –								Щ							
22 -								K							
24 -								K							
25 -								Ю							
26 -						22	w	XI	SS	15					
ŀ	END OF BORING			!··!·!									<u> </u>		
	Northing=210988.6 Easting=551565.3														
														L <u>.</u>	
DEPT	TH: DRILLING METHOD				R LEVEL MEA	· · ·		,	אווחמ		11/ ^ 77	D	NOTE:		1
0-9		DATE	TIME	SAMPL DEPTI		CAV DEI		FLU	RILLIN JID LE	VEL	WATE LEVE	L	THE A		
91/2'-24	½' RD w/DM	6/21/07	9:30	11.5	9.5	9.	.7	<u> </u>			9.4		SHEET		
BORING	ΕΤΈΓΟ, <b>Κ/21/07</b>												EXPLAI ERMIN		1
DR: SG														IS LOO	
		h	L			1						1			

Geotecn TCAAP	ical Ev	aluatio		BORING	DN: N	210		<b>T-6</b> 2 68, E:	2 550782.855 See
	lighway	y 10 <sup>°</sup> and	Highway 96	attached s	ketch.				
DRILLER		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	5/07		SCA	LE: 1'' = 4'
feet 884.3		ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Notes
Sic Log of BRAUN GDT 102001 14:45 (See Descriptive Terminology sheet for explanation of abbreviations)		FILL STATES SM	FILL: Silty Sand, trace of Roots, dark brown, m FILL: Silty Sand, very fine- to fine-grained, trac Gravel, mixed with Poorly Graded Sand, light br brown, moist. SILTY SAND, fine-grained, trace of Roots, sligh Organic, dark gray, waterbearing, loose. (Swamp Deposit) POORLY GRADED SAND with SILT, fine-grai gray, waterbearing, loose. (Lacustrine) SANDY LEAN CLAY, trace of Gravel, gray, we medium to rather stiff. (Glacial Till) END OF BORING. Water observed at 12 feet while drilling. Boring then grouted.	e of own to       	18         22         14         7         6         5         7         7         10	Σ	25	17	OC = 2%

Braun Pr Geotecnica TCAAP Ro NE of High Arden Hill	Evaluation development way 10 and	a nt Highway 96	BORING LOCATH attached	ON: N		<b>ST-63</b> 7.940, E: 55063	37.026 S
DRILLER:	K. Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	5/07	SCALE:	1"=
Elev. Dep feet fee 886.1		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
	0 CL	FILL: Poorly Graded Sand with Silt, fine-grof Gravel, mostly brown mixed with dark brown for the start of the start o	own, moist - - -grained,  grained,   	23 17 23 7 6 3 10	$\mathbf{\nabla}$		



### SUBSURFACE BORING LOG

AET J	OB NO:	22-00081						LC	G OF	BO	RING N	10	ST	-64	(p. 1	of 1	
PROJ	ECT:	TCAAP Red	evelopm	ent; Ard	en Hi	ills	, MN										
DEPTH IN FEET	SUI	RFACE ELEVATION: _	883.5			6	GEOLOGY			SA	MPLE	REC	FIELI	)&LA	BORA	FORY '	TESTS
FEET		MATERIAL	DESCRIPTI	ON				N	MC	] ]]	MPLE TYPE	IN.	WC	DEN	LL	PL	<b>%-#</b> 200
		Bituminous Paveme		- 114 3		FI	LL	_		Ň	SU						
1 -	Claye	, mixture of gravelly y sand, trace roots, b	sand with	silt and				7	M	M	SS	12					
	FILL	, mixture of sand wit y sand, a little gravel	h silt, silty	sand and	-					$\square$							
3		n, gray and black	, orown, a	inthe dark				12	M	M	SS	16	11				
4 -	1				ľ					यि							
5 -								32	м	IXI	SS	19	7				
6 -	]									Д							
8-	FILL	, mixture of silty san	d and orga	nic clay		-				M							
9	trace	roots, brownish gray	and black	ine engy,	-			25	М	M	SS	20					
10 -		UC PEAT, black (PI	<u>(</u> )				VAMP EPOSIT			B							
11 -	SILT	Y SAND, trace roots	, fine grain	ed, gray		CC	ARSE	3	M	IXI	SS	14					
12 -	and b silt (S	lack, wet very loose, M)	lamination	is of organi	c	AL	LUVIUM			E							
13		,						3	w	M	SS	12					
14 -										Д							
15 —	SANI	DY LEAN CLAY, a	little grave	l, gray, firr	n	ТП	LL			М							
16 -	to still	f, laminations of san	a (CL)					6	М	M	SS	12	14				
17 –										D							
18 —										$\left \right\rangle$							
19 -										$\left \right\rangle$							
20 -										$\square$	~~						
21 -								6	М	M	SS	22	16				
22 -										21							
23 –										$\left \right\rangle$							
24 -										2							
25 -								12	м	М	SS	22	17				
26 -			<u>.</u>					12	141	М	00	<i>44.</i>	1/				
		OF BORING ng=210683.3				-											
	Eastin	g=550895.7															
DEPI	TH: D	RILLING METHOD		www.cz.u.	WATE	ERL	EVEL MEA	SURE	MEN	rs			1		I NOTE:	REFE	
0-9	0½' 3	.25" HSA	DATE	TIME	SAMPL DEPT	.ED H	CASING DEPTH	CAV DEI	E-IN PTH	L FL	NRILLIN UID LE	JG VEL	WATE LEVE		THE A		
9½'-24		D w/DM	6/20/07	3:35	11.5		9.5	10					10.2		SHEET	'S FOR	AN
	~													I	EXPLAI	OITAN	N OF
BORINO	i ETED:	6/20/07						_						Т	ERMIN		1
DR: SG	LG:	SB Rig: 91C													TH	IS LOC	ì



### SUBSURFACE BORING LOG

AET J	OB NO: 22-00081					LC	)G OF	BO	RING N	10	ST	-65	(p. 1	of 1	)
PROJE	CT: TCAAP Red	evelopm	ent; Arc	<u>len Hi</u>	lls, MN										
DEPTH	SURFACE ELEVATION: .	886.2	2		GEOLOGY			SA	MPLE	REC	FIELI	)&L/	ABORA	TORY	TESTS
IN FEET	MATERIAL		ION		dicition i	N	MC	<b>1</b> "]	MPLE TYPE	ÎN.	wc	DEN	LL	PL	%-#200
1	4.5" Bituminous Pavemer				FILL			ħ	SU						
1 – 2 –	FILL, mixture of silty san clayey sand, with gravel, light brown and gray	trace roots,	dark brow	'n,		14	М	Å	SS	13					
3 - 4 -	SAND WITH SILT, fine and brown mottled, moist laminations of silty sand (	, medium d	ght brown lense,		COARSE ALLUVIUM	22	M	X	SS	19	1				
5 —	SAND WITH SILT, fine moist to waterbearing, me	grained, lig	ght brown, e (SP-SM)			23	w	M	SS	17					
6-						23		Д							
7	SAND WITH SILT, fine gray, a little black, w Sand	ilty sand) 0.3	3' to 2.5'			<u> </u>	>	М	~~						
0 9	anen moist, medium (Sand	w Silt 2.5' to 12' to 14.5' y Silt 14.5' to	<u>y</u>			15	M	Ш	SS	17					
10 —		ey Sand 18' 1					Ţ	M		• •					
11 -	SAND WITH SILT, trace	roots, fine	grained,			14	М	Д	SS	20					
12 — 13 —	gray and black, moist, me organic silt (SP-SM)							M							
13	SAND, fine grained, gray brown mottled, waterbear	and light g	rayish m dense			12	W	Й	SS	19					
15 —	(SP) SANDY SILT, gray and b	rownish g	ray, wet,		FINE ALLUVIUM			М							
16 -	loose, lenses and lamination	ons of lean	clay (ML)		TILLO VIONI	8	М	Щ	SS	17					
17								K							
19 -	CLAYEY SAND, a little g laminations of wet silty sa	gravel, gray nd (SC)	y, stiff,		TILL			K	:						
20								М							
21 –						9	М	$\mathbb{N}$	SS	20	14				
22 -								R							
23 — 24 —	SANDY LEAN CLAY, a (CL)	little grave	l, gray, stif	f 🥼				K							
25 -	<b>`</b> ,							H							
. 26 —						13	М	M	SS	19	19				
-	END OF BORING Northing=210684.0	·····	·····												
	Easting=551396.3														
DEPT	H: DRILLING METHOD		· · · · · · · · · · · · · · · · · · ·	WATE	R LEVEL MEA	SURE	MENT	ГS	[		L		NOTE:	REFEI	ато
0-1	2' 3.25" HSA	DATE	TIME	SAMPLI DEPTI		CAV DEF	E-IN 'TH	D FLI	RILLIN JID LE	IG VEL	WATE LEVE	R	THE A		
12'-24	½' RD w/DM	6/21/07	8:20	14.0	12.0	12	.1				10.0		SHEET	S FOR	AN
BORING	-		· ·			ļ				-			EXPLAN		
COMPLI	ETED: 6/21/07											<sup>T</sup>	ERMIN	OLOG IS LOG	- 1
DR: SG	LG: SB Rig: 91C			l		1							1111	IS LUU	·



AET JOE	B NO: <b>22-00081</b>						_				~~~				
PROJEC		_ edevelop	ment; A	rden Hi	ills, MN	I	.0G (	DF B	ORING	NO	ST	<u>`-66</u>	<u>(p. 1</u>	<u>of 1</u>	)
DEPTH IN FEET	SURFACE ELEVATION		8.9		· · · · · · · · · · · · · · · · · · ·		1				EIET				
	MATERI	AL DESCRI	PTION		GEOLOG	Y N	M	c S	AMPLE TYPE	E REO		D&LA	T	1	
1 1 7 1	FILL, mostly silty sand roots, dark brown			/	FILL				r	<u> </u>		DEN		PL	<b>%-#20</b>
L/1	FILL, mixture of sand little gravel, trace roots	. light broy	n and broy	d, a	00.1000	20	M	Ň	SS	19					
	nedium dense (SM)	uined, brow	n, moist,		COARSE ALLUVIUN	A 20	М	$\mathbb{N}$	SS	18					
5 b	SAND WITH SILT, fu	1 moiet m	odium don	sh se.				R							
6 -	aminations of silty san	d (SP-SM)				15	М	X	SS	15					
	AND WITH SILT, fin ray and brown mottled							E							
9- W	aterbearing, medium d	lense to loc	ibout 9.5', i ose (SP-SN	then (1)		18	M	M	SS	18					
10 —	, <b>n</b>						Y	R							
11 - 12 -						12	Ŵ	Д	SS	17					
13 -						6	w	M	SS	14					
14 - 15 - SI	LTY SAND, a little gr	avel fine t	omodium					Ð							
16 gra	ained, gray, wet, very	loose (SM)				2	W	M	SS	13					
17 -								Ы						ļ	
	AYEY SAND, a little	gravel, gra	iy, soft (SC	C) T	TLL			$\left\{ \right\}$							
20 -								4							
21 22						4	М	$\mathbb{X}$	ss	24	18				
22								$\sum$							
24 (CL	NDY LEAN CLAY, a	little grave	el, gray, fir	m				$\langle  $							
25 -							K	4							
26 -	DOEDOD		<u> </u>			7	м	X	ss	24	21				
Nor	D OF BORING thing=210683.5 ting=551850.2		<u></u>		<u> </u>			1							
		·	. <u></u>												
DEPTH:	DRILLING METHOD	<u> </u>	г <u> </u>		LEVEL MEA	SUREM	ENT	<u> </u>	<del></del>				TE: RI		
0-9½'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE- DEPT		DR	ILLING D LEVI	EL I	VATER .EVEL		E ATT		
9½'-24½'	RD w/DM	6/21/07	2:05	11.5	9.5	10.2					10.0	ѕн	EETS I	FOR A	N
BORING COMPLETED	6/31/07			ļ								EXP	LANA	TION	OF
			<u></u>									TERM	MINOL	.OGY (	лс
<u>DR: 56 10</u> 6/04	i: SB Rig: 91C											1	THIS I	JOG	



### SUBSURFACE BORING LOG

AET J	OB NO:	22-00081					-	LC	OG OF	во	RING N	10	ST	-67	(p. 1	of 1	
<b>PROЛ</b>	ECT:	TCAAP Red	evelopm	ent; Ard	len Hi	ills, l	MN										
DEPTH	SUR	FACE ELEVATION:	888.7	,		GE	OLOGY	N	мс	SA	MPLE	REC	FIELE	)&L	ABORA	TORY '	FESTS
IN FEET		MATERIAL						IN	MC	1	MPLE FYPE	IN.	wc	DEN	1 LL	PL	<b>%-#20</b> 0
1 -	FILL, -\roots.c	mostly organic silt, lark brown and blac	, surface roo ck	ots, trace	/	FILL	J	8	м	М	SS	15					
2 -	FILL,	mixture of silty san	d and claye		_			0	141	Μ	33	15					
3 -	little g	ravel, trace roots, d rown	ark brown,	brown and				17	м	Μ	00						
	SAND	WITH SILT, a litt			-11		RSE UVIUM	17	M	М	SS	14					
4	to light mediu	t brown mottled, wa m dense (SP-SM)	aterbearing	, loose to			0 1 10101			R							
_								17		IXI	SS	15					
6									-	Д							
7 -							_			M					·		
8	İ	Fill (silty sand) Sand w Silt 3'				-	$\rightarrow$	21	W	M	SS	17	1		·		
9		Clayey Sand 1 Sandy Lean C	2' to 14.5'	26'						图					ľ		
10 —		Sandy Lean C	lay 14.5 10 2	-0				9	w	M	SS	15					
11										Д							
12 -	CLAY	EY SAND, a little	gravel, gray	y, stiff (CL)		TILL		-		Н			17				
13 -								9	М	IXI	SS	10					
14 -										Ð							
15 -	SAND to stiff	Y LEAN CLAY, a	little grave	l, gray, firr	n ///			6	м	М	SS	17	15				
16 -									IVI	Μ	55						
17 —										27							
18 -										$\mathbb{Z}$							
19 -										$\left \right\rangle$							
_20 —										Μ			17				
21 -								11	M	М	SS	16					
22										$\sum$							
23 -										)]							
24 —										)]							
25										[		ľ	18				
26 -								10	М	M	SS	18	10			1	
	END (	OF BORING													-		
		ng=210683.4 =552397.5															
DUN			1														L
DEP1	IH: DI	RILLING METHOD	· · · · · ·				VEL MEA	T	<u> </u>		<u></u>		117 4 1717		NOTE:	REFE	r to
0-9	<u>1/2' 3.</u>	25" HSA	DATE	TIME	SAMPL DEPT		CASING DEPTH	DE	'E-IN PTH	FL	ORILLIN UID LE	VEL	WATE LEVE		THE A		
9½'-24	1/2' R	D w/DM	6/22/07	8:40	9.0		7.0	6	.8				6.0		SHEET		
BORING	<del>.</del>							ļ							EXPLA		
BORING		<u>5/22/07</u>													TERMIN TH	IS LOG	1
DR; SG	G LG: S	SB Rig: 91C						1							111	IO LOC	,



### SUBSURFACE BORING LOG

AET J	OB NO: <b>22-00081</b>						LC	G OF	BO	RING N	ю	ST	-68	(p. 1	of 1	
PROJE	CT: TCAAP Red	evelopm	ent; Ard	en Hi	ills,	MN										
DEPTH IN	SURFACE ELEVATION: _	895.0	····		GE	EOLOGY	N	мс	SA	MPLE	REC	FIELI	)&L/	BORA	TORY 1	rests
FEET	MATERIAL						19	IVIC.		ГҮРЕ	IN.	wc	DEN	LL	PL '	<b>%-#20</b> 0
1 - 2 -	FILL, mixture of silty san little gravel, surface roots, brown, brown and dark br	trace roots			FILI	Ĺ	13	м	M	SS	12					
3 -							16	м	M	SS	6					
4 -									$\square$							
5							12	<b>▼</b> M	$\square$	SS	14					
6							12	IVI	Д	55	14					
7 — 8 —	ORGANIC CLAY, trace I (OL/OH)	roots, black	, soft		SWA	PSOIL OR AMP POSIT	3	м	Ź	SS	10	39				
· 9 10	SAND WITH SILT, a littl gray, waterbearing, mediu	e gravel, bi m dense (S	rown and P-SM)			ARSE LUVIUM	28	w	Ď	SS	17					
11 -							20		Д	00	17					
12 — 13 —	LEAN CLAY, gray and b sandy lean clay, lamination	lack, stiff, l ns of fat cla	enses of ay (CL)		TILI	L	14	м	Ź	SS	24	16				
14	SANDY LEAN CLAY, a	little grave	l, gray, firr	n ///			;		Ð							
15 16	to stiff, laminations of lear	n clay (CL)					5	м	X	SS	6					
10									$\mathbb{R}$	•						
18									$\left \right\rangle$							
19 —									$\left  \right\rangle$							
20 —							11	М	$\mathbb{N}$	SS	19	17				
21 –								101	Д	00	17					
22 – 23 –									5							
23 - 24 -							:		K						ļ	
25 -									H							
26 -							12	М	M	SS	21	18				
	END OF BORING Northing=210684.3 Easting=552897.4															
DEPI	TH: DRILLING METHOD			WATI	ER LE	EVEL MEA	SURE	MEN	ГЛ ГS		L	1		NOTE:	REFE	R TO
0-4	<sup>1</sup> / <sub>2</sub> ' 3.25" HSA	DATE	TIME	SAMPI DEPT	.ED H	CASING DEPTH	CAV DEI	E-IN PTH	I FL	DRILLI UID LE	NG VEL	WATI		THE A		
41/2'-24		6/22/07	1:00	6.5		4.5		.0				5.2		SHEET	S FOR	AN
DOBD														EXPLA		
BORINO COMPL	BETED: 6/22/07												]1	FERMIN		
DR: SG	LG: SB Rig: 91C							:						TH	IS LOC	Ĵ

Geote TCAA NE of	cnical È AP Rede <sup>v</sup> Highwa	ect SP-00 valuation velopment y 10 and 1 Jinnesota		BORING LOCATIO attached s	DN: N: 210744	<b>RI-3002-05</b> 4.173, E: 553428.679 See
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/19/07	SCALE: 1" = 4'
Elev. feet 894.8	Depth feet 0.0	ASTM	Description of Materials	Dill.	BPF WL	Tests or Notes
		Symbol FILL 🔆	(ASTM D2488 or D2487) FILL: Poorly Graded Sand with Silt, trace of	Gravel, dark		**************************************
893.8	1.0	SM	brown, moist. SILTY SAND, fine-grained, gray, moist, loos (Lacustrine)	e	8	
890.8	4.0	SP- SM	POORLY GRADED SAND with SILT, trace brown, waterbearing, very loose to loose. (Lacustrine)	of Gravel,	$\begin{bmatrix} & & & \\ & & & & \\ & & & \\ & & & \\ & & & & \\ & & & \\ & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & $	
_	17.0	CL	SANDY LEAN CLAY, trace of Gravel, gray, medium to rather stiff. (Glacial Till)	wet,	8	
	26.0		END OF BORING. Water observed at 4 feet while drilling. Boring then grouted.			

BRAUN

LOG OF BORING

Geote TCAA NE of	n Proje cnical E P Rede Highwa Hills, N	valuati velopm y 10 ar	on ent id H:	.05871 ighway 96	BORING LOCATIC attached s	ON: N	21024	<b>ST-70</b> 0.974. E: 55058	34.304 See
DRILLI	ER: K.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	5/07	SCALE:	1'' = 4'
Elev. feet 885.0	Depth feet 0.0	2	51	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
883.5	1.5	SM SP- SM		SILTY SAND, trace of Roots, dark brown, m (Topsoil) POORLY GRADED SAND with SILT, fine-g					
878.0	7.0			orange-brown, moist, loose. (Lacustrine)	- - -	9	<b>∑</b>		
		SP- SM		POORLY GRADED SAND with SILT, fine-g brown to gray with rust, waterbearing, very lo (Lacustrine)	grained, light ose to loose 	4			
871.0	14.0	CL	1	SANDY LEAN CLAY, trace of Gravel, gray, nedium to rather stiff.		M 8 M 9			
				(Glacial Till)	- - - - - - -	¥ 6			
859.0	26.0		1	END OF BORING. Vater observed at 7 feet while drilling. Boring then grouted.		9			

#### SP-06-05871

BRAUN"

### LOG OF BORING

Geote TCAA NE of	cnical Ě P Rede	valua velopi y 10 a	tion nent and l	6-05871 Highway 96	BORING LOCATIO attached s	N: NC		<b>RI-1015</b> .469. E: 55092	
ORILLI		Keck	<u>jota</u>	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	5/07	SCALE:	1"=4'
Elev. feet 887.3	Depth feet 0.0	AST Sym		Description of Materials (ASTM D2488 or D2487)	·	BPF	WL	Tests or	Notes
887.1 <i>)</i> 885.8	0.3	FILL	***	3" of Bituminous FILL: Poorly Graded Sand with Silt, fine-graine of Gravel, brown, moist.	ed, trace –				
880.3	7.0	SP- SM SP- SM		POORLY GRADED SAND with SILT, fine-gra brown to orange-brown, moist, loose to medium (Lacustrine) POORLY GRADED SAND with SILT, fine-gra brownish-gray to gray, waterbearing, very loose (Lacustrine)	dense		Σ		
- 875.3	12.0				-	10			
		CL		SANDY LEAN CLAY, trace of Gravel, gray, w stiff to very stiff. (Glacial Till)	et, rather - - 	25 14			
_				· · · ·	- - - -	M 11			
361.3	26.0			END OF BORING. Water observed at 7 feet while drilling.	- 	11			
-				Boring then grouted.	-				



AET J	OB NO: <b>22-00081</b>				*	L	OG OF	F BC	DRING 1	NO.	ST	-72	(p. 1	of 1	)
PROЛ	ECT: TCAAP Red	levelopn	<u>nent; Ar</u>	den H	ills, MN										<u> </u>
DEPTH IN FEET	JUNIACE BLEVATION.				GEOLOGY	N	мс	s	AMPLE TYPE	REC	FIELI	) & LA	BORA	TORY	TESTS
FEET		L DESCRIPT					IVIC		ТҮРЕ	IN.	wc	DEN	LL	PL	%-#200
1 - 1	FILL, mixture of silty sa brown, brown and dark b	nd and san prown	d, light		FILL	6	M	$\mathbb{N}$	ss	14					
2 -								$\Delta$							
3						3	w	X	ss	12					
4	Fill (silty sand) 0' Sand w Silt 7' to 1	to 7'		$\rightarrow$				A							
5	Clayey Sand 10' 1					-	⊥ w	$\square$		1.5					
6-						7	W	$\wedge$	SS	15					
7-	SAND WITH SILT, fine	to medium	n grained, a		COARSE	1		R							
8	little gravel, brown, water (SP-SM)	rbearing, k	oose		ALLUVIUM	6	W	Х	SS	14					
9 - 10 -	SAND WITH SILT AND	GRAVE	medium					E							
11 -	tine grained, brown, wate	rbearing, l	oose		TILI.	5	м	X	SS	18	16				
12	CLAYEY SAND, a little	gravel, gra	ıy, firm (Cl					H			10				
13 —						6	м	M	SS	14	15				
14 —							141	Д	55	14					
15 -								M							
16 -						7	М	X	SS	15	14				
17 -								R							
18 +	SANDY LEAN CLAY, a	little grave	el, gray, sti	ff				ł							
19 -	(CL)							岱							
20 -						9	м	M	SS	23	17				
21 – 22 –								Д							
23 -								ł							
24 —								ł							
25								Ы							
26 -		-				12	М	XI	SS	23	16				
	END OF BORING Northing=210217.1		<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>				/								
	Easting=551467.5														
DEPT	H: DRILLING METHOD		<u></u>	WATE	R LEVEL MEA	SUPE		 >'							
0-241	/! 3 <b>25</b> !! 116 A	DATE	TIME	SAMPLI		CAV	·····		RILLIN JID LEV	G	WATE LEVEI		OTE: 3		
0-247	2' 3.25" HSA	6/26/07	11:55	0EPT4 6.5	4.5	DEP		FLU	JID LEV	/EL	LEVEI 4.8		HE AT HEETS		
		6/26/07	12:20	26.5	24.5	26					4.0 None		(PLAN		1
BORING COMPLE	TED: 6/26/07												RMINO	DLOG	Y ON
DR: SG	LG: SB Rig: 91C												THIS	8 LOG	



### SUBSURFACE BORING LOG

	DB NO: <u>22-00081</u>			11:	11. N. KNI	LC	)G OF	BO	RING N	10	ST	-73	(p. 1	of 1	
PROJE	CT: TCAAP Red	evelopm	ent; Ard	en Hi	IIS, IVLIN		·····								
DEPTH IN FEET	SURFACE ELEVATION: _ MATERIAL	891.3 DESCRIPTI			GEOLOGY	N	мс	SA	MPLE FYPE	REC IN.	FIELI WC	· · · ·	BORAT	F	TESTS 1⁄6-#200
1	FILL, mixture of silty san sandy silt, a little gravel, s roots, dark brown, black a	surface root	h silt and s, trace		FILL	8	м	M	SS	12					
3						6	М	$\mathbb{N}$	SS	8					
5	LEAN CLAY WITH OR black, firm (CL)	GANICS, ti	race roots,		TOPSOIL	6	м	X	SS	14	23				
7	SAND WITH SILT, fine brown mottled, waterbear (SP-SM)	grained, gra ing, mediur	ay and n dense		COARSE ALLUVIUM	13	W	R	SS	16	-				
9 10 11	SAND WITH SILT, a littl medium grained, brown, a waterbearing, medium der	1 little gray 1se (SP-SM	mottled, I)		22	w	R	SS	17						
12 - 13 - 14 -	SAND WITH SILT, fine gray, waterbearing, mediu	grained, lig m dense (S	ht brownisł P-SM)	1		25	w	Å	SS	16					
15 16 17	SANDY LEAN CLAY, a (CL)	little grave	l, gray, firn	1	TILL	6	м	Ŕ	SS	15	24				
18	CLAYEY SAND, a little	gravel, gray	/, firm (SC)			5	М		SS	24	19				
23	SANDY LEAN CLAY, a (CL)	little grave	l, gray, firm			7	м	X	SS	17	18				: : :
	END OF BORING Northing=210182.9 Easting=551898.2														
DEPT	TH: DRILLING METHOD		· · · · ·	WATI	ER LEVEL MEA	SURF	EMEN	TS		•			NOTE:	REFF	R TO
0-9	1⁄2' 3.25" HSA	DATE	TIME	SAMPI DEPT	ED CASING H DEPTH	CAV	'E-IN PTH	FL	ORILLI UID LE	NG VEL	WATI LEVE		THE A		
9½'-24	½' RD w/DM	6/21/07	3:00	11.5	9.5	1	).0			1	9.0		SHEET	<b>IS FOR</b>	R AN
· · · ·								1				] I	EXPLA	NATIO	ON OF
BORINC COMPL	} ETED: 6/21/07											1	ERMIN	IOLOG	GY ON
	LG: SB Rig: 91C						-						ТН	IS LO	G

AET J	OB NO: <b>22-00081</b>		· · · · · · · · · · · · · · · · · · ·			LC	)g of	F BC	RING N	NO	ST	-74	(p. 1	<u>of</u> 1	)
PROJE	ECT: TCAAP Red	levelopn	aent; Are	den Hi	ills, MN										
DEPTH	SURFACE ELEVATION:	891.	8		GEOLOGY			SA	AMPI E	REC	FIELI	) & LA	BORA	TORY	TESTS
IN FEET		DESCRIPT				N	MC		AMPLE FYPE	IN,		DEN	LL	PL	%-#200
1	FILL, mixture of sand w little gravel, surface roots	ith silt and s. trace roo	silty sand, a	a	FILL	15		Μ	60	1.5					
2 -						15	M	Μ	SS	15					
3 -	FILL, mixture of clayey little gravel, trace roots, l	sand and si brown	ilty sand, a			14		$\square$	SS	10	15				
4						14	M	$\mathbb{N}$	22	18					
5								R							
6 -	SAND WITH SILT, a lit medium grained, light bro	own, water	bearing.		COARSE ALLUVIUM	6	M.	X	SS	13					
7 -	loose to medium dense, la (SP-SM)	aminations	of silty san	d			<b>_</b>	R							
8 -	(01 011)					13	w	M	SS	15					
9 –						15		Μ	22	15					
10 -	×							R							
11 -	SAND WITH SILT, a litt	le gravel, f	fine to			19	W	X	SS	1 <del>9</del>					
12 -	\medium grained, gray, m CLAYEY SAND, a little	edium dens oravel ora	se (SP-SM)		TILL			म			17				
13 -	very stiff (SC)	Braton, Bra	y, mm to			7	м	М	SS	18	17				
14 —								Д	55	10					
15 -								M							
16 -						10	М	X	SS	17	13				
17 -								सि							
18 -	SANDY LEAN CLAY, a	little grave	al arou atif	x MA				Ħ							
19 -	(CL)	intie grave	si, gray, stil					Ŧ							
20 -								$\overline{\mathbf{M}}$			17				
21 –						10	M	X	SS	14	17				
22 -								Ł							
23 —								ł							
24 —								ł							
25 -								$\langle \rangle$			14				
26						13	M	Ň	SS	24	14				
Ì	END OF BORING Northing=210212.8														
	Easting=552416.8														
DEPT	H: DRILLING METHOD			WATE	R LEVEL MEA	SURF		 S							
0.041		DATE	TIME	SAMPLI DEPTI		CAVI		D	RILLIN	G	WATEI LEVEI		IOTE:		
0-245	4' 3.25" HSA	6/7/07	3:05	DEPTH 6.5	4.5	DEP		FLU	ЛD LEV	/EL			THE AT		
		6/27/07	3:10	9.0	7.0	4. 7.					None 6.4	·	XPLAN		
BORING COMPLE	TED: 6/27/07	6/27/07	3:35	26.5	24.5	26.					None	—	RMIN		· [
DR: SG	LG: SB Rig: 91C								·				THI	S LOG	



# SUBSURFACE BORING LOG

AET JO	B NO: <u>22-00081</u>												· · · · ·	<del></del>	
PROJEC		edevelop	oment; A	rden Hi	ills, MN		LOG	OF B	BORING	NO	ST	-75	( <u>p. 1</u>	_ of 1	)
DEPTH	SURFACE ELEVATION	NJ- 89	8.8	<u>.</u>						7					
IN FEET		AL DESCRI			GEOLOG	Y   N	1   N	NC S	SAMPLE TYPE	REC	FIEL	D&LA	BORA	TORY	TESTS
	SAND WITH SILT, fi				<u></u>					IN.	WC	DEN	LL	PL	<b>%</b> #20
1-	nule graver, surface ro	ots trace ro	oots, brown	1, a	COARSE ALLUVIUN	м I "		Λ	Λ					1	1
2 -	(SP-SM) (possible fill)				OR FILL	M 8		м ()	ss	10					
								- K-	ł						
3 -						15	.   1	мΪ	ss	10					
4+	CLAVEV SAND									10					
5-	CLAYEY SAND, a litt brown and gray mottled	le gravel, t	prown, ligh	it ///	MIXED	_		<b>Y</b> [3	٤Į						
I. N	laminations of sand wit	h silt (SC)			ALLUVIUN			$\sim N$			14				
	SAND WITH SILT, a l	ittle gravel	, trace root	/   .   !	COARSE	7	W.	/M	SS	14				1	
7-5	biown, waterbearing, lo	ose (SP-SI	M)		ALLUVIUM	1		ਸਿ	2						
8 -	SANDY SILT, a little g wet, medium dense (MI	ravel, trace	e roots, gra	у,	FINE ALLUVIUM			$\overline{\Lambda}$	7					1	
0 -						1 12	ν	V X	SS	NR					
	CLAYEY SAND, a littl	e gravel, b	rownish gr	av.	TILL	_									
10 - 5	stiff (SC)		0						1						
11 -						10	W	v  X	SS	13	14				
12								4							
13 - f	SANDY LEAN CLAY, irm to stiff (CL)	a little gra	vel, dark g	ray,				ET 1							l
	1111 to sum (CL)					7	W	7  X	SS	21	19				
14								$\square$							[
15 -								ΡJ							
16 -						10	w	, IVI	ss	18	18				
							[ "	$\mathbb{N}$	55	10					
17								$\square$							
18 -								51							
19 -								KI							
20 -								2							
1								М			16				
21 -						12	М	Ň	SS	18	10				
22 -								Ы	]						
23 -								K							
24 -								14				j			
								$\left  \right\rangle$							
25								$\mathbf{h}$							j
26 -						13	М	X	SS	17	11				
	ND OF BORING			//				4					_		
No	orthing=210184.0														
	sting=552897.6														
DEPTH:	DRILLING METHOD														
<u>.</u>			Γ		LEVEL MEA			<u> </u>	· <u></u> .			NO	re: Ri	EFER 7	ro
0-41/2'	<u>3.25" HSA</u>	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE DEP	E-IN ITH	DF FLU	RILLING ID LEVE	a W	ATER EVEL	1		ACHE	
11/2'-241/2'	RD w/DM	6/25/07	10:30	6.5	4.5	4.9					4.3	_		FOR A	
				<u> </u>				<u> </u> -			4.3	_		TION (	
SORING COMPLETEI	D: 6/25/07	·	<u></u>	<u>†                                    </u>											
	.G: SB Rig: 91C									<u> </u>		4		.0GY (	NC
<u></u>	mg. 710			L	L								THIS L	.0G	

		ect SP-0 valuation	6-05871	BORING		01-02 ST-76
TCAA NE of	P Redev Highwa	velopmen	t Highway 96	LOCATION attached s		3.678, E: 553362.349 Se
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/23/07	SCALE: 1" = 4
Elev. feet 907.0	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF WL	Tests or Notes
906.0	1.0	FILL	FILL: Silty Sand, fine-grained, with Organics	and Gravel,		
		FILL	dark brown, moist. FILL: Silty Sand, fine- to coarse-grained, with brown, moist.	Gravel, –	19	
- 900.0	7.0		Petroleum odor at 5 1/2 feet.		32	
_		CL	SANDY LEAN CLAY, trace of Gravel, brown medium to rather stiff. (Glacial Till)	n, moist, –	8	
					9	
- 893.0	14.0	CL	SANDY LEAN CLAY, trace of Gravel, gray, medium.	moist,	9	
- 900.0 - - - - - - - - - - - - - - - - - -			(Glacial Till)		7	
- - 	26.0			-	7	
- 4			END OF BORING. Water not observed during drilling. Water not observed with 24 1/2 feet of hollow- in the ground. Boring then grouted.	-stem auger 		
-						

**BRAUN**<sup>\*\*</sup>

#### LOG OF BORING

Geote TCAA NE of	cnical E AP Rede Highwa	valuation velopmen	t Highway 96	BORING LOCATIC attached s	ON: N	: 20977:	<b>ST-77</b> 5.961, E: 55069	9.340 Se
DRILL	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	6/07	SCALE:	1"=4
Elev. feet 892.4	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
891.4	1.0	FILL XX	FILL: Silty Sand, trace of Roots, dark brown,	moist.	Π			
	7.0	FILL	FILL: Silty Sand, fine-grained, trace of Grave brown to brown, moist.	I, dark -   	9			
		SP- SM	POORLY GRADED SAND with SILT, fine-g brown to grayish-brown, moist, loose to mediu (Lacustrine)	rained, light im dense	12 12			
881.4	11.0	SP-	POORLY GRADED SAND with SILT, fine-g		∦ 7	Σ		
			(Lacustrine)		5			
					M 10			
- 870.4	22.0	CL	SANDY LEAN CLAY, trace of Gravel, gray, v stiff. (Glacial Till)	 wet, rather 				
·				-				
866.4	26.0		END OF BORING. Water observed at 11 feet while drilling.		9			
-			Boring then grouted.	 				

Geote TCAA NE of	cnical E P Rede Highwa	ect SP-0 valuation velopmen vy 10 and 2 Ainnesota	t Highway 96	BORING: LOCATIC attached s	DN: N:	209		<b>T-78</b> 47, E∷	550898.325 See
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	6/07		SCAI	.E: 1" = 4'
Elev. feet 886.1	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Note
		FILL	FILL: Silty Sand, trace of Roots, dark brown, mc	oist.					
- <u>884.6</u> - - -	1.5	FILL	FILL: Silty Sand, fine-grained, dark brown mixed light brown and gray, moist.	d with	3				
<u>879,1</u>	7.0	PT 14 14 14 14 14 14 14 14 14 14 14 14 14	PEAT, fibrous, dark gray, wet, very soft. (Swamp Deposit)		WH WH		421	61	
872.1	14.0	SP-SM	POORLY GRADED SAND with SILT, fine-grain gray, waterbearing, very loose to loose. (Lacustrine)	ned,		Ţ			
860.1	26.0		END OF BORING. Water observed at 14 feet while drilling. Boring then grouted.		8				

#### m SP-06-05871

ST-78 page 1 of 1



## SUBSURFACE BORING LOG

	OB NO: <u>22-00081</u>					LC	og of	BO	RING N	10	ST	-79	(p. 1	of 1	)
PROJE	ECT: TCAAP Red	evelopm	ent; Ard	en Hil	ls, MN							·			
DEPTH IN FEET	SURFACE ELEVATION: MATERIAL	888.9 DESCRIPTI			GEOLOGY	N	мс	SA T	MPLE YPE	REC IN.	FIELI WC	D&LA	BORA	F	TESTS
1 -	SILTY SAND, a little gra roots, dark brown, moist, SILTY SAND WITH GR	loose (SM) AVEL, tra	)	7116	TOPSOIL COARSE ALLUVIUM	10	м	M	SS	16					
3 -	brown, moist, loose (SM) SAND, fine grained, light	brown, mo	oist, loose,			9	м	$\mathbb{N}$	SS	16					
4 -	laminations of silty sand (							E							
5 — 6 —		S	Silty Sand 0' t Sand 2' to 11. Sand w Silt 1	5'		13	W/M		SS	18				:	
7	SAND, fine grained, light medium dense to loose (S	brown, wa		· .·.		11	⊥ w	E X	SS	17					
9 10 11						7	w	R	SS	17					
11 12 13	SAND WITH SILT, fine a waterbearing, very loose t	grained, gra o very dens	ay, se (SP-SM)			2	w		SS	13					
14 -								۲Į I	33	13					: : :
15 - 16 - 17 -						55	w	X R	SS	14					
18 19	SILTY SAND, a little gra waterbearing, very loose (	vel, gray, SM)			<u>FILL</u>			77777							
20	SANDY LEAN CLAY, a to very stiff, laminations o (CL)	little grave f silty sand	l, gray, soft l at 24.5'			4	w	M R	SS	16	15				
23 —														3	
24 – 25 –								团							
25 26 –						17	м	M	SS	21	16				
	END OF BORING Northing=209686.5 Easting=551325.7														
DEPI	TH: DRILLING METHOD			WATE	R LEVEL MEA	SURE	MEN	rs				<u>د</u> ا	IOTE:		н
0-24	1½' 3.25" HSA	DATE	TIME	SAMPLE DEPTE	ED CASING DEPTH	CAV DE	'E-IN PTH	D FL	RILLIN JID LE	IG VEL	WATE LEVE	R L	THE A	TTAC	HED
		6/26/07	1:05	9.0	7.0	7	.6				7.0		SHEET	'S FOF	R AN
ענטער	5												XPLAI		
BORINO	ETED: 6/26/07											T	ERMIN		
DR: <b>SG</b>	LG: SB Rig: 91C				.								TH	IS LOO	3

		ect SP-0 valuation		BORING				T-80	
TCAA NE of	AP Rede Highwa	velopmen	t Highway 96	LOCATI attached	ON: N: sketch.	: 2090	589.4	84, E: 55189	1.038 See
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	8/07		SCALE:	1" = 4'
Elev. feet 891.1	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	Tests	or Notes
889.1	2.0	FILL CL	FILL: Silty Sand, very fine- to fine-grained, t Gravel, brown, moist. SANDY LEAN CLAY, trace of Gravel, light brown and gray mixed with rust, wet. (Glacial Till)	_	5				
884.1	7.0	CL	SANDY LEAN CLAY, trace of Gravel, grayi		7		15		
			wet, rather stiff to medium. (Glacial Till)		9		14		
879.1	12.0	CL	SANDY LEAN CLAY, trace of Gravel, gray, soft to medium. (Glacial Till)	wet, rather - -	5 M 7		16		
				- - - - - - - - - -	7				
865.1	26.0		END OF BORING. Water not observed with 24 1/2 feet of hollow in the ground. Boring then grouted.	-stem auger - - - 					

**BRAUN**"

#### Braun Intertec Corporation



## SUBSURFACE BORING LOG

AET J	OB NO: <b>22-00081</b>					L	OG OF	во	RING N	10.	ST	-81	(p. 1	of 1	)
PROJ	ECT: TCAAP Red	evelopm	ent; Ard	len Hi	lls, MN								,	<b></b>	
DEPTH	SURFACE ELEVATION:				GEOLOGY	N	мс	SĄ	MPLE FYPE	REC	·	)&L	ABORA	TORY	TESTS
FEET	MATERIAI	DESCRIPT			TODGOU				IYPE	IN.	wc	DEN		PL	<b>%-#</b> 200
1 - 1		loose (ML	)	ДЩ	TOPSOIL	10	м	M	SS	16					
2 -	SAND WITH SILT, fine trace roots, brown, moist	grained, a loose (SP-	little gravel	,	ALLUVIUM			Д							
3	· · · · · · · · · · · · · · · · · · ·	,				6	М	X	SS	6	-				
4 -	SILTY SAND, trace root	s. brown, w	vaterbearing					Н							
5 -	loose, laminations of lear	clay (SM)	-	" _/ ////	TILL	7	м	M	88	15					
6 -	SANDY LEAN CLAY, a and gray mottled, firm (C	L)	el, brown			'	M	М	SS	15	16				
7 –	SANDY LEAN CLAY,	little grave	el, brownisl	1				R							
8 -	gray, a little brown, stiff, sand (CL)	laminations	s of silty			11	М	IXI	SS	19	15				
9-			<u> </u>					E							
10 -	CLAYEY SAND, a little	gravel, gra	y, firm (SC	)		8	М	М	SS	22	15				
11 -								Д							
12 -	SANDY LEAN CLAY, a gray, a little brown, stiff,	little grave	l, brownish	1				M			16				
13 -	sand (CL)		•			13	М	Ŵ	SS	21					
14	SANDY LEAN CLAY, a to stiff (CL)	little grave	el, gray, firr	n 🥢				E							
15						8	М	IXI	SS	17	15				
17 –								H							
18 —								ţ							
19 —								扣							
20 -								H							
21 -						11	М	XI	SS	20	17				
22 -								स्रो							
23 -								ł							
24 -								<u>}</u>							
25						10		M		10	14				
26 -		<b></b>				12	М	$\mathbb{N}$	SS	19					
	END OF BORING Northing=209624.8														
	Easting=552198.7										Ì				
DEPT	H: DRILLING METHOD			WATE	R LEVEL MEA	I SURE	MEN	LL FS	]		<b>I</b> .		NOTE:	PEEE	
0-24	½' 3.25" HSA	DATE	TIME	SAMPL DEPTI	ED CASING DEPTH	CAV	E-IN PTH	D FI 7	RILLIN UID LE	IG.	WATE LEVE		THE A		
0-24	1107A	6/26/07	2:55	26.5	24.5	26					Non		SHEET		
	· · · · · · · · · · · · · · · · · · ·												EXPLAN	JATIO	N OF
BORINC												Т	ERMIN		
DR: SG	LG: SB Rig: 91C					_				T			TH	S LOG	



### SUBSURFACE BORING LOG

AET .	IOB NO: <b>22-00081</b>						LC	)G OF	BO	RING N	10	ST	-82	(p. 1	of 1	)
PROJ	ECT: TCAAP Red	<u>evelopm</u>	ent; Ard	en Hi	ills,	MN				. <u>.</u>			<u></u>			
DEPTH	SURFACE ELEVATION: _	898.6	i		GE	EOLOGY			SA	MPLE	REC	FIELI	)&LA	BORA	FORY	TESTS
IN FEET	MATERIAL						N	MC		MPLE TYPE	ĨN,	wc	DEN	LL	PL	<b>%-#20</b> 0
1 -	FILL, mostly sandy silt, s roots, dark brown	urface root	s, trace		FIL	L	25	м	Μ		14					
2 -	FILL, mixture of silty san	d and claye	ey sand, a	-1	]		25	M	Μ	SS	14					
1	little gravel, trace roots, li dark brown	ght brown,	brown and						$\square$	~ ~						
3 -				-			15	M	M	SS	13					
4 -	-								E				-			
5 -							20	М	X	SS	16					
7 -									E							
8-	LEAN CLAY WITH OR gray and black, moist, ver	GANICS, t	race roots,		TOF	PSOIL	19	1.5770.7	М	SS	17	15				
9-	laminations of silty sand (	CL)			TIL	L	19		Μ	20	17	1				
10	SILTY SAND, a little gra	vel, brown nse (SM)	ish gray, 💠						R							
11 -	CLAYEY SAND, a little gray and brown mottled, s	gravel, trac	e roots,				3	М	X	SS	20	19				
12 -	gray and brown motica, s	on (SC)							2							
13 -	•						4	м	M	SS	21	17				
14 -									Д			1				
. 15 —	SANDY LEAN CLAY, g	ray, firm to	stiff (CL)					:	$\bigwedge$							
16 -							6	M	M	SS	21	16				
17 –									सि							
18									$\{$							
19 -									<b>}</b>							
20 —									$\square$							
21 -							11	М	M	SS	22	14				
22 –									3							
23 —									ł							
24 —									ł							
25 -									Ŵ	00		15	:			
26							15	М	Μ	SS	22					
	END OF BORING Northing=209687.1															
	Easting=552381.8															
DEP	TH: DRILLING METHOD		WATE	I ER LE	EVEL MEA	I SURE	MEN	L rs			i -	   .	NOTE:	REED		
0-24	1½' 3.25" HSA	TIME	SAMPL DEPT	,ED	CASING DEPTH	CAV	E-IN PTH	[ FI	DRILLIN UID LE	VEI	WATE		THE A			
0-24		8;15	11.5		9.5	· · · · ·	.2				Non		SHEET		1	
		8:30	26.5		24.5		5.5				Non	— <u> </u>	EXPLAI	NATIO	N OF	
BORIN COMPL	G ETED: 6/28/07										-			ERMIN	OLOG	Y ON
DR: SC	G LG: SB Rig: 91C													TH	IS LOC	ì

## SUBSURFACE BORING LOG

AET JOB NO: 22	-00081	······································					LC	OG OF	BC	RING N	JO.	ST	-83	(p. 1	of 1	)
PROJECT: TC	AAP Red	<u>evelopm</u>	ent; Ar	den H	lills	, MN					_			<u>, , , , , , , , , , , , , , , , , , , </u>		
DEPTH SURFACE	ELEVATION: . MATERIAL				6	GEOLOGY	N	мс	SĄ	AMPLE FYPE	REC IN.			BORA	1	
	re of sand wi				FI							wc	DEN	LL	PL	%-#200
1 + gravelly, tra	ce roots, brov between 1' to	vn to dark l	prown	_/-			25	М	IX	SS	12					
END OF B	ORING	2							$\square$							
Northing=20 Easting=552	)9676.4 900.3								.							
				ŀ												
										:						
1																
											*					
														:		
DEPTH: DRILLIN	G METHOD					EVEL MEA	SURE	MEN	rs					NOTE:	REFE	۲0 r
<u>0-2'</u> 3.25" H	SA	DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CAV DEF	E-IN TH	E FL	NRILLIN UID LE	IG VEL	WATE LEVE		THE A	ГТАСН	IED
														SHEET	S FOR	AN
BORING														XPLAN		- 1
BORING COMPLETED: 6/25/0						• .								ERMIN		
DR: SG LG: SB	Rig: 91C													TH	S LOG	

AET.	JOB NO: <u>22-00081</u>			<u> </u>							<u>.</u>	0.2 4			
PROJ	ECT: TCAAP R	edevelor	oment: A	Arden Hi	ills. MN	1	LOG	OF B	ORING I	NO	<u> 51-</u>	83A	<u>(p.</u>	<u>1 of</u>	1)
DEPTH			)3.0												
IN FEET	)	N: IAL DESCRI			GEOLOG	BY N	M	IC S	AMPLE TYPE	REC	FIELI	D&LA	BORA	TORY	TESTS
	2.5" Bituminous Paver				FILL					IN,	wc	DEN	LL	PL.	<b>%-#2</b> 00
1	FILL, mixture of clave	v sand and	silty sand	with	FILL		.   .	. Ñ	SU						
2 -	gravel, possible cobble	es, brown	•			27	/   N	$^{\prime}$	SS	6					
3								ħ	1	[					
4 –						37	N	1   )	SS	10					
5 -	SANDY LEAN CLAY	a little or						R	¥.				İ		
_	1 Drown allo gray mottled	, a fittle gra 1, stiff, lam	inations of	f 💋	TILL			. N							
6	silty sand (CL)					9		ľŇ	SS	16	17				
7 -	SANDY LEAN CLAY	a little ora	vel brown					R							
8 –	very stiff (CL)	, « maio git	1101, DIOWI	n,		18		. M							
9 -						10	M	M	SS	18	16				
10 -	SANDY LEAN CLAY,	a little gra	vel. dark g	rav.				B							
11 -	stiff to very stiff (CL)	· ·				15	М	IVI	SS	20	16				
12 -								Д							
13 -								H							
						13	м	IXI	SS	20	15				
14 -								Д							
15 -							[								
16 -						13	М	X	SS	22	16				
17								H							
18 -								H							
19 -								Ħ							
20 -								Ĩ							
21 -						13	М	M	SS	, , ,	10				
22 -							141	M	33	17	15				
								Ð							
23 -								H							
24								£{							
25 –															
26 -						16	М	X	SS 2	24	15				
	END OF BORING Northing=209676.4		· · · · · · · · · ·			┼──┼		4-							
Ē	Easting=552900.3						l								
DEPTH:	: DRILLING METHOD	<b> </b>		WATED I	EVELAT										
0 341/1		DATE	TRE		LEVEL MEA			_			<del></del>	NOT	E: RE	FER	го
0-24½	3.25" HSA		TIME	SAMPLED DEPTH	CASING DEPTH	CAVE DEPT	H	DR FLUI	ILLING D LEVE		ATER EVEL	THE	EATT	ACHE	D
		6/28/07	10:00	26.5	24.5	26.0	)			N	one	SHE	ETS F	OR A	N
ORING COMPLETI				ļ								EXPL	ANAT	FION (	OF
												TERM	INOL	OGY (	ON
<u>78: 5G</u>	LG: SB Rig: 91C											1 1	THIS L	OG	



# SUBSURFACE BORING LOG

AET J	OB NO: <b>22-00081</b>					1.0			RING N	10	ST	-84	(n 1	of 1	)
PROJ		levelopm	nent; Ard	len Hi	lls, MN	Ľ	50 OF	00	ICING P	NO	51	-07	( <u>b. 1</u>	1 10	<u> </u>
DEPTH	1 ·····				GEOLOGY		<u> </u>				FIELI	) & LA	BORA	TORY	TESTS
IN FEET	MATERIAI	. DESCRIPT	ION		GEOLOGY	N	MC	SA	MPLE TYPE	REC IN.	wc	DEN	· · · · ·	PL	<b>1</b> ⁄6-#200
1 -					FILL	13	м	М	SS	14					
2	FILL, mixture of sand wi clay, a little gravel, trace	th silt and roots, brow	sandy lean vn, gray, lig	ht				А							
3 - 4 -	gray and light brown					7	М	M	SS	13	16				
5 -	SANDY LEAN CLAY, a	a little grav	el. light		TILL	-		P							
6	brown and gray mottled,	with gray,	firm to stiff			7	М	X	SS	17	19				
7 -								R							
8 9						10	M	M	SS	20	17				
10 -	SANDY LEAN CLAY, a mottled, dark brown, stiff	little grave	el, brown					R							
11 ~	(CL)	, miniatio	115 01 511			14	M	Д	SS	24	15				
12 13	SANDY LEAN CLAY, a stiff to very stiff (CL)	little grave	el, dark gray	,		14	М	M	SS	19	15				
14 —								Д	00	17	15				
15 —															
16 -						15	М	Ň	SS	16	15				
17 -								Ħ							
18 19								Ŧ							
20								뙤							
21 -						19	М	X	SS	16	14		ĺ		
22 –								रि		ľ					
23 -								3							
24 -								ł						İ	
25 -						21	м	$\overline{\mathbb{N}}$	SS	18	16				
26 -	END OF BORING	<u></u>	<u>.                                    </u>			41		Μ			10				
	Northing=209598.8 Easting=553354.1														
DEPT	H: DRILLING METHOD	[	· · · · · · · · · · · · · · · · · · ·	WATE	R LEVEL MEA	SURE	MENT	 `S		ŀ					
0-245	½' 3.25" HSA	DATE	TIME	SAMPLE DEPTH		CAV DEP			RILLIN JID LEV	G.	WATE LEVE		OTE: 1 HE AT		1
<u> </u>		7/18/07	3:35	26.5	24.5	26					None		HEETS		
DODD							-					·	(PLAN		
BORING COMPLE												TE	RMINO		1
DR: SG 6/04	LG: SB/BRig: 91C												THIS	SLOG	



AET JO PROJE	$\frac{22-00081}{TCAAPPa}$	davalan		do TT*	11. B <i>a</i> dy	LC	OG OF	BOR	UNG N	10	ST	-85	(p. 1	<u>of 1</u>	l <b>)</b>
				den Hi											
DEPTH IN FEET	SURFACE ELEVATION: MATERIA	L DESCRIPT			GEOLOGY	N	мс	SAN T	MPLE YPE	REC IN	WC	DEN	BORA	T	·
1 -	FILL, mixture of silty sa little gravel, surface root	and and sand ts, trace root	l with silt, s, brown	a	FILL	13	м	M	SS	15					
2	CLAYEY SAND, a little dark brown, very stiff (S	e gravel, tra SC)	ce roots,		TILL	23	м	$\square$	SS	17	8				
4 5 6	SILTY SAND, trace roo grained, moist, very loos with silt (SM)	ots, fine to m se, laminatio	edium ons of sand			4	м	ਸ਼   	SS	18					
7	CLAYEY SAND, a little gray and brown mottled,	e gravel, trac firm (SC)	ce roots,			5	м	된 X	SS	18	19				
10 - 11 -	CLAYEY SAND, a little dark gray, firm to stiff (S	e gravel, trac SC)	ce roots,			5	м	R N	SS	23	17				
12 - 13 -						6	м	ਸ X	SS	24	15				
14 -		·						य							
15 - 16 -						10	м	X	SS	23	14				
17 -								R							
18 19	SANDY LEAN CLAY, a stiff (CL)	a little grave	l, dark gra	у,											
20 21						9	м		SS	24	19				
22 – 23 –							•	FI							
24 25							4				1.5				
]	END OF BORING Northing=209496.7		<u></u>			14	M	X	SS	22	15				
	Easting=551939.7		-												
DEPTH	I: DRILLING METHOD		r		LEVEL MEA	,							IOTE: ]	REFEI	R TO
0-24%	2' 3.25" HSA	DATE	TIME	SAMPLE DEPTH		CAV DEP		DR FLUI	ILLIN D LEV	G 'EL	WATE LEVEI		THE AT		
	······································	6/27/07	9:35	9.0	7.0	8.					None		SHEETS		
ORING	TED: 6/27/07	6/27/07	10:05	26.5	24.5	26.	.5				None		XPLAN RMINO		
	$15D,  \mathbf{V}\mathbf{\Delta}\mathbf{I}\mathbf{V}\mathbf{V}\mathbf{I}$	1		ł	ł					l l		115	VI/14/11/0	200G	t U



# SUBSURFACE BORING LOG

	юв NO: <u>22-00081</u>					Ľ	OG OF	F BO	RING N	10	ST	-86	(p. 1	of 1	)
PROJE		levelopn	ient; Ar	den Hi	ills, MN										
DEPTH IN FEET	SURFACE ELEVATION: MATERIA	<b>897.</b> L DESCRIPT			GEOLOGY	N	мс	SA	MPLE YPE	REC IN,	FIELI	D & LA	BORA		TESTS
1 – 2 –	SAND WITH SILT, fine trace roots, brown, moist (SP-SM)	grained, a	little grave	<b>I</b> ,	COARSE ALLUVIUM	22	М	M	SS	15		DEN			10-#20
3 - 4						22	м	M	SS	19					
5 — 6 —	SILTY SAND, a little gr moist, medium dense (SN	avel, browr 1)	n and gray,			33	М	M	SS	16					
7 - 8 - 9 -	SANDY LEAN CLAY, a to stiff, lenses of lean clay	a little grave with sand	el, gray, fir l at 8' (CL)	m	WEATHEREI TILL	6			SS	17					
10 11	SANDY LEAN CLAY, a	little grave	el. brown		TILL	9	м	H H	SS	20	17				
12 - 13 - 14 -	and gray mottled, stiff to silty sand (CL)	firm, lamin	ations of			8	м		ss	22	15				
15 16 17						9	м		SS	24	17				
17 - 18 - 19 - 20 - 21 - 22 - 22 - 21 - 22 - 22 - 21 - 22 - 22 - 21 - 22 - 22 - 21 - 22 - 22 - 21 - 22 - 22 - 21 - 22 - 22 - 21 - 22 -	SANDY LEAN CLAY, a a little brown, stiff, lamina (CL)	little grave ations of sil	el, dark gra ity sand	y,		13	М		SS	21	14				
23 24 25 26	SANDY LEAN CLAY, a stiff (CL)	little grave	l, dark gray	y,		15	м		SS	20	15				
	END OF BORING Northing=209336.2 Easting=552138.3														
DEPT	H: DRILLING METHOD	]		WATE	R LEVEL MEA	SURE	MENI	LL S	l	1	1				
0-24	'2' 3.25" HSA	DATE	TIME	SAMPLI DEPTI		CAV DEP	· · · · · ·		RILLIN ID LEV	G ÆL	WATE LEVE		OTE: 1 HE AT		
		6/26/07	3:40	9.0	7.0	9.					8.1		HEETS	S FOR	AN
000000	·····					_						Ех	PLAN	ATIO	N OF
SORING	ETED: 6/26/07											TE	RMIN	DLOG	Y ON
DR: SG	LG: SB Rig: 91C												THIS	S LOG	ł



#### SUBSURFACE BORING LOG

AET JO						LC	G OF	BO	RING N	0	ST	-87	( <u>p. 1</u>	<u>of 1</u>	)
PROJEC	CT: TCAAP Rede	velopme	ent; Ard	en Hi	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION:	898.3			GEOLOGY	N	мс	SA	MPLE TYPE	REC	FIELI	0 & LA	BORA	TORY	TEST
FEET	MATERIAL	DESCRIPTIC	NC				MC	1	ГҮРЕ	ĪN.	wc	DEN	LL	PL	<b>%-#</b> 2
1 -	FILL, mixture of silty sand sand with silt, a little grave roots, dark brown and blac	el, surface r	and and roots, trace		FILL	19	м	M	SS	14	7				
2	SANDY LEAN CLAY, a roots, brown and gray mot	little grave	l, trace		TILL			H	66	14	17				
3 4	SANDY LEAN CLAY, a	· · ·				8	М	Å	SS	14					
5 -	brown and gray mottled, st	tiff (CL)	i, ngni			11	м	M	SS	19	16				
6 7								H			14				
8 —						11	М	X	SS	20	1.1				
9 10 11	SANDY LEAN CLAY, a gray, a little brown, stiff, la sand (CL)	little grave aminations	l, brownish of silty			14	м	R	SS	21	15				
12 — 13 —	SANDY LEAN CLAY, a (CL)	little grave	l, gray, stif	f		11	м	R	SS	22	14				
14 — 15 —								R							
16 -						14	М	X	SS	20	15				
17 — 18 —								XX XX							
19 -															
20 -						15	м	$\mathbb{N}$	SS	21	14				
21 — 22 —								EI EI							
23 24								ł							
24 -						14	м	¥ ∏	SS	19	15			-	
26 -	END OF BORING Northing=209443.6 Easting=552400.6														
DEPT	H: DRILLING METHOD			WAT	ER LEVEL ME	ASURI	EMEN	TS	<u></u>	ł	1		NOTE:	REF	L ER T
0-24	½' 3.25" HSA	DATE	TIME	SAMPI DEP1	LED CASING H DEPTH	CAV DE	/E-IN PTH	[] FL	DRILLI UID LE	NG VEL	WAT LEV		THE A	ATTAG	CHEI
<i>u</i>		6/26/07	9:20	26.	5 24.5	2	5.0	1			Nor		SHEE		
nontria													EXPLA		
BORING	ETED: 6/26/07											T	ERMI		
dr: SG	LG: SB Rig: 91C												TI	IIS LC	G

		ect SP-0 valuation		BORING			ST-88	
TCAA NE of	.P Rede Highwa	velopmen	t Highway 96	LOCATI attached	ON: N: sketch.	209329	9.011, E: 55081	1.898 See
DRILLI	-	Keek	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	8/07	SCALE:	1'' = 4'
Elev. feet 889.7	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
		FILL	FILL: Silty Sand, very fine- to fine-grained, tr Gravel, trace of Roots at 5' sample depth, mix brown to brown, moist.	ace of ed dark _ - -	16			
883.7	6.0	SP- SM	POORLY GRADED SAND with SILT, fine-g brown, moist, loose.	rained,	24			
- <u>881.7</u>	8.0	SP- SM	(Lacustrine) POORLY GRADED SAND with SILT, fine-g	rained,		¥		
		, IVIC	brownish-gray to gray, waterbearing, loose to r dense. (Lacustrine)		15			
-				-	-  -  6 -			
				-	10			
871.7	18.0	CL	SANDY LEAN CLAY, trace of Gravel, gray, v soft to rather stiff. (Glacial Till)	wet, rather -				
					10			
- 863.7	26.0			-	4			
			END OF BORING. Water observed at 8 feet while drilling. Boring then grouted.	- - -				

		ect SP-0	6-05871	BORING	:		ST-89	. <u> </u>
TCAA NE of	.P Rede Highwa	valuatior velopmer vy 10 and /linnesota	t Highway 96	LOCATIC attached s	DN: N ketch.	: 20918)	1.170, E: 55089	95.450 S
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	7/07	SCALE:	1" =
Elev. feet 890.4	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	ſ	BPF	WL	Tests or	Notes
890.27	7.0	PAV FILL SP- SM	<u>POORLY GRADED SAND with SILT, fine-grabrown, waterbearing, medium dense.</u> (Lacustrine)	 	21 10 14 10 11 11	Ţ		
872.4	26.0	CL	SANDY LEAN CLAY, trace of Gravel, gray, we soft. (Glacial Till) END OF BORING. Water observed at 7 feet while drilling Boring then grouted	et, rather	4			

		ect SP-0 <sup>,</sup> valuation	6-05871	BORING			<u>ST-90</u>	0.000 -
TCAA NE of I	P Rede <sup>.</sup> Highwa	velopmen	Highway 96	LOCATIC attached s		209183	3.404, E: 55139	9.923 See
DRILLE	R: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	6/07	SCALE:	1" = 4'
Elev. feet 891.0	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
889.0	2.0	SM	SILTY SAND, very fine- to fine-grained, trace dark brown, moist. (Topsoil)	of Roots, –				
885.0	6.0	SP- SM SP-	POORLY GRADED SAND with SILT, fine-gr light brown, moist, loose to medium dense. (Lacustrine) Silty Sand 0' to 2' Poorly Graded Sand w Silt 2' to 17' Sandy Lean Clay 17' to 26' POORLY GRADED SAND with SILT, fine-gra	7 -	9	Σ		
880.0	11.0	SM	grayish-brown with rust, waterbearing, medium (Lacustrine)	dense	15			
_		SP- SM	POORLY GRADED SAND with SILT, fine-gra gray, waterbearing, loose to medium dense. (Lacustrine)		11			
874.0	17.0	CL	SANDY LEAN CLAY, trace of Gravel, gray, w medium. (Glacial Till)	et,	6			
-								
865.0	26.0		END OF BORING. Water observed at 6 feet while drilling. Boring then grouted.		7			

BRAUN



	DB NO: $22-00081$	dansta		1 77		L	OG OF	во	RING N	10	ST	-91	(p. 1	of 1	1)
PROJE	CT: TCAAP Ree	developn	nent; Ar	den Hi	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION:				GEOLOGY	N	MC	SA	MPLE TYPE	REC	FIELI	) & LA	BORA	TORY	TES
FEET		L DESCRIPT				19	IVIC	]	ГYPE	IN.	wc	DEN	LL	PL	<b>%</b> -i
1	FILL, mostly sandy silt, rots, trace roots, dark bro	a little grav	el, surface/	· /	FILL			М	~~						
2 -	FILL, mixture of silty sa	ind and san	d with silt,	/		13	M	M	SS	16					
1	little gravel, pieces of br	ick, brown	and black					П							
3 –						26	М	IXI	SS	21					
4								स्र							
5 -						00		М					ĺ		
6 –						28	M	M	SS	23					
7 -								ष्ये							
8 -						14	м	M	ss	18					
9 -	ORGANIC CLAY, trace	roots, trace	e shells,		SWAMP		IVI	$\mathbb{N}$	00	10	89				
10	black, stiff to very soft ((	OL/OH)	F		DEPOSIT			म				:			ľ
11 -	BOGLIME, trace roots, g moist, very soft to firm, l	gray, a little	black,			2	м	XI	ss	23	118				
12 -		ense or sap	ne pear (O			ĺ		Д			149				
13 -	SAND WITH ON T - 14	41 1				7	w	XL	ss	20					
14 -	SAND WITH SILT, a litt waterbearing, loose (SP-S	tie gravel, g SM)	gray,		COARSE ALLUVIUM			ਸ਼ੀ							
15 –	CLAYEY SAND, a little	gravel, gra	y, very sof	ī ///	TILL	1		$\mathbf{N}$			17				
16 -	to stiff (SC/CL)					2	М	Å.	SS	18	17				
17 -							Ī	R	ĺ						
18 -								<b>F</b>							
19 -							e e	ţĮ.							
20 -							K	Ц.							
21 -						6	м	XI	ss	17	15				ĺ
22 -							K								
							Į	$\left  \right $							
23 -							Į	4			[				
24 –							Ś	Ľ							
25							$\sim$	$\Lambda$			14				
26 -						9	M	$\mathbb{N}$	SS	18	.			ĺ	
	END OF BORING Northing=209184.1							Ť							<u>.</u>
Í	Easting=551898.2													.	
		T	<u></u>				_								
DEPTH	E DRILLING METHOD				R LEVEL MEA	SURE	MENTS	5				N	OTE: 1	REFER	Т
0-241/2	' 3.25" HSA	DATE	TIME	SAMPLE DEPTH	D CASING DEPTH	CAVE DEP		DI TIT	RILLING ID LEV		WATEI LEVEI		HE AT		
		6/27/07	11:05	14.0	12.0	12.		20	···· ··· ··· · · · · · · · · · · · · ·		12.0		HEETS		
											14.0		PLAN		
ORING OMPLET	TED: 6/27/07								·· · · · · · · · · · · · · · · · · · ·				RMINC		
							E			1					



# SUBSURFACE BORING LOG

AET J	OB NO: <b>22-00081</b>					LC	G OF	BO	RING N	10	ST	-92	(p. 1	of 1	)
PROJE	CT: TCAAP Red	evelopm	ent; Arc	len Hi	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION:	<b>898.</b> 4 DESCRIPT			GEOLOGY	N	мс	SA	MPLE YPE	REC IN.	FIELI WC	D&LA	r	FORY PL	TESTS
1 - 2 -	1.5" Bituminous Pavemer FILL, mixture of silty san little gravel, pieces of bitu	nt d and claye minous, br	ey sand, a 'own		FILL	26	м	$\overline{\mathbb{N}}$	SU SS	3	7				10-#200
3-4-	(OL/OH)	sandy lean	clay		SWAMP DEPOSIT	10	м	$\left[ \right]$	SS	17	13				
5 6	ORGANIC CLAY, trace (OL/OH)	roots, blacl	k, soft			4	м	R	SS	17	46				
7 - 8 -	CLAYEY SAND, a little laminations of sand with s	gravel, gra ilt (SC)	y, soft,		TILL	3	м	ਸ 	SS	18	18				
9 10 11	CLAYEY SAND, a little brown and gray mottled, s	gravel, trac oft to firm	e roots, (SC)			4	м	R	SS	17	16				
12 - 13 <sup>°</sup> -						8	м	E	SS	23	16				
14	SANDY LEAN CLAY, a gray, a little black, stiff, la (CL)	little grave minations	l, brownisl of silty san	h Id		10	М		SS	23	16				
18	SANDY LEAN CLAY, a (CL)	little grave	l, gray, stif	T		10	М		SS	24	13		-		
22 23 - 24 - 25 - 26 -						15	М		SS	21	14				
	END OF BORING Northing=209185.3 Easting=552151.9													<u> </u>	
DEPT	H: DRILLING METHOD			WATE	R LEVEL MEA	SURE	MENI	∟⊥ rs	f					01707	
0-24	½' 3.25" HSA	DATE	TIME	SAMPL DEPTI	· · · · · · · · · · · · · · · · · · ·	CAV		r	RILLIN JID LE	IG VEL	WATE LEVE		OTE:		
		6/27/07	12:25	26.5	24.5	26	.0				None		SHEET	S FOR	AN
BUDINIC												E	XPLAN	IATIO	N OF
BORING												TE	RMIN		
DR: SG	LG: SB Rig: 91C												THI	S LOC	) 



# SUBSURFACE BORING LOG

	DB NO: 22-00081					LC	)G OF	во	RING N	10	ST	-93	(p. 1	of 1	)
PROJE	CT: TCAAP Red	evelopm	ent; Ard	len Hi	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION:	901.2 DESCRIPT			GEOLOGY	N	мс	SA	MPLE	REC IN.		) & LA	F	<u> </u>	
	FILL, mixture of sand wi				FILL						WC	DEN		PL	%-#20
1	surface roots, trace roots,	dark brown	1	_/		14	М	X	SS	16					
2 -	FILL, mixture of clayey s little gravel, trace roots, b	rown and d	ty sand, a lark brown					H							
3						8	М	XI	SS	14					
4 -	CLAYEY SAND, a little stiff (SC)	gravel, bro	wn, firm to		TILL			स्रि			13				
5 -						8	м	М	SS	20	17				
6 -							141	Δ	55	20					
7 -								R							
8 -						9	м	XI	SS	23	16				
9	CANDY LEAN OF AN	1:41.	1 1. 1.					团							
10 -	SANDY LEAN CLAY, a brown to brown, firm to s	tiff (CL)	l, light			7	м	М	SS	22	16				
11 -								Д							
12								M			10				
13 -						11	М	١XI	SS	24	16				
14 -								মি							
15 -						13	м	M	ss	24	18				
16 -								Д							
17 -								ł							
18 19	SANDY LEAN CLAY, a (CL)	little grave	l, gray, stif	f				H							
20 -								14							
20 -						11	М	XI	SS	22	16				
21								H							
22 -								}							
24 -								<u>}</u>							
25 -								버							
26						11	Μ	XI	SS	23	16				
	END OF BORING Northing=209104.1 Easting=552534.6							/ \						<u> </u>	
 DEPTI	H: DRILLING METHOD			WATE	R LEVEL MEA	SIDE	MENT	<u> </u>				ŀ			<u> </u>
		DATE	TIME	SAMPLI DEPTI		····			RILIN	G	WATE		IOTE:		
· 0-24½	<u>4' 3.25" HSA</u>	6/27/07				CAV DEF		FLĨ	RILLIN JID LEV	VEL	WATE LEVE		THE AT SHEET		
		0/2//0/	2:10	26.5	24.5	26	.ə				Non	-	XPLAN		
BORING	ETED: 6/27/07					·							RMIN		
DR: SG	LG: SB Rig: 91C													S LOC	
6/04	• • • • • • • • • • • • • • • • • • • •	<u> </u>	<del></del>	•	l	<u> </u>						I			

Geote TCAA	cnical È P Rede	ect SP-00 valuation velopment vy 10 and 1		BORING LOCATIO attached s	ON: N:	: 209		<b>Γ-94</b> 73, Ε: 55290	2.330 See
<mark>Arden</mark> DRILLI	Hills, N	<mark>/linnesota</mark> Keck			- /-			CONTR	
Elev.	Depth	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1.	1/07	<b></b>	SCALE:	1'' = 4'
feet 922.9	feet 0.0		Description of Materials (ASTM D2488 or D2487)	· .	BPF	WL	MC %	Tests	or Notes
918.9	4.0	SM	SILTY SAND, trace of Roots, dark brown, mo (Topsoil)	-	8				
-		CL	SANDY LEAN CLAY, trace of Gravel, light rather soft to medium. (Glacial Till)	brown, wet, 	5		16		
				- - 	7		10		
-					M 8				
904.9	18.0	CL	SANDY LEAN CLAY, trace of Gravel, gray,		7				
-			medium to rather stiff. (Glacial Till)		11				
					X 7				
393.9	29.0	CL	SANDY LEAN CLAY, trace of Gravel, gray,	– moist,					
-			medium. (Glacial Till)		7				

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# LOG OF BORING

Geotect TCAAI NE of H	nical Ev P Redev Highwa	ect SP-0 valuation velopmen y 10 and J linnesota	t Highway 96	BORING: LOCATIO attached s	DN: N	*****		<b>(cont.)</b> 73, E: 552902	.330 See
DRILLE	R: K.I	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	1/07		SCALE:	1'' = 4'
Elev. feet 890.9	Depth feet 32.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	Tests o	r Notes
881.9	41.0		SANDY LEAN CLAY, trace of Gravel, gray, m medium. (Glacial Till) (continued) END OF BORING. Water not observed with 39 1/2 feet of hollow-s in the ground. Boring then grouted.		7				

	n Proj cnical E			5-05871	BORING			ST-95	
TCAA NE of	P Rede	velop y 10 :	ment and l	Highway 96	LOCATI attached s	ON: N sketch.	: 20918	4.739, E: 55339	97.793 See
ORILLI	ER: К.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	1/07	SCALE:	1'' = 4'
Elev. feet 924.0	Depth feet 0.0	AST Sym		Description of Materials (ASTM D2488 or D2487)	•	BPF	WL	Tests or	Notes
922.0	2.0	FILL		FILL: Silty Sand, trace of Roots, trace of Root brown, moist.	-				
917.0	7.0	FILL		FILL: Sandy Lean Clay, mixed light brown, br dark brown, moist.	rown and -  	6 7 9			
917.0	9.0	SC		CLAYEY SAND, trace of Roots, dark gray, me (Buried Topsoil)	oist. –	10			
907.0	17.0	CL		SANDY LEAN CLAY, trace of Gravel, greeni light brown, wet. (Glacial Till)	-	4	Σ		
	26.0	CL		SANDY LEAN CLAY, trace of Gravel, gray, v stiff to stiff. (Glacial Till)	vet, rather	13			
_				END OF BORING. Water observed at 13 feet while drilling. Boring then grouted.	·				

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#### 5.1

Geote	cnical E			6-05871	BORING: <b>ST-96</b> LOCATION: N: 208934.186, E: 550891.188 See								
TCAA NE of	AP Rede	velop vy 10 :	men and	Highway 96	LOCATIC attached s	)N: N: ketch.	: 208934	4.186, E: 55089	1.188 Se				
DRILLI	ER: K.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	7/07	SCALE:	1'' = 4				
Elev. feet 892.3	Depth feet 0.0	AST Sym		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes				
888.3	4.0	PT		FILL: Sandy Lean Clay, dark brown to light br PEAT, dark gray, wet, rather soft to soft. (Swamp Deposit)	own, wet	10							
883.3	9.0	SP- SM		POORLY GRADED SAND with SILT, fine-gray, waterbearing, loose to medium dense.		3	Ā						
_		5141		(Lacustrine)		7 8 12							
	23.0					8							
		CL		SANDY LEAN CLAY, trace of Gravel, gray, w medium. (Glacial Till)	/et, 	7 8							
866.3	26.0			END OF BORING. Water observed at 9 feet while drilling. Boring then grouted.									

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AET JO	OB NO: 22-00081						LC	GOF	BO	RING N	io	ST	-97	( <u>p. 1</u>	of 1	
PROJE	TCAAP Rede	velopme	nt; Ard	en Hi	lls,	MN				<u>_</u>						
DEPTH IN FEET	SURFACE ELEVATION: MATERIAL I	891.0 DESCRIPTIO			GI	EOLOGY	N	мс	SA T	MPLE YPE	REC IN.	FIELI WC	D&LA			rests %-#200
. 1 -	FILL, mixture of sand with clayey sand, a little gravel, roots, dark brown and blac	surface ro			FIL	L	14	м	M	SS	17	12				
2 3 4	SAND WITH SILT, fine g brown, moist, medium den	rained, a l se (SP-SM	ittle gravel	,		ARSE LUVIUM	26	м	$\mathbb{N}$	SS	10	9				
5 -							12		M	SS	9					
6 -							12	<b>T</b>	$\bigwedge$	55	-					
7							2	w	$\mathbb{N}$	SS	14					
9			~						R							
10	SILTY SAND, a little gra medium grained, gray, wat to medium dense (SM)	vel, trace re erbearing,	oots, fine to very loose	0			2	w	X	SS	10					
12 -	to meditin dense (3M)								B							
13 -					•		22	w	X	SS	17	ł				
14 —									Þ						1	
15							23	w	X	SS	17					
16									Б							
18 -	SANDY SILT, dark gray,	waterheari	ng mediun	n	FIN	IE			$\left \right\rangle$							
19 -	dense, laminations of lean	clay at 20'	(ML)		AL	LUVIUM			$\mathbb{Z}$							
20 -							16	w	M	SS	15	24				
21 -									μ							
22 -									5							
23	CLAYEY SAND, a little g (SC)	gravel, dark	gray, firm		TIL	L.			$\left \right\rangle$							
25 -	· •								$\mathbb{N}$			16				
26							7	M	Ň	SS	19					
	END OF BORING Northing=208912.1 Easting=551143.1															
DEP	TH: DRILLING METHOD			WAT	ER L	EVEL MEA								NOTE	REFI	ER TO
0-9	9½' 3.25" HSA	DATE	TIME	E SAMPLED CASING DEPTH DEPTH		CA DE	VE-IN PTH	FI	DRILLI JUID LI	NG EVEL	WAT LEV	ER EL	THE A			
91/21-24	4½' 3.25" HSA	7/25/07	8:05	9.0	)	7.0	) 7.0				6.		SHEE			
BORIN	G			<b> </b>					-					EXPLA FERMI		
	G LETED: 7/11/07 G LG: SB Big: 91C								+						IIS LO	
DR: S	G LG: SB Rig: 91C		1													

Geote TCAA NE of	cnical E AP Rede Highwa	valuation velopmen	t Highway 96	BORING: <b>ST-98</b> LOCATION: N: 208927.565, E: 551670.574 Se attached sketch.							
DRILL	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/26/	/07	SCALE:	1'' = 4'			
Elev. feet 892.8	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487) FILL: Sandy Lean Clay, dark brown, moist.		BPF	WL	Tests or	Notes			
-	7.0	PT 111		-   	5						
883.8	9.0	P1	PEAT, dark gray, wet, medium. (Swamp Deposit)		6	¥					
		SP- SM	POORLY GRADED SAND with SILT, fine- medium-grained, with Gravel, light brown to rust at 12' sample depth, waterbearing, mediun dense. (Glaciofluvium)	gray with	X *	*	50 blows for 5	inches			
876.8	16.0	CL	SANDY LEAN CLAY, trace of Gravel, gray, medium. (Glacial Till)	wet,	18						
					7						
866.8	26.0				7						
_			END OF BORING. Water observed at 8 feet while drilling. Boring then grouted.								

#### SP-06-05871

BRAUN

Braun F Geotecnic TCAAP F NE of Hig Arden Hi	al Éval edevel hway 1	lluation lopment 10 and E		BORING LOCATIO attached s	ON: N	2080		<b>Γ-99</b> 70, Ε:	) 550941.756 See
DRILLER:	K. Kec	eck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	7/07		SCA	LE: 1" = 4'
Elev. De feet fo 892.8	et   A	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Note
- - - - - - - - - - - - - - -	2.0 P		FILL: Clayey Sand, trace of Gravel, mixed dark f brown, moist to wet. PEAT, dark gray, wet, rather soft. (Swamp Deposit) SILTY SAND, fine-grained, gray to brownish-gr waterbearing, very loose to loose. (Lacustrine) END OF BORING. Water observed at 12 feet while drilling. Boring then grouted.		$\begin{array}{c} 13 \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ $		17		LL = 30% PI = 15 OC = 69

#### Braun Intertec Corporation

#### ST-99 page 1 of 1

Geote TCAA NE of	cnical E AP Rede	valua velop vy 10	tion ment and l		BORING LOCATIC attached s	ON: N		<b>ST-100</b> 6.177, E: 55139	98.832 See
ORILLI	ER: K.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	6/07	SCALE:	1'' = 4'
Elev. feet 895.7	Depth feet 0.0		nbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
889.7	<u>    6.0</u> <u>    9.0</u>	FILL PT SM		FILL: Clayey Sand, fine- to medium-grained, t Gravel, dark brown to brown, moist.          Fill (Clayey Sand) 0' to 6' Peat 6' to 9' Poorly Graded Sand 9' to 22'         PEAT, Fibrous, dark gray, wet, rather stiff. (Swamp Deposit)         POORLY GRADED SAND with SILT, fine-gragray, waterbearing, loose to medium dense. (Glacial Till)	- - - - - -	9 6 11 12 14	₽		
 873.7	22.0					6			
		CL		SANDY LEAN CLAY, trace of Gravel, gray, w medium. (Glacial Till)					
869.7	26.0			END OF BORING. Water observed at 9 feet while drilling. Boring then grouted.		6			

SP-06-05871



### SUBSURFACE BORING LOG

AET JC			<u></u>		<u></u>	LC	)G OF	BO	RING N	10	ST-	101	(p. 1	l of :	1)
PROJE	CT: TCAAP Rede	velopme	nt; Arde	n Hi	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION: MATERIAL I	897.9			GEOLOGY	N	мс	SA T	MPLE YPE	REC IN.	FIELI WC	D & LA	BORA	r – – – – – – – – – – – – – – – – – – –	TESTS
1 –	FILL, mixture of sand with clayey sand, a little gravel, roots, brown	n silt, silty s	and and		FILL	28	м	M	SS	12					
2 — 3 —						5	М	$\mathbb{N}$	SS	13	10				
4 —								N R					-		
5 - 6 -	CLAYEY SAND, a little g dark gray, a little black, ve organic clay (SC)	ravel, trace ry soft, lam	e roots, ainations of		MIXED ALLUVIUM OR TOPSOIL	1	W/M		SS	4					
7	SANDY LEAN CLAY, a roots, dark gray, very soft with silt at 9.5' to 9.9' (CL)	to firm, a le	, trace ense of sand		TILL	1	м	M M	SS	2	15				
10 - 11 -	CLAYEY SAND, a little g	ravel. trace	roots.			5	M	M	SS	10	18				
12 — 13 —	gray and brown, stiff (SC)	,,	,			10	м	K	SS	19	14				
14 — 15 — 16 — 17 —	SANDY LEAN CLAY, a stiff (CL)	little gravel	, dark gray			10	М	द्धे ∕∕ि सि	SS	19	14				
18 — 19 — 20 —						12	м		SS	23	14				
21 22 23								$\langle xxxxx$							
24 - 25 - 26 -						13	М		SS	23	15				
	END OF BORING Northing=208686.2 Easting=551895.0														
DEPT	TH: DRILLING METHOD			WAT	ER LEVEL ME	ASUR	EMEN	ITS					NOTE	REF	ER TO
0-24	1½' 3.25" HSA	DATE TIME SAMPL			LED CASING TH DEPTH	CA DF	VE-IN PTH	FL	DRILLI JUID LI	NG EVEL	WAT LEV	ER EL	THE A		
		6/29/07	9:40	9.0	7.0	,	7.1				No		SHEE		
		6/29/07	9:45	11.	5 9.5	1	0.5				10.		EXPLA		
BORING COMPL	G ETED: 6/29/07	6/29/07	10:00	26.	5 24.5	2	6.5				No	ae 7	ERMI		
DR: SO													TH	HIS LO	)G



AET JO PROJE	DB NO: <u>22-00081</u> CT: <u>TCAAP Rede</u>	velopme	ent: Ard	en Hi	ills. N	AN	LO	G OF	BO	RING N	iO	ST-	102	(p. 1	of 1	l)
DEPTH IN FEET	SURFACE ELEVATION: MATERIAL	902.2			1	DLOGY	N	мс	SA T	MPLE YPE	REC IN.	FIELI WC	r	BORA	1	TESTS %-#200
1 -	FILL, mostly sandy silt, a roots, trace roots, dark bro	little grave	l, surface		FILL		10	м	M	SS	3			-		
2	FILL, moslty clayey sand, roots, brown, dark brown						5	М	$\square$	SS	6	12				
4 — 5 —							16	М	ਸ਼ \	SS	7	16				
6 7	CLAYEY SAND, a little g	gravel, dark	gray, firm		TILL				시 된 			13				
8 — 9 —	to stiff (SC)						10	M	K R	SS	19	1.5				
10 - 11 -							8	M	X	SS	17					
12 — 13 —							9	м	Ň	SS	20	15				
14 15 16							9	М	ਸ X	SS	21	16				
16									E E	·						
18 — 19 — 20 —	SANDY LEAN CLAY, a stiff (CL)	little gravel	l, dark gray	,												
20 21 - 22 -							9	М		SS	21	16			-	
23 – 24 –																
25 26							10	М	X	SS	21	15				
	END OF BORING Northing=208692.0 Easting=552395.5				1											
DEP	TH: DRILLING METHOD					VEL MEA								NOTE:	REFE	ER TO
0-24	1½' 3.25" HSA	DATE 6/29/07	TIME <b>9:00</b>	SAMPI DEPT 26.	[	CASING DEPTH 24.5	<b>}</b>	/E-IN PTH 5.0	FL	ORILLI UID LE	NG EVEL	WAT LEVI		THE A		
BORING	3													EXPLA FERMI		
BORING COMPL DR: SC								<u> </u>						IIS LO		
06/04	<u> </u>				1		<u>I</u>	14 1	1				<u>I</u>			

Brau	n Proj	ect SP-	06-05	5871	BORING	: SJ	[-1(	03	<b>RI-100'</b>	7-07
TCAA NE of	P Rede Highwa	valuatio velopme iy 10 and /linnesot	nt I Higł	iway 96	LOCATI attached	ON: N sketch.	: 208	804.6	74, E: 55290	6.273 See
DRILLI		Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	9/07		SCALE:	1" = 4
Elev. feet 924.9	Depth feet 0.0	ASTM Symbol		Description of Materials (ASTM D2488 or D2487)	<b>E</b>	BPF	WL	MC %	Tests	or Notes
		FILL X	🕺 FII	L: Silt, dark brown, moist.				70		
<u>923.9</u> 920.9	1.0	FILL	FII	L: Lean Clay, brown to dark brown, dry.		18				
-	4.0	CL	SA we	NDY LEAN CLAY, gray with iron stainin , rather soft to rather stiff. (Glacial Till)	g, moist to 	8				
					- - 	¥ 5		18		
					-	7	- manual and a second			
906.9	18.0	CL	S A		-					
_		C	me	NDY LEAN CLAY, trace of Gravel, gray, lium to stiff. (Glacial Till)	moist, –	8				
					-					
						8				
_					- · -	V 15				

Braun Intertec Corporation

SP-06-05871

# BRAUN M

Geote	enical E	ect SP-0 valuation		LOCATI	ON: N			<b>1007-07</b> 74, E: 55290	
NE of	Highwa	velopment y 10 and 1 linnesota	Highway 96	attached	sketch.			.,	
DRILLE	ER: К. ]	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	9/07		SCALE:	1" = 4'
Elev. feet 892.9	Depth feet 32.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487	)	BPF	WL	MC %	Tests	or Notes
			SANDY LEAN CLAY, trace of Gravel, g medium to stiff. (Glacial Till) (continued)	-	11 11				
884.9	40.0		END OF BORING. Water not observed with 38 1/2 feet of ho in the ground. Boring then grouted.	llow-stem auger					
				- - -					
				- - - -					
-									
-									

BRAUN

BRA	VUN	5M.						LOG OF BORI
INTE								
				6-05871	BORING	: <b>R</b> ]	[-400	3-01 ST-104
TCAA NE of	cnical E AP Rede Highwa Hills, N	velopi y 10 a	ment and ]	Highway 96	LOCATI attached	ON: N sketch.	: 20868	2.011, E: 552906.273 See
DRILLI		Keck	5014		DATE:	7/2	3/07	SCALE: 1'' = 4'
Elev. feet 934.9	Depth feet 0.0	AST Sym		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or Notes
934.4		FILL	$\bigotimes$	FILL: Silty Sand, fine-grained, dark brown, moist		-		
-		FILL		FILL: Silty Sand, fine- to coarse-grained, trace of with Clay layers, brown, moist.	Gravel, - -			
930.9 	4.0	FILL		FILL: Silty Sand, fine-grained, mixed with Clay, I moist.	black,	8		
927.9	7.0	OL	-	ORGANIC CLAY, black wet, very soft to rather s	soft.			
927.9 	12.0			(Swamp Deposit)		5		
		CL		SANDY LEAN CLAY, bluish-gray, wet, soft to ra soft. (Lacustrine)	ather - -	5		
- - 916.9	18.0	CL		SANDY LEAN CLAY, trace of Gravel, brown, m	- - ioist,			
-				medium. (Glacial Till)	- 	7		
911.9	23.0	CL		SANDY LEAN CLAY, trace of Gravel, gray, mois medium.	st,			
-  908.9	26.0			(Glacial Till)		6		
				END OF BORING. Water not observed during drilling.	-			
				Water not observed with 24 1/2 feet of hollow-ster in the ground.	m auger –			
				Boring then grouted.				
2-06-05871				Braun Intertec Corporation		<u> </u>	<u> </u>	RI-4003-01 ST-104 page

Braun Intertec Corporation

RI-4003-01 ST-104 page 1 of 1

	n Proj cnical E			5871	BORING			ST-105	
TCAA NE of	AP Rede Highwa Hills, N	velopm vy 10 ar	ient 1d High	away 96	LOCATIO attached s	DN: Ni ketch.	: 208435	5.237, E: 55114	7.610 See
DRILL	ER: K.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	7/07	SCALE:	1'' = 4'
Elev. feet 899.1	Depth feet 0.0	ASTN Symbol FILL	ol XX FIL	Description of Materials (ASTM D2488 or D2487 L: Clayey Sand, fine- to medium-grai avel, grayish-brown, moist.	)	BPF	WL	Tests or	Notes
- - <u>895.1</u> -	4.0	FILL		L: Silty Sand, fine-grained, dark brow	- - /n, moist. 	13			
892.1	7.0	SP-	XX III PO	ORLY GRADED SAND with SILT, fi	ne-grained, light				
- 890.1	9.0	SM SP-	bro	wn, moist, loose. (Lacustrine) ORLY GRADED SAND with SILT, fi	-	6	I₽		
		SM	bro den	wn to grayish-brown, waterbearing, Io se. (Lacustrine)	ose to medium  	8 7 7 7			
877.1	22.0	CL	SA1 stiff	NDY LEAN CLAY, trace of Gravel, g . (Glacial Till)	- ray, wet, rather - -				
873.1	26.0					9			
			r	O OF BORING.	-				
				er observed at 9 feet while drilling.	-				
-			) ; ;						

**BRAUN**\*\*



AET JO	DB NO: 22-00081						LO	G OF	BO	RING N	10	ST-	106	(p. 1	of 1	<u>)</u>
PROJE	CT: TCAAP Rede	velopme	ent; Ard	en Hi	lls,	MN						<u></u>				
DEPTH	SURFACE ELEVATION:	903.4			GE	EOLOGY			C A		REC	FIELI	) & LA	BORAT	ORY	TESTS
IN FEET	MATERIAL I		)N			000001	N	MC	Ĩ	MPLE YPE	IN.	wc	DEN	LL	PL	<b>%-#2</b> 00
1 -	FILL, mixture of clayey sa organic clay, a little gravel roots, dark brown, brown a	, surface ro	nd and ots, trace		FILI	Ĺ	11	М	М	SS	14	9				
2							26	м	M	SS	19	15				
4 —									R			8				
5 — 6 —	LEAN CLAY WITH ORC black, stiff, lense of silty s	JANICS, tr and (CL)	ace roots,		TOF	SOIL	14	м	M	SS	19	22				
7 — 8 —	SILTY SAND, a little grav grained, light brown, medi					ARSE LUVIUM	15	м	R	SS	16					
9 10	SAND WITH SILT, a littl	e gravel, fi	topsoil topsoi	nd 7' to 9	9.5'				R							
11 -	medium grained, light brow medium dense (SP-SM)	wn, waterb	earii <mark>Sand w</mark>	silt 9.5'	to 13	3 <mark>.5'</mark>	16	M	Å	SS	17					
12 13					-		23	w	M	SS	16	13				
14 -	CLAYEY SAND, a little g _stiff to stiff (SC)	-			TIL	L			E							
15 — 16 —	CLAYEY SAND, a little g stiff (SC)	gravel, gray	, soft to				4	M	X	SS	17	17		Ē		
17 18									Į							
19 -									Ĭ							
20 21							7	М	X	SS	20	14				
22 –									F							
23 – 24 –																
25 -							11	м	$\left  \right\rangle$	SS	23	14				
26 —	END OF BORING Northing=208433.1 Easting=551647.6															
DEP	TH: DRILLING METHOD			WAT	I ER LI	EVEL MEA	SURI	L EMEN	TS	L,	4			L NOTE:	REFI	ER TO
0-24		DATE	TIME	SAMPI DEPT		CASING DEPTH		/E-IN PTH		DRILLI .UID LI	NG EVEL	WAT LEV		THE A	ATTAC	CHED
		7/11/07	9:20	14.	0	12.0	1	2.4				12.		SHEE		
		7/11/07	9:30	26.	5	24.5	2	6.4				Noi	1e	EXPLA	NATI	ON OF
BORIN COMPI	G .eted: 7/11/07															GY ON
DR: SC							<u> </u>							Tł	IIS LC	)G



AET JO	DB NO: 22-00081					LC	G OF	BO	RING N	10	ST-	107	(p. 1	of 1	
PROJE	CT: TCAAP Rede	evelopme	ent; Ard	<u>en Hil</u>	ls, MN										
DEPTH	SURFACE ELEVATION:	902.7		ľ	GEOLOGY	N	мс	SA	MPLE YPE	REC	FIELI	)&LA	BORA	FORY 7	ESTS
IN FEET	MATERIAL						IVIC		YPE	ĨN.	wc	DEN	LL	PL	<b>%-#2</b> 00
1	SILTY SAND, a little grav roots, dark brown, moist, i	vel, surface medium der	roots, trac		TOPSOIL	11	м	М	SS	15	4				
2 -	SAND WITH SILT, fine	grained, tra	ce roots,	-  :	COARSE ALLUVIUM			Ш	00	~~					
3 -	light brown, moist, mediu	m dense (SI	P-SM)			14	м	М	SS	20					
4								Д	00						
5 –								M							
6 -						13	М	XI	SS	20					
7-								ष्ट्रि							
8						15	м	M	SS	21					
9								Д							
10 -								M					1		
11 -		1.6				11	W/M	M	SS	19					
12 -	SILTY SAND, a little gray grained, brownish gray, w	aterbearing	, medium				Ţ	团							
13 —	dense to very loose, lense (SM)	of silt with	sand at 11			9	W	M	SS	15					
14 -								Д							
15 -								М							
16						2	W	M	SS	8					
17 —								R							
18 -	CLAYEY SAND, a little	rravel grav	etiff to		TILL	-		H							
19 —	firm (SC)	giavei, giay	, 5011 10		THE SEC			ł							
20 —								$\square$		10	12				
21 -						14	М	$\mathbb{N}$	SS	19					
22 –								ß		:					
23 —								H							
24 –								H				1			
25 –	. · · ·					8	М	Μ	SS	23	15				
26 -						0	IVI	Μ	33	2.5				<u> </u>	<u> </u>
	END OF BORING Northing=208260.5														
	Easting=551137.6														
DEP	TH: DRILLING METHOD	<u> </u>		WATE	R LEVEL ME	L ASURI	I EMEN	<u>   </u> TS		1	1	1	NOTE:	 2229	
		DATE	TIME	SAMPL DEPT			/E-IN PTH		DRILLI UID LE	NG	WAT LEV	ER	THE A		· ·
0-24	1½' 3.25" HSA	7/11/07	10:30	14.0			2.3		UDLE	VEL	12.			IS FOI	
		7/11/07	10:30	26.5			4.9	+			Nor		EXPLA	NATIO	ON OF
BORIN COMPI	G LETED: 7/11/07									-			FERMD	NOLO	3Y ON
DR: SC				-				1					TI	IIS LO	G

Geote	cnical E	valua	ntion	6-05871				<b>1-02 ST</b> 5.939, E: 55140	
NE of	P Rede Highwa Hills, N	y 10	and ]	t Highway 96	attached s	Sketch.	: 208180	5.939, E: 55140	12.993 Se
DRILLI	ER: K.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2	4/07	SCALE:	1'' = 4
Elev. feet 906.6	Depth feet 0.0	AS' Syn		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
906.4./	0.2	PAV	XXX	$2^{\circ}$ of Bituminous					
-		FILL		FILL: Silty Sand, fine- to medium-grained, dar moist.	rk brown, – –	M 26			
902.6	4.0					Δ			
		SP		POORLY GRADED SAND, fine-grained, brow iron staining, moist, loose to medium dense. (Glacial Outwash)	wn with	5			
-					-				
- 897.6	9.0	SP		POORLY GRADED SAND, fine-grained, brow					
				waterbearing, medium dense. (Glacial Outwash)		15			
						12	Σ		
				With Gravel layer at 15 1/2 feet.		22			
888.6	18.0				_				
		CL		SANDY LEAN CLAY, trace of Gravel, gray, w soft. (Glacial Till)	vet, rather				
						5			
					_				
-						-			
880.6	26.0			END OF BORING.		5			
				Water observed at 12 1/2 feet while drilling.	-				
				Boring then grouted.	-	-			
-06-05871				Braun Interlee Corporation					T-108 page

LOG OF BORING

<u>ka</u>un™



AET J	OB NO: 22-00081						LC	OG OF	во	RING N	10	ST-	109	<b>(p.</b> ]	l of 1	l)
PROJE	CT: TCAAP Red	<u>evelopm</u>	ent; Ard	en Hi	ills,	MN						••••				
DEPTH IN FEET	SURFACE ELEVATION:	904.5	;		G	EOLOGY	N	мс	SA	MPLE TYPE	REC		)&L/	BORA	FORY '	TESTS
FÊÊT	MATERIAL							wie		ГҮРЕ	IN.	WC	DEN		PL	<b>%-#</b> 200
1 1-	FILL, mostly silty sand, a	little grave own	el, surface		FII	.L	11	М	М	SS	12					
2 -	FILL, mixture of sand wit clayey sand, a little grave			_					Д			1.5				
3 -	brown and light brown	i, ilace 1001	s, dark				7	М	М	SS	11	15				
4 -									Д							
5 —									M			16				
6							11	М	M	SS	21					
7 -	SANDY LEAN CLAY, a	little grave	l gray a		TIL		ł		E							
8	little brown, stiff to firm,	laminations	s of silty			-1L-	12	М	IXI	SS	19	16				
9 —		and w silt) 0.5 lean clay 7'														
10 -							0		M	00	14	17				
11 -	$\checkmark$						8	M	Ŵ	SS	14	17				
12 —	SANDY LEAN CLAY, a	little grave	l, dark grav						R							
13 -	firm to stiff (CL)	U	,,				9	М	IXI	SS	24	16				
14 —									E							
15 —							7	м	М	SS	17	17				
16 -									Д	22						
17 -									Ħ							
18 -									Ħ							
19 -									国							
20 -							8	М	M	SS	22	16				
21 -	et.								/\ स							
22 -									3							
23 - 24 -									H							
24 -									비							
26 -							10	М	IXI	SS	20	17				
	END OF BORING															
	Northing=208177.9 Easting=551886.3															
	·····															
DEPT	TH: DRILLING METHOD					EVEL MEA	· · · ·		-		10	117 4 000		NOTE:	REFE	r to
0-24	½' 3.25" HSA	DATE	TIME	SAMPL DEPT	ED H	CASING DEPTH	CAV DEI	E-IN TH	FL <sup>I</sup>	ORILLIN UID LE	∜G VEL	WATE LEVE	L R	THE A		
		7/18/07	9:40	26.5	;	24.5	24	.9				Non		SHEET		
BORINO	3													EXPLAI ERMIN		
															IS LOG	
DR: SG	LG: <b>SB/BR</b> ig: <b>91C</b>		i i								1			111	10 200	'

Geote TCAA	cnical E P Rede	valuation velopmen			)N: N:		<b>7-05 ST</b> - 2.321, E: 55239	
		ly to and Ainnesota						
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/24	1/07	SCALE:	1"=4
Elev. feet 913.2	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
912.2	1.0	FILL 💥	FILL: Silty Sand, fine-grained, trace of Gravel, dar	k				
904.2	9.0	CL	brown, moist. SANDY LEAN CLAY, trace of Gravel, brown with staining, wet, rather soft to medium. (Glacial Till)	h iron	6			
<u> </u>		CL	SANDY LEAN CLAY, trace of Gravel, gray, moist medium to rather stiff.	t,				
887.2	26.0		(Glacial Till)		9 8 8 12			
			END OF BORING.					
			Water not observed during drilling.					
			Water not observed with 24 1/2 feet of hollow-stem in the ground.	auger				
-			Boring then grouted.					

**BRAUN**<sup>™</sup>

LOG OF BORING

Geote TCAA NE of	cnical E P Rede <sup>v</sup> Highwa	valuatio velopme	nt Highway 96	BORING LOCATIC attached s	ON: N: 2081	<b>07-06 ST-111</b> 84.910, E: 552896.448 S
DRILLI	E <b>R:</b> К.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/24/07	SCALE: <b>1</b> " = 4
Elev. feet 922.1	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF WL	Tests or Notes
<u>921.1</u> - - 918.1	<u>    1.0</u> 4.0	FILL K	FILL: Silty Sand, fine-grained, with Roots, trac Gravel, dark brown, moist. FILL: Organic Clay, with Silty Sand layer, blac brown, moist.	7	11	
	4.0	SP ××	POORLY GRADED SAND, fine-grained, brow loose. (Glacial Outwash)	vn, wet,	8.	
915.1	7.0	CL	SANDY LEAN CLAY, trace of Gravel, brown, rather soft. (Glacial Till)	wet,	4	
915.1	14.0	CL	SANDY LEAN CLAY, trace of Gravel, brown moist, medium to rather stiff. (Glacial Till)		9	
		CL	SANDY LEAN CLAY, trace of Gravel, gray, w medium. (Glacial Till)	ret, 	7	
					7	
	20.5				6	
	28.5		END OF BORING. Water not observed with 27 feet of hollow-stem the ground.	auger in		

		ect SP-( valuation	06-05871	BORING				<b>F-11</b> 2	
TCAA NE of	.P Rede Highwa	velopme	nt Highway 96	LOCATI attached	ON: N sketch.	: 208	188.4	59, E: 5	553395.319 See
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	9/07		SCAL	.E: 1'' = 4'
Elev. feet 936.8	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	•	BPF	WL		P200	Tests or Note
936.7	0.1	PAV	(ASTM D2488 of D2487) 2" Bituminous Pavement.	/			%	%	······
<u>- 935.8</u>	1.0_	FILL XX SM	FILL: Poorly Graded Sand with Silt, trace of G brown, moist. POORLY GRADED SAND with SILT, fine- t medium-grained, trace of Gravel, reddish brow loose to medium dense. (Glacial Outwash)	/_	7	-	4	9	
927.8	9.0	SP	POORLY GRADED SAND, fine- to medium-	- - - rained	28			2	
924.8	12.0		reddish brown, moist, medium dense. (Glacial Till)		27				
_		SM	SILTY SAND, fine- to medium-grained, trace reddish brown, moist, medium dense to dense. (Glacial Till)	of Gravel, - - - -	32				
918.8	18.0	SP SP	POORLY GRADED SAND, fine- to medium- trace of Gravel, light brown, dense to very dense	grained, .e					
					39				
910.8	26.0				50		2		
			END OF BORING. Water not observed with 24 1/2 feet of hollow- in the ground.	– stem auger –					
-			Boring then grouted.	-					

**BRAUN**\*

LOG OF BORING

Geote TCAA NE of	cnical E AP Rede Highwa	ect SP-0 valuation velopmen ey 10 and 1 Ainnesota	t Highway 96	BORING LOCATIC attached s	ON: N: 20818	<b>ST-113</b> 32.505, E: 553828.508 See
DRILLI	ER: к.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/29/07	SCALE: 1" = 4"
Elev. feet 941.8	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF WL	Tests or Notes
939.5	2.3	SC SM	CLAYEY SAND, trace of roots, dark brown, (Topsoil) SILTY SAND, fine- to medium-grained, trace	_		
-			reddish brown, moist, medium dense. (Glacial Till)		17 21	
					55	
					32	
929.8	12.0	SP	POORLY GRADED SAND, fine- to medium- trace of Gravel, light brown, moist, medium dense.	grained, ense to	16	
-			(Glacial Outwash)	-  	20	
	ł					
					36	
915.8					¥ 33	
3.3.8	26.0		END OF BORING.			
			Water not observed with 24 1/2 feet of hollow in the ground.	stem auger		
_ ]			Boring then grouted.			



PROJECT: UCAAP Redevelopment; Arden Ibils, MN         DEP/II       SURACE ELEVATION       13.1       GEOLOGY       N       MC       SAMPL B       REF       MCD DEN       I       N         1       HILL mixture of days and samdy silt, a       FILL mixture of days and samdy silt, a       FILL       8       M       SS       6       8       I       I       IV       WC DEN       LL       PL       KC         2       ORGANIC CLAY, trace roots, black, a little gravel, and could (OLOH)       WMME       SS       15       38       24       4       24       24       24       24       24       24       24       24       24       24       24       24       24       24       24       24       28       24       10       10       M       SS       15       18       14       44       28       24       14       10		DB NO: <u>22-00081</u>	wolonmo	nt. And		lla	MN	LO	G OF	BO	RING N	10	ST-	114	(p. 1	of	I)
Dir.N.T.       SURACE ELEVATION       Jobs       MATERIE VATION       Mode State of the second s		CI: <u>ICAAP Kede</u>	-	at; Arde		<u>115,</u>	TATTA								DOD		
1       bittle gravel, surface roots, black and brown       8       M       X       SS       6       8         2       CMRANIC CLAY, trace roots, black, a little gravel, fine, laminations of silly sand (OL/OH)       26       SWAMP       7       M       X       SS       15       38         4       EXANCY SILT, a little gravel, fine const, gray, a       FINE       ALLUVIUM       19       M       SS       12       28         5       LEAN CLAY, gray, very stiff (CL)       SS       11       ALLUVIUM       19       M       SS       12       28         6       Hitle dark gray, very stiff (CL)       TILL       3       W       SS       16       19         9       SANDY LEAN CLAY, a little gravel, gray, soft       3       M       SS       16       16         10       to very stiff (CL)       3       M       SS       16       16         12       3       M       SS       16       16       16         14       M       SS       16       17       16       11       M       SS       24       16       16         12       14       M       SS       24       16       16       16       16	DEPTH IN FEET					GE	EOLOGY	N	мс	SA T	MPLE YPE	REC IN.	<u> </u>	r —	1		T
3       Gray, firm, laminations of sity same, outcome		little gravel, surface roots,	and and san trace roots,	dy silt, a , black and		FILI	L	8	М	M	SS	6	8				-
SANDY SILT, a little gravel, trace roots, gray, a little dark gray, wet, medium dense, laminations       IALUVIUM       19       M       SS       12       28         of lean clay (ML)       SILTY SAND, a little gravel, fine to medium grained, gray, waterbearing, very loose (SM)       1       TILL       3       W       SS       16       19         SANDY LEAN CLAY, a little gravel, gray, soft       3       M       SS       15       18         9       SANDY LEAN CLAY, a little gravel, gray, soft       3       M       SS       16       19         10       to very stiff (CL)       3       M       SS       16       16         11       M       SS       16       17       18       10       10         12       10       10       W       SS       16       17       16         12       11       M       SS       16       17       14       M       SS       24       16         12       14       M       SS       24       16       16       16       17       14       14       14       14       14       15       18       16       16       16       16       16       16       16       16       16						DEF	POSIT	7	М	X	SS	15	24				
SILTY SAND, a liftle gravel, fine to medium grained, gray, waterbearing, very loose (SM)       TILL       3       W       SS       16       19         SANDY LEAN CLAY, a little gravel, gray, soft to very stiff (CL)       3       M       SS       15       18         11- 12- 13- 14- 15- 16- 17- 18- 19- 20- 21- 22- 23- 24- 24- 25- 26-       9       M       SS       16       16         14       M       SS       16       17       16         12- 22- 23- 24- 25- 26-       14       M       SS       24       16         END OF BORING Northing=207847.6 Easting=552482.9       17       M       SS       24       16         DEPTH:       DRILLING METHOD       WATER LEVEL MEASUREMENTS       NOTE: REFER       NOTE: REFER       NOTE: REFER         0-24%'       3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASEN DEPTH       DRILLING METHOD       SZ       None         RORNG OMPLETED:       7/18/07       11:40       9.0       7.0       5.2       SZ       None         RORNG OMPLETED:       7/18/07       12:05       26.5       24.5       26.5       None	-	SANDY SILT, a little grav little dark gray, wet, mediu	vel, trace ro	ots, gray, a aminations		FIN ALI	E LUVIUM	19	₩ M	M	SS	12					
SANDY LEAN CLAY, a little gravel, gray, soit       3       M       SS       15       18         11       12       3       M       SS       15       18         12       -       9       M       SS       16       16         13       -       9       M       SS       16       16         14       -       -       9       M       SS       16       17         16       -       -       -       11       M       SS       16       17         16       -       -       -       11       M       SS       16       17         18       -       -       -       -       14       M       SS       24       16         19       -       -       -       14       M       SS       24       16       -         21       -       -       -       17       M       SS       24       16       -         22       -       -       -       17       M       SS       24       16       -         23       -       -       -       17       M       SS       24	8 —	SILTY SAND, a little grav				TIL	L	3	w	Í	SS	16	19				
12 -       3 -       9       M       SS       16       16         14 -       15       16       11       M       SS       16       17         16 -       11       M       SS       16       17       1       18         19 -       20       14       M       SS       24       16       16         21 -       14       M       SS       24       16       16       16         23 -       14       M       SS       24       16       16       16         24 -       17       M       SS       24       16       16       16         25 -       17       M       SS       24       16       16       16         26 -       17       M       SS       24       16       16       16         26 -       17       M       SS       24       16       16       16       16         26 -       17       M       SS       24       16       16       16       16       16         27 -       114       M       SS       24       16       16       16       16       16	10 —	SANDY LEAN CLAY, a to very stiff (CL)	little gravel	l, gray, soft				3	М	R	SS	15	18				
15 -       11       M       SS       16       17         16 -       17       11       M       SS       16       17         18 -       19       14       M       SS       24       16         20 -       14       M       SS       24       16       16         21 -       14       M       SS       24       16       16         22 -       23 -       17       M       SS       24       16       16         24 -       25 -       17       M       SS       24       16       16       16         END OF BORING Northing=207847.6 Easting=502482.9       WATER LEVEL MEASUREMENTS       NOTE: REFER         0-24½'       3.25'' HSA       DATE       TIME       SAMPLED       CAVE-N       DEPTH       CAVE-N       NOTE: REFER         0-24½'       3.25'' HSA       DATE       TIME       SAMPLED       CAVE-N       DEPTH       SAMPLED	12 —							9	м	E	SS	16	16				
17       -	15 -							11	м	N N	SS	16	17				
19 -	17 -									<u> </u>							
21 -       -	19 —									NEXT.							
24 -       25 -       17       M       SS       24       16         26 -       17       M       SS       24       16       10         END OF BORING Northing=207847.6 Easting=552482.9         WATER LEVEL MEASUREMENTS         NOTE: REFER         O-24½' 3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH       CAVE-IN DEPTH       DRILLING FLUID LEVEL       WATER LEVEL       NOTE: REFER         O-24½' 3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH       CAVE-IN DEPTH       DRILLING FLUID LEVEL       WATER LEVEL       NOTE: REFER         O-24½' 3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH       CAVE-IN DEPTH       DRILLING FLUID LEVEL       WATER LEVEL       SHEETS FOR A         O-24½' 3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH       CAVE-IN DEPTH       DRILLING FLUID LEVEL       WATER LEVEL       SHEETS FOR A         O-24½' 3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH       DRILLING DEPTH       DRILLING FLUID LEVEL       VATER         O-24½' 3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH								14	м		22	24	16				
26 -       17       M       SS       24       16       16         END OF BORING Northing=207847.6 Easting=552482.9         DEPTH:       DRILLING METHOD       WATER LEVEL MEASUREMENTS       NOTE: REFER         0-24½       3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH       CAVE-IN DEPTH       DRILLING FLUID LEVEL       WATER LEVEL       NOTE: REFER         0-24½       3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH       CAVE-IN DEPTH       DRILLING FLUID LEVEL       WATER LEVEL       THE ATTACHE         0-24½       3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH       DRILLING DEPTH       WATER FLUID LEVEL       SHEETS FOR A         5.2       7/18/07       11:40       9.0       7.0       7.0       5.2       EXPLANATION         BORING COMPLETED:       7/18/07       12:05       26.5       24.5       26.5       None       THIS LOG	1									1111							
Northing=207847.6 Easting=552482.9     Northing=207847.6       DEPTH:     DRILLING METHOD     VATER LEVEL MEASUREMENTS       0-24½'     3.25" HSA     DATE     TIME     SAMPLED DEPTH     CASING DEPTH     CAVE-IN DEPTH     DRILLING FLUID LEVEL     WATER LEVEL     NOTE: REFER THE ATTACHE SHEETS FOR A       0-24½'     3.25" HSA     DATE     TIME     SAMPLED DEPTH     CASING DEPTH     DRILLING FLUID LEVEL     WATER LEVEL     THE ATTACHE SHEETS FOR A       0-24½'     3.25" HSA     7/18/07     11:40     9.0     7.0     7.0     5.2     SHEETS FOR A       BORING COMPLETED:     7/18/07     12:05     26.5     24.5     26.5     None     EXPLANATION TERMINOLOGY		END OF BORING						17	М	K	SS	24	16				
0-24½' 3.25" HSADATETIMESAMPLED DEPTHCASING DEPTHCAVE-IN DEPTHDRILLING FLUID LEVELWATER LEVELTHE ATTACHE SHEETS FOR A7/18/0711:409.07.07.05.2SHEETS FOR A7/18/0712:0526.524.526.5NoneEXPLANATIONBORING COMPLETED:7/18/07		Northing=207847.6															
7/18/07         11:40         9.0         7.0         7.0         5.2         SHEETS FOR A           7/18/07         12:05         26.5         24.5         26.5         None         EXPLANATION           BORING COMPLETED:         7/18/07	DEP	TH: DRILLING METHOD			WAT	ER L	EVEL MEA	SURI	EMEN	TS					NOTE:	REF	ER TO
7/18/07         11:40         9.0         7.0         7.0         3.2           7/18/07         12:05         26.5         24.5         26.5         None         EXPLANATION           BORING COMPLETED:         7/18/07	0-24	4½' 3.25" HSA	DATE	TIME				· · · · ·		FL	DRILLI JUID LI	NG EVEL					
BORING COMPLETED:         7/18/07         12:05         26.5         24.3         26.5         140he           TERMINOLOGY         THIS LOG         THIS LOG         THIS LOG         THIS LOG         THIS LOG			7/18/07														
THISLOG	BORIN	G	7/18/07	12:05	26.:	5	24.5	2	6.5				Noi	IE			
DR: SG LG: SB/BRig: 91C									<u> </u>	+					TI	IIS LC	G



### SUBSURFACE BORING LOG

AET JO	OB NO: 22-00081	·					LC	G OF	BOI	RING N	ю	ST-	115	<u>(p. 1</u>	of 1	L)
PROJE	CT: TCAAP Rede	velopme	nt; Ard	en Hi	lls,	MN										
DEPTH	SURFACE ELEVATION: _	908.2			GI	EOLOGY	N	мс	SA	MPLE YPE	REC	FIELD	) & LA	BORAT	ORY	TESTS
FEET	MATERIAL						11	MC	T	YPE	IN.	wc	DEN	LL	PL	<b>%-#200</b>
1 –	FILL, mostly silty sand, su roots, dark brown	irface roots	, trace		FIL	L.	15	М	M	SS	21					
2 -	FILL, mixture of clayey sa trace roots, brown and bla	and and san ck	d with silt,						H							
3 -							20	M	M	SS	20					
4 – 5 –	SAND WITH SILT, a littl	e gravel, m	edium to		CO.	ARSE			田							
6-	fine grained, brown, moist (SP-SM)			e	ALI	LUVIUM	12	М	M	SS	18					
7 -									Ø							
8 -							18	М	IXI	SS	19					
9 -									国							
10 -							11	W/M	X	SS	17	15				
11 12	CLAYEY SAND, a little g stiff (SC)	gravel, dark	t brown,		TIL	L			E							
13 -	CLAYEY SAND, a little g to stiff (SC)	gravel, dark	gray, soft				4	м	М	SS	19	17				
14									H							
15 —							7	M	М	SS	21	16				
16 —									Д							
17 -									ł							
18 19						:			ł							
20 -									M							
21 -							8	M	M	SS	23	13			]	
22 -									R							
23 –									X							
24 —									国							
25 26							10	м	X	SS	24	16				
20 7	END OF BORING		<u>.</u>						<u> </u>			<u> </u>				
	Northing=207758.9 Easting=551498.2															
DEP	TH: DRILLING METHOD		· · · · · ·	WAT	ER L	EVEL MEA	SURI	EMEN	TS		·			NOTE:	REFE	ER TO
0-24	4½' 3.25" HSA	DATE	TIME	SAMPI DEPT	_ED H	CASING DEPTH	CAV DE	/E-IN PTH	FL	DRILLI UID LE	NG EVEL	WAT LEVI	ER EL	THE A	TTAC	HED
		7/11/07	11:20	11.	5	9.5	1	0.1				Nor		SHEE		
	~	7/11/07	11:40	26.	5	24.5	2	4.5				Nor	e	EXPLA		
BORIN COMPI	G LETED: <b>7/11/07</b>						<u> </u>						]			GY ON
DR: SC	G LG: SB Rig: 91C					1								TH	IS LO	G



AET JO	DB NO: 22-00081						LC	G OF	BO	RING N	io	ST-	116	(p. 1	of	l)
PROJE	CT: TCAAP Rede	evelopme	ent; Ard	en Hi	<u>lls,</u>	MN				<u></u>						
DEPTH	SURFACE ELEVATION:	913.0			GI	EOLOGY		240	SA	MPLE YPE	REC	FIELD	) & LA	BORA	FORY	TESTS
DEPTH IN FEET	MATERIAL	DESCRIPTIC	N				N	мс	L	YPE	IN.	wc	DEN	LL	PL	<b>∕₀-</b> #20
	SILTY SAND, a little grav	vel, surface	roots, trace			PSOIL			М							
1 -	roots, brown and dark brow dense (SM)	wn, moist, i	medium			ARSE LUVIUM	13	М	M	SS	17					
2	SILTY SAND, trace roots			- i i i					Ħ			14				
3 —	grained, brown, medium d _ sand at 3.5' (SM)	lense, lense	ofclayey				20	М	IXI	SS	18	14				
4 —	CLAYEY SAND, a little g				TIL	L			E					ŀ		
5 —	\gray and gray mottled, ver CLAYEY SAND, a little g			ſ ŢĮĮ					М	00	19	18				
6 —	mottled, firm to stiff (SC)	giavei, giay					8	М	М	SS	19					
7									শ্র						1	
8							11	м	M	SS	23	17				
9 –									Ш	~~						
	SANDY LEAN CLAY, a	little oravel	l orav firm						R							
10	to stiff (CL)	inclo gruvo	i, gruj, inn				8	М	IXI	SS	21	17				
11 -									Д							
12 —									M			19				
13 —							6	М	IXI	SS	24	19				
14 —									R							
15							-		М	SS	24	19				
16 -							7	М	М	22	24					
17									8							
18 -									R							
19 -									17							
									K							
20							7	М	IXI	SS	24	17				
21									Д							
22 –									ł							
23									$\left  \right\rangle$				i			
24 —									I							
25 –							9	м	M	SS	24	17	1			
26 -								101	$\mathbb{N}$		-47			1		
	END OF BORING				1											
	Northing=207685.1 Easting=551917.3															
		1			L								<u> </u>		1	
DEP	TH: DRILLING METHOD		1			EVEL MEA			<del>.</del>					NOTE:	REFI	ER TO
0-24	1½' 3.25" HSA	DATE	TIME	SAMPI DEPT	.ED H	CASING DEPTH	CAV DE	Æ-IN PTH	FL	DRILLI UID LE	NG VEL	WAT LEV	ER EL	THE A	TTAC	THED
		7/11/07	1:00	26.5	5	24.5	24	4.5				Nor	ie	SHEE	TS FO	R AN
														EXPLA	NATI	ON OF
BORIN COMPL	G ETED: 7/11/07					· · ·			Í				1	TERMI	NOLO	GY ON
DR: SC		·							Γ					TH	IIS LO	G



AET JO	OB NO: 22-00081						LC	G OF	BO	RING N	ro	ST-	117	(p. 1	of 1	)
PROJE	CT: TCAAP Rede	velopme	ent; Ard	en Hi	lls,	MN					<del></del>					
DEPTH	SURFACE ELEVATION: _	914.4			GI	EOLOGY	N	мс	SA	MPLE	REC	FIELI	)&LA	BORAT	'ORY	FESTS
IN FEET	MATERIAL	DESCRIPTIO	DN				14	IVIC		YPE	IN.	wc	DEN	LL	PL	<b>%-#2</b> 00
1	4" Bituminous Pavement FILL, mixture of clayey sa	and sandy	silt and		FIL	L .	18	м	$\mathbb{N}$	SU SS	12	8				
2	sand with silt, a little grave bituminous, brown, gray a	el, pieces o nd black	f				10	101	А	55	12					
3 -	SAND WITH SILT, fine g	grained, gra	iy, medium			ARSE LUVIUM	19	¥	Х	SS	15					
4	SAND WITH SILT, fine t	o medium	grained,					-	घ							
5 6	brownish gray, medium de	ense (SP-Sr	vi)				13	w	X	SS	16				-	
7									ম							
8							15	w	M	SS	17					
9 -									$\square$							
10	SANDY LEAN CLAY, a firm to stiff (CL)	little grave	l, dark gray	,	TIL	.L	8	М	M	SS	14	17				
11 -	()								Д	00						
12									M							
13 -							8	M	M	SS	16	16				
14 -	1								图							
15 -							9	м	IXI	SS	22	16				
16 -									Д							
17 -									Ł							
18 -									Ł							
19 — 20 —									꿤							
20 - 21 -							10	М	XI	SS	24	17				:
21									सि							
23 -									1							
24 -									X		-					
25 —									M							
26 -							12	M	M	SS	24	17				
	END OF BORING				1							1	1	1		
	Northing=207683.1 Easting=552397.2															
DEP	TH: DRILLING METHOD			r		EVEL MEA			1					NOTE:	REFE	R TO
0-24	1½' 3.25" HSA	DATE	TIME	SAMPI DEPT	.ED H	CASING DEPTH	CAV DE	/E-IN PTH	FL	DRILLI UID LE	NG EVEL	WAT LEVI	ER EL	THE A		
		7/18/07	10:30	6.5		4.5	<u> </u>	.5	_			3.6		SHEE:		
BORIN	G	7/18/07	10:55	26.5	5	24.5	20	5.5				Nor		EXPLA TERMIN		
BORIN COMPL								•••	-						IS LO	
DR: <b>S</b> C	G LG: SB/BRaig: 91C		[	1		l	1		1							

Geote TCAA NE of	cnical E P Rede	valuati velopm iy 10 ar	ent d Highway		LO	RING: CATION ched ske	I: N: tch.		<b>ST-118</b> 7.923, E: 55264	13.604 See
ORILLI	E <b>R: К</b> .	Keck	Ν	/IETHOD: 3 1/4" HSA, Autoh	mr DA	TE:	7/1	0/07	SCALE:	1'' = 4'
Elev. feet 914.9	Depth feet 0.0	ASTN Symbo	1	Description of Mater (ASTM D2488 or D2 NIC CLAY, trace of Roots, da	487)	1	3PF	WL	Tests or	Notes
910.9	4.0	SM		(Topsoil) (SAND, fine-grained, gray, wet (Lacustrine)			7 3	₽		
905.9	9.0	<u>2</u> 2	<u></u> 2. :	dark gray, wet. (Swamp Deposit)			3			
900.9	14.0	SM	<u>, , ,</u> , ,	SAND, fine-grained, gray, wat (Lacustrine)	erbearing, very		3 2			
- 892.9	22.0	CL	SANDY	LEAN CLAY, trace of Grave	l come weet		3			
388.9	26.0		medium	(Glacial Till)	а, gray, wcl,		7			
_			Water of	bserved at 6 feet while drilling hen grouted.						

Geote FCAA NE of	cnical E P Rede	valua velop vy 10	ntion men and	t Highway 96	BORING LOCATI attached	ON: N	: 207	<b>ST-119</b> 678.910, E: 552897.340 Se	e
RILLI		Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/9	0/07	SCALE: 1'' = 4	ļ'
Elev. feet 929.7	Depth feet 0.0	AS Syn		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or Notes	
929.2	9.0	FILL		FILL: Silty Sand, trace of Roots, dark brown, FILL: Silty Sand, fine- to medium-grained, tra Gravel, brown, moist to wet. SANDY LEAN CLAY, light brown to brown and rust, wet, rather soft to rather stiff. (Glacial Till)	ace of	20 13 12 5 8 9			
07.7	22.0	CL		SANDY LEAN CLAY, trace of Gravel, gray, wedium. (Glacial Till)		19			
03.7	26.0			END OF BORING.	· · · · · · · · · · · · · · · · · · ·	8		*NR Suspected Cobble or Boulder	
				Water not observed with 24 1/2 feet of hollow- in the ground. Boring then grouted.					

		RTEC		DA	6 02071				~~~		0
I	Geote FCAA NE of	cnical E P Rede	valuat velopr y 10 a	tion nent ind ]	6-05871 t Highway 96	BORING: LOCATIC attached s	)N: N:	2076		7 <b>-12</b> 34, E:	<b>U</b> 553359.506 See
	ORILLI	-	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	9/07	T	SCA	LE: 1'' = 4'
	Elev. feet 940.8	Depth feet 0.0	AST Syml	bol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Notes
scriptive Terminology sheet for explanation of abbreviations)	931.8 	9.0			SILTY SAND, trace of roots, dark brown, moist. SANDY LEAN CLAY, trace of Gravel, yellowisf moist, rather stiff to medium. (Glacial Till) LEAN CLAY with Sand, reddish brown, moist, v (Glaciofluvium)		7 5 9 21 21 18 48 48		16	73	LL = 26% PI = 10%
AUN BASIC LOG OF BORING	-	29.0	SM		SILTY SAND, fine- to medium-grained, trace of ( reddish-brown, moist, medium dense to very dense (Glacial Till)	Gravel, e.	23				

	n Proje cnical E		06-05871	BORING	:	ST	-12	0 (	cont.)
TCAA NE of	AP Redev	velopm y 10 an	nt I Highway 96	LOCATIC attached s	DN: N sketch.	: 207	684.6	34, E:	553359.506 See
DRILL	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	9/07		SCA	LE: 1" = 4'
Elev. feet 908.8	Depth feet 32.0	ASTM Symbo	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Note
	<u> </u>	SP	SILTY SAND, fine- to medium-grained, trace of reddish-brown, moist, medium dense to very den (Glacial Till) (continued) No sample recovery at 35 1/2 feet. POORLY GRADED SAND, fine- to medium-gr brown, moist, dense. (Glacial Till) POORLY GRADED SAND, fine- to coarse-grain of Gravel, brown, moist, very dense. (Glacial Outwash)	ained,	₹ 29 7 53				* 70 blows for 1 inches
	46.0		END OF BORING. Water not observed with 44 1/2 feet of hollow-st in the ground. Boring then grouted.	em auger					

		ect SP-0 valuatior	6-05871	BORING	: <u> </u>		<u>ST-121</u>	
TCA NE of	AP Rede f Highwa	velopmen	it Highway 96	LOCATIC attached s	DN: N ketch.	207682	2.711, E: 55389	9.659 S
DRILL		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2	2/07	SCALE:	1'' =
Elev. feet 944.6	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	• • • • • • • • • • • • • • • • • • •	BPF	WL	Tests or	Notes
940.6	4.0	FILL CL	FILL: Silty Sand, trace of Gravel, trace of roo foot, mixed light brown to brown, moist. SANDY LEAN CLAY, trace of Gravel, grayis brown, with rust, wet, rather soft to rather stiff (Glacial Till)		24			<u> </u>
  935.6	.9.0			-	4			
935.6 	14.0	CL	SANDY LEAN CLAY, trace of Gravel, light b brown, rather soft to rather stiff. (Glacial Till)	prown to	4			
	1	CL- ML	SILTY CLAY, reddish brown, wet. (Glaciofluvium)	-	21			
				-	16			
918.6	26.0				10			
			END OF BORING. Water not observed with 24 1/2 feet of hollow- in the ground. Boring then grouted.					

**BRAUN**<sup>\*\*</sup>

### LOG OF BORING

Geote	cnical E	valuat	tion	-05871	BORING		<b>ST-122</b> 84.411, E: 554279.817 See
NE of	.P Rede Highwa Hills, N	iy 10 a	nd H	lighway 96	attached	sketch.	94.411, E: 334279.817 See
DRILLI	ER: K.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	6/28/07	SCALE: 1" = 4'
Elev. feet 959.5	Depth feet 0.0	AST. Symt		Description of Materials (ASTM D2488 or D2487)		BPF WL	Tests or Notes
		FILL		FILL: Silty Sand, with Gravel, brown, moist.			
957.5	2.0				-		
		CL		SANDY LEAN CLAY, trace of Gravel, brown rather soft to medium.	n, moist,	5	
				(Glacial Till)			
_					-		
						5	
					_	M 7	
					_		
_					· · · ·		
					_	M 7	
					_		
					_		
945.5	14.0	SP		DOODLY OD ADED GANYD C			
-		SP		POORLY GRADED SAND, fine- to medium- reddish-brown, moist, medium dense.	grained,		
				(Glacial Outwash)		32	
					_		
941.5	18.0	SC	7/	CLAYEY SAND, trace of Gravel, reddish-bro			
				very stiff.	wii, moist, 		
-				(Glacial Till)		V 25	
ĺ							
937.5	22.0	SM		SILTY SAND, fine- to medium-grained, reddi	sh-brown		
				moist, very dense. (Glaciofluvium)			
				(Gracionuvium)	_		
						M 70	
933.5	26.0			END OF BORING.			
			,	Water not observed with 24 1/2 feet of hollow- in the ground.	stem auger –		
		}	1	Boring then grouted.			
	1						

# ≩ SP-06-05871

Geote TCAA NE of	cnical E P Rede Highwa	ect SP-00 valuation velopment y 10 and 1 Ainnesota			DN: N		1 <b>7-03 ST</b> - 8.088, E: 55233	·
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2	4/07	SCALE:	1'' = 4'
Elev. feet 913.4	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
912.4	6.0	FILL	FILL: Silty Sand, fine- to medium-grained, dar moist. FILL: Sandy Lean Clay, trace of Gravel, brown Fill (silty sand) 0 Fill (sandy lean clay Sandy Lean Clay No sample recovery at 5 1/2 feet. SANDY LEAN CLAY, trace of Gravel, gray, m wet, rather soft to medium. (Glacial Till)	i, moist. to 1' ay) 1' to 6' 6' to 26'	12 12 7 6 5 6			
887.4	26.0		END OF BORING. Water observed at 25 feet while drilling. Boring then grouted.		6	Σ		

Geote TCAA NE of	cnical E AP Rede Highwa		t Highway 96		ON: N: 20742	<b>09-01 ST-124</b> 29.899, E: 552647.857 See
DRILLI		<b>Ainnesota</b> Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/24/07	SCALE: 1" = 4'
Elev. feet 923.8	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF WL	Tests or Notes
922.8	1.0	FILL X	FILL: Silty Sand, fine- to medium-grained, tra Gravel, dark brown, moist. FILL: Sandy Lean Clay, brown, moist to wet.		7 12 7 6	
914.8	9.0	OL 111	ORGANIC CLAY, black, wet. (Swamp Deposit)		5	
911.8 909.8	12.0	CL	SANDY LEAN CLAY, trace of Gravel, grayisl wet, soft. (Lacustrine) SANDY LEAN CLAY, trace of Gravel, gray, w	-	3	
_			medium. (Glacial Till)	-	6	
897.8	26.0		END OF BORING. Water not observed during drilling.		6	
			Water not observed with 24 1/2 feet of hollow-s in the ground. Boring then grouted.	stem auger –		



## SUBSURFACE BORING LOG

AET J	OB NO:	22-00081						LO	G OF	BO	RING N	io	ST-	125	(p. 1	of	<u>)</u>
РROЛ	ECT:	TCAAP Rede	velopme	ent; Ard	en Hi	ills,	MN										
DEPTH	SUR	FACE ELEVATION: _	932.7			G	EOLOGY	N	мс	SA	MPLE	REC		)&LA	BORA	FORY	FESTS
IN FEET		MATERIAL					-		1910		YPE	IN.	WC	DEN	LL	PL	<b>⁄₀-</b> #200
1 -		mixture of silty sand e roots, trace roots, p				FIL	.L	27	м	М	SS	9	7				
2 - 3 -	FILL, cobble	mostly clayey sand es, trace roots, brown	with grave	l, possible		-		31	М	$\mathbb{N}$	SS	11	7				
4 - 5 -										R							
6~	-							12	М	M	SS	8	9				
7 -										E							
8 -								6	M	М	SS	4	10				
9 - 10 -	CLAY	'EY SAND, a little g	gravel, trac	e roots,		TIL	L			R			10				
- 11	brown	, firm (SC)						7	М	M	SS	6	10				
12 -										M							
13 - 14 -								7	M	Å	SS		10				
15 -	SANE graded dense	) WITH GRAVEL, ( l, light brownish gra (SW)	trace roots, y, moist, m	well iedium			ARSE LUVIUM .L	13	м	X	SS	16	14				
16 – 17 –		EY SAND, a little g tiff (SC)	gravel, ligh	t brownish						7 1							
18 19	CLAY cobble	EY SAND, a little g s, brown, very stiff	gravel, poss (SC)	sible				-									
20 -								20	м	M	SS	21	10				
21 — 22 —		~								  F							
22 - 23 -	CAND		a anaval fi				ARSE			ł							
24 —	mediui (SP-SI	WITH SILT, a little m grained, brown, m	oist, very	dense			LUVIUM			ł		1					
25 -		· • •				,		66	М	M	SS	NR					
26 —	Northi	OF BORING ng=207429.3 g=552897.4															
	Lasting	5 552671.7							<u> </u>								<u> </u>
DEP	TH: D	RILLING METHOD					EVEL MEA	· · · ·				F			NOTE:	REFE	ER TO
0-2	41/2' 3	.25" HSA	DATE	TIME	SAMPI DEP1		CASING DEPTH	{	/E-IN PTH	FL	DRILLI UID LE	NG EVEL	WAT LEVI		THE A		
			7/6/07	10:30	26.	5	24.5	20	6.5	_			Non		SHEE EXPLA		
BORIN	IG							 							EAFLA FERMI		
COMPI DR: S		7/6/07 SB Rig: 91C								┢						IIS LO	



# SUBSURFACE BORING LOG

AET JO	DB NO: <b>22-00081</b>					LC	G OF	BORING NO	o	<u>ST-1</u>	25A	A (p.	1 of	2)
PROJE	CT: TCAAP Rede	velopme	nt; Ard	en Hil	ls, MN			<u></u>						
DEPTH	SURFACE ELEVATION:	932.7		1	GEOLOGY	N	мс	SAMPLE TYPE	REC	FIELD	)&L/	ABORA	FORY 1	ESTS
DEPTH IN FEET	MATERIAL I						IVIC	TYPE	IN.	WC	DEN		PL	%-#200
1	No samples taken to 29.5', Boring ST-125	Refer to Lo	og of											
2 -								H						ĺ
3								ł						
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28 -								Ħ						
29 -								Ħ						
DEP	TH: DRILLING METHOD				ER LEVEL ME							NOTE	REFE	R TO
0-39	9½' 3.25" HSA	DATE	TIMÉ	SAMPL DEPT	ED CASING H DEPTH	CA' DE	VE-IN PTH	DRILLIN FLUID LE	∛G VEL	WAT LEV	ER EL	THE A	ATTAC	HED
		7/25/07	1:20	41.5			1.5			Nor	ae		TS FOI	
												EXPLA		
BORIN COMPI	G LETED: 7/25/07											TERMI		
DR: S	G LG: BR Rig: 91C			<u> </u>		<u> </u>						11	IIS LO	u 



AET JO	ЭВ NO: <b>22-00081</b>			LO	G OF	BO	RING N	0.	ST-1	25A	(p.	2 of	2)
PROJE	TCAAP Redevelopment; Arde	n Hi	lls, MN										
DEPTH IN FEET			GEOLOGY	N	мс	SA	MPLE YPE	REC		) & LA			r1
			COADSE		me		YPE	IN.	wc	DEN	LL	PL	%-#200
30 -	SAND, a little gravel, fine to medium grained, light brown, moist, medium dense to dense (SP)		COARSE ALLUVIUM	31	м	M	SS	20					
31 -						Щ							
32 -						ł							
33		· · · · · ·				$\left\{ \right\}$							
34						비							
35 36				25	М	IXI	SS	19					
30 -						দি							
38 -						凶							
39 -					ľ	ば							
40						M							
41 —		; · · · ·		38	М	M	SS	20				ł	
06/04	END OF BORING Northing=207429.3 Easting=552897.4												

Geote TCAA	cnical E P Rede	ect SP-0 valuation velopmen		BORING LOCATIC attached s	DN: N		<b>ST-126</b> 1.256, E: 55416	51.240 Se
Arden	Hills, N	/linnesota					F	
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/2	8/07	SCALE:	1'' = 4
Elev. feet 957.0	Depth feet 0.0		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
		FILL	FILL: Silty Sand, fine- to medium-grained, Gravel, brown to light brown, moist.	trace of	V 8			
950.0	7.0	OL	ODCANIC CLAY date and and a fits					
		5	ORGANIC CLAY, dark gray, wet, soft to ra (Swamp Deposit)		2			
945.0	12.0				Ň			
-		CL	SANDY LEAN CLAY, trace of Gravel, gra soft to medium. (Glacial Till)	y, wet, rather 	6			
					9			
931.0	26.0				9			
			END OF BORING.	-				
			Water observed at 12 feet while drilling. Boring then grouted.	- - -	-			
				_				

LOG OF BORING

BRAUN™



# SUBSURFACE BORING LOG

AET JC	DB NO: <b>22-00081</b>					LOG	OF	BORING N	o	ST-1	26A	<u>(p.</u>	<u>1 of</u>	2)
PROJE	CT: TCAAP Rede	velopme	ent; Ard	len Hil	ls, MN									
DEPTH	SURFACE ELEVATION:	957.0	······································		GEOLOGY	NN	мC	SAMPLE TYPE	REC IN.	FIELI	······	BORAT	FORY	TESTS
DEPTH IN FEET	MATERIAL					IN F	vic	TYPE	IN.	wc	DEN	LL	PL	<b>%-</b> #200
1	No samples taken to 29.5', Boring ST-126	, Refer to L	og of											
2 -								옵 ·						
3 -								뷥						
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19 —								<u>{</u> }						
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21 -								ł						
22 -								ł		1				
23 -								1						
24 25								ł						
25 - 26 -				.				1						
20 – 27 –								H						
28 -								1						
		1	· · · · ·					14			<u> </u>	1	1	
DEPI	TH: DRILLING METHOD		r -		R LEVEL MEA							NOTE:		
0-39	½' 3.25" HSA	DATE	TIME	SAMPL DEPT	ED CASING H DEPTH	CAVE DEPT	-IN TH	DRILLIN FLUID LE	VEL	WAT LEVI	EK	THE A		
		7/23/07	11:15	41.5	39.5	41.	5			Nor		SHEE		
BORING	7			<u> </u>								EXPLA FERMI		
BORING COMPL											· ·		IIS LO	
DR: SC	LG: BR Rig: 91C	<u> </u>	L	<u> </u>		<u> </u>								·



### SUBSURFACE BORING LOG

#### LOG OF BORING NO. ST-126A (p. 2 of 2) 22-00081 AET JOB NO: **TCAAP Redevelopment; Arden Hills, MN** PROJECT: FIELD & LABORATORY TESTS DEPTH REC IN. SAMPLE TYPE GEOLOGY MC Ν IN FEET WC DEN LL PL **%-#20** MATERIAL DESCRIPTION SILTY SAND, fine to medium grained, brown, COARSE 30 ALLUVIUM moist, very dense (SM) 79 М SS 22 7 TILL 31 LEAN CLAY WITH SAND, brown, hard, lense of sand with silt and gravel at 31 feet (CL) 32 33 SILTY SAND WITH GRAVEL, fine to medium grained, brown, moist, very dense (SM) 34 35 SS 15 148 Μ 36 37 38 SILTY SAND, a little gravel, fine to medium grained, brown, a little light brown, moist, very 39 dense, lense of sand with silt and gravel at 41 40 feet (SM) SS 24 63 Μ 41 **END OF BORING** Northing=207401.3 Easting=554161.2

	n Proje enical E			5-05871	<u> </u>				····	4006-21
TCAA NE of	P Rede	velopr y 10 a	nent ind I	Highway 96	LOCATIC attached s	DN: N ketch.	: 207	512.9	39, E:	554545.415 Se
DRILLI		Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2	2/07		SCA	LE: 1" = 4
Elev. feet 952.8	Depth feet 0.0	AST Symt		Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Not
<u>951.8</u> _ _	1.0	FILL		FILL: Silty Sand, trace of Roots, dark brown, mo FILL: Clayey Sand, trace of Gravel, dark brown and reddish brown, moist.		8				
946.8	6.0	SC		CLAYEY SAND, Organic, dark gray, wet, soft to medium. (Swamp Deposit)		▼ 4 ▼ 4 ▼ 3		35	42	OC = 6
946.8	14.0	CL		LEAN CLAY, olive gray, wet, rather soft. (Swamp Deposit)		6				
- 934.8	18.0	CL		SANDY LEAN CLAY, trace of Gravel, gray, wet stiff. (Glacial Till)	t, rather	Ū 12				
- - - - 926.8	26.0					11		15		
				END OF BORING. Water not observed with 24 1/2 feet of hollow-ste in the ground. Boring then grouted.	em auger	47 ************************************				
- P-06-05871				Braun Intertec Corporation	_					RI-4006-21 page

LOG OF BORING

BRAUN™

		ect SP-0 valuation		BORING:				<b>RI-4006</b>	
TCAA NE of	AP Rede Highwa	velopmen	t Highway 96	attached s	)N: N: ketch.	: 207:	347.0	78, E: 554700	).746 Se
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2	2/07		SCALE:	<b>1''</b> = 4
Elev. feet 954.1	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	Tests	or Notes
953.1	1.0	FILL XXX	FILL: Silty Sand, trace of roots, dark brown, me	oist.					
		FILL	FILL: Sandy Lean Clay, trace of Gravel, reddisl moist.	h brown, 	10				
 	7.0			_	7				
		CL	SANDY LEAN CLAY, slightly Organic, dark g olive gray, soft. (Swamp Deposit)	ray to 	3				
 942.1	12.0				2		21	OC = 3%	
 	12.0	CL	SANDY LEAN CLAY, grayish brown with rust medium. (Glacial Till)	, wet, - -	7				
- 936.1	18.0	SM	SILTY SAND, fine- to medium-grained, trace of reddish brown, moist, medium dense to dense. (Glacial Till)	f Gravel,					
-			(Glacial Till)	-	26				
				-					
928.1	26.0				33*			*Suspect col boulder	oble or
-	1		END OF BORING. Water not observed with 24 1/2 feet of hollow-st	em auger					
-			in the ground. Boring then grouted.						
-			Joing then grouted.						
P-06-05871	<u> </u>		Braun Intertec Corporation	:				ST-128 RI-400	

BRAUN

LOG OF BORING



### SUBSURFACE BORING LOG

AET JO						<del></del>	LO	G OF	BO	RING N	iO	ST-	129	(p. 1	of	)
PROJE	CT: TCAAP Rede	velopme	nt; Arde	<u>n Hi</u>	lls, N	/IN										
DEPTH IN FEET	SURFACE ELEVATION: MATERIAL I	915.9 DESCRIPTIO	 DN		GEO	DLOGY	N	мс	SA T	MPLE YPE	REC IN.	FIELI WC	r	BORAT	1	TESTS 6-#200
. 1	FILL, mixture of clayey sa sand with silt, a little grave	el, surface re	nd and oots, trace		FILL		18	м	M	SS	15	6				
2	roots, dark brown and brow	wn							H							
3 — 4 —							12	М	Щ	SS	15					
5 6	CLAYEY SAND, a little g brown mottled, firm (SC) CLAYEY SAND, a little g			[ V///	TILL		5	М	X	SS	19	12				
7 8	mottled, firm, laminations clay (SC)	of silt and s	andy lean				8	м	R	SS	19	16				
。 9 —									E E							
10 – 11 –	CLAYEY SAND, a little g brownish gray mottled, stil	gravel, brow ff (SC)	vn and				12	М	X	SS	18	15				
12 -	CLAYEY SAND, a little g to stiff (SC)	gravel, dark	gray, firm						B							
13 -							5	М	X	SS	22	16				
14 -									B							
15 -							8	М	M	SS	24	18				
16 -									Д							
17 –									ł							
18 -									ł							
19 20									₽ ∏							
21 —							9	М	Ŵ	SS	24	18				
22 –									3							
23 —									ĮĮ		1					
24									KI KI							
25 – 26 –							11	м	X	SS	24	18				
	END OF BORING Northing=207214.0 Easting=551928.3					<u> </u>										
DEP'	TH: DRILLING METHOD			WAT	ER LE	VEL MEA	SÚRI	I EMEN	TS	1			1 T	NOTE:		
0-24		DATE	TIME	SAMPI DEP		CASING DEPTH	CAV	/E-IN PTH		DRILLI .UID LI	NG EVEL	WA1 LEV	ER	THE A		
<u></u>		7/11/07	2:05	26.		24.5	2	4.5				No		SHEE		
														EXPLA		
	LETED: 7/11/07								-						NOLO HIS LC	GY ON MG
DR: SC	G LG: SB Rig: 91C						<u> </u>									

Geoteo TCAA	n Proj mical E P Rede	valua velop	tion ment	t				BORI LOCA attach	TIO	N: N: etch.	: 207		Г <b>-13(</b> 16, Е:	<b>)</b> 552428.	985 See
	Highwa Hills, N				vay 96										
DRILLE	R: K.	Keck			METHOD:	3 1/4" HSA,	Autohmr	DATE	3:	7/1	3/07		SCAL	Æ:	1'' = 4'
Elev. feet 915.1	Depth feet 0.0	AS' Syn	1			Description of 1 ASTM D2488 (				BPF	WL	MC %	P200 %	Tests	or Note
914.8	0.3	FILL FILL					lark brown, mo	oist.			1				
		FILL		FILL	: Silt, black,	moist.									
									-						
			$\bigotimes$						X	8		9	4		
			$\bigotimes$						-						
-			$\bigotimes$							_					
									_X	5					
908.1	7.0		$\bigotimes$												
		CL		SAN	DY LEAN C	LAY, brown,	wet.			5					
004 1	0.0					(Glacial T	11)		- Δ	5		ļ			
906.1	9.0	CL		SAN	DY LEAN C	LAY, trace of	Gravel, brown	and grav.							
-				wet,	rather soft to	medium.				8					
						(Glacial T	111)		_X	0					
	:														
										5					
901.1	14.0								μ						
201.1	U	CL		SAN	DY LEAN C	LAY, trace of	Gravel, gray, w	vet,			Í	Ì			
. [				medi	um.	(Glacial T				6					
							,		-Å						
												ļ			
-								-		7					
									-4						
889.1	26.0								X	7					
				END	OF BORING	•									
	ļ			Water	not observed	t during drillir	ıg.								
				Water		_	eet of hollow-s	tem auge	r						
-				Borin	g then groute	d.		-							
											1				



## SUBSURFACE BORING LOG

AET JO	DB NO: <u>22-00081</u>						LO	G OF	BO	RING N	0	ST-	131	(p. 1	of 1	)
PROJE	CT: TCAAP Rede	velopme	nt; Ard	en Hi	lls,	MN										
DEPTH	SURFACE ELEVATION:	926.9			GE	EOLOGY	N	мс	SA	MPLE	REC			BORAT		
IN FEET	MATERIAL I					-				YPE	IN.	WC	DEN		PL.	<b>%-#</b> 200
1-	FILL, mostly sandy silt, su voots, grayish brown	rface roots,	, trace	/	FIL	L	17	М	М	SS	17	6				
2 -	FILL, mixture of clayey sa	nd and san	dy lean	_				1	Д							
3 -	clay, a little gravel, possibl grayish brown and brown						11	м	M	SS	5	11				
4 -		Fill (cl	andy silt) 0' 1 ayey sand) and w silt) 7'	0.5' to 7					Д							
5 -		Silty S	Sand 8' to 9. Lean Clay	5'					М	~~	10	17				
6 -		Sanuy		<u>9.3 10 2</u>			6	M	М	SS	19	18				
7 -	FILL, mixture of sand with	silt and si	lty sand						图							
8 -	trace roots, brown and blac	.k		-/ []]	CO.	ARSE	8	М	IXI	SS	12					
9 -	SILTY SAND, trace roots, brown, a little brown, mois				AL	LUVIUM FILL			E							
10 -				ſ		ATHERED	6	М	М	SS	20					
11 -	roots, gray, a little brown a					<i>.</i> L	Ū	111	Д	00	20	21				
12 -	SANDY LEAN CLAY, a	little gravel	, light		TIL	L			M			17				
13 -	brownish gray, a little brow laminations of silty sand (C	vn, stiff to '	very stiff,				12	Μ	X	SS	15					
14 -		,							मि							
15 -							18	М	X	ss	19	16				
16 -									H							
17 –									ł							
18 -	SANDY LEAN CLAY, a			· ///					ł							
19 -	gray to dark gray, very stif		·L)													
20 -							23	М	X	ss	24	16				
21 – 22 –									प्ति							
22									ĮĮ							
23		·							X							
25 -									$\square$			16		Ì		
26							14	M	Ň	SS	24					
	END OF BORING				1			1	Ť					1		
	Northing=207188.3 Easting=552633.8															
			<u></u>	WAT		EVEL MEA	SUR	EMEN				<u> </u>	1			
DEP	TH: DRILLING METHOD	DATE	TIME	SAMP		CASING DEPTH		VE-IN	- · ·	DRILLI	NG	WAI	ER	NOTE	ATTA	
0-2	4½' 3.25" HSA					<u> </u>	<u> </u>	ертн 6.5	FI	LUID LI	SVEL	LEV			TS FO	
		7/6/07	11:45	26.	5	24.5		0.3	╀			140		EXPLA	NATI	ON OF
BORIN	G LETED: <b>7/6/07</b>			+					+					fermi	NOLO	GY ON
DR: S							<u> </u>							TI	HIS LC	)G



## SUBSURFACE BORING LOG

AET JO	OB NO: <b>22-00081</b>	-				LC	G OF	BOI	RING N	10	ST-	132	(p. 1	<u>of 1</u>	)
PROJE	ECT: TCAAP Re	developm	ent; Ard	len Hil	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION	936.0			GEOLOGY	N	мс	SA	MPLE YPE	REC	<u> </u>	1	BORA	FORY '	TESTS
FÉET		L DESCRIPTI	ON				me		SU	ĪN.	wc	DEN	LL	PL	<b>%-#</b> 200
1 2	4.25" Bituminous Paver FILL, mixture of clayey clay, a little gravel, dark gray and black	sand and sar	brownish		FILL	9	М	Å	SS	5	9				
3 - 4 -	SILTY SAND, a little g brown, medium dense to		le cobb <del>les,</del>	Silty Sand	y sand) 0.3' to 3 d 3' to 7' and 7' to 18'	3.	ſ	Å	SS	20					
5								M							
6 —	-		V			36	М	Å	SS	18					
7 8 9	CLAYEY SAND, a littl cobbles, brown, very sti	e gravel, pos ff (SC)	sible			29	М	M	SS	19	9				
10						28	м	X	SS	14	10				
11 12								E							
13 —						19	М	X	SS	24	12				
14 -								मि							
15 — 16 —						17	М	M	SS	24	13				
17 18 19	SAND WITH SILT AN medium grained, light b (SP-SM)	D GRAVEL rown, moist,	, fine to dense		COARSE ALLUVIUM			2222222							
20 21 22						36	M		SS	13					
23 — 24 — 25 — 26 —	GRAVELLY SAND W. cobbles, medium to fine moist, very dense (SP-S	grained, ligh	ossible t brown,			62	м		SS	15					
-	END OF BORING Northing=207171.7 Easting=552904.3														
DEP	TH: DRILLING METHOD	)		WATE	ER LEVEL MEA	SURI	EMEN	TS		,			NOTE:	REFE	R TO
0-24	4½' 3.25" HSA	DATE	TIME	SAMPL DEPT		DE	/E-IN PTH	FL	ORILLI UID LE	NG VEL	WAT LEVI		THE A		
		7/6/07	9:00	26.5	24.5	2	5.2				Nor		SHEE EXPLA		
BORIN	IG												EAPLA FERMI		
COMPL	LETED: 7/6/07							<u> </u>						IIS LO	
DR: SC	G LG: SB Rig: 91C	1	ł	1	1	1		1					× 4.		-



### SUBSURFACE BORING LOG

AET JO	DB NO: 22-00081					LO	G OF	BORING N	10	<u>ST-1</u>	32 <i>A</i>	(p. 1	1 of	2)
PROJE	CT: TCAAP Rede	velopme	nt; Ard	en Hill	s, MN									
DEPTH	SURFACE ELEVATION:	936.0			GEOLOGY			SAMPLE TYPE	REC	FIELL	) & L	ABORAT	ORY 1	ESTS
DEPTH IN FEET	MATERIAL I	DESCRIPTIC	)N		0.000000	N	мс	TYPE	IN.	WC	DEN		PL '	<b>%-#</b> 200
1 -	No samples taken in upper Boring ST-132	29.5', Refe	er to Log of	Ē										
2 -								ł		1				
3								11						
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24								R						
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26 -								Ð						
27 -							1	1						
28 -								1						
29 -								17			<u> </u>			
DEP	TH: DRILLING METHOD				R LEVEL MEA					<u>.</u>		NOTE:	REFE	R TO
0-39	9½' 3.25" HSA	DATE	TIME	SAMPLI DEPTI	ED CASING I DEPTH	CA DE	/E-IN PTH	DRILLI FLUID LI	NG EVEL	WAT LEVI	ER EL	THE A		
		7/25/07	2:47	41.5	39.5	4	1.0			Nor	ıe	SHEE		
								<u> </u>				EXPLA		
	G LETED: <b>7/25/07</b>											TERMI TH	NOLOC IIS LO	
DR: SC	G LG: BR Rig: 91C		<u> </u>	L <u></u>		<u> </u>								



### SUBSURFACE BORING LOG

#### LOG OF BORING NO. ST-132A (p. 2 of 2) 22-00081 AET JOB NO: TCAAP Redevelopment; Arden Hills, MN PROJECT: FIELD & LABORATORY TESTS DEPTH IN FEET REC IN. SAMPLE TYPE GEOLOGY Ν MC WC DEN LL $\mathbf{PL}$ MATERIAL DESCRIPTION 1/6-#200 SAND, a little gravel, fine to medium grained, light brown, moist, dense to medium dense (SP) COARSE 30 ALLUVIUM 49 Μ SS 19 31 32 33 34 35 39 М SS23 36 37 38 39 40 SS 19 35 Μ 41 **END OF BORING** Northing=207171.7 Easting=552904.3

				5-05871	BORING	S T	-13	33	<b>RI-400</b> ′	7-20
TCAA NE of	cnical E AP Rede Highwa A Hills, N	velop iy 10 a	ment and ]	Highway 96	LOCATIC attached s	DN: N: ketch.	: 207	181.7	41, E: 55339	7.254 See
DRILLI		Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2	0/07		SCALE:	1''=4'
Elev. feet 945.0	Depth feet 0.0	AST Sym		Description of Materials (ASTM D2488 or D2487)	•	BPF	WL	MC %	Tests	or Notes
944.0	1.0	FILL		FILL: Silt, with Roots, dark brown, moist. FILL: Sand Lean Clay, trace of Gravel, brown, r	noist. 	9				
  	4.0	FILL		FILL: Sandy Lean Clay, reddish-brown, gray and brown, moist.	d dark 	↓ 4 ↓ 3				
933.0	12.0	FILL		FILL: Silty Sand, fine- to medium-grained, dark wet.	brown,	3				
931.0	14.0	SM		SILTY SAND, fine- to medium-grained, reddish- wet, very loose. (Glacial Till)	-brown,	4				
927.0	18.0	CL		SANDY LEAN CLAY, trace of Gravel, reddish- wet, medium. (Glacial Till)	brown, 	7				
922.0	23.0	SM		SILTY SAND, fine- to medium-grained, trace of reddish-brown, wet, stiff. (Glacial Till)	f Gravel, –	16				
917.0	28.0	SP- SM		POORLY GRADED SAND with SILT, fine- to coarse-grained, trace of Gravel, brown, wet, stiff.	-					
				(Glacial Till)		15				

#### Braun Intertec Corporation

#### ST-133 RI-4007-20 page 1 of 2

### LOG OF BORING

### BRAUN

Braun Pro Geotecnical	pject SP-0						4007-20	<u>`</u>
TCAAP Ree	levelopmen vay 10 and	t Highway 96	LOCATI attached	ON: N sketch.	: 2071	81.74	41, E: 55339 <sup>°</sup>	7.254 See
	K. Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2	0/07	:	SCALE:	1'' = 4'
Elev. Dept feet feet 913.0 32	ASTM	Description of Materials (ASTM D2488 or D2487)	•	BPF	WL	MC %	Tests	or Notes
	SP	POORLY GRADED SAND, fine- to coarse-gr trace of Gravel, brown, moist, loose. (Glacial Outwash) END OF BORING. Water not observed with 44 1/2 feet of hollow-s in the ground. Boring then grouted.				4		

LOG OF BORING

**BRAUN**"

Arden H DRILLER	PRedev lighwa Hills, N	velopi y 10 a	ment and I	t Highway 96	LOCATIC attached s	)N: N:		<b>RI-4007-22</b> 617, E: 553719.021	
DRILLER Elev. 1 feet 949.0	₹: K. Depth								
feet 949.0	Depth			METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2	0/07	SCALE: 1"	' = 4'
948.0	0.0	AST Syml		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or Notes	s
	1.0	FILL		FILL: Silt, with Root Fibers, dark brown, moist					
-		FILL		FILL: Silty Sand, brown to dark brown, moist. With Roots and pieces of topsoil at 5 1/2 feet.		7			
942.0	7.0	CL		SANDY LEAN CLAY, trace of Gravel, reddish- wet, rather soft to rather stiff. (Glacial Till)	-brown,	4			
935.0	14.0	SM		SILTY SAND, fine- to coarse-grained, trace of G reddish-brown, wet, medium dense.	Gravel,	10			
931.0	18.0			(Glacial Till)	-	15			
		SP		POORLY GRADED SAND, fine- to coarse-grai of Gravel, reddish-brown, wet to waterbearing, v	ned, trace ery loose				
				to medium dense. (Glacial Outwash)		7			
						3	Σ		

			06-05871	BORIN	<u>T-134</u> I	RI-4007-22 (cont.
TCAA NE of	cnical E AP Redev Highwa Hills, N	velopme y 10 an	ent å Highway 96	LOCATI attached	ON: N: 2071 sketch.	46.617, E: 553719.021 See
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/20/07	SCALE: 1'' = 4'
Elev. feet 917.0	Depth feet 32.0	ASTM Symbol	,		BPF WL	Tests or Notes
906.0	43.0		POORLY GRADED SAND, fine- to coarse-g of Gravel, reddish-brown, wet to waterbearing to medium dense. (Glacial Outwash) (continued)	rained, trace ;, very loose _     	X 4	
-	43.0	SP	POORLY GRADED SAND, fine-grained, bro waterbearing, loose. (Glacial Till)	wn,	M 7	
903.0	46.0		END OF BORING.		Å í l	
			Water down 24 feet with 44 1/2 feet of hollow in the ground.	 stem auger 		
			Boring then grouted.			
-						
-		-				

SP-06-05871



AET JO	DB NO: 22-00081						LO	GOF	BOI	RING N	íO	ST-	<u>135</u>	(p. 1	of 1	)
PROJE	CT: TCAAP Rede	velopme	nt; Ard	en Hi	lls,	MN						<u> </u>				
DEPTH	SURFACE ELEVATION:	950.5			GE	EOLOGY	N	мс	SĄ	MPLE YPE	REC			BORAT		
IN FEET	MATERIAL I			··	<b>T</b>				ו ר-ר	TL	IN.	WC	DEN	LL	PL	%-#200
1-	FILL, mixture of sand with little gravel, pieces of bitur trace roots, dark brown	ninous, sur	face roots,		FIL		36	М	X	SS	15					
2	FILL, mixture of silty sand little gravel, trace roots, cir brown	i and clayey nders and cl	/ sand, a linkers,				18	М	X	SS	13	11				
4 5	SANDY LEAN CLAY, a roots, brown, very stiff to l	little gravel hard, lamina	, trace ations of		TIL	L	20	м	R	SS	20	14				
6 7	silt (CL)								 ₽							
8 -							19	М	X	SS	23	15				
9 10									E			19				
11 -	CLAYEY SAND WITH G		orown,				31	М	Å	SS	18	8				
12 13	hard, lense of silty sand (S SAND WITH GRAVEL, 1 grained, brown, moist, ver	medium to 1		 		ARSE LUVIUM	56	М	$\left  \right\rangle$	SS	14					
14	-	y uchse (SP	J .						H		1					
15 —	GRAVEL WITH SAND, I (GP)	brown, moi	st, dense				44	М	Ň	SS	4					
16 —								101	Д	00						
17 –									ł							
18 19	SAND WITH GRAVEL, 1 grained, brown, moist, ver			<del></del>												
20							60		$\nabla$	SS	8					
21 -							58	М	Д	22	0					
22 –									<b>[</b> {							
23 —									3					1		
24 -						· .						1				
25 26							63	М	X	SS	12					
	END OF BORING Northing=207176.8 Easting=553896.4	<u> </u>			<u>'-</u>											
DEP	TH: DRILLING METHOD	]		 WAT	 ER L	EVEL MEA	L ASURI	L EMEN	L TS		<u> </u>		<u> </u>	I NOTE	 	ER TO
		DATE	TIME	SAMP		CASING DEPTH		VE-IN PTH	T	DRILL LUID L	NG EVEL	WA1 LEV	ER		ATTA(	
0-24	4½' 3.25" HSA	6/28/07	1:15	26.		24.5		6.4				No		SHEE	TS FO	R AN
	unun ,															ON OF
BORIN COMP	IG LETED: 6/28/07														NOLO HIS LC	GY ON
DR: S	G LG: SB Rig: 91C						1							11	no LU	ν <b>υ</b>



AET J	OB NO: _	22-00081						LO	G OF	BORING N	10	ST-1	35A	(p.	<u>1 of</u>	2)
PROJE	ECT: _	TCAAP Rede	velopme	ent; Ard	<u>en Hi</u>	<u>lls,</u>	MN									
DEPTH IN FEET	SURF	ACE ELEVATION:	950.5			GI	EOLOGY	N	мс	SAMPLE TYPE	REC IN.	FIELD	) & L/	ABORAT	FORY	TESTS
FEET		MATERIAL I						14	IVIC	TYPE	IN.	WC	DEN		PL	<b>%-#200</b>
1 -	No sam Boring	ples taken in upper ST-135	· 29.5', Refe	er to Log of	f											
2 -	-									X						
3 -	_									£{					,	
4 -										<b>{</b>						
5 -										Į.						
6 -	}									Į.						
7	4									Ħ				1		
8										Ħ	1					
9 -	-									Ħ						
10 -	-									Ħ						
11 -	-									1						
12 -	-									H .						
13 -										1						
14										ł.	:					
15	-									H						
16 -										H						
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18 -	f									H						
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22 -												1				
23 —										E						
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25 -	1				1					ł						
26			-							H						
27										E						
28 – 29 –										7						
DEP	TH: DR	ULLING METHOD	1	·	 WATI	 ER L	EVEL MEA	L	 EMEN	<u>וז ו</u> דs	1	.l	1	NOTE:	DEET	 72 TO
			DATE	TIME	SAMPI DEPT		CASING DEPTH		/E-IN PTH	DRILLI FLUID LI	NG	WAT LEVI	ER	THE A		
0-4	41/2' 3.2	25" HSA	7/23/07	9:12	DEPT		DEPTH 44.5		ртн 6.5	FLUIDLE	2VEL	Nor		SHEE		
			1123107	9;14	40.3	5	44,3	4				1101		EXPLA		
BORIN	ig Leted: 7	//23/07			1									TERMI	NOLO	GY ON
DR: S		BR Rig: 91C			· · · · ·					-				ΤH	IIS LO	G



## SUBSURFACE BORING LOG

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AET JO	DB NO: <u>22-00081</u>		LO	G OF	BORIN	G NO.	ST-J	35A	(p.	2 of :	<u>Z)  </u>
PROJE	TCAAP Redevelopment; Arden Hi	lls, MN									
DEPTH		GEOLOGY			SAMP	LE RE	FIELI	) & LAI	BORAT	ORY 1	ESTS
DEPTH IN FEET	MATERIAL DESCRIPTION	0100001	Ν	MC	SAMP TYP	Ē	wc	DEN	LL	PL	%-#200
30 -	SAND WITH SILT AND GRAVEL, medium to	COARSE ALLUVIUM	20		M						
31 —	fine grained, brown, moist, dense (SP-SM)	ALLOVION	39	М	X s	S   20					
32 -	moist, dense (SP-SM)				स						
33 —					2						
34 —					Ĩ						
35 —			40	м	M s	s   18					
36 —											
37					ł						
38	SAND WITH SILT, a little gravel, medium to fine grained, brown, a little dark brown, moist,				ĽI						
40	medium dense, lenses and laminations of silty sand (SP-SM)				M						
41 —			29	M	∭ s	S 22				1	
42 —					ł						
43 —					Ħ						
44 —					1 I						
45 —			35	М	X  s	S 20	)				
46 —	END OF BORING				/						
	Northing=207176.8										
	Easting=553896.4									-	
	· · · · · · · · · · · · · · · · · · ·		ł	1							
		1	1	1	1 1	1	1	1	1	1	1

Geote	cnical E	ect SP-0 valuation		BORING		*** *** *****	<b>F-136</b> 52, E: 5	54398.416 See
NE of	Highwa	velopmen y 10 and /linnesota	t Highway 96	attached s	ketch.		,	
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	6/28/0	)7	SCAL	E: 1" = 4'
Elev. feet 956.7	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF W	VL MC	P200 %	Tests or Note
-	7.0	FILL	FILL: Clayey Sand, trace of Gravel, brown, m	oist	9 10			
949.7 947.7	<u>7.0</u> 9.0	OL 11	ORGANIC SILT, trace of fibers, dark green, w soft. (Swamp Deposit)	vet, rather	4			
 		CL	SANDY LEAN CLAY, trace of Gravel, brown with rust, wet, medium. (Glacial Till)	and gray	7			
942.7	14.0	SM	SILTY SAND, fine- to medium-grained, trace reddish brown, moist, medium dense to dense. (Glacial Till)	of Gravel, – –	29			
					28	6	25 L P	L = 13 1 = 1
930.7	26.0		END OF BORING.		35			
			Water not observed with 24 1/2 feet of hollow- in the ground.	stem auger –				
			Boring then grouted.					

BRAUN

Geotecnica TCAAP Re	l Évalu develoj	ation oment		BORING LOCATIC attached s	ON: N: 2		<b>T-137</b> 401, E: 55464	7.884 See
NE of High Arden Hill			Highway 96					
DRILLER:	K. Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2/0	7	SCALE:	1'' = 4'
Elev. Dep feet fee 956.0	t AS ).0 Syr	TM nbol	Description of Materials (ASTM D2488 or D2487)		BPF W	VI	Tests or	Notes
955.0	I.0 FILI		FILL: Silty Sand, with Gravel, brown, moist. FILL: Clayey Sand, trace of Gravel, reddish-bro moist.	wn,	7			
949.0	7.0 OL		ORGANIC CLAY, trace of Roots, dark brown, r	-	5			
947.0	0.0 SM		SILTY SAND, trace of Gravel, reddish-brown, n		4			
939.0 17	.0		medium dense to dense. (Glacial Till)		7 18 44			
	SP		POORLY GRADED SAND, fine- to medium-gra trace of Gravel, light brown, moist, medium dens (Glacial Outwash)	ained, se	11			
930.0 26	0		END OF BORING. Water not observed with 24 1/2 feet of hollow-stein the ground. Boring then grouted.	em auger –	18			

BRAUN\*



	DB NO: $22-00081$	walanm	mte And	lon Ui	ปิล	MN	LC	)G OF	BO	RING N	10	ST-	138	(p. 1	of 2	2)
PROJE DEPTH		955.9	ent; Aru		1		•					FIELD	) & LA	BORAT	FORY	TESTS
IN FEET	SURFACE ELEVATION: MATERIAL		 ON		GI	EOLOGY	N	MC	SA 1	MPLÉ FYPE	REC IN.	WC	DEN	}		6-#200
1	FILL, mixture of clayey sa	dark brown and and san	d with silt		FIL	L	17	м	X	SS	14	8				
3 -	a little gravel, trace roots, and gray	brown, ligh	it brown				13	м	M	SS	7	10				
4 —								1	Z			13		· ·		
5 — 6 —							15	М	X	SS	12	1.0				
7 — 8 —					-		9	W/M	X	SS	15	14				
9 10							5	M	Þ	SS	14	20				
11 -									Д	33	14					
12 — 13 —							3	W/M	M	SS	18	15				
14 -									R							
15 16	ORGANIC CLAY, trace r to soft (OL/OH)	oots, black	, very soft			AMP POSIT	4	м	М	SS	20	41				
17 -									E	00	24	28				
18 19							2	W/M	Х И	SS	24					
20 – 21 –							3	М	M	SS	18	29				
22 — 23 —	LEAN CLAY WITH SAN of wood, dark gray, firm (	ID, trace ro CL)	ots, pieces		FIN ALI	E LUVIUM	8	W/M	R	SS	4	38				
24	CLAYEY SAND, a little g soft (SC)				TIL	L	3	. <b>⊥</b> w/m	R	SS	24	23	:			
26 – 27 –	CLAYEY SAND, a little g lenses and laminations of s	gravel, gray silty sand (S	r, soft, SC)						FI			22				
28	······································	1							ł			<u> </u>				
DEPT	TH: DRILLING METHOD		[	r		EVEL MEA	1			ייז זז סר		\\\/ A TT		NOTE:		
0-29	"/2" 3.25" HSA	DATE	TIME	SAMPI DEPT		CASING DEPTH	DE	VE-IN PTH	FL	ORILLII UID LE	VEL	WATI LEVI		THE A		
		6/29/07	11:45	26.5		24.5	<u> </u>	5.0	<u> </u>			24.3	́⊣.	SHEE		
BORINO	G ETED: 6/29/07	6/29/07	11:50	31.5	<u>}</u>	29.5	3	1.5	-			Non	C			GY ON
DR: SG									$\vdash$		<u> </u>				IS LO	



#### SUBSURFACE BORING LOG

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AET JO	DB NO: <b>22-00081</b>			LO	G OF	BOI	RING N	0	ST-	138	(p. 2	of 2	)
PROJE	CT: TCAAP Redevelopment; Arden	Hi	lls, MN										
DEPTH			GEOLOGY			SA	MPLE	REC	FIELD	& LAI	BORAT	ORY T	ESTS
DEPTH IN FEET	MATERIAL DESCRIPTION		OPOLOO I	N	мс	Ĩ	MPLE YPE	REC IN.	wc	DEN	LL	PL	⁄o <b>-</b> #200
	SANDY LEAN CLAY, a little gravel, brown,					ধ্য			17				
30 —	stiff (CL) (continued)			14	М	Υ	SS	24	17				
31 —	SAND WITH SILT, a little gravel, fine to					$\Lambda$							
	medium grained, brown, moist, medium dense (SP-SM)		ALLUVIUM										
	END OF BORING								:				
	Northing=207165.1 Easting=554854.2												
	Easting=334634.2												
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	AET JO PROJE	DB NO: <u>22-00081</u> CT: <b>TCAAP Rede</b>	velonme	nt• Ard	en Hi	lls MN	LC	)G OF	BO	RING N	10	ST-	139	(p. 1	of 1	<u>)</u>
	PROJE DEPTH IN FEET	SURFACE ELEVATION:	951.8		-	GEOLOGY	N	мс	SA	MPLE YPE	REC IN.	FIELI WC	D & LA	BORA	1	TESTS
	1 -	FILL, mixture of clayey sa silty sand and sand with si	nd, sandy l lt, a little gr	ean clay,		FILL	26	M	M	SS	12	9				
	2 3	roots, brown and dark brow	wn				21	м	$\square$	SS	19	8				
	4 —								R			10				
	5 6						14	М	X	SS	14					
	7 - 8 -						10	М	X	SS	15	20 18				
	9 10	ORGANIC CLAY, trace r dark gray, firm, lenses and	oots, pieces lamination	of wood, s of silty		SWAMP DEPOSIT	5	₩ W	X	SS	12	20 38				
	11 - 12 - 13 -	sand (OL/OH) SANDY SILT, pieces of v very loose, laminations of				FINE ALLUVIUM	4	W/M	E N	SS	14	19 18				
	14 – 15 –	SILTY SAND, fine graine very loose (SM) SANDY LEAN CLAY, a	d, gray, wa little gravel	terbearing		COARSE ALLUVIUM TILL	10	М	N R N	SS	19	19		-		
	16 17	brown mottled, stiff, lamin (CL)	ations of si	lty sand				141	$\wedge$	55	15	15				
	18	SANDY LEAN CLAY, a firm, laminations of silty s	little gravel and (CL)	, brown,			:									
	20 21						8	М	X	SS	21	19				
	22 23															
	24 – 25 –	CLAYEY SAND WITH (	GRAVEL, t	orown, har	d		54	м	¶∑  }	SS	18	11				
	26 -	SAND WITH SILT, a littl medium grained, brown, m (SP-SM)	e gravel, fir ioist, very o	ne to lense	- /	COARSE ALLUVIUM			<u> </u>				-			
		END OF BORING Northing=206844.7 Easting=553486.0														
$\vdash$	DEP	TH: DRILLING METHOD			WAT	ER LEVEL MI	ASUR	EMEN	ITS	<b>I</b>		_		NOTE	REFI	ER TO
Γ	0-24	4½' 3.25" HSA	DATE	TIME	SAMPI DEPT	ED CASING	CA DI	VE-IN PTH	FI	DRILLI JUID LI	NG EVEL	WA1 LEV	ER EL		ATTAC	
			6/28/07	10:44	11.	5 9.5		9.8				9.			TS FO	
			6/28/07	11:05	26.	5 24.5	2	6.5				No	пе			ON OF
	BORIN COMPI	G LETED: 6/28/07							-						NOLO 415 LO	GY ON
L	DR: <b>S</b>	G LG: SB Rig: 91C	l												цэ LU	



	AET JO		volonmo	nti Ardi	m Wills	MN	LO	G OF	BORING N	0	ST-1	39A	(p.	1 of	2)
ł	PROJE		_	nı; Aru							FIFL	)&ĭ4	BORAT	ORY	TESTS
	DEPTH IN FEET	SURFACE ELEVATION: MATERIAL 1	951.8	N N	G	EOLOGY	N	МС	SAMPLE TYPE	REC IN.	<b></b>	DEN			<b>/</b> 6-#200
		No samples taken in upper			<del>.     -</del>				स						
	1 -	Boring ST-139		0					Į						
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	28 -								Ħ						
ĺ	DEP	TH: DRILLING METHOD				LEVEL MEA							NOTE	REF	ER TO
	0-44	1½' 3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CA DE	/E <b>-IN</b> PTH	DRILLI FLUID LI	NG EVEL	WAT LEV	ER EL	THE A	ATTAG	CHED
ŀ			7/23/07	1:16	46.5	44.5		6.5			No		SHEE		
ľ													EXPLA		
	BORIN COMPL	G ETED: <b>7/23/07</b>					<u> </u>							NOLO IIS LC	GY ON
L	DR: SC	G LG: BR Rig: 91C		<u> </u>	l	<u> </u>							1F		



#### SUBSURFACE BORING LOG

#### LOG OF BORING NO. **ST-139A** (p. 2 of 2) 22-00081 AET JOB NO: TCAAP Redevelopment; Arden Hills, MN PROJECT: FIELD & LABORATORY TESTS REC IN. DEPTH SAMPLE TYPE GEOLOGY Ñ MC IN FEET WC DEN PL LL **%-#20** MATERIAL DESCRIPTION H COARSE ALLUVIUM SILTY SAND WITH GRAVEL, medium to fine 30 grained, brown, moist, dense (SM) (possible SS 6 40 М cobbles) 31 32 33 34 35 SS 47 6 Μ 36 37 38 SAND WITH SILT, a little gravel, fine to medium grained, light brown, moist, dense 39 (SP-SM) 40 SS 21 33 Μ 41 42 43 SAND, fine grained, light brown, dense (SP) 44 45 SS 20 33 М 46 END OF BORING Northing=206844.7 Easting=553486.0

Geote TCAA NE of	cnical E P Rede	valuat velopn iy 10 a	tion nent ind H	5-05871 Highway 96	BORING: LOCATIC attached s	DN: N		006-15 ST-140 836.519, E: 554906.041 See
DRILLI	ER: К.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/3	2/07	SCALE: 1" = 4'
Elev. feet 962.9	Depth feet 0.0	AST Symt		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or Notes
951.9	23.0	SM		SANDY LEAN CLAY, trace of Gravel, yellowis to brown, moist, medium dense. (Glacial Till) SILTY SAND, fine- to medium-grained, trace of reddish-brown, moist. (Glacial Till) POORLY GRADED SAND, fine- to medium-gra	Gravel,	8 6 8 17 42 *		*70 blows for 6" (set) suspected Cobble or Boulde *50 blows for 1" (set) suspected Cobble or boulde
036.0	26.0			trace of Gravel, brown, moist, very dense. (Glacial Outwash)		54		
-	26.0			END OF BORING. Water not observed with 24 1/2 feet of hollow-ste in the ground. Boring then grouted.	em auger - - - -			



AET JO						LC	)G OF	BORI	NG NO	 	<u>ST-1</u>	40A	(p.	1 of	2)
PROJE	CT: TCAAP Rede	velopme	nt; Ard	en Hi	lls, MN		<u> </u>								
DEPTH IN FEET	SURFACE ELEVATION:	962.9			GEOLOGY	N	MC	SAM TYI	PLE	EC			BORAT		1
FEET	MATERIAL I								PE 1	IN.	WC	DEN	LL	PL	<b>%-#</b> 200
1	No samples taken in upper Boring ST-140	19.5', Refe	er to Log o	f				Ĭ							
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3 -								ł							
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16 -													·		
17								ł							
18 —								ł							
19 -								1 1							
20 -	CLAYEY SAND, a little g (SC)	gravel, brow	vn, hard		TILL	37	М	Μ	ss	20	9				
21 -	, -							Д						. *	r.
22 -								Ð							
23 -								2					1		
24 –		1 - <del>C</del>			COARSE	_		묍							
25 –	SAND WITH SILT, a little medium grained, light brow	e gravel, fir wn, moist, o	le to dense		ALLUVIUM	<sup>[</sup> 44	М	M	SS	16		1			
26 -	(SP-SM)							Д							
27 -							1	H							
DEP	TH: DRILLING METHOD			WATI	ER LEVEL M	EASUR	EMEN	TS	r				NOTE:	REFI	ER TO
0-44	1½' 3.25" HSA	DATE	TIME	SAMPI DEPT	ED CASING	G CA	VE-IN EPTH	DR FLUI	ILLINO D LEV	G EL	WAT LEVI	ER EL	THE A	ATTAC	CHED
<u> </u>		7/25/07	11:10	41.5			1.4	1			Nor	ie	SHEE	TS FO	R AN
															ON OF
BORIN COMPL	G LETED: <b>7/25/07</b>		······································												GY ON
DR: SC	G LG: BR Rig: 91C							<u> </u>					T	IIS LO	KG



AET JO	DB NO: <u>22-00081</u>		LO	G OF	BORI	NG N	0	<u>ST-1</u>	40A	<b>(p.</b> )	2 of :	<u>2)  </u>
PROJE	CT: TCAAP Redevelopment; Arden Hi	ills, MN			u_ <del>.</del> .							
DEPTH		GEOLOGY			SAM	नाग	REC	FIELD	) & LAI	BORAT	ORY 1	FESTS
DEPTH IN FEET	MATERIAL DESCRIPTION	GLOLOGI	N	мс	ŤΫ	PLE PE	REC IN.	wc	DEN	LL	PL	<b>⁄₀-</b> #200
29 —	GRAVELLY SAND WITH SILT, medium to fine grained, light brown, moist, very dense (SP-SM)		<u> </u>									
30 — 31 —			116	М	X	ss	14					
31					रि							
33					ł							
34					H						:	
35			79	м	M	ss	17				:	
36 —			19	101	Д	55	17					
37 —					Ŧ							
38 -	GRAVEL WITH SILTY SAND, light brown,				ł							
39	moist, very dense (GP)				R						-	
40 41			99	М	X	SS	16					
	END OF BORING Northing=206836.5 Easting=554906.0											



AET JO	DB NO: 22-00081						LO	GOF	BO	RING N	10	ST-	141	(p. 1	of 1	)
PROJE	CT: TCAAP Rede	velopme	nt; Arde	en Hi	lls,	MN										<u> </u>
DEPTH	SURFACE ELEVATION:	913.3			GE	EOLOGY	N	мс	SĄ	MPLE YPE	REC			BORAT		[
IN FEET	MATERIAL								1	IFE	IN.	wc	DEN	LL	PL	%-#200
1 -	FILL, mixture of silty sand gravel, surface roots, trace FILL, mixture of silty sand	roots, brov	vn	/	FIL		17	М	X	SS	17				:	
2 - 3 -	sandy lean clay, a little gra organic clay, brown, dark	vel, trace re	oots,				19	м	$\forall$	SS	22	10				
4 -									/\ 된				-			
5 -							11	м	M	SS	17	9				
6-									R							
7	CLAYEY SAND, a little g brown and dark gray, stiff SANDY LEAN CLAY, a	(SC)			TIL	L	9	м	M	SS	17	19				
9 — 10 —	and gray mottled, a little b laminations of silty sand a	rown, firm,							E							
10 -			. <b>.</b>				5	М	Щ	SS	20	22				
12 — 13 —	SANDY LEAN CLAY, a brown and gray mottled, s						10	М	M	SS	12	19				
13 – 14 –	brown silty sand (CL)	,							∐ ₽							
15 — 16 —							14	М	X	SS	24	18				
10 -									3							
18 -	CLAYEY SAND, a little g to very stiff (SC)	gravel, dark	gray, stiff						ł							
19 — 20 —							14		K	SS	24	15				
21 -							14	М	Д	00	24					
22 —									X							
23 —									ł							
24 —															[	
25 26							18	M	X	SS	16	15				
~~	END OF BORING Northing=206683.1 Easting=552396.6				×			<u> </u>		¥		-				
DEP	TH: DRILLING METHOD	<u> </u>		WAT	 ER L	EVEL MEA	SUR	L EMEN	I TS	<u> </u>	<u> </u>	-		NOTE	REF	ER TO
0-2		DATE	TIME	SAMP DEP		CASING DEPTH	1 <sup></sup>	VE-IN PTH		DRILLI JUID LI	NG EVEL	WA1 LEV		THE		
<u> </u>	772 J.2J 110A	7/18/07	1:50	26.		24.5		6.5				26.		SHEE		
														EXPLA		
BORIN COMPI	IG LETED: <b>7/18/07</b>						ļ		_			<u>_</u>		TERMI	NOLO IIS LC	
DR: S	G LG: BR Rig: 91C													11	цо г¢	-u



#### SUBSURFACE BORING LOG

AET JOB NO: 22-00081					LC	og of	BO	RING N	10	ST-	142	(p. 1	of 2	2)
PROJECT: TCAAP Red	evelopm	ent; Ard	en Hil	ls, MN										
DEPTH SURFACE ELEVATION:	933.7			GEOLOGY	N	мс	SA	MPLE YPE	REC	FIELI	) & LA	BORA	FORY '	FESTS
	DESCRIPTI					IVIC		YPE	IN.	wc	DEN	LL	PL	<b>%-#2</b> 00
FILL, mostly sandy silt, s	surface root	s, trace		FILL	17	М	М	SS	10	9				
2 - FILL, mostly clayey sand cobbles, trace roots, brow			le				Д			8				
	Fill	(sandy silt) 0			14	М	M	SS	4	10				
4 —		(clayey sand (silty sand) 9		.5'			Д							
5							M							
6 —	$\checkmark$				8	M	Ŵ	SS	7	13				
7 -							E							
8 -					2	W/M	X	SS	2	18				
9							म म							
10 – FILL, mixture of silty sar sand with silt, a little grav	id, clayey sa	and and wish brown			18	м	Μ	SS	19	20				
11 – gray and black	oi, aan gio		,		10	IVI	М	33	19					
12 -							R							
13 -					10	Μ	XI	SS	14					
14							ष्ट्र			20				
15 SANDY SILT, trace root	s, dark brov	vnish gray,	a	FINE	6	М	M	SS	18	20				
<ul> <li>16 – little gray, moist, loose, le</li> <li>of silty sand (ML)</li> </ul>	enses and la	minations		ALLUVIUM			Д							
17 SILT WITH ORGANICS	, black, we	t, loose					M							
18 – (ML)					5	W	M	SS	23	27				
19 – 20 – CLAYEY SAND, gray, a	little brown			MIXED			E							
laminations of wet silty sa	and (SC)	1, 3111,		ALLUVIUM	9	M/W	XI	SS	19	20				
21 - 22 -							F							
23							ţ.							
LEAN CLAY, trace roots 24 – stiff, laminations of fat cla	, gray, a litt av (CL)	le black,		FINE ALLUVIUM	-	Ţ	¥.							
25 -							R	66		32				
26 SILTY SAND, fine graine	ed, gray, we	et, medium		COARSE	11	M	Щ	SS	17					
27 – dense (SM) 27 – SILTY SAND, a little gra	vel fine to	medium	-/	ALLUVIUM			1							
28 – grained, gray, wet, medium	m dense (SI	M)			14	w	M	SS	20					
	1	····					<u> </u>				L			<u> </u>
DEPTH: DRILLING METHOD	 		WATE: SAMPLE	R LEVEL MEA		EMEN Æ-IN	T	RILLIN	JG	WATI		NOTE:		
0-29½' 3.25" HSA	DATE	TIME	DEPTH	I DEPTH	DE	PTH	FL	JID LE	VEL	WATH		THE A		
	7/5/07	9:35	26.0	24.5		4.8 \\ 0				23.7		SHEET EXPLAI		
BORING COMPLETED: 7/5/07	7/5/07	2:00	31.5	29.5		).9	-			24.5	,	ERMIN		
COMPLETED: 7/5/07 DR: SG LG: SB Rig: 91C			<u>_</u>									TH	IS LOO	3



	AET JO PROJE	DB NO: <u>22-00081</u> CT: <u>TCAAP Redevelopment; Arder</u>	n Hi	lls. MN	LC	g of	BO	RING N	iO	ST-	142	(p. 2	of 2	5)
$\left  \right $		. <u></u>		GEOLOGY	~ *		SA	MPLE	REC	FIELI	) & LAI	BORAT	ORY	TESTS
	DEPTH IN FEET	MATERIAL DESCRIPTION	11.36	GLODOGI	N	мс		MPLE YPE	ĪN.	wc	DEN	LL	PL	<b>%-</b> #200
	30 —	SANDY LEAN CLAY, a little gravel, gray, firm (CL)		TILL	5	М	ł	SS	14	19				
	31 —	END OF BORING				· · · · ·								
		Northing=206683.8 Easting=552897.3												
								·					-	
	1													
L														

	n Proj cnical E			6-05871				RI-4007	
TCAA NE of	AP Rede	velop vy 10 :	men and ]	Highway 96	LOCATIC attached s	)N: N: ketch.	206653.:	285, E: 55340	0.699 See
DRILL	ER: K.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	8/07	SCALE:	1'' = 4'
Elev. feet 949.9	Depth feet 0.0	AS Sym		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
949.3	0.6	FILL FILL		FILL: Silty Sand, trace of Roots, dark brown, mo FILL: Clayey Sand, trace of Gravel, mixed light l and dark brown, moist.		29			
<u>945.9</u> -	4.0	SP- SM		POORLY GRADED SAND with SILT, fine- to medium-grained, trace of Gravel, light brown, mo		18			
940.9	9.0	CL		SANDY LEAN CLAY, trace of Roots, dark brow (Buried Topsoil)	n, moist. 	4			
937.9	12.0	CL		SANDY LEAN CLAY, trace of Gravel, grayish-b wet, rather soft to medium. (Glacial Till)	rown,	3 7 6			
<u>930.9</u> -	19.0	CL		SANDY LEAN CLAY, trace of Gravel, reddish-b wet, rather soft to rather stiff. (Glacial Till)		5			
921.9	28.0	SM		SILTY SAND, fine- to medium-grained, trace of 0	- - -	10			
-		UIVI		reddish-brown, moist, medium dense to dense. (Glacial Till)		21			

Geotecnical Ev	ct SP-06-0: aluation	5871			******	L-4007-02	
TCAAP Redev NE of Highway Arden Hills, M	elopment y 10 and Higl	nway 96	attached s	N: N: N: ketch.	: 206653	3.285, E: 55340	U.099 See
DRILLER: K. H	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	8/07	SCALE:	1'' = 4'
Elev.Depthfeetfeet917.932.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
	EN Wa in 1	D OF BORING. ter not observed with 44 1/2 feet of hollow he ground. ting then grouted.	e	18       35       12			

BRAUN"



Concrete     END over bolic busches intervel, brown     FILL     BIL SU     BIL SU       1     FILL, mixture of clayey sand and silty sand, a     10     M     SS     9       2     HILL, mixture of clayey sand and silty sand, a     10     M     SS     20       3     Hitle gravel, fore grained, brown, medium dense (SM)     TILL     12     M     SS     20       4     SILTY SAND, a little gravel, fine to medium grained, brown, medium dense (SM)     15     M     SS     20     13       6     SILTY SAND, a little gravel, fine to medium grained, brown, moist, medium dense (SM)     15     M     SS     20     13       7     SAND WITH SILT, a little gravel, medium to fine grained, brown, moist, medium dense to dense (SP-SM)     15     M     SS     14       10     fore grained, brown, moist, medium dense to dense (SP-SM)     30     M     SS     14       11     Goo F BORING Morthing=206618.1     44     M     SS     15     14       12     M     SS     15     M     SS     15     14       12     M     SS     15     14     14     14     14       13     fore grained, brown, moist, medium dense to dense (SP-SM)     30     M     SS     14     15       14<	AET JO	OB NO: 22-00081					LC	G OF	BO	RING N	10	ST-	144	(p. 1	of 1	<u>)</u>
Day In     SURFACE BLEVATION     Same Status       MATERIAL DESCRIPTION     MATERIAL DESCRIPTION     FILL     NMC     SAME IN     WC     DEN IN     MC     DEN IN     MC     DEN IN <t< td=""><td>PROJE</td><td>CT: TCAAP Rede</td><td>velopme</td><td>nt; Arde</td><td>en Hi</td><td>lls, MN</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	PROJE	CT: TCAAP Rede	velopme	nt; Arde	en Hi	lls, MN										
Fact         Concrete         PELL	DEPTH	SURFACE ELEVATION:	955.0			GEOLOGY	N	MC	SA	MPLE		FIELI	) & LA	BORAT	FORY	TESTS
FILL, mostly sand with silt, a little gravel, brown       10       M       SS       9         FILL, mostly sand with silt, a little gravel, fine grained, brown, medium dense (SM)       21       M       SS       20         SILTY SAND, a little gravel, fine to medium       11       12       M       SS       20       13         SILTY SAND, a little gravel, fine to medium       11       11       11       M       SS       20       13         SILTY SAND, a little gravel, fine to medium       11       11       M       SS       20       13         Bandon dense (SM)       11       12       M       SS       20       13         SAND WITH SILT, a little gravel, medium to fine grained, brown, moist, medium dense       11       15       M       SS       12         SAND WITH SILT WITH GRA VEL, medium to fine grained, brown, moist, medium dense to a class (SP-SM)       30       M       SS       6       14         SAND WITH SILT WITH GRA VEL, medium to fine grained, brown, moist, medium dense to a class (SP-SM)       30       M       SS       14       15       14       14       14       14       14       14       14       15       14       14       14       14       14       14       14       14       14	FEET	MATERIAL I	DESCRIPTIO	N				IVIC			IN.	wc	DEN	LL	PL	<b>%-#2</b> 00
2       FILL, mixture of clavey sand and silty sand, a       10       M       A       SS       9         3       little gravel, brown       fill gravel, fine grained, fine grained, fine grained, fine grained, fine grained, fine grained, fine gravel, medium to fine grained, brown, medium dense (SM)       11       12       M       SS       20       13         9       grained, brown, medium dense (SM)       11       12       M       SS       20       13         9       grained, brown, moist, medium to fine grained, brown, moist, medium to fine grained, brown, moist, medium dense       12       M       SS       8       12         11       SAND WITH SILT, a little gravel, medium to fine grained, brown, moist, medium dense       13       15       FM       SS       8       12         14       SAND WITH SILT WITH GRAVEL, medium to fine grained, brown, moist, medium dense to danse (SP-SM)       14       15       FM       SS       14       15       14       15       14       15       14       15       14       15       14       15       14       15       14       15       14       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16		<b>`</b>	. 1971	.1.1		FILL			R	SU						
FILL, mixture of clayey sand and siny sand, a       21       M       SS       20       13         Surget, brown, medium dense (SM)       TTLL       12       M       SS       20       13         B       SILTY SAND, a little gravel, fine to medium tense (SM)       15       M       SS       20       13         B       SILTY SAND, a little gravel, fine to medium tense (SM)       15       M       SS       20       13         B       SILTY SAND, a little gravel, medium dense (SM)       15       M       SS       20       13         B       SAND WITH SILT, a little gravel, medium dense       ALLUVIUM       12       M       SS       8         SAND WITH SILT WITH GRAVEL, medium dense to       15       FM       SS       14       15       SS       6         SAND WITH SILT WITH GRAVEL, medium dense to       15       FM       SS       14       15       SS       14         SAND WITH SILT WITH GRAVEL, medium dense to       44       M       SS       14       14       15       14       14         SAND WITH SILT WITH GRAVEL, medium dense to       40       M       SS       14       14       15       14       14       15       14       14       14		FILL, mostly sand with sir	t, a intie gra	ivel, brown	a		10	М	X	SS	9					
3       SILTY SAND, a little gravel, fine grained, brown, medium dense (SM)       11       12       M       SS       20       13         4       SILTY SAND, a little gravel, fine to medium important dense (SM)       15       M       SS       20       13         9       grained, brown, medium dense (SM)       15       M       SS       20       13         10       SAND WITH SILT, a little gravel, medium dense       15       M       SS       8       14         10       SAND WITH SILT, a little gravel, medium dense       12       M       SS       8       14         10       SAND WITH SILT, a little gravel, medium dense       15       M       SS       12       14         11       SAND WITH SILT with GRAVEL, medium to fine grained, brown, moist, medium dense to dense (SP-SM)       30       M       SS       14         12       Au       M       SS       14       14       15       14         13       SS       14       15       M       SS       14       15         14       M       SS       15       14       14       15       14       14         14       M       SS       15       14       15       14       15<		FILL, mixture of clayey sa	nd and silty	' sand, a					$\mathbb{H}$	66	20					
SILTY SAND, a little gravel, fine grained, brown, medium dense (SM)       IIIL       IIIL       IIIL       IIIL       IIIL       IIIIL       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		inthe graver, brown						IVI	Μ	33	20					
3       brown, medium dense (SM)       12       M       SS       20         4       SILTY SAND, a little gravel, fine to medium grained, brown, medium dense (SM)       15       M       SS       20       13         9       grained, brown, medium dense (SM)       12       M       SS       20       13         10       SAND WITH SILT, a little gravel, medium dense       COARSE       12       M       SS       8         11       (SP-SM)       12       M       SS       8       12       M       SS       8         12       SAND WITH SILT, a little gravel, medium dense       15       M       SS       12       13         14       SAND WITH SILT WITH GRAVEL, medium to fine grained, brown, moist, medium dense to dense (SP-SM)       30       M       SS       6       14         15       M       SS       14       15       M       SS       14       14         14       SS       14       15       M       SS       14       14       14       15       14       14       14       14       14       15       14       14       14       14       14       14       14       15       14       15       15 <td< td=""><td></td><td>SILTV SAND a little gray</td><td>el fine grai</td><td>ined</td><td></td><td>TILL</td><td>-</td><td></td><td>E</td><td></td><td>-</td><td>13</td><td></td><td>1</td><td></td><td></td></td<>		SILTV SAND a little gray	el fine grai	ined		TILL	-		E		-	13		1		
7       -				mou,			12	М	X	SS	20				1	
8         SILTY SAND, a little gravel, fine to medium grained, brown, medium dense (SM)         15         M         SS         20         13           10         SAND WITH SILT, a little gravel, medium to fine grained, brown, moist, medium dense         12         M         SS         8         1           12         SAND WITH SILT, a little gravel, medium dense         12         M         SS         8         1           14         -         -         -         -         -         -         -           13         - <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>H</td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td>									H				1			
SILTY SAND, a little gravel, fine to medium       Image: Constrained brown, molist, medium dense       Image: Constrained brown, molist, medium dense       Image: Constrained brown, molist, medium dense         Indext: SAND WITH SILT, a little gravel, medium dense       Image: Constrained brown, molist, medium dense       Image: Constrained brown, molist, medium dense       Image: Constrained brown, molist, medium dense         Indext: SAND WITH SILT WITH GRAVEL, medium to fine grained, brown, molist, medium dense to fine grained, brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense to dense (SP-SM)       Image: Constrained brown, molist, medium dense t								1	$\square$	00	20	12				
SAND WITH SILT, a little gravel, medium to fine grained, brown, moist, medium dense       Image: COARSE ALLUVIUM       12       M       SS       8         11 -       (SP-SM)       12       M       SS       8       12         12 -       13       -       15       M       SS       12         13 -       -       15       M       SS       12       15         14 -       -       -       15       M       SS       12         14 -       -       -       -       30       M       SS       6         15 -       -       -       -       30       M       SS       6         16 -       -       -       -       -       44       M       SS       14         17 -       -       -       -       44       M       SS       14         19 -       -       -       -       44       M       SS       14         12 -       -       -       -       40       M       SS       15         20 -       -       -       -       40       M       SS       15       -         21 -       -       - <td></td> <td>SILTY SAND, a little grav</td> <td>el, fine to n</td> <td>nedium</td> <td></td> <td></td> <td>15</td> <td>м</td> <td>M</td> <td>22</td> <td>20</td> <td>  15</td> <td></td> <td></td> <td></td> <td></td>		SILTY SAND, a little grav	el, fine to n	nedium			15	м	M	22	20	15				
10       — fine grained, brown, moist, medium dense       []       ALLUVIUM       12       M       M       SS       8		•		dium to		COARSE	-		R							
12 -       15       M       SS       12         13 -       15       M       SS       12         14 -       15       M       SS       12         15 -       SAND WITH SILT WITH GRAVEL, medium to fine grained, brown, moist, medium dense to dense (SP-SM)       30       M       SS       6         16 -       dense (SP-SM)       30       M       SS       6       1         17 -       18 -       44       M       SS       14       1       1         17 -       18 -       44       M       SS       14       1 <t< td=""><td></td><td>fine grained, brown, moist</td><td>, medium de</td><td>ense</td><td></td><td></td><td>12</td><td>М</td><td>X</td><td>SS</td><td>8</td><td></td><td></td><td></td><td></td><td></td></t<>		fine grained, brown, moist	, medium de	ense			12	М	X	SS	8					
13 -       15       M       X       SS       12       12         14 -       15       M       X       SS       12       12         15 -       SAND WITH SILT WITH GRAVEL, medium to fine grained, brown, moist, medium dense to dense (SP-SM)       30       M       SS       6         16 -       dense (SP-SM)       30       M       SS       6       14         17 -       18       19       -       44       M       SS       14         20 -       20 -       44       M       SS       14       14       14       14         21 -       22 -       -       44       M       SS       14		(SP-SM)				- - -			A							
14       14       14       15       SAND WITH SILT WITH GRAVEL, medium to fine grained, brown, moist, medium dense to dense (SP-SM)       30       M       SS       6         17       17       17       18       10       14       15       10       11         18       19       20       21       21       22       23       24       24       25       26       40       M       SS       15       14       15       14       15       14       16       <	1								$\mathbb{N}$	0 00	10					
15 -       SAND WITH SILT WITH GRAVEL, medium to fine grained, brown, moist, medium dense to dense (SP-SM)       30       M       SS       6       Image: state s							15- )*	M	Ŵ	55	12					
10       to fine grained, brown, moist, medium dense to dense (SP-SM)       30       M       SS       6         17       -				madium		•			R							1
17 -       18 -       19 -       44       M       SS       14         19 -       20 -       44       M       SS       14       10 -         20 -       21 -       44       M       SS       14       10 -       10 -         22 -       23 -       40       M       SS       15       10 -	15 -	to fine grained, brown, mo	ist, medium	, meanum i dense to		•	30	М	IX	SS	6					
18 -       19 -       20 -       44       M       SS       14       14       M       SS       14	16 -	dense (SP-SM)				•										
19 -       -       44       M       SS       14       - </td <td>17 —</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ł</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	17 —								ł							
20 -       1       44       M       SS       14       I </td <td>18 -</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ł</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	18 -								ł							
21 -       -       44       M       SS       14       I </td <td>19 —</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	19 —								1							
22 -       -	20 -						44	M	Ŋ	SS	14					
23 -       24 -         25 -       40 M         26 -       40 M         END OF BORING Northing=206618.1 Easting=553935.0       Northing=206618.1 Easting=553935.0         DEPTH:       DRILLING METHOD         WATER LEVEL MEASUREMENTS       NOTE: REFER TO THE ATTACHED         0-24½'       3.25" HSA         DATE       TIME         SAMPLED       CASING DEPTH         DEPTH:       DATE         TIME       SAMPLED DEPTH         DEPTH       CASING DEPTH         DATE       TIME         SAMPLED       CASING DEPTH         DEPTH       DATE         TIME       SAMPLED DEPTH         DATE       TIME         SAMPLED       CASING DEPTH         DEPTH       DEPTH         DATE       TIME <tr< td=""><td>21 —</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr<>	21 —															
24 -       25 -       40       M       SS       15       Image: state s	22 -					<i>•</i>			$\left\{ \right\}$	,						
25 -     26 -     40     M     SS     15     Image: constraint of the system of the s	23 -								H							
26 -       40       M       SS       15       Image: state sta	24 —								NI NI							
26 -       END OF BORING Northing=206618.1 Easting=553935.0       WATER LEVEL MEASUREMENTS       NOTE: REFER TO         DEPTH:       DRILLING METHOD       WATER LEVEL MEASUREMENTS       NOTE: REFER TO         0-24½'       3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH       CAVE-IN DEPTH       DRILLING WATER LEVEL       NOTE: REFER TO         0-24½'       3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH       CAVE-IN DEPTH       DRILLING FLUID LEVEL       WATER LEVEL       SHEETS FOR AN         BORING COMPLETED:       7/9/07       8:55       26.5       24.5       26.2       None       EXPLANATION OF TERMINOLOGY OF THIS LOG	25 -					1	40	М		SS	15					
Northing=206618.1 Easting=553935.0     WATER LEVEL MEASUREMENTS     NOTE: REFER TO       DEPTH:     DRILLING METHOD     WATER LEVEL MEASUREMENTS     NOTE: REFER TO       0-24½'     3.25" HSA     DATE     TIME     SAMPLED DEPTH     CASING DEPTH     CAVE-IN DEPTH     DRILLING FLUID LEVEL     WATER LEVEL     NOTE: REFER TO       0-24½'     3.25" HSA     DATE     TIME     SAMPLED DEPTH     CASING DEPTH     DATE     THE ATTACHED       0-24½'     3.25" HSA     DATE     TIME     SAMPLED DEPTH     CASING DEPTH     DRILLING MATER     WATER LEVEL     SHEETS FOR AN       BORING COMPLETED:     7/9/07     Image: Completent of the second	26			•••••••	ļ l	:			$\downarrow$	\						
Easting=553935.0     WATER LEVEL MEASUREMENTS     NOTE: REFER TO       DEPTH:     DRILLING METHOD     WATER LEVEL MEASUREMENTS     NOTE: REFER TO       0-24½'     3.25" HSA     DATE     TIME     SAMPLED DEPTH     CASING DEPTH     DRILLING WATER LEVEL     NOTE: REFER TO       0-24½'     3.25" HSA     DATE     TIME     SAMPLED DEPTH     CASING DEPTH     DRILLING WATER LEVEL     SHEETS FOR AN       0-24½'     3.25" HSA     DATE     TIME     SAMPLED DEPTH     CASING DEPTH     DRILLING WATER LEVEL     SHEETS FOR AN       0-24½'     3.25" HSA     DATE     TIME     SAMPLED CASING DEPTH     DEPTH     DRILLING ENDER     SHEETS FOR AN       BORING COMPLETED:     7/9/07     Image: Completence     Image: Casing Depth<		Northing=206618.1														
0-24½' 3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH       DRILLING LEVEL       WATER LEVEL       THE ATTACHED SHEETS FOR AN         7/9/07       8:55       26.5       24.5       26.2       None       SHEETS FOR AN         BORING COMPLETED:       7/9/07		Easting=553935.0				1										
0-24½' 3.25" HSA       DATE       TIME       SAMPLED DEPTH       CASING DEPTH       DRILLING LEVEL       WATER LEVEL       THE ATTACHED SHEETS FOR AN         7/9/07       8:55       26.5       24.5       26.2       None       SHEETS FOR AN         BORING COMPLETED:       7/9/07	DEP	TH: DRILLING METHOD	l		WAT	I ER LEVEL ME.	ASUR	I EMEN	۱ ۱	1	_ <u></u>		-	NOTE	: REF	ER TO
0-24/1         5.25         10/A         SHEETS FOR AN           7/9/07         8:55         26.5         24.5         26.2         None         SHEETS FOR AN           BORING COMPLETED:         7/9/07         Image: Complete the second seco		<u> </u>	DATE	TIME	1				- 1	DRILL	NG	WA	TER			
BORING COMPLETED: 7/9/07 EXPLANATION OF TERMINOLOGY OF THIS LOG	0-2-	4½' 3.25" HSA			<u> </u>											
COMPLETED: 7/9/07 THIS LOG	}		113/01	0.33		5 44.5			+			110		EXPLA	ANATI	ON OF
THISLOG	BORIN								+					TERMI	NOLC	GY ON
DR: SG LG: SB Rig: 91C					-							-		TI	HIS LO	)G



AET JO					<u></u>	LOC	GOF	BORING N	0.	ST-1	44A	. (p.	<u>1 of</u>	2)
PROJEC	TE TEAAP Rede	velopme	nt; Ard	en Hills.	MN									
DEPTH IN FEET	SURFACE ELEVATION:	955.0		G	EOLOGY	N	мс	SAMPLE TYPE	REC	h		BORAT		1
FÉÉT	MATERIAL I								IN.	WC	DEN	LL	PL	<b>%-#2</b> 00
1	No samples taken in upper Boring ST-144	24.5', Refe	r to Log o	f				Į						
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3														
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21 -								H		ŀ				
22 -								1						
23 - 24 -														
DEPT	H: DRILLING METHOD			WATER 1	LEVEL MEA	L	MEN	<u>เริ่น</u> TS	1			NOTE:	REF	ER TO
0-44		DATE	TIME	SAMPLED	1	CAV		DRILLI FLUID LI	NG EVEL	WAT LEV	ER EL	THE A		
0-44	72 J.4J HOA	7/24/07	12:02	46.5	44.5	46				Nor		SHEE	TS FO	R AN
	· · · · · · · · · · · · · · · · · · ·				1	1						EXPLA		
BORING COMPLI	ETED: <b>7/24/07</b>											TERMI		
DR: SG												Tł	IS LC	)G



## SUBSURFACE BORING LOG

AET JO	DB NO: 22-00081		<u></u>	LO	G OF	BO	RING N	0	ST-1	44A	(p.	2 of	2)
PROJE	CT: TCAAP Redevelopment; Arden I	Hil	ls, MN										
DEPTH			GEOLOGY			SA	MPLE	REC	FIELD	) & LAI	BORAT	ORY	TESTS
IN FEET	MATERIAL DESCRIPTION			N	МС	Ĩ	MPLE YPE	ĨÑ.	WC	DEN	LL	PL.	<b>%-#</b> 200
25 —	SAND WITH SILT, a little gravel, fine to medium grained, light brown, moist, dense to		COARSE ALLUVIUM	35	М	М	SS	20					
26 —	very dense (SP-SM)					Д							
27 -						1							
28 —						ł							
29 —						¥							
30				51	М	IVI	SS	24					
31 —						/\ म							
32 -						ł							
33 -	SAND WITH SILT, fine to medium grained, light brown, moist, dense to very dense (SP-SM)					Ĭ							
34 35						¥۱ ۱							
36 -				39	М	X	SS	21					
37 -						स							
38 -						ł							
39 —						ł							
40						M							
41				53	М	Ŵ	SS	22					
42 —						3							
43 —	SAND WITH SILT, a little gravel, fine to					ł							
44 —	medium grained, light brown, moist, very dense (SP-SM)					ł							
45 -				57	м	M	SS	22					
46						Д							
	END OF BORING Northing=206618.1 Easting=553935.0												



#### SUBSURFACE BORING LOG

	ов NO: <u>22-00081</u>					LC	OG OF	во	RING N	10	ST-	145	(p. 1	lof	1)
PROJE	ECT: TCAAP Rede	evelopme	ent; Ard	<u>en Hi</u>	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION: MATERIAL	954.7 DESCRIPTION	 ON		GEOLOGY	N	мс	SA 1	MPLE TYPE	REC IN.	FIELI WC	D & LA	BORA	TORY PL	TESTS
1-	FILL, mixture of clayey s	and and silt	y sand, a		FILL TILL	24	м	M	SS	16	7				
2 -	brown CLAYEY SAND, a little	gravel, trac	e roots,		· · ·			Д			9 12				
3 -	brown, laminations of silt	y sand, very	y stiff (SC)			25	М	X	SS	13	7				
4 5	-				-			E			14				
6 -						18	М	X	SS	15	14				
7 -						67/0.9		R						[	
8 9							M	Å	SS	11	7				
10 -						11	ie	M	00	10	8				
11 —						16	М	Д	SS	12			,		
12 — 13 —	SAND, a little gravel, mec brown, moist, medium der				COARSE ALLUVIUM	18	М	M	SS	14					
14 —								A FI							
15 -						33	м	M	SS	14					
16 17								/\ {}							
18 -	GRAVELLY SAND WIT	H SILT, fir	ie to coars	:::: :::::::::::::::::::::::::::::::::				ł							
19 20	grained, brown, moist, ver	y dense (SI	P-SM)					۲Į							
20 21 –						60	М	M	SS	12					
22 —								Ł							
23 — 24 —	SAND WITH SILT, fine the brown, moist, dense (SP-S		grained,					ł							
25 -		-				44	м	M	SS	15					
26 –	END OF BORING					44	М 	Д		13				 	
	Northing=206685.1 Easting=554399.4														
DEP	TH: DRILLING METHOD			WATE	R LEVEL MEA	SURE	MEN	TS		1			NOTE:	REFE	RTO
0-24	1½' 3.25" HSA	DATE	TIME	SAMPL DEPT	ED CASING H DEPTH	CAV	'E-IN PTH	FL	ORILLI UID LE	NG VEL	WATI LEVI	ER EL	THE A		
		6/29/07	1:40	26.5	24.5	20	5.5				Non		SHEET		
													EXPLA		
BORIN	G LETED: 6/28/07											Т			GY ON
DR: SC	G LG: SB Rig: 91C												TH	IIS LO	G



## SUBSURFACE BORING LOG

AET J	OB NO: <b>22-00081</b>					L	OG OF	BORING N	10	ST-1	45A	. (p.	<u>1 of</u>	2)
PROJE	CT: TCAAP Rede	velopme	nt; Ard	en Hi	lls, MN							<u> </u>		]
DEPTH	SURFACE ELEVATION:	954.7			GEOLOGY	, N	мс	SAMPLE TYPE	REC	FIELD	) & LA	BORAT	FORY	rests
DEPTH IN FEET	1						IVIC	TYPE	IN.	wc	DEN	LL	PL	<b>⁄₀-</b> #200
1 -	No samples taken in upper Boring ST-145	29.5', Refe	r to Log o	f										
2 -								H						
3 -								H						
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24 -								1						
25 -								4						
26 -								1						
27 -								H						
28 -								1						
29								H.						
DEP	TH: DRILLING METHOD			WATI	ER LEVEL M	EASUR	EMEN	TS			<u> </u>	NOTE:	REFE	RTO
0-3	9½' 3.25" HSA	DATE	TIME	SAMPI DEPT	ED CASIN H DEPTI	G CA	VE-IN EPTH	DRILLI FLUID LE	NG EVEL	WAT LEVI	ER	THE A	TTAC	HED
<u> </u>	/// J.4.5 IRJA	7/24/07	9:55	41.5			40.4			Nor		SHEE	IS FOI	R AN
												EXPLA		
BORIN COMPI	G LETED: <b>7/24/0</b> 7											rermin		
DR: S	G LG: BR Rig: 91C											TE	IIS LO	G



AET JO	DB NO: 22-00081			LO	G OF	BO	RING N	0	ST-1	<u>45A</u>	(p. 1	2 of	2)
PROJE	CT: TCAAP Redevelopment; Arden	Hi	lls, MN										
DEPTH IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	мс	SA T	MPLE YPE	REC IN.	FIELI WC	& LAI	BORAT LL		rests ⁄6-#200
30 -	SAND WITH SILT, fine grained, light brown, a		COARSE ALLUVIUM	05		M		17					
31	little black, moist, medium dense, laminations of silt at 31 feet (SP-SM)		ALLO VION	25	Μ	Ŵ	SS	17					
32 —						ß							
33 -	SANDY SILT, light brown, moist, dense (ML)		FINE			¥.							
34 —			ALLUVIUM			묍							
35 —				50	М	М	SS	19					
36 —						Д							
37 -					:	<b>{</b> }							
38	SAND WITH SILT, a little gravel, medium to fine grained, brown, moist, very dense (SP-SM)		COARSE			<b>[</b> ]							
39	fine grained, brown, moist, very dense (SP-SM)		ALLUVIUM			[1]							
40				57	М	X	SS	22					
06/04	END OF BORING Northing=206685.1 Easting=554399.4												

TCA/ NE of	AP Rede <sup>.</sup> Highwa 1 Hills, N	valuation velopmen iy 10 and /linnesota		LOCATIC attached s	DN: N: ketch.	2060	671.5	99, E:	554897.200 S		
Elev.	ER: K							SCALE: 1" = 4			
		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2	2/07		SCA	LE: $1'' = 4$		
966.0	Depth feet 0.0		Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or No		
<u>965.5</u> - - 962.0	4.0	SM CL	SILTY SAND, trace of Roots, dark brown, mois (Topsoil) SANDY LEAN CLAY, trace of Gravel, brown, (Glacial Till)	H	10						
962.0	4.0	CL	SANDY LEAN CLAY, trace of Gravel, yellowi wet. (Glacial Till)	sh-brown, 	7						
 957.0	9.0	CL	SANDY LEAN CLAY, trace of Gravel, reddish	-brown	4		22	54	LL = 29 PI = 17		
955.0	11.0		moist, hard. (Glacial Till)		X 33						
		SM	SILTY SAND, fine- to medium-grained, trace o reddish-brown, moist, medium dense to dense. (Glacial Till)	-	46		6	25	NR Suspected Col or Boulder		
					32						
	26.0		END OF BORING.		32						
_			Water not observed with 24 1/2 feet of hollow-st in the ground. Boring then grouted.	tem auger – –		:					

LOG OF BORING

BRAUN™



## SUBSURFACE BORING LOG

AET JO				<u></u>	<u> </u>	LO	G OF	BORING NO.	ST-146	А (р.	1 of 2)
PROJE	CT: TCAAP Rede	velopme	nt; Ard	en Hills	s, MN					· · · · · · · · · · · · · · · · · · ·	
DEPTH IN FEET	SURFACE ELEVATION:	966.0			GEOLOGY	N	MC	SAMPLE RE TYPE IN		- r	FORY TEST
FEET	MATERIAL						IVIC	TYPE IN	· WC DE	N LL	PL %-#2
1	No samples taken in upper Boring ST-146	27', Refer	to Log of								
2								Į			
3 -											
4											
5								\$			
6 -								1			
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24 -											
25 -								E			
2-5 26							•	E			
~~~											
DEPT	TH: DRILLING METHOD			·····	LEVEL MEA					7	REFER TO
0-44	1/2' 3.25" HSA	DATE	TIME	SAMPLE DEPTH	D CASING DEPTH	CAV DEF	E-IN YTH	DRILLING FLUID LEVE	L LEVEL		ATTACHED
	· · · · · · · · · · · · · · · · · · ·	7/25/07	8:46	46.5	44.5	46	.0		None		TS FOR AN
BORIN	1										NATION O NOLOGY O
	3 ETED: 7/25/07										HIS LOG
DR: <b>SG</b>	LG: BR Rig: 91C			-		<u> </u>				L	



## SUBSURFACE BORING LOG

AET JO	OB NO:	22-00081				LC	G OF	во	RING N	io	ST-1	46A	(p.	<u>2 of</u>	2)
PROJE	CT:	TCAAP Redeve	lopment; Arde	n Hi	lls, MN										
DEPTH IN FEET		-			GEOLOGY	N	мс	SA	MPLE	REC	FIELD	& LA1	BORA	FORY 1	FESTS
FËÈT		MATERIAL DES				, IN	IVIC		TYPE	IN.	WC	DEN	LL	PL	<b>%-#2</b> 00
28 —	GRAV moist,	EL WITH SILTY SAM dense to very dense (G	ND, light brown, P)	<u>             </u>	COARSE ALLUVIUM	79	м	М	SS	19					
29 —				1 1 1 1 1 1 1 1				R							
30 —				¶		42	М	M	SS	10					
31 —								Д							
32 —				1 0 0				{}							
33 -								ł							
34				<u>*</u> **				ł							
35 —				# # #		57	м	M	SS	14					
36 -				0 0 0				И							
37 -				# # # #				ł							
38 — 39 —	SAND light br	, a little gravel, fine to r own, moist, dense (SP)	nedium grained,					Ł							
40 -	- 0	,						ŁТ М							
41 -						40	М	X	SS	17					
42 -	-							रि							
43 -	CDAT							ł							
44 —	fine gra (SP-SM	ELLY SAND WITH S lined, light brown, mois 1)	st, very dense					ł							
45 -	·					56	м	M	SS	18					
46 –								Δ		10					
	END ( Northin Easting	<b>DF BORING</b> g=206671.6 =554897.2													

Geotec TCAA NE of J	nical E P Rede Highwa	valuation velopmen	t Highway 96		DN: N: 206	006-16 ST-147 5638.252. E:555108.351 See
DRILLE	:R: К.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2/07	SCALE: 1" = 4'
Elev. feet 958.6	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	•	BPF WI	- Tests or Notes
958.1	9.0	SP	SILTY SAND, trace of Roots, dark brown, mo (Topsoil) SILTY SAND, fine- to medium-grained, trace reddish-brown, moist, medium dense. (Glacial Till) POORLY GRADED SAND, fine- to medium- trace of Gravel, light brown, moist, medium de dense. (Glacial Outwash) END OF BORING. Water not observed with 24 1/2 feet of hollow- in the ground. Boring then grouted.	grained, nse to very	20 22 28 28 22 52 34 38 53	Suspected Cobble or Bould

BRAUN



AET JO	DB NO: 22-00081				*****	LO	G OF	BORING N	10	ST-1	47A	(p.	1 of	2)
PROJE	CT: TCAAP Rede	velopme	nt; Ard	en Hil	ls, MN									
DEPTH	SURFACE ELEVATION: _	958.6			GEOLOGY	N	мс	SAMPLE TYPE	REC			BORAT	FORY	TESTS
DEPTH IN FEET	MATERIAL					N .	MC	TYPE	IN.	WC	DEN	LL	PL	6-#200
1 -	No samples taken in upper Boring ST-147	29.5', Refe	er to Log of	f										
2 -								ł						
3 –								ł						
4 -						1		ł						
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7 -								<b>{</b>						
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DEP	TH: DRILLING METHOD			WATE	R LEVEL MEA	ASURE	EMEN	TS	F	_1	<u> </u>	NOTE:	REFI	ER TO
0-44	1½' 3.25" HSA	DATE	TIME	SAMPL DEPT	ED CASING H DEPTH	CAV	/E-IN PTH	DRILLI FLUID LI	NG EVEL	WAT LEV		THE A		
U-44	1/2 J.43 NOA	7/24/07	2:20	45.5			5.4			Noi		SHEE	TS FO	R AN
														ON OF
BORIN COMPI	G LETED: <b>7/24/07</b>										]1			GY ON
DR: SO												TH	HIS LO	G



AET JO	DB NO: <u>22-00081</u>		LO	G OF	BOI	RING N	0	<u>ST-1</u>	<u>47A</u>	<b>(p.</b> )	<u>2 of (</u>	2)	
PROJE	TCAAP Redevelopment; Arden	Hi	lls, MN										
DEPTH			GEOLOGY	N	мс	SA	MPLE YPE	REC				FORY 7	r**
DEPTH IN FEET	MATERIAL DESCRIPTION	1 <u>11111</u>		14	1110		YPE	ĪN.	WC	DEN	LL	PL 1	⁄₀-#200
30	GRAVEL WITH SAND, brown, very dense (GP)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	COARSE ALLUVIUM	119	м	M	SS	16					
31 —		# # #				Д							
32 -						Į						1	
33 —						Į							
34 —		# <sup>0</sup> •		84/0.8		国							
35				84/0.8	м	М	SS	14				:	
36 —		<b>*</b> *				Д							
37 —						ł							
38 —	GRAVELLY SAND WITH SILT, medium to					H							
39	fine grained, brown, moist, very dense (SP-SM)		•	100/0.	\$	붬				ļ			
40					М	X	SS	8					
41			• •			प्ति							
42			•			H	:						
44 –						X							
45 -				62/0,5	M	K	SS	8					
	END OF BORING Northing=206638.3 Easting=555108.4												



## SUBSURFACE BORING LOG

AET JO	DB NO: 22-00081	<del>.</del> .					LO	GOF	BO	RING N	10.	ST-	148	(p. 1	of 2	3)
PROJE	CT: TCAAP Rede	velopme	nt; Arde	en Hill	ls, ľ	MN										
DEPTH	SURFACE ELEVATION:	957.9			CE/	OLOGY			SA	MPI F	REC	FIELD	)&LA	BORAT	ORY	rests
IN FEET	MATERIAL I		N .		UE	01001	N	мс	1	MPLE	IN.	wc	DEN	LL	PL	<b>%-#</b> 20
	6" Bituminous Pavement			/ 1	FILL	·			यि	SU						
1-	FILL, mostly gravelly silty	sand, brov	vn and ligh	t			26	М	X	SS	9					1
2 -	brown FILL, mixture of sandy lea	n clay clay	vev sand	1		1			Ħ							
3	and silty sand, a little grave	el, pieces of	f				17	М	M	SS	10	10				
4 —	bituminous, brown, gray, d little black	lark gray ar	id brown, a						团							
5 —	Intro Shaoh						20	М	М	SS	20					
6 -									Д							
7 -								<b>T</b>	M							
8							1	W	X	SS	14			1		
9 -									Þ		ļ					
10 -	ORGANIC CLAY, trace re	oots, black	and dark		SWA	MP OSIT	2	м	M	SS	21	26		1		
11 -	gray, soft (OL/OH) HEMIC PEAT, dark brown	n, a little or	ay.		, 1UL V		2	IVI	$\square$	50		182	1			
12 -	_laminations of lean clay (P	Ť)							P			1				
13 —	ORGANIC CLAY, trace revery soft (OL/OH)	oots, black,	soft to				2	М	X	SS	24	102				
14									B							
15 -							4	м	$\nabla$	SS	23	31				
16 -	SILTY CLAY, gray and bl	look yery c	off		FINE	3	1	M	$\mathbb{N}$	00	25	27				
17 -	laminations of silty sand (C	CL-ML)	011,		ALL	UVIUM			P							
18 -	CLAYEY SAND, a little g				TILL		2	М	IX	SS	16	18				
19 -	brownish gray, very soft to	very sum	(30)						A							
20 -									$\overline{\mathbf{N}}$	~~~	_					
21 -						I	1	M	Ŵ	SS	7	23				
22 –									3							
23 -									1							
24 -								1	KI KI	ł			1			
25 -																
26 -							18	M	Ň	SS	5	18				
20									1							
28 -									17							1
20 -									ば							
30 -	CLAYEY SAND, a little g	brown,						$\mathbb{K}$	1		10					
30 31 -	very stiff (SC)	2				20	M	X	SS	20	15		1			
DEP	TH: DRILLING METHOD			<u>/////</u> WATE	ER LE	EVEL MEA	SUR	I EMEN	TS	¥				NOTE	REF	ER TO
		DATE	TIME	1				VE-IN EPTH		DRILLI LUID LI	NG	WAT LEV	ER	THE		
0-3	9½' 3.25" HSA		<b>_</b>	SAMPLED CASING DEPTH DEPTH 9.0 7.0				FI	LUID L	EVEL			SHEE			
ļ	7/17/07 12:05					7.0	-	7.4				7		EXPLA		
BUDIN	7/17/07 12:45				5	34.5		5.7	+			33.	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	TERMI		
	BORING COMPLETED:         7/17/07         7/17/07         12:50					39.5	4	0.3				39.	.9		IIS LC	
DR: SC	G LG: SB/BRig: 91C						1									-



AET J	OB NO:	22-00081				LO	GOF	BO	RING N	10	ST-	148	(p. 2	of 2	)	
PROJE	ECT:	TCAAP Red	levelopment;	Arden	Hi	lls, MN										
DEPTH IN FEET						GEOLOGY	N	мс	SA	MPLE	REC		& LAI	BORAT	ORY 7	FESTS
FEET			L DESCRIPTION	,			IN	MC	1	TYPE	ĪN.	WC	DEN	LL	PL	<b>%-</b> #200
32 -	SAND brown	Y LEAN CLAY, a little brown, ve	a little gravel, dar rv stiff, lense of s	rk iltv					抖						, I	
33	\sand a	, a little brown, ve t 31.5' (CL)		/					ţ						r	
34	brown	EY SAND, a little , hard to firm (SC)	e gravel, trace roo	its,					म्							
35 -							36	w	X	SS	16	10				
36 37									/\ स्र							
38 -									打							
39 -	-								抖						ĺ	
40 -									$\forall$		10	14				
41							8	W	Ň	SS	19	11				
	END Northi	<b>OF BORING</b> ng=206425.9														
	Easting	g=554458.6														
				-												
						-										
													1			1
											L					<u> </u>

Brau		ect SP-0	6-05871	BORING	:		ST	-149
Geote TCAA NE of	cnical E AP Rede Highwa	valuation velopment	t Highway 96		ON: N	2063		47, E: 555391.606 See
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	1/07		SCALE: 1'' = 4'
Elev. feet 990.9	Depth feet 0.0		Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	Tests or Notes
989.9	1.0	FILL FILL FILL CL	FILL: Silty Sand, trace of Roots, moist. FILL: SANDY LEAN CLAY, trace of GRAVE light brown to dark brown, moist. FILL: Silty Sand, fine- to medium-grained, trace gravel, reddish-brown to grayish-brown, moist to SANDY LEAN CLAY, trace of Gravel, gray, we (Globaid Till)	e of 		₽		
_			(Glacial Till)		4		23	

Geotec TCAA NE of Arden	enical E P Redev Highwa Hills, N	linnesota	t Highway 96	attached s	DN: N			<b>9 (cont.)</b> 47, E: 555391.606 See
DRILLE		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	1/07		SCALE: 1'' = 4'
Elev. feet 958.9	Depth feet 32.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	Tests or Notes
939.9	38.0	CL SM	SANDY LEAN CLAY, trace of Gravel, reddish wet. SILTY SAND, fine- to medium-grained, trace of reddish-brown, moist, medium dense to hard.	of Gravel,	× 30 59 229		7	*50 blows for 6"

BRAUN



#### SUBSURFACE BORING LOG

AET J	OB NO: 22-00081	*******					LC	G OF	BO	RING N	10	ST-	150	(p. 1	of 1	)
PROJE	TCAAP Rede	evelopme	ent; Ard	en Hi	ills,	MN										
DEPTH IN FEET	SURFACE ELEVATION:	927.0			G	EOLOGY	N	мс	SA T	MPLE YPE	REC IN.	FIELI WC	) & LA DEN	BORAT		FESTS %-#200
I CEI	FILL, mostly sandy silt, su				FIL	L			7			7	DEN	1,1,1	114	10-#200
1 2 3	FILL, mixture of clayey sa little gravel, trace roots, gr brown						34 21	M M	X	SS SS	12 19					
4 -									团							
5	CLAYEY SAND, trace ro (SC) (possible fill)	oots, dark b	rown, firm		TO FIL	PSOIL OR L	7	М	M	SS	3	16				
7	CLAYEY SAND, a little g gray mottled, stiff (SC/CL	gravel, brov )	wn and ligh	t	TIL	.L	10	м	M	SS	16	17				
9 — 10 — 11 —	CLAYEY SAND, a little g gray, a little brown, stiff, h sand (SC/CL)	t brownish of silty				11	м	R	SS	21	18					
12 -								Ø								
13 -						14	м	X	SS	21	16					
14		1:41	1 1						图				1			
15 -	SANDY LEAN CLAY, a and dark brown, very stiff	(CL)	i, drown				16	м	X	SS	24	14				
16 – 17 –		•							/\ {{							
18									ł							
19 —									Ł							
20							16	м	M	SS	24	14				
21 — 22 —								1	/\ प्र							
22 -		1.41							<u>{</u>							
24 —	SANDY LEAN CLAY, a very stiff, lenses and lamin	nitile grave nations of s	and (CL)						ł							
25 -							23	м	M	SS	21	14				
26 –	END OF BORING	_////					Д									
	Northing=206182.3 Easting=552896.3															
DEP	TH: DRILLING METHOD					EVEL MEA			1					NOTE:	REFE	R TO
0-24	1½' 3.25'' HSA	DATE	TIME	SAMPI DEPT	LED FH	CASING DEPTH	CAV DE	/E-IN PTH	FL	ORILLI UID LE	NG EVEL	WAT LEVI	ER	THE A		
	7/6/07 2:10				5	24.5	20	5.5				Nor		SHEE EXPLA		
BORIN	BORING								-							JY OF
	BORING COMPLETED: 7/6/07 DR: SG LG: SB Rig: 91C								╞					TH	IIS LO	G



#### SUBSURFACE BORING LOG

AET J	OB NO: <b>22-00081</b>					LC	)g of	во	RING N	10	ST-	151	<b>(p.</b> 1	lof	1)
PROJE	ECT: TCAAP Red	evelopm	ent; Ard	en Hi	lls, MN										
DEPTH IN	SURFACE ELEVATION: _	922.3			GEOLOGY	N	MC	SA	MPLE TYPE	REC	FIELI	D&L/	ABORA	TORY	TESTS
FÊÊT	MATERIAL						IVIC		FYPE	IN.	WC	DEN		PL	<b>%-#2</b> 0
1 -	FILL, mixture of clayey s surface roots, trace roots,				FILL	24	М	M	SS	14	33				
2	CLAYEY SAND, a little brown, very stiff (SC)	gravel, trac	e roots,		TILL	18	М	$\left[ \right]$	SS	24	12				
4 -	SAND WITH SILT, fine t	o medium	grained, a		COARSE	-	-	B							
5 6	little gravel, brown, wet, n	nedium der	nse (SP-SM	)	ALLUVIUM	13	₩. W	M	SS	11					
7	SANDY LEAN CLAY, a	little grave	el, gray, a		TILL	_		E			18				
8 9	little reddish brown, firm t silty sand at 7.5' (CL)	o stiff, lam	linations of			5	M	Å И	SS	18					
10 11						7	М	M	SS	24	15				
12 —								E		_	16				
13 14						10	М	Ň	SS	24					
15 -								K			15				
16 -						10	M	Å	SS	21	15				
17 18								ł							
19 -	LEAN CLAY, brownish g to very stiff, laminations o	ray, a little f silt (CL)	gray, hard		FINE ALLUVIUM			Į				:			
20 -						33	М	$\overline{\mathbb{M}}$	SS	21	17				
21 22								/\ स							
23 -								ł							
24 –								<u>}</u>							
25 - 26 -						25	м	M	SS	24	25				
20	END OF BORING Northing=206254.2 Easting=553051.5										- 				
 DEP	TH: DRILLING METHOD			WATE	R LEVEL MEA	L ASURE	I Emen	LLI TS		1			NOTE:	REE	
0-24	1½' 3.25" HSA	DATE	TIME	SAMPL DEPT	ED CASING H DEPTH	CAV	Æ-IN PTH	I FL	ORILLIN UID LE	NG VEL	WATI LEVI		THE A		
U-4/1		7/9/07	9:35	6.5	4.5	+	.2				5.1		SHEET	rs foi	R AN
·····		7/9/07	10:00	26.5	24.5		5.4				Non	ie 1	EXPLA	NATIO	ON OF
BORING COMPL	G ETED: <b>7/9/07</b>						<u></u>					.  1	ERMIN	10L0(	gy on
DR: SC						····							TH	IS LO	G



### SUBSURFACE BORING LOG

AET JO	DB NO: 22-00081						LO	G OF	BOI	RING N	10	ST-	152	(p. 1	of 1	)
PROÆ	CT: TCAAP Rede	velopme	nt; Ard	en Hi	lls,	MN										
DEPTH	SURFACE ELEVATION:	942.0			GI	EOLOGY		мс	SĄ	MPLE YPE	REC		r	BORAT		I
IN FEET	MATERIAL I	DESCRIPTIC	N	<u></u>		<u></u>			1	YPE SU	IN.	WC	DEN	LL	PL	<b>%-#2</b> 00
1 –	5" Bituminous Pavement FILL, mostly sand with sil	t and grave	l brown	-∕├─	FIL	L	21	м	$\overline{\mathbb{N}}$	SS	5			1		
2	· · · ·	-	-				21	М	Д	33						
3	FILL, mixture of sandy lea sand, with gravel, brown a		clayey				16	м	M	SS	11					
4	, , , , , , , , , , , , , , , , ,	υ.							Д			15				
5 -						-			$\overline{\mathbb{N}}$							
6-							9	M	M	SS	5	16				
7 -									团							
8							7	М	M	SS	12	24				
9 —									Д			•				
10 -	SILTY SAND, fine graine	d, dark bro	wn, wet,			ARSE LUVIUM	_		[]							
11 -	very loose (SM) (possible	fill)				FILL	3	W	M	SS	14					
12 —	SAND WITH SILT, fine g	rainad bro	umich			ARSE		▼	E							
13 -	gray, waterbearing, mediu	m dense (Sl	P-SM)			LUVIUM	11	w	X	SS	13					
14	SILTY SAND, fine graine	d, gray, we	t, medium		-				E							
15 -	dense (SM)				-		15	w	X	SS	14					
16	CLAYEY SAND, gray, st	iff (SC)			TIL	L			Д			22				
17 -	CLAYEY SAND, a little g	gravel, gray	ish brown,						M	~~						
18 —	stiff (SC)						9	M	M	SS	21	17				
19 -	OLANDY SAND - 141-								मि						1	
20 —	CLAYEY SAND, a little g mottled, stiff (SC)	gravel, brov	vn and gra				12	М	X	SS	21	17				
21 -									Ц							
22 –							:		H							
23 -	SANDY LEAN CLAY, a	little grave	l, gray, stif	f ///					ł							
24	(CL)															
25 —							14	M	IX	SS	8	15	1			
26 –	END OF BORING			_{///	1				<u> </u>						-	
	Northing=206184.0									1						
	Easting=553397.6															
DEP	TH: DRILLING METHOD			WAT	ER L	EVEL MEA	1							NOTE	: REFI	ER TO
0-2-	4½' 3.25" HSA	DATE	TIME	SAMP	LED TH	CASING DEPTH	CA' DE	VE-IN EPTH	FI	DRILLI LUID LI	NG EVEL	WAT LEV	ER EL	THE	ATTA(	CHED
0-24	TIL U.AJ ILUIA	7/5/07	11:50	14.		12.0		2.5				12.			TS FO	
		7/5/07	12:10	26.	5	24.5	2	6.4				No	це			ON OF
BORIN COMPI	IG LETED: <b>7/5/07</b>						1			-						GY ON
DR: S	G LG: SB Rig: 91C		_	1										11 	HIS LC	



AET J	OB NO: <b>22-00081</b>						LO	G OF	BO	RING N	10	ST-	153	(p. 1	of	l)
PROJ	ECT: TCAAP Rede	velopme	nt; Arde	en Hi	ills,	MN										<u></u>
DEPTH	SURFACE ELEVATION:	951.2			GF	OLOGY	27	мс	SA	MPLE	REC	FIELI	) & LA	BORAT	(ORY	TESTS
IN FEET	MATERIAL I	DESCRIPTIC	)N		Ų.		N	MC	1	MPLE YPE	IN.	WC	DEN	LL	PL	<b>%-#20</b> 0
1 -	FILL, mostly gravelly silty cobbles, surface roots, trac				FILI	L	22	М	M	SS	12					
2 -	-								Д							
3 -	FILL, mixture of clayey sa clay, a little gravel, brown						25	М	X	SS	10	13				
4 -						to 4.5'			因							
5 -	SANDY LEAN CLAY, a l little gray, firm, lamination				Sandy 4.5' to	/ Lean Clay 7'	5	М	M	SS	17	20				
7-									R							
8 -	CLAYEY SAND, a little g stiff (SC)	ravel, brow	vn mottled,				12	М	M	SS	18	17				
9 -	CLANEN CANES - 1991		humanist						E							
10 -   11 -	CLAYEY SAND, a little g gray, a little brown, mottle laminations of silty sand (S	d, stiff, lens					12	М	X	SS	17	18				
12 -									B							
13 -	SANDY LEAN CLAY, a brownish gray and brown i	ittle gravel nottled, sti	l, light ff to very				14	м	M	SS	23	15				
14 -	stiff (CL)		2						Д							
15 -									$\mathbb{N}$		•					1
16 -	-						16	М	Ŵ	SS	23	15				
17 -	-								Ł							
18 -	-								ł							
19 -									Ľ							
20 -	-						30	М	$\mathbb{N}$	SS	22	13				
21 -									Å							
22 -									ł							
23 -	CLAYEY SAND, a little g								ł							
24 -	cobbles, dark grayish brow	ii lo drown	i, naru (SC				100/0.!		R							
25 -								M	И	SS	12	7	<u> </u>			
	END OF BORING															
	Northing=206179.7 Easting=553901.3															
DEI	PTH: DRILLING METHOD		· · · · · · · · · · · · · · · · · · ·	 WAT	ER L	EVEL MEA	l SURI	I EMEN	TS	1	<u> </u>	<u> </u>	- <u>I</u>	NOTE	I : REF	ER TO
	24½' 3.25" HSA	DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CAV	/E-IN PTH	FI	DRILLI LUID LI	NG EVEL	WA1 LEV		THE		
0-2	172 J.4J IJOA	7/5/07	11:05	25.		24.5	ļ	5.3				No	ne	SHEE	TS FO	R AN
																ON OF
BORIN COMP	NG LETED: 7/5/07												[]			GY ON
DR: S	G LG: SB Rig: 91C														HIS LO	



#### SUBSURFACE BORING LOG

AET JO PROJE		evelopm	ent: Ard	len Hill	s. MN	LO	G OF	BORING N	iO	ST-1	53A	(p.	<u>1 of</u>	2)
DEPTH IN FEET	SURFACE ELEVATION: MATERIAL	951.2	<u>}</u>		GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELI WC	) & LA DEN	BORAT LL	· · · · ·	TESTS %-#200
1 -	No samples taken in uppe Boring ST-153	er 29.5', Rei	fer to Log c	of				<u>{</u>						
2 -								ł						
3 –								ł						
4								ł						
5								ł						
6								Į –						
7 -								Į.						
8 -								Ŗ						
9-								<b>1</b>						
10 -								Ħ						
11								1						
12								F.		-				
13 -								F.						
14 15								{						
15 -								<b>A</b>						
10								Ħ						
18 -								{						
19 -								1						
20 -								¥						
21 -								<b>1</b>						
22								<b>X</b>						
23 -								Ħ						
24 -								Ħ						
25 —								¥						
26 -								1						
27 -								<b>[</b> ]						
28 -								¥						
29 -								FI						
DEPT	H: DRILLING METHOD				LEVEL MEA	F						OTE:	REFE	R TO
0-44½	2' 3.25'' HSA	DATE	TIME	SAMPLEI DEPTH	D CASING DEPTH	CAVE DEP1	E-IN FH	DRILLIN FLUID LEV	G /EL	WATE LEVE	R 7	HE A	TACI	-TED
		7/23/07	3:07	46.5	44.5	46.4	4			Non	, s	HEET		
RUDINIC	· · · · · · · · · · · · · · · · · · ·											(PLAN		
BORING COMPLE												RMIN		ł
DR: SG	LG: BR Rig: 91C				1	[						IHI	S LOG	·]



AET JO	DB NO: <u>22-00081</u>			LO	G OF	BOI	RING N	10	ST-1	53A	(p.	<u>2 of</u>	2)
PROJE		len Hi	lls, MN		r								
DEPTH IN FEET			GEOLOGY	N	MC	SA T	MPLE YPE	REC IN.		& LA			T[
FEET			TTI I						WC	DEN	LL	PL	<b>%-#</b> 200
30 -	SILTY SAND, a little gravel, fine to medium grained, brown, moist, very dense (SM)		TILL	73	М	M	SS	22			:		
31 -													
32						ł							
33 -	CLAYEY SAND WITH GRAVEL, brown,					Į							
34	moist, hard to very stiff, lense of silty sand, a little gravel at 46 feet (SC)					Ľ							
35 -				56	м	М	SS	20	11				
36						Д	55						
37 —						Į.							
38						划							
39 —						묍				1			
40 —				34	м	М	SS	24	9				
41 —				54	IVI	Δ	55		ĺ				
42 -						ł							
43						Ľ							
. 44 -			,			Ł							
45 -						Μ		24	9				
46				28	M	Μ	SS	24	9				
	END OF BORING Northing=206179.7 Easting=553901.3												

			6-05871	BORING	: ST	-154	RI-400	8-15
TCAA NE of	P Redev Highwa	valuation velopmen y 10 and Iinnesota	t Highway 96	LOCATIOn attached s	ON: N		4.030, E: 55440	
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	7/07	SCALE:	1'' = 4
Elev. feet 956.7	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
955.7	1.0	FILL 💥	FILL: Silty Sand, brown, moist.					
		FILL	FILL: Sandy Lean Clay, with Sand layer, brow brown and reddish-brown, moist.	n, dark - 	₩ 10 10 10 10 10 10 10 10 10 10 10 10 10			
eviations)				 	21			
of abbreviat - - - - - - - - - - - - -	0.0		With topsoil lense at 8 feet.	-	12			
	9.0	FILL XX	FILL: Sandy Lean Clay, trace of Gravel, brown	n, moist.				
uonanatu 945.7	11.0			·	8			
	16.0	SC	dark brown, wet. With Organic Clay layer at 15 1/2 feet. CLAYEY SAND, trace of Gravel, brown and g iron staining, wet, medium. (Lacustrine)					
928.7	28.0	CL	SANDY LEAN CLAY, trace of Gravel, brown staining, moist, stiff. (Glacial Till)	with iron	7 13			

LOG OF BORING

BRAUN"

Geote TCAA NE of	cnical E P Redev Highwa		t Highway 96		ON: N: 20	<b>RI-4008-15</b> 06184.030, E: 55440	
Arden DRILLI		<mark>linnesota</mark> Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/17/0	7 SCALE:	1"=4'
Elev. feet 924.7	Depth feet 32.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	Diff	BPF W	1	- <u></u>
919.7	37.0	SM	SANDY LEAN CLAY, trace of Gravel, brown staining, moist, stiff. (Glacial Till) (continued) SILTY SAND, fine- to medium-grained, trace reddish-brown, moist, dense. (Glacial Till)	-	15		
915.7	41.0		END OF BORING. Water not observed during drilling. Water not observed with 39 1/2 feet of hollow in the ground.		38		
_			Boring then grouted.	 - - -			
			н н н				
-							
_							

Brau		ect SP-00 valuation	5-05871	BORING		ST-157
TCAA NE of	P Rede Highwa	velopment	: Highway 96	LOCATI attached	ON: N: 20618 sketch.	85.157, E: 555395.351 Se
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/10/07	SCALE: 1" = 4
Elev. feet 995.9	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF WL	Tests or Notes
994.9	1.0	FILL	FILL: Silty Sand, trace of Roots, dark brown	n, moist.		
_		FILL	FILL: Sandy Lean Clay, mixed, light brown brown, moist.	to grayish - - - - -	12 7 12	
986.9	9.0	FILL XX				
_			FILL: Silty Sand, fine-grained, trace of Roo Sample Depth, brown to dark brown, moist.		9 7 6	
981.9	14.0	CL	SANDY LEAN CLAY, trace of Gravel, light brown, moist, medium to very stiff. (Glacial Till)	t brown to 	7	
_				 		
_				  	V 13	
	1				μ	

BRAUN™

LOG OF BORING

		ect SP-00	6-05871	BORING	:	ST	-157 (cont.)	)
TCAA NE of	AP Redev Highwa	valuation velopment y 10 and I Jinnesota	t Highway 96	LOCATIOn attached s	ON: N:		85.157, E: 555395	
ORILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	0/07	SCALE:	1'' = 4'
Elev. feet 963.9	Depth feet 32.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	₩	BPF	WL	Tests or N	lotes
		SM	SILTY SAND, fine-grained, reddish-brown, n to very dense.	noist, dense				
948.9	47.0		(Glaciofluvium)		38		*50 blows to for 5 suspected cobble c	" (set) r boulde
_		SP	POORLY GRADED SAND, fine- to medium- trace of Gravel, light brown, moist, very dense (Glacial Outwash)	grained,	88			
-					*		*50 blows for 4" (s	set)

Braun Pro Geotecnical I TCAAP Redo NE of Highw Arden Hills,	Valuation velopmen ay 10 and 1	t Highway 96	BORING: LOCATIC attached s	DN: N		2 <b>-157 (cont.)</b> 185.157, E: 555395.351 Se
	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	0/07	SCALE: 1" = 4
Elev. Depth feet feet 931.9 64.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or Notes
		<ul> <li>POORLY GRADED SAND, fine- to medium-gratrace of Gravel, light brown, moist, very dense. (Glacial Outwash) (continued)</li> <li>END OF BORING.</li> <li>Water not observed with 79 1/2 feet of hollow-stuin the ground.</li> <li>Boring then grouted.</li> </ul>		52 68 *		*50 blows for 6" (set)



#### SUBSURFACE BORING LOG

AET JO	DB NO: 22-00081						LO	GOF	BO	RING N	10	ST-	<u>158</u>	(p. 1	of 1	<u>)</u>
PROJE	CT: TCAAP Rede	velopme	nt; Ardo	en Hi	lls,	MN					<u></u>					
DEPTH	SURFACE ELEVATION:	955.5			GI	EOLOGY	N	мс	SĄ	MPLE YPE	REC		) & LA	r		r
IN FEET	MATERIAL I									YPE	IN.	WC	DEN	LL	PL.	<b>⁄₀-#200</b>
1	FILL, mixture of sandy lea and silty sand, surface root light brown and gray				FIL	L	26	М	M	SS	14	7				
3 -			Fill (Sand		lav)		35	м	M	SS	15	8				
4	<del>&lt;</del>		<mark>0' to 13'</mark>	,					Д							
5 -							-		Й	SS	18	14				
6							7	М	$\square$	33	10					
7 -									K							
8 -							12	М	X	SS	17	22				
9 -									E							
10 —							15	М	X	SS	19	15				
11 -							]		R		ĺ					
12 13							9	м	M	SS	15	19				
14 -	FILL, mixture of clayey sa clay, a little gravel, trace ro	oots, brown	and gray,													
15 —	a little black, lense of organ of sandy silt	nic clay, la	minations						$\left  \right\rangle$							
16 -							8	M	Ņ	SS	14	20				
17 —									R							
18 —							10	М	IX	SS	24	17				
19 —									E							
20 —							9	М	X	ss	20	19 24				
21 -	LEAN CLAY, trace roots,	eray and b	lack. stiff.		FIN	VE	-		E			24				
22 — 23 —	\lense of organic clay, lense	e of silty sa	nd (CL)	ſ	AL TII	LUVIUM	4	м	M	ss	24	19				
24 -	CLAYEY SAND, a little g	gravei, gray	, son (SC)													
25 -	SANDY LEAN CLAY, a	little gravel	, gray, a						$\left  \right $							
26 —	little brown, stiff, lamination	ons of lean	ciay (CL)				11	M	Ņ	SS	24	21				_
	END OF BORING Northing=206042.2															
	Easting=554402.2							1								
DEP	TH: DRILLING METHOD			WAT	I ER L	EVEL MEA	ASUR	EMEN	ITS	.ł.,		!		NOTE	: REF	ER TO
0-2-	4½' 3.25" HSA	DATE	TIME	SAMP	LED TH	CASING DEPTH	CA	VE-IN EPTH	F	DRILLI LUID L	ING EVEL	WA1 LEV	ER EL	THE .	ATTA	CHED
0-24	7/2 J.23 HOA	7/17/07	11:05	26.		24.5		6.5				No	_			R AN
																ON OF GY ON
BORIN COMP	G LETED: 7/17/07	<u></u>							+						NOLU HIS LO	
DR: S	G LG: SB/BRaig: 91C						<u> </u>					L			_~ ~ ~	·

Geotec TCAA NE of I	nical E P Rede Highwa	ect SP-06 valuation velopment vy 10 and I Ainnesota		BORING LOCATIC attached s	ON: N	: 20604	53.240 See	
DRILLE	R: M	Rowland	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	2/07	SCALE:	1'' = 4'
Elev. feet 959.4	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
933.4	26.0	FILL	FILL: Poorly Graded Sand with Silt, fine- to medium-grained, trace of Gravel, brown, mo waterbearing at 20' sample depth. (Lacustrine) Fill (Poorly graded s 0' to 26' END OF BORING. Water observed at 18 feet while drilling. Boring then grouted.	ist then		Σ		



#### SUBSURFACE BORING LOG

AET J	OB NO: <b>22-00081</b>						LO	G OF	BO	RING N	10	ST-	160	(p. 1	of	L)
PROJE	ECT: TCAAP Rede	velopme	ent; Ard	en Hi	ills, i	MN										
DEPTH IN FEET	SURFACE ELEVATION: MATERIAL	920.2	 ON		GE	OLOGY	N	мс	SA 1	MPLE YPE	REC IN.	FIELI WC	D & LA	BORA	ſ <u></u>	TESTS
1 -	FILL, mixture of silty sand little gravel, trace roots, su	and claye	y sand, a		FILI		24	м	М	SS	13	15				
2	FILL, mixture of sand with silty sand, a little gravel, tr	n silt, claye ace roots, l	y sand, and brown and				21	м	Ĥ	SS	23	10				
4	gray, possible cobbles								시 된							
5							11	м	M	SS	12	16				
7 –	LEAN CLAY WITH ORC	ANICS, tr	race roots.		TOP	SOIL OR			E							
8	black, firm (CL) SILTY SAND, trace roots	-			SWA DEP	AMP OSITS ARSE	8	М	X	SS	20	20				
10 -	gray, loose (SM) SILTY SAND, trace roots, waterbearing, very loose w	fine grain	ed, gray,			UVIUM	4	W/M	M	SS	14					
11 12	laminations of lean clay wi	ith sand (S	M)					Ţ	四							
13 -	SAND WITH SILT, fine g waterbearing, medium den	se (SP-SM	l)		•		11	w	X	SS	15					
14 ~	OLAVEN CAND - Bul-					,			图							
15 - 16 -	CLAYEY SAND, a little g stiff, laminations of silty sa	and at 26' (	, soft to SC)		TILI		4	М	X	SS	17	16				
17 —									Ł							
18 19																
20 -							11	М	M	SS	4	19				
21 22									LI LI							
23																
24 - 25 -							10	м	M	SS	22	16				
26 -	END OF BORING						10		Д	<u></u>						
	Northing=205865.8 Easting=553115.1															
DEP'	TH: DRILLING METHOD	·		WAT	ER LE	EVEL MEA	SURF	EMEN	TS		•			NOTE:	REFE	R TO
0-24	4½' 3.25" HSA	DATE		SAMPI DEPI		CASING DEPTH		/E-IN PTH	I FL	ORILLI UID LE	NG VEL	WAT LEVI	ER EL	THE A	TTAC	HED
		7/9/07	10:45	14.0		12.0		2.3				11.		SHEE		
BORIN	G	7/9/07	11:00	26.5	5	24.5	20	6.5				Non		EXPLA TERMIN		JN OF JY ON
COMPL DR: SC									+						IS LO	
DR: SC	J LU. DU KIE. 710		L				L		1.							



AET JO	DB NO: <b>22-00081</b>						LO	G OF	BOI	RING N	0	ST-	<u>161</u>	(p. 1	of	l)
PROJE	CT: TCAAP Rede	velopme	nt; Arde	n Hi	lls, MN											
DEPTH IN FEET	SURFACE ELEVATION: MATERIAL I	926.9 DESCRIPTIC	 )N		GEOLOG	GY	N	мс	SA T	MPLE YPE	REC IN.	FIELI WC	D&LA	BORAT	r	TESTS
1	FILL, mostly gravelly sand grayish brown	l with silt, l	light		FILL		15	М	M	SS	4					
2 - 3 -	FILL, mixture of sandy lea and silty sand, a little grave and brown	in clay, clay el, light bro	yey sand wnish gray				15	Μ	$\left[ \right]$	SS	20	12				
4 5	LEAN CLAY WITH SAN firm, laminations of organi	D, gray, a l	little black, silty sand		FINE ALLUVIU	лм	7	М	R	SS	5	13				
6 — 7 —	(CL) CLAYEY SAND, a little g	-			TILL				A E A			10				
8 9							10	М	R	SS	14	18				
10 – 11 –	CLAYEY SAND, a little g gray and brown mottled, st laminations of silty sand (S	iff to firm,	: brownish				9	М	K	SS	20	18				
12 — 13 —							8	М	X	SS	21	18				
14 15 16							12	М	R	SS	21	18				
17 — 18 — 19 —	CLAYEY SAND, a little g (SC)	ravel, dark	gray, stiff						Travara.							
20 - 21 - 22 - 23 -							13	М	X 44	SS	20	13				
24 — 25 — 26 —							14	М		SS	21	16				
	END OF BORING Northing=205683.9 Easting=553397.5		<u> </u>													
DEP	TH: DRILLING METHOD			WAT	ER LEVEL				TS					NOTE	REF	ER TO
0-24	1½' 3.25" HSA	DATE		DEP				E IN PTH	FL	ORILLI UID LI	NG IVEL	WAT LEV	EL	THE A		
		7/9/07	3:05	26.	5 24	.5	26	5.5				Noi				ON OF
BORIN	G LETED: <b>7/9/07</b>													ERMI	NOLO	GY ON
DR: SC														TI	HIS LO	)G

		ect SP-0		371	BORING			ST-162	
TCAA NE of	.P Rede <sup>.</sup> Highwa	valuation velopmen y 10 and dinnesota	ıt Highv	vay 96	LOCATIOn attached s	ON: N ketch.	20568	5.324, E: 55389	96.610 See
DRILLI		Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/3	3/07	SCALE:	1'' = 4'
Elev. feet 956.7	Depth feet 0.0	ASTM Symbol		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
955.7	29.0	SM CL CL	SAN to br stiff.	Y SAND, trace of Roots, dark brown, m (Topsoil) DY LEAN CLAY, trace of Gravel, yello own with rust lenses scattered, moist, me (Glacial Till) (Glacial Till) DY LEAN CLAY, trace of Gravel, reddis , rather stiff. (Glacial Till)	wish-brown dium to	7         9         13         14         15         16         13         14         15         16         13         14         15         16         11         12			

LOG OF BORING

BRAUN™

Geotec TCAA NE of	enical E P Redev Highwa	valuatio velopme	nt I Highway 96	BORING LOCATI attached	ON: N		<b>162 (cont</b> 5.324, E: 55389	<u> </u>
DRILLE		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/3	3/07	SCALE:	1'' = 4'
Elev. feet 924.7	Depth feet 32.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
923.7	33.0	SM	SILTY SAND, fine- to medium-grianed, trace reddish-brown, moist, dense. (Glacial Till)	-	35			
		SP	POORLY GRADED SAND, fine- to coarse-g brown, moist, dense. (Glacial Outwash)	rained,	40 M 40 M 40			
910.7	46.0		END OF BORING. Water not observed with 44 1/2 feet of hollow in the ground. Boring then grouted.	-stem auger - - - 				
-				- 				
- -								



#### SUBSURFACE BORING LOG

AET J	OB NO: <b>22-00081</b> ECT: <b>TCAAP Red</b>	evelonm	ent: Ar	len Hi	ille	MN	LC	)G OF	BO	RING N	10. <u> </u>	ST-	163	(p. 1	of	L)
DEPTH IN FEET		949.2	}			EOLOGY	N	мс	SA	MPLE YPE	REC IN.	FIELI	D&LA	BORAT		TESTS
1 - 2 -	7.5" Bituminous Pavemer FILL, mixture of sand wit clayey sand with gravel, b	h silt, silty	sand and brownish		FII	L	15	м	ł	SU SS	12					
3 — 4 —	gray FILL, mixture of clayey s clay, a little gravel, gray a	and and sai nd brown	ndy lean				19	М	M	SS	12	17				
5							15	М	$\square$	SS	8	13 16				
7 — 8 — 9 —					-		3	М	M	SS	8	18 20				
9 – 10 – 11 –							10	м	R	SS	15	17 20 18				
12 - 13 -							5	м	E	SS	7	19				
14	SAPRIC PEAT, black (PT ORGANIC CLAY, trace r (OL/OH)		, firm			'AMP POSIT	7	м	R	SS	20	159 35				
17 — 18 —	LEAN CLAY WITH SAN gray, firm, laminations of	ID, dark br sand (CL)	ownish		FIN AL	IE LUVIUM	5	М	R	SS	21	25				
19 20 21	CLAYEY SAND, a little g laminations of fine grained	ravel, gray sand (SC)	/, soft, )		TIL	L	3	W/M		SS	14	18	: - -			
22 23																
24 25 26							3	М	¥ X	SS	24	17				
	END OF BORING Northing=205683.4 Easting=554148.1	·														
I DEPT	TH: DRILLING METHOD	·		WATE	RL	EVEL MEA	SURE	MENT	LL ГS	[		I		I VOTE:	DEFF	
0.24	'⁄2' 3.25" HSA	DATE	TIME	SAMPL DEPT		CASING DEPTH	CAV			RILLIN	IG.	WATE LEVE		THE A		
0-24	<u>/2</u> J.23 NðA	7/2/07	1:55	26.5	+	24.5			гL		<u>اند ،</u>	Non		SHEET		
· · · · ·														XPLA	NATIC	ON OF
BORING COMPLI	; ETED: <b>7/2/07</b>												T	ERMIN		
DR: <b>SG</b> 06/04	LG: SB Rig: 91C													TH	IS LOO	3



AET JO	OB NO: 22-00081						LO	G OF	BOI	RING N	10	ST-	<u>164</u>	(p. 1	of 1	<u>1)</u>
PROJE	TCAAP Rede	velopme	nt; Ard	en Hi	lls,	MN										
DEPTH	SURFACE ELEVATION:	951.0			GI	EOLOGY	27		SA	MPLE	REC	FIELI	) & LA	BORAT	FORY	TESTS
IN FEET	MATERIAL I	DESCRIPTIC	DN				N	мс	T	MPLE YPE	IN.	wc	DEN	LL	PL	<b>⁄₀-#</b> 200
	4.25" Bituminous Pavemer				FIL	L			R	SU						
1 -	FILL, mixture of silty sand gravel, brown and gray	l and clayey	y sand with	1			19	M	М	SS	13	8				
2 -	SANDY LEAN CLAY, a	little gravel	, brownish		TIL	,L			$\square$			16				
3	gray and brown, stiff (CL)						15	М	M	SS	1			1		
4	•				to 8.	ean Clay .5'			因							
5 —		4					15	м	М	SS	12	14				
6 -							15	IVI	M	50	12	16				
7 -									ম							
8 -							9	М	IXI	SS	19	21				
9-	SILTY SAND, trace roots,					ARSE			Д							
10 -	brown and gray, moist, loo laminations of sand with si	se, lenses a	ind		AL	LUVIUM										
	SAND WITH SILT, fine g	rained, bro	wn and		-	:	4	W/M	IXI	SS	12					
11 -	gray, very loose, moist to v lean clay with sand (SP-SM		tions of						R							
12 -	CLAYEY SAND, a little g		, firm (SC)	5	TIL	L		м	М	SS	22					
13 -							6	М	Μ	33	22	19				
14 -									R							
15 -	CLAYEY SAND, a little g mottled, firm (SC)	gravel, gray	and brown				5	М	IXI	SS	18	17		1		
16 —									Ц							
17 —									1							
18 -	CLAYEY SAND, a little g	ravel, brov	vn. stiff	-\(//					Į							
19 —	(SC)	<b>,</b> ,	·, - ·						Ľ							
20 —									Μ		24	15				
21 -							11	M	M	SS	24					
22 -								1	Ł							
23 -		<u> </u>							ł							
24 -	CLAYEY SAND, a little g stiff (SC)	gravel, dark	gray, very						R							
25 -									K			1.0				
25 26							18	М	X	SS	24	15				
20 -	END OF BORING				4				<u>/.\</u>	<b> -</b>				+		
	Northing=205683.9															
	Easting=554395.9															
DEP	TH: DRILLING METHOD			WAT	ER L	EVEL MEA	SUR	EMEN	TS					NOTE	REF	ER TO
		DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CAT	VE-IN PTH	FI	DRILLI JUID LI	NG EVEL	WAT LEV	ER EL	THE A	ATTA(	CHED
0-2	4½' 3.25" HSA	7/5/07	10:00	26.		24.5		6.5				No		SHEE	TS FO	R AN
					-								-+	EXPLA	NATI	ON OF
BORIN	IG LETED: <b>7/5/07</b>								$\uparrow$					TERMI	NOLO	GY ON
DR: S									+-					T	HIS LO	G

ICAAP Redevelopment       attached sketch.         NE of Highway 10 and Highway 96       attached sketch.         Arden Hills, Minnesota       attached sketch.	Geoteo	nical E	valua	ation	6-05871				<b>RI-400</b>	
Elev. feet     Depth feet     ASTM 0.0     Description of Materials (ASTM D2488 or D2487)     BPF     WL     Tests or Notes       951.1     2.0     0.3     PAV     3 1/2" of Bituminous     7       951.1     2.0     CL     SANDY LEAN CLAY, trace of Gravel, brown, moist, medium to very stiff. (Glacial Till)     7       951.1     2.0     CL     SANDY LEAN CLAY, trace of Gravel, brown, moist, medium to very stiff. (Glacial Till)     8       940.1     13.0     ML     SIL7, reddish-brown, moist, medium dense. (Glaciofluvium)     13       940.1     13.0     ML     SIL7, reddish-brown, moist, medium dense. (Glaciofluvium)     23       935.1     18.0     SIL7, reddish-brown, moist, medium dense. (Glaciofluvium)     23       935.1     18.0     SIL7, reddish-brown, moist, medium dense. (Glaciofluvium)     23       935.1     18.0     SIL7, reddish-brown, moist, medium dense. (Glaciofluvium)     23       935.1     18.0     SIL7, reddish-brown, moist, medium dense. (Glaciofluvium)     39       930.1     23.0     SM     SILTY SAND, fine-grained, with Cobbles, reddish-brown, moist, dense. (Glacial Till)     39       927.1     26.0     END OF BORING.     39	NE of	Highwa	ıy 10	and l					, . <u>.</u>	
feet       ASTM       Description of Materials       BPF       WL       Tests or Notes         953.1       0.0       Symbol       (ASTM D2488 or D2487)       0       0       1/2" of Bituminous       0         951.1       2.0       TELL:       Silly Sand, fine-grained, brown, moist.       0       7       7         951.1       2.0       CL       SANDY LEAN CLAY, trace of Gravel, brown, moist, medium to very stiff.       7       8       13         951.1       2.0       CL       SANDY LEAN CLAY, trace of Gravel, brown, moist, medium to very stiff.       8       13         940.1       12.0       SILT, reddish-brown, moist, medium dense.       13       14         940.1       13.0       ML       II       SILT, reddish-brown, moist, medium dense.       24         940.1       13.0       ML       II       SILT, reddish-brown, moist, medium dense.       23         9351       18.0       SILT, reddish-brown, moist, medium dense.       22       22         930.1       23.0       SILT, reddish-brown, moist, dense.       39       39         931.1       18.0       SILT, reddish-brown, moist, dense.       39       39         931.1       24.0       SILT, reddish-brown, moist, dense.       39       3	DRILLE	ER: K.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	6/07	SCALE:	1"=4
951.1       2.0       FILL: Silty Sand, fine-grained, brown, moist.         951.1       2.0       CL       SANDY LEAN CLAY, trace of Gravel, brown, moist, medium to very stiff.         (Glacial Till)       7         940.1       12.0       Sandy Lean Clay 2.0 to 12         941.1       12.0       ML       SILT, reddish-brown, moist, medium dense.         940.1       13.0       ML       SILT, reddish-brown, moist, medium dense.         940.1       13.0       ML       SILT, reddish-brown, moist, medium dense.         940.1       13.0       ML       SILT, reddish-brown, moist, medium dense.         (Glacial Outwash)       24         935.1       18.0       ML       SILT, reddish-brown, moist, medium dense.         (Glacial Outwash)       23         935.1       18.0       ML       SILT, reddish-brown, moist, medium dense.         (Glacial Outwash)       23         930.1       23.0       SM       SILTY SAND, fine-grained, with Cobbles, redish-brown, moist, dense.         (Glacial Till)       39       39         927.1       26.0       END OF BORING.       39	feet	feet					BPF	WL	Tests or	Notes
951.1       2.0       CL       SANDY LEAN CLAY, trace of Gravel, brown, moist, medium to very stiff.       7	952.8	0.3	h	_K X X X						
medium to very stiff.       Glacial Till)       7         Sandy Lean Clay       8         Sandy Lean Clay       13         941.1       12.0         940.1       13.0         SP       POORLY GRADED SAND, fine-grained, reddish-brown, moist, medium dense. (Glacial Outwash)       24         935.1       18.0       ML         935.1       18.0       SILT, reddish-brown, moist, medium dense. (Glacial Outwash)       23         930.1       23.0       SM       SILT, reddish-brown, moist, dense. (Glacial Outwash)       22         930.1       23.0       SM       SILT, reddish-brown, moist, dense. (Glacial Till)       22         930.1       23.0       SM       SILTY SAND, fine-grained, with Cobbles, reddish-brown, moist, dense. (Glacial Till)       39         927.1       26.0       END OF BORING.       39	951.1	2.0			The state state in the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of					
941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         941.1       12.0         91.1       SP         POORLY GRADED SAND, fine-grained, reddish-brown, moist, medium dense. (Glacial Outwash)         23       23         935.1       18.0         ML       II         SILT, reddish-brown, moist, medium dense. (Glaciofluvium)         22       22         930.1       23.0         SM       II         SILTY SAND, fine-grained, with Cobbles, reddish-brown, moist, dense. (Glacial Till)         927.1       26.0         END OF BORING. </td <td>-</td> <td></td> <td>CL</td> <td></td> <td>medium to very stiff.</td> <td>moist, —</td> <td>7</td> <td></td> <td></td> <td></td>	-		CL		medium to very stiff.	moist, —	7			
20 to 12       13         941.1       12.0         940.1       13.0         ML       SILT, reddish-brown, moist, medium dense. (Glaciofluvium)       24         940.1       13.0         SP       POORLY GRADED SAND, fine-grained, reddish-brown, moist, medium dense. (Glaciofluvium)       23         935.1       18.0       SILT, reddish-brown, moist, medium dense. (Glaciofluvium)       23         930.1       23.0       SILT, reddish-brown, moist, medium dense. (Glaciofluvium)       22         930.1       23.0       SILT, reddish-brown, moist, dense. (Glacial Till)       22         930.1       23.0       SILTY SAND, fine-grained, with Cobbles, reddish-brown, moist, dense. (Glacial Till)       39         927.1       26.0       END OF BORING. Water not observed with 24 1/2 feet of hollow-stem auger in the ground.       39	-		4 4		Sandy Lean Clay		8			
941.1       12.0       III. SILT, reddish-brown, moist, medium dense. (Glaciofluvium)       24         940.1       13.0       ML       SILT, reddish-brown, moist, medium dense. (Glaciofluvium)       24         POORLY GRADED SAND, fine-grained, reddish-brown, moist, medium dense. (Glacial Outwash)       23         935.1       18.0       SILT, reddish-brown, moist, medium dense. (Glaciofluvium)       23         935.1       18.0       SILT, reddish-brown, moist, medium dense. (Glaciofluvium)       22         930.1       23.0       SILTY SAND, fine-grained, with Cobbles, reddish-brown, moist, dense. (Glacial Till)       22         927.1       26.0       END OF BORING. Water not observed with 24 1/2 feet of hollow-stem auger in the ground.       39	-					_	13			
941.1       12.0       III. SILT, reddish-brown, moist, medium dense. (Glaciofluvium)       24         940.1       13.0       ML       SILT, reddish-brown, moist, medium dense. (Glaciofluvium)       24         POORLY GRADED SAND, fine-grained, reddish-brown, moist, medium dense. (Glacial Outwash)       23         935.1       18.0       SILT, reddish-brown, moist, medium dense. (Glaciofluvium)       23         935.1       18.0       SILT, reddish-brown, moist, medium dense. (Glaciofluvium)       22         930.1       23.0       SILTY SAND, fine-grained, with Cobbles, reddish-brown, moist, dense. (Glacial Till)       22         927.1       26.0       END OF BORING. Water not observed with 24 1/2 feet of hollow-stem auger in the ground.       39	-									
940.1       13.0       ML       SIL T, reddish-brown, moist, medium dense. (Glaciofluvium)       24         900.1       SP       POORLY GRADED SAND, fine-grained, reddish-brown, moist, medium dense. (Glacial Outwash)       23         935.1       18.0       XIL T, reddish-brown, moist, medium dense. (Glaciofluvium)       23         935.1       18.0       XIL T, reddish-brown, moist, medium dense. (Glaciofluvium)       22         930.1       23.0       XIL T, reddish-brown, moist, medium dense. (Glacial fluvium)       22         930.1       23.0       XIL T, reddish-brown, moist, dense. (Glacial Till)       23         927.1       26.0       XIL TY SAND, fine-grained, with Cobbles, reddish-brown, moist, dense. (Glacial Till)       39         927.1       26.0       XIL TY SAND, fine-grained, with 24 1/2 feet of hollow-stem auger in the ground.       39	-					_	× 19			
940.1       13.0       111       (Glaciofluvium)       24         SP       POORLY GRADED SAND, fine-grained, reddish-brown, moist, medium dense. (Glacial Outwash)       23         935.1       18.0       23         935.1       18.0       111       SIL T, reddish-brown, moist, medium dense. (Glaciofluvium)       22         930.1       23.0       ML       SIL T, reddish-brown, moist, dense. (Glacial Till)       22         930.1       23.0       SM       SIL TY SAND, fine-grained, with Cobbles, reddish-brown, moist, dense. (Glacial Till)       39         927.1       26.0       END OF BORING. Water not observed with 24 1/2 feet of hollow-stem auger in the ground.       39	941.1	12.0	<b>N</b> .AT		CH T raddish brown work and the last					
935.1     18.0     Imoist, medium dense. (Glacial Outwash)     23       935.1     18.0     Imoist, medium dense. (Glaciofluvium)     23       930.1     23.0     Imoist, reddish-brown, moist, medium dense. (Glaciofluvium)     22       930.1     23.0     Imoist, reddish-brown, moist, medium dense. (Glaciofluvium)     22       930.1     23.0     Imoist, reddish-brown, moist, medium dense. (Glaciofluvium)     22       930.1     23.0     Imoist, reddish-brown, moist, dense. (Glacial Till)     Imoist, dense. (Glacial Till)     39       927.1     26.0     Imoist, BORING. Water not observed with 24 1/2 feet of hollow-stem auger in the ground.     39	940.1	13.0			(Glaciofluvium)		24			
935.1       18.0       Image: state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the stat			51		moist, medium dense.	sh-brown, _				
ML ML SILT, reddish-brown, moist, medium dense. (Glaciofluvium) 22 930.1 23.0 SM SILTY SAND, fine-grained, with Cobbles, reddish-brown, moist, dense. (Glacial Till) 39 927.1 26.0 END OF BORING. Water not observed with 24 1/2 feet of hollow-stem auger in the ground.	. :					_	23			
930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         930.1       23.0         927.1       26.0         930.1       END OF BORING.         Water not observed with 24 1/2 feet of hollow-stem auger         1       1	935.1	18.0								
930.1 23.0 930.1 23.0 SM SILTY SAND, fine-grained, with Cobbles, reddish-brown, moist, dense. (Glacial Till) 927.1 26.0 927.1 26.0 END OF BORING. Water not observed with 24 1/2 feet of hollow-stem auger in the ground. 939			ML		SILT, reddish-brown, moist, medium dense. (Glaciofluvium)	_				
SM       SILTY SAND, fine-grained, with Cobbles, reddish-brown, moist, dense. (Glacial Till)		ľ					22			
SM       SILTY SAND, fine-grained, with Cobbles, reddish-brown, moist, dense. (Glacial Till)	930 1	23.0				-				
927.1     26.0     11.1       END OF BORING.     Water not observed with 24 1/2 feet of hollow-stem auger in the ground.		~~.v	SM		reddish-brown, moist, dense.	_				
END OF BORING. Water not observed with 24 1/2 feet of hollow-stem auger in the ground.	927.1	26.0					39			
					Water not observed with 24 1/2 feet of hollow-sta	em auger	Y			
						_				
						-				

LOG OF BORING

BRAUN



AET JO	DB NO: 22-00081						LO	G OF	BOI	RING N	0	ST-	166	(p. 1	of 1	)
PROJE	CT: TCAAP Rede	velopme	nt; Arde	en Hi	<u>lls, I</u>	MN										
DEPTH IN FEET	SURFACE ELEVATION:	955.0			GEO	OLOGY	N	мс	SA	MPLE YPE	REC	┣────	) & LA	BORAT	ORY '	TESTS
FEET	MATERIAL I	DESCRIPTIC	DN				1	MC	Т		IN.	wc	DEN	LL	PL	<b>%-#</b> 20(
	4.75" Bituminous Pavemer				FILL	, 1			H	SU						
	FILL, mostly gravelly sand (possible base)						19	М	Д	SS	3					
3 -	SANDY LEAN CLAY, a l grayish brown, a little light	t brown, sti				THERED	11	М	M	SS	7	14				
4	stiff, laminations of sandy	silt (CL)	·		TILL			•	Д							
5									M		00					
6 -							16	М	Ŵ	SS	20	15				
7	SANDY LEAN CLAY, a l	little gravel	. light	-\//	TILL				R							
8 —	grayish brown, a little brow very stiff, laminations of si	vn and ligh	nt brown,	. ///			20	М	IXI	SS	18	15				
9 -	(CL)	nty sanu an	iu sanuy sh						E			15		8		
10 -							23	м	М	SS	21	15				
11 -									Д							
12 -									M			15				
13 -			-				20	М	Ŵ	SS	17					
14									R							
15 -							19	М	IXI	SS	21	15			1	
16 -									F							
17 – 18 –									Į							
19	CLAYEY SAND, a little g cobbles, brown, a little ligh	ravel, poss	sible a gray, hard						Į.							
20	(SC)		· 6						K			1.1				
20							88	¥	X	SS	14	13				
22 -								_	ব্রি							
23 -	CAND a little group 1	ium to for-	amain ad			RSE			ł				1			
24 -	SAND, a little gravel, med brown, waterbearing, dense	e (SP)	; gramed,			UVIUM			ł							
25 -							4.1	w	$\square$	SS	24		-			
26 —	SILTY SAND, fine graine	d. brown, v	vet, dense		-		41	~~~~	$\square$	55	24	<u> </u>				<u> </u>
	(SM)	-,													1	
	END OF BORING Northing=205683.0															
DEP	Easting=555397.1 TH: DRILLING METHOD			WAT	I ER LE	EVEL MEA	SURI	I. EMEN	TS	L.,,	<b></b>	"I		NOTE:	REFI	ER TO
		DATE	TIME	SAMPI DEP	LED	CASING DEPTH	CAN	/E-IN PTH	[] FI	DRILLI JUID LI	NG EVEL	WA1 LEV	ER	THE A		
0-24	1½' 3.25" HSA	7/5/07	8:35	26.		24.5		4.1	1			21.		SHEE	TS FO	R AN
														EXPLA		
BORING COMPL	G ETED: <b>7/5/07</b>												]1	TERMI		
	G LG: SB Rig: 91C													Tł	HIS LC	)G



AET JO	DB NO: 22-00081						LO	G OF	BO	RING N	10	ST-	167	(p. 1	of 1	
PROJE	CT: TCAAP Rede	velopme	nt; Arde	<u>n Hi</u>	lls,	MN										
DEPTH	SURFACE ELEVATION:	945.0			GE	OLOGY	N	мс	SA	MPLE YPE	REC			BORAT		
DEPTH IN FEET	MATERIAL I		N	····							IN.	WC	DEN	LL	PL	<b>%-#</b> 200
1	5.75" Bituminous Pavemer			/	FILI				M	SU						
2	(possible base)			/			20	M	Щ	SS	8					
3	FILL, mixture of clayey sa and silty sand, a little grave	nd, sandy le el. brown ar	ean clay 1d grayish				9	м	M	SS	3	9				
4	brown	,							Д							
5	SANDY LEAN CLAY, a	ittle gravel	, grayish			ATHERED			M			15				
6	brown, firm (CL)				TIL	L	8	M	IXI	SS	12					
7 –				_\///					Ø							
8 -	SANDY LEAN CLAY, a firm, lenses and lamination	little gravel is of organi	, gray, c clay and				5	м	M	SS	9	20				
9	sand (CL)								Д							
10	CLAYEY SAND, gray, a	little brown	, soft (SC)						M			24				
11 -	CLAYEY SAND, a little g	ravel, gray	, a little		TIL	L	3	М	Ŵ	SS	15	24				
12 -	brown, soft, laminations of	-							R							
13	SANDY LEAN CLAY, a soft (CL)	inale gravel	, drown,				4	M	X	ss	20	22				
14 -									F							
15 -	SANDY LEAN CLAY W	ITH GRAV	/EL, gray,						$\overline{\mathbb{N}}$	SS	17	19				
16	stiff (CL)						9	М	$\square$	00	11	19				
17 -									<b>∦</b>							
18 -	CLAYEY SAND, a little g	ravel grav	stiff (SC)						H							
19 -		,ruver, gruj	, 5000 (50)						团							
20 -							9	WA	ſŊ	SS	19	16				
21 —								<b>T</b>	ĺΔ							
22 -									H							
23 -									H							
24 -									1							
25							13	М	$\mathbb{N}$	SS	22	15			1	
26 -			· <u></u>		4				1				<u> </u>			-
	END OF BORING Northing=205551.6															
	Easting=553796.8															
DEF	PTH: DRILLING METHOD			WAT	TER L	EVEL MEA	SUR	EMEN	ITS					NOTE	: REF	ER TO
	41/1 2 354 376 4	DATE	TIME	SAMP DEP	LED	CASING DEPTH	CA	VE-IN EPTH	۲ F	DRILL LUID L	ING EVEL	WA1	TER TEL	THE	ATTA	CHED
0-2	4½' 3.25" HSA	7/2/07	8:40	21.		19.5		1.5				21			TS FC	
	. <u> </u>	7/2/07	8:45	26		24.5	2	26.5				No	пс			ON OF
BORIN COMP	NG LETED: 7/2/07															GY ON
	G LG: SB Rig: 91C				_				1					T:	HIS LO	JG



#### SUBSURFACE BORING LOG

AET JO	DB NO: 22-00081						LC	G OF	BO	RING N	10	ST-	168	(p. 1	of 1	)
PROJE	CT: TCAAP Rede	velopme	ent; Arde	en Hi	ills,	MN										
DEPTH IN	SURFACE ELEVATION:	947.2			GE	EOLOGY	N	мс	SA	MPLE	REC	<u> </u>	) & LA	BORAT	ORY '	rests
FEET	MATERIAL		ON								IN.	WC	DEN	LL	PL	%-#200
1 -	10.5" Bituminous Paveme				FILI	L			国	SU						
2 -	FILL, mostly gravelly san							М	Щ	SS	8					
3	FILL, mostly sandy lean c trace roots, gray and brow			,			5	м	M	SS	14	19				
4 -	SANDY LEAN CLAY, tr	ace roots, l	ight		TILI	ATHERED L			Д			16				
5 –	∣ brownish gray and light gr ∖of silt (CL)	ay, firm, la	minations		TIL	Ĺ			М			14				
6 -	SANDY LEAN CLAY, a	little grave	l, trace				15	М	IXI	SS	17	15				
7-	roots, light brownish gray, to very stiff, laminations o	f silt (CL)	it gray, sum						E							
8-							20	м	М	SS	19	16				
9-						-	20	IVI	Δ	55						
-									R		· · · ·					
10 -							21	M	IXI	SS	14	14				
11 -	: چ.								R			14				
12 -	* SANDY LEAN CLAY, a brownish gray, a little brown	little grave	l, light				10		$\square$	SS	18	16				
13 -	a laminations of silty sand (	CL)	11,				18	М	M	22	10					
14	CLAYEY SAND, a little g	mavel grav	vish brown						R	-						
15 -	a little brown, very stiff (S		ISH DIOWH,				29	М	X	SS	12	14				
16 -									$\square$							
17 —	CLAYEY SAND, a little g	gravel, brov	vn, very						M							
18 -	_stiff (SC)						21	М	M	SS	17	15				
19			_						团							
20 -	SANDY LEAN CLAY, a very stiff (CL)	little grave	l, brown,				24	М	Х	SS	19	16				
21 -	•								Ê						1	
22 –									Ł				·			
23 -	GRAVELLY SAND, med	ium graine	d, brown,			ARSE			Į							
24 —	moist, medium dense (SP)	U			ALI	LUVIUM			1							
25 -							16	м	Μ	SS	6					
26 –							10	141	Μ	50						
	END OF BORING Northing=205519.6															
	Easting=554022.3				ł											
DEP	TH: DRILLING METHOD	1		_  ₩∆⊤	 ER U	EVEL MEA	SURT		 TS		i		<u> </u>		h.	
		DATE	TDC		·					ORILLI	NG	WAT	ER	NOTE: THE A		
0-24	1½' 3.25" HSA	DATE	TIME	SAMPI DEPT		CASING DEPTH		/E-IN PTH	FL	UID LE	VEL	LEVI	EL	SHEE		
	<u></u>	7/2/07	11:20	26.	5	24.5	20	6.5	1	<u> </u>		Nor		EXPLA		
BORIN	G ETED: <b>7/2/07</b>						1							ſERMI		
COMPL DR: SC					-+				-			<u></u>		TH	IIS LO	G



AET JO	OB NO:	22-00081						LO	G OF	BOI	RING N	10	ST-	<u>169</u>	(p. 1	of 1	l)
PROJE	ECT:	TCAAP Rede	velopme	nt; Ard	en Hi	lls,	MN				·······						<u> </u>
DEPTH	SUR	FACE ELEVATION:	948.1	r		GI	EOLOGY	N	мс	SA	MPLE YPE	REC		) & LA			1
DEPTH IN FEET	1	MATERIAL I		DN				14				IN.	WC	DEN	LL	PL	%-#200
1 -		'Bituminous Paveme				FIL	L			国	SU						1
2 -	clayey	mixture of sand wit sand with gravel, br	rown			-		28	М	Ж	SS	11	7				
3 -		mixture of sand with one with gravel, brow						26	w	M	SS	6					
4 -				1						E							
5 -	and si	mixture of sandy leastly sand, a little grave	in clay, clay el, gray and	yey sand I brown			:	16	М	M	SS	12	13				
6 7										E							
8-	~							9	М	M	SS	12	17				
9 -	-									E							
10	ORG/	NIC CLAY, a little	gravel, tra	ce roots,			AMP	14	М	X	SS	19	39				
12	gray,	very stiff to soft (OL	/OH)			I DEI	POSIT			मि			24				1
13 -	SANE (CL/S	)Y LEAN CLAY, a C)	little grave	l, gray, sof	ì 💋	TIL	L	3	М	X	SS	20	22				
14	SANE	Y LEAN CLAY, a	little grave	l, gray, a						Ø							
15 —		rown, stiff, laminatio	ons of silty	sand (CL)				15	м	X	SS	18	17				
16 17										सि							
18 -										Į							
19 —	}							-		ł							
20 —								14	М	M	SS	19	16				
21 -										Д	~~						
22 –										X		1					
23 -										ł							
24 -	]									범							
25 26								14	M	X	SS	22	20				
	Northi	OF BORING ng=205580.7 g=554087.9				4											
DEP	<u> </u> лтн: г	RILLING METHOD		<u> </u>	 WAT	 ER L	EVEL MEA	I SURI	EMEN	ITS		1	<u> </u>	<u> </u>	NOTE		
			DATE	TIME	SAMP		CASING DEPTH	1	VE-IN PTH		DRILLI	NG	WAT LEV		THE		
0-2	4½' 3	.25" HSA	7/2/07	12:20	26.		24.5		6.5				Noi		SHEE	TS FO	R AN
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			-		<u> </u>		1-					EXPLA	NATI	ON OF
BORIN	IG LETED:	7/2/07	-								-			]]			GY ON
DR: S															TI	HIS LO	)G



TCAAP Redevelopment; Arden Hills, MN         DEPTH IN FEET       SURFACE ELEVATION:949.7       GEOLOGY       N       MC       SAMPLE TYPE       FIELD & LABORATOR         DEPTH IN FEET       SURFACE ELEVATION:949.7       GEOLOGY       N       MC       SAMPLE TYPE       FIELD & LABORATOR         0       6.25" Bituminous Pavement FILL, mixture of sand with silt and gravel and clayey sand, brown and brownish gray       FILL       H       SU       H       M       SS       4         2       FILL, mixture of clayey sand and sandy lean 3 - clay, a little gravel, light brownish gray, gray and a little brown       9       M       SS       6       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       15       16       16 <th>Y TESTS L %-#200</th>	Y TESTS L %-#200
DEFINATION:       SURFACE ELEVATION:       949.7       GEOLOGY       N       MC       SAMPLE TYPE       REC IN.       WC       DEN       LL       F         1       -       6.25" Bituminous Pavement       FILL, mixture of sand with silt and gravel and clayey sand, brown and brownish gray       FILL       III       IIII       III       III       III       III       III       IIII       IIIIII       IIIIIII       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	
FEE1     MATERIAL DESCRIPTION       1     6.25" Bituminous Pavement       1     FILL, mixture of sand with silt and gravel and clayey sand, brown and brownish gray       2     FILL, mixture of clayey sand and sandy lean       3     clay, a little gravel, light brownish gray, gray and a little brown       4     9       5     15	L %-#200
1     FILL, mixture of sand with silt and gravel and clayey sand, brown and brownish gray     14     M     SS     4       2     FILL, mixture of clayey sand and sandy lean 3 - clay, a little gravel, light brownish gray, gray and a little brown     9     M     SS     6     15       4     -     5     -     15     15	
2       clayey sand, brown and brownish gray       14       M       X       SS       4         3       -       clay, a little gravel, light brownish gray, gray and a little brown       9       M       X       SS       6       15         4       -       -       -       -       -       -       -       -       15       -	
3 -       clay, a little gravel, light brownish gray, gray and a little brown       9       M       SS       6       15         4 -       -       -       -       15       15	
4 – a little brown 5 – 1 15 115	
	1
11 LEAN CLAY WITH ORGANICS, trace roots, TOPSOIL 6 M SS 12 23	
12     black, firm (CL)       12     SILTY SAND, fine grained, gray and brown	
13 -  mottled, wet, medium dense (SM) $11 - COARSE = 11 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12 - COARSE = 12$	
15 – SANDY LEAN CLAY, a little gravel, gray, a little brown, firm, laminations of silty sand (CL)	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
18 - CLAYEY SAND WITH GRAVEL, gray, a little	
19 – brown, stiff, laminations of silty sand (SC)	
20 - 13 M SS 21 17	
21 - 13 M X SS 21 17	
23 CLAYEY SAND, a little gravel, gray, stiff (SC)	
25 - 11 M  SS 5 17	
END OF BORING Northing=205558.5	
Easting=554273.5	
DEPTH: DRILLING METHOD WATER LEVEL MEASUREMENTS NOTE: R	FER TO
DATE TIME SAMPLED CASING CAVE-IN DRILLING WATER THE AT	
0-24 <sup>1</sup> / <sub>2</sub> ' 3.25" HSA DATE TIME DEPTH DEPTH DEPTH FLUID LEVEL LEVEL THE SHEETS	FOR AN
7/2/07 2:55 26.5 24.5 26.5 None EXPLANA	TION OF
BORING COMPLETED: 7/2/07	LOGY ON
DR: SG LG: SB Rig: 91C THIS	LOG
06/04	



AET JO	OB NO: 22-00081						LC	OG OF	BO	RING N	10	ST-	171	(p. 1	of 1	)
PROJE	CT: TCAAP Red	evelopme	nt; Ard	en Hi	lls,	MN		_								
DEPTH IN FEET	SURFACE ELEVATION:	915.0			G	EOLOGY	N	мс	SA	MPLE YPE	REC			BORAT	ORY 1	<b>FESTS</b>
FEET	MATERIAL		ON					MC			IN.	WC	DEN	LL	PL '	<b>%-#200</b>
1 –	3.25" Bituminous Paveme FILL, mostly sand with si		brown		FIL	L,	21	м	$\mathbb{N}$	SU SS	14					
2 -					ļ		21	IVI	Д	55	14					
3	FILL, mixture of sandy le sand, a little gravel, light	an clay and	clayey vn to light			-	11	м	М	SS	8	14				
4	brownish gray	51491011010	in to ngin				11	147	Ш	55		10				
5 -									图							
6-							4	М	IXI	SS	16	16				
7-									মি							
8							5	-	М	SS	17	20				
9_	SAND, a little gravel, med	lium to fine	grained,		TO	PSOIL OR	5	<b>_</b>	Д	88		18				
	brown, waterbearing, loos	e (SP)		-/ <del>.</del>		ARSE LUVIUM			K				1			
10 -	SILTY SAND, fine graine very loose, lenses and lam	inations of	organic sil	5, [+].;} t [:]:;			3	W	X	SS	19					
12 -	and sand (SM)								R							
12 -	CLAYEY SAND, a little gray, very soft, lenses of v	gravel, trace	e roots, g sand with		TIL	L	1	М	М	SS	22	18				
13	silt (SC)	, ator o our mi	5 build in itil				1		Δ	00						
14	SANDY LEAN CLAY, a	little grave	l. grav. a 2'	· ////					R							
	thick fine grained sand ler	ises at 15.6	., 8, ,				5	М	XI	SS	24	19				
16									H							
17 -									ţ							
18 -									Ł							
19 -									벋							
20 -							11	М	X	SS	17	17				
21 -	.**								H							
22 -									Ł				·			
23 -									ł							
24 -									붬							
25 -							12	M	X	SS	23	19				
26 -	END OF BORING		· · ·		1				Р			-			<u> </u>	
	Northing=205644.7												1			
	Easting=553192.7															
DEPT	TH: DRILLING METHOD			WAT	ER L	EVEL MEA	SURI	EMEN	TS					NOTE:	REFF	R TO
0-24	4½' 3.25" HSA	DATE	TIME	SAMPI DEP1	LED H	CASING DEPTH	CAV	VE-IN PTH	I FL	ORILLI UID LE	NG EVEL	WAT LEVI	ER EL	THE A	TTAC	HED
0-24	7 <u>2</u> 5.25 H5A	7/6/07	12:50	11.		9.5		0.5	1			8.6		SHEE	rs foi	R AN
		7/6/07	1:05	26.		24.5		6.4				Nor	ie	EXPLA	NATIO	ON OF
BORING COMPL	G LETED: <b>7/6/07</b>	1											]	FERMI	10L00	GY ON
	G LG: SB Rig: 91C	1												TH	IIS LO	G

Geotecnical TCAAP Red	evelopment		BORING LOCAT attached	ION: N	: 205		<b>Γ-17</b> 06, Ε:	72 553392.375 See
NE of Highw Arden Hills,	ay 10 and H Minnesota	Highway 96						
DRILLER: K	. Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/	9/07		SCA	LE: 1" = 4'
Elev. Depth feet feet 925.1 0.0		Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	P200 %	Tests or Note
924.6 0.5	SC PT SC SC SC SC SC SC SC SC SC SC SC SC SC	FILL: Silty Sand, trace of Roots, dark brown, m         FILL: Sandy Lean Clay, trace of Gravel, mixed brown to brown, moist.         CLAYEY SAND, Organic, dark gray, wet, soft t soft.         (Swamp Deposit)         PEAT, dark gray, soft.         (Swamp Deposit)         SANDY LEAN CLAY, trace of Gravel, gray, we soft to medium.         (Glacial Till)         END OF BORING.         Water observed at 6 feet while drilling.         Boring then grouted.	light	14 9 4 3 2 3 4 3 4 3 4 5 6	$\Sigma$	29	48	LL = 36 PI = 23

Geote TCAA NE of	cnical E AP Rede	valua velopi y 10 a	tion nent ınd I		BORING: LOCATIC attached s	DN: N	: 2054	<b>ST-173</b> 433.823, E: 553574.478 See
DRILLI	Е <b>R: к</b> .	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/9	0/07	SCALE: 1'' = 4'
Elev. feet 942.9	Depth feet 0.0	AST Sym		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or Notes
941.9	7.0	SM CL CL		SILTY SAND, trace of Roots, dark brown, wet. (Topsoil) SANDY LEAN CLAY, trace of Gravel, light brow moist, very stiff to hard. (Glacial Till) SANDY LEAN CLAY, trace of Gravel, light brow brown with gray and rust, wet, rather soft to rather (Glacial Till)		19 46 9 5 7 9		*NR Suspected Cobble or Boulde
- 920.9	22.0	CL		SANDY LEAN CLAY, trace of Gravel, gray, wet, stiff. (Glacial Till)	very	10		
-	26.0			END OF BORING. Water not observed with 24 1/2 feet of hollow-sten in the ground. Boring then grouted.	n auger	17		



#### SUBSURFACE BORING LOG

AET JO	OB NO: 22-00081						LO	G OF	во	RING N	iO	ST-	174	(p. 1	<u>of 1</u>	<u>)</u>
PROJE	CT: TCAAP Rede	velopme	ent; Ard	en Hi	ills,	MN										
DEPTH _IN_	SURFACE ELEVATION: _	944.9			G	EOLOGY	N	мс	SA	MPLE	REC		<del>۲</del>	ABORA	FORY 7	FESTS
FÉÉT	MATERIAL			·			11	171~		YPE	IN.	wc	DEN		PL	<b>%-#2</b> 00
1 —	FILL, mixture of sandy sil a little gravel, possible cot trace roots, brown and ligh	obles, surfa			FIL	<i>.</i> L	15	М	M	SS	12	12				
2 3							17	м	$\mathbb{N}$	SS	3	13				
4 —	SANDY LEAN CLAY, a	little grave	1 nossible		WE	ATHERED			H							
5 6	cobbles, trace roots, gray a little light gray, very stiff, silt (CL)	and brown 1	mottled, a		TIL		21	М	M	SS	19	14				
7 -			<u> </u>						<b>[</b> 2]							
8 -	SANDY LEAN CLAY, a cobbles, trace roots, light g	grayish brov	wn, a little		TIL	L.	27	м	M	SS	16	16				
9 -	brown, very stiff, lamination (possible fill)	ons of sand	y silt (CL)						21 21							
10 -		1	* 1. 1				21	м	M	SS	NR		:			
11	CLAYEY SAND, a little g to gray, very stiff to stiff (	gravel, gray SC)	'ish brown						И							
12 -							21	N	$\mathbb{N}$	SS	20	15				
13 — 14 —							21	M	Щ	33	20	1.0				
14							r		K							
16 -							19	М	X	SS	18	16				
17 –									Ħ		-					
18 -									]}							
19 -									ł							
20 –							15	М	M	SS	18	16				
21 -									Д		-					
22 -						-			2							
23 —	CLAYEY SAND, a little g								8							
24 -	cobbles, brown and gray m laminations of sand with si	ilt (SC)	a,						12							
25 – 26 –							32	М	X	SS	20	13				
20	END OF BORING	<u></u>			1										<u> </u>	<u> </u>
	Northing=205436.5 Easting=553898.8									-						
DEP	TH: DRILLING METHOD			WAT	ER L	EVEL MEA	SURE	EMEN	TS					NOTE:	REFE	R TO
0-24	1½' 3.25" HSA	DATE	TIME	SAMPI DEPT	LED TH	CASING DEPTH	CAV DE	/E-IN PTH	] FL	ORILLI UID LE	NG VEL	WAT LEVI	ER EL	THE A	TTAC	HED
		7/2/07	10:10	26.	5	24.5	20	5.4				Nor			IS FOF	
DODDU	0		ļ						ļ					EXPLA		
	ETED: 7/2/07									<u></u>				TERMIN TH	NOLOC IIS LOO	
DP SC	G LG: SB Rig: 91C	1	1		1	1	Ι.		1					11	עט בטי	ာ

Geotee TCAA NE of	cnical E P Rede <sup>.</sup> Highwa	valuatio velopme	nt Highway 96	BORING: LOCATIC attached s	DN: N		<b>ST-174</b> 6.535, E: 55389	8.789 See
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2	5/07	SCALE:	1" = 4'
Elev. feet 944.9	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
			Power Auger to 29 feet. No samples obtained.	_				
				_				
-								
				_				
				-				
				_				
				-				
-								
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				-				
				-				
		ĺ		_				
915.9	29.0							
_		SM	SILTY SAND, fine-grained, trace of Gravel, reddish-brown, moist, medium dense to dense. (Glacial Till)					
	.		(Glacial Till)		16			

Geote TCAA NE of	cnical È AP Redev Highwa	ect SP-0 valuation velopment y 10 and l finnesota	t Highway 96	BORING LOCATIC attached s	ON: N		174 (cont 6.535, E: 55389	
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2	5/07	SCALE:	1'' = 4'
Elev. feet 912.9	Depth feet 32.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
903.9	41.0		SILTY SAND, fine-grained, trace of Gravel, reddish-brown, moist, medium dense to dense. (Glacial Till) (continued) END OF BORING. Water not observed during drilling. Water not observed with 39 1/2 feet of hollow-st in the ground. Boring then grouted.		X 31			
			·	- - - - - - - -				·
								н 

#### ST-174 page 2 of 2



AET JO	DB NO: <b>22-00081</b>						LO	G OF	BO	RING N	10	ST-	175	(p. 1	of 1	<u>1)</u>
PROJE	CT: TCAAP Rede	velopme	ent; Ard	en Hi	lls, I	MN										
DEPTH	SURFACE ELEVATION:	948.1			GEG	OLOGY			SA	MPLE	REC	FIELI	) & LA	BORA	FORY	TESTS
DEPTH IN FEET	MATERIAL I	DESCRIPTIO	 DN			02001	Ν	мс	Ĩ	MPLE YPE	ÎN.	wc	DEN	LL	PL	<b>%-#</b> 200
1	FILL, mixture of clayey sa little gravel, surface roots, brick, brown and dark brow	trace roots			FILL		18	м	М	SS	15	6				
2 -	Difek, brown and dark brow	W11							H							
3 -	SANDY LEAN CLAY, a roots, brown, very stiff (Cl	little grave	l, trace		TILL		18	м	X	SS	19	11				
4-									R			12				
5 6	CLAYEY SAND, a little g brown, stiff (SC) SANDY LEAN CLAY, a						12	м	M	SS	17	15				
7	roots, gray, stiff to hard (C		i, liace						团							
8							30	м	M	SS	20	20				
° 9–	CLAYEY SAND, a little g (SC)	ravel, brov	vn, hard						Д	~-	- `	1		]		
10 -	CLAYEY SAND, a little g stiff to firm, laminations of						10	м	M	SS	7	16				
11 12									R							
13 -			·				8	м	X	SS	7	-13				
14 —									团							
15 - 16 -	LEAN CLAY WITH SAN mottled, firm, laminations	D, gray an of silty san	d brown d (CL)				7	₩.	M	SS	16	31				
17 –									Ŧ							
18	SANDY LEAN CLAY, a laminations of brown silty	little gravel	l, gray, soft	, ///		· .			1							
19 -	lammations of brown sity	sanu (CL)							꿤			17				
20 -							8	М	X	SS	18					
21 -									H							
22 -									Ł							i
23	SANDY LEAN CLAY, a	little gravel	l, gray, soft						ł							
24 -	(CL)						1		꿤							1
25 -							7	М	X	SS	16	18				
26 –	END OF BORING Northing=205434.5															
	Easting=554148.7															
DEP	TH: DRILLING METHOD		-	WAT	ER LE	VEL MEA	SURI	IMEN	тs					NOTE	REFI	ER TO
0-24	1½' 3.25" HSA	DATE	TIME	SAMPI DEPT	LED	CASING DEPTH	CAV	/E-IN PTH	FI	DRILLI JUID LI	NG EVEL	WAT	ER EL	THE /	<b>ATTA</b>	CHED
0-24	1/2 J.4J 113/A	7/3/07	8:45	16.		14.5		5.4				15.		SHEE	TS FO	R AN
		7/3/07	8:50	21.		19.5		0.3	1			Nor		EXPLA	NATI	ON OF
BORIN	G ETED: <b>7/3/07</b>	7/3/07	9:00	26.		24.5		6.5	+			No		FERMI	NOLO	GY ON
DR: SC									1					ŤĪ	IS LC	G
			L		1				-							



AET JO	DB NO: 22-00081						LO	G OF	BO	RING N	10	ST-	176	(p. 1	of 1	
PROJE	CT: TCAAP Rede	velopme	nt; Ard	en Hi	lls,	MN										
DEPTH	SURFACE ELEVATION:	951.0	····		GI	EOLOGY	N	мс	SA	MPLE YPE	REC	FIELI	) & LA	BORAT	ORY 1	TESTS
IN FEET	MATERIAL						19	MC	I	TYPE	IN.	WC	DEN	LL	PL	<b>%-#</b> 200
1	FILL, mostly sand with sil surface roots, trace roots, t		avel,		FIL	L	17	М	М	SS	8					
2	FILL, mixture of sand with a little gravel, trace roots, l						23	М	$\square$	SS	14					
4	and gray						:		Л							
5 -							17	М	$\square$	SS	3	16				
6 —							17	1/1	Д	33						
7									R M			12				
8 —							13	М	X	SS	10	13				
9 –									E							
10 -	LEAN CLAY WITH ORC black and dark brown, stif	GANICS, tr	ace roots,		TO	PSOIL	9	М	X	SS	17	13 29				
11 -	sand (CL)	r, lanniatio	ins of sinty						R 1			29				
12	SANDY LEAN CLAY, a roots, gray, a little black, s	little gravel tiff to soft (	l, trace (CL)		WE TIL	ATHERED L	9	М	M	SS	16	20				
14			()						Д							
15									M	~~		23				
16 -	SANDY LEAN CLAY, a	little grave	may soft	. (///	TIL	.I.	3	М	Ŵ	SS	20	22				
17 –	to stiff (CL)	nuie grave	, gruy, 301						ß							
18 -									ł							
19 -									Ľ	-						
20 —							15	м	X	SS	22	18				
21 —									Д			1				
22							:		ł							
23 -	CLAYEY SAND WITH C	JRAVEL, §	gray (SC)						ł							
24 –	END OF BODING OF	the stad to 0	10 at 74 01		1		<del>50/0.3</del>	м.	图	SS	4	16			<u> </u>	
	END OF BORING, Obs Northing=205436.4	structed to a	55 at 24.8		-											
	Easting=554397.8						ļ									
DEP	TH: DRILLING METHOD			WAT	ER L	EVEL MEA			TS	•				NOTE:	REFE	ER TO
0-24	4½' 3.25" HSA	DATE	TIME	SAMPI DEPT	ED H	CASING DEPTH	CAV DE	Æ-IN PTH	FI	DRILLI UID LI	NG EVEL	WAT LEVI	ER EL	THE A	TTAC	HED
		6/29/07	3:10	24.8	8	24.5	24	4.8				Nor		SHEE		
יממאק	G							<u> </u>						EXPLA		ON OF GY ON
	G LETED: 6/29/07		· · · ·						-	-					IIS LO	
DR: SO	G LG: SB Rig: 91C	1							1.							



#### SUBSURFACE BORING LOG

AET JO	OB NO: 22-00081						LC	G OF	BO	RING N	10	ST-	177	(p. 1	of 1	)
PROJE	CT: TCAAP Rede	evelopme	ent; Ard	en Hi	lls,	MN										
DEPTH	SURFACE ELEVATION: _	953.6			GE	EOLOGY	N	мс	SA	MPLE	REC		1	BORA	ORY :	rests
IN FEET	MATERIAL									YPE	IN.	WC	DEN		PL	<b>%-#2</b> 00
1 - 2 -	FILL, mixture of sand with little gravel, surface roots, metal at 3", brown	trace roots	, piece of		FILI	L	28	М	X	SS	12					
3 -	FILL, mixture of sand wit a little gravel, trace roots,			,			40	м	M	SS	17	5				
4 -									ম							
5							11	М	M	SS	18	8	1			
7 -									R							
8 -							12	М	Х	SS	17	11				
9 — 10 —							16	M	R	SS		13				
11 -							10	IVI	Д	00	11					
12 13							6	М	M	SS	16	19				
14	CLAYEY SAND, trace ro brown, a little gray, firm, l	ots, black a laminations	and dark of silty		TIL	ATHERED L OR			Д	00						
15 -	∖sand (SC) CLAYEY SAND, a little g	gravel, trac	e roots,		TIL	PSOIL	10	М	$\left[ \right]$	SS	9	18				
16 17	gray and brown, stiff, lam clay (SC)	inations of	sandy lean						/\ ₹₹							
18 -																
19 —									Ł							
20 -	CLAYEY SAND, a little g mottled, a little black, stiff	gravel, brov , lamination	wn and gra ns of silty	y (///			12	М	X	SS	24	17				
21 – 22 –	sand (SC)								/\ R		1					
23 -									Į							
24 –									ł							
25							14	М	M	SS	20	11				
26 –	END OF BORING				1				ľ		<u> </u>					
	Northing=205436.7 Easting=555146.5															
DEP	TH: DRILLING METHOD			WAT	ER LI	EVEL MEA	·		-					NOTE	REFE	R TO
0-24	1½' 3.25" HSA	DATE	TIME	SAMPI DEPT	LED TH	CASING DEPTH	CAV DE	/E-IN PTH	] FL	DRILLI .UID LI	NG EVEL	WAT LEV	ER EL	THE A		
		7/3/07	10:15	26.5	5	24.5	2	6.5				Nor		SHEE		
BORIN	G								-					EXPLA TERMI		
	G ETED: 7/3/07								-						IIS LO	
DR: SO	G LG: SB Rig: 91C	1	1	1			1		1							



AET JO	OB NO:	22-00081						LO	G OF	BO	RING N	10	ST-	178	(p. 1	of 1	)
PROJE	CT:	TCAAP Rede	velopme	nt; Ard	en Hi	lls,	MN										
DEPTH IN FEET	SUR	FACE ELEVATION:	948.4			GI	EOLOGY	N	мс	SA	MPLE	REC	FIELD		BORAT	ORY 1	ESTS
FEET	1	MATERIAL I							me		TYPE	IN.	WC	DEN		PL /	<b>%-</b> #200
1 -	FILL, cobble	mostly silty sand, a les, brown and grayisl	little gravel h brown	, possible		FIL	Ľ	17	М	Х	SS	6					
2	- 									$\forall$							
3	sand,	mixture of sandy lea a little gravel, possib and brownish gray			,			14	M	X	SS	18	11				
5 —							:	_		$\overline{n}$							
6								9	М	Ň	SS	2	13				
7										R							
8 —								27	М	X	SS	8	8				
9 —			4- 1-11			a ou	AMP			শ্ব							
10 11	(OL)	ANIC SILT, trace roo		-		DE WE	POSIT /	6	w	X	SS	14	47				
12	to soft	, laminations of silty	sand (SC)	own, mm		TIL	L			ষ্ট্র			22				
13 —		'EY SAND, gray, a lations of sand (SC)	little black,	soft,				4	М	X	SS	15	20				
14 —										E							
15 —	light g	'EY SAND, a little g ray, very soft (SC)	gravel, trace	e roots,		TIL	L	wн	М	M	SS	19	15				
16 -										R							
17										ł							
18 19	CLAY stiff (S	EY SAND, a little g	gravel, gray	, firm to						X							
20 -		,								K							
21 -								6	M	ľŇ	SS	24	19				
22										E							
23 -										ł							
24									1	ł							
25 –								15	М	$\mathbb{N}$	SS	22	15				
26								15		N			15		_		<u> </u>
	Northi	<b>OF BORING</b> ng=205431.4															
	Eastin	g=555363.5															
DEP	TH: C	RILLING METHOD			WAT	ER L	LEVEL MEA								NOTE:	REFE	ER TO
0-24	41/2' 3	.25" HSA	DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CAV DE	VE-IN PTH	FI	DRILLI .UID LI	NG EVEL	WAT LEV	ER EL	THE A		
		· · · · · · · · · · · · · · · · · · ·	7/3/07	11:50	26.	5	24.5	2	6.5				Noi		SHEE		
DODDI	IC														EXPLA		ON OF GY ON
BORIN COMPI	LETED:	7/3/07														IS LO	
DR: SC	G LG:	SB Rig: 91C															~

		ect SP-00 valuation	5-05871	BORING:		ST-179
TCAA NE of	.P Rede Highwa	velopment	Highway 96	LOCATIC attached s	JN: N: 20529' ketch.	7.766, E: 553501.960 See
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/9/07	SCALE: 1'' = 4'
Elev. feet 929.3	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF WL	Tests or Notes
928.8	4.0		SILTY SAND, trace of Roots, dark brown, v (Topsoil) SILTY SAND, moist, stiff. SANDY LEAN CLAY, trace of Gravel, ligh grayish-brown with rust and dark brown, we rather stiff. (Glacial Till)	t brown to	8 8 8	
915.3	14.0	CL	SANDY LEAN CLAY, trace of Gravel, gray medium to rather stiff. (Glacial Till)		9 8 8	
903.3	26.0		END OF BORING. Water not observed with 24 1/2 feet of hollo	w-stem auger	10	
-			Boring then grouted.			

BRAUN"

LOG OF BORING

		ect SP-0	6-05871	BORING	:	ļ	ST-180	
TCAA NE of	AP Redev Highwa	valuation velopmen y 10 and ] finnesota	t Highway 96	LOCATI attached s	ON: N sketch.	205254	4.843, E: 55389	6.986 Se
DRILL	······································	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/3	5/07	SCALE:	1'' = 4
Elev. feet 935.9	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)	<b> </b>	BPF	WL	Tests or	Notes
934.9	1.0	SM	SILTY SAND, trace of Roots, dark brown, moi (Topsoil)	ist.				**
		CL	SANDY LEAN CLAY, trace of Gravel, yellow to grayish-brown with rust at 5' sample depth, r tot very stiff. (Glacial Till)	rish-brown ather stiff - - -	18 M 18			
				- - -	M 12			
- - - - - - -					M 16			
923.9	12.0	CL	SANDY LEAN CLAY, trace of Gravel, gray, w stiff to stiff. (Glacial Till)	vet, rather	13			
-					9			
_				-	10			
- 	26.0		END OF BORING.		10			
		144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144 - 144	Water not observed with 24 1/2 feet of hollow-s in the ground. Boring then grouted.	stem auger				

Geote TCAA NE of	cnical É AP Rede	valua velop iy 10 a	tion ment and l	6-05871 t Highway 96	BORING LOCATIO attached s	ON: N		<b>ST-181</b> 2.130, E: 55409	9.221 See
DRILL	ER: K.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/9	/07	SCALE:	1'' = 4'
Elev. feet 935.0	Depth feet 0.0	-		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
934.0	1.0	SM CL CL		SILTY SAND, trace of Roots, dark brown, mo (Topsoil) SANDY LEAN CLAY, light brown, moit, rath very stiff. (Glacial Till) SANDY LEAN CLAY, trace of Gravel, light b brown, wet, stiff to very stiff. (Glacial Till)	er stiff to	11 15 19 19 19 13 16			
913.0	22.0	CL		SANDY LEAN CLAY, trace of Gravel, reddis gray, stiff. (Glacial Till)	- 	24			
909.0	26.0		~	END OF BORING. Water not observed with 24 1/2 feet of hollow- in the ground. Boring then grouted.	stem auger	14			

Geotee TCAA NE of	cnical E .P Rede Highwa	ect SP-0 valuation velopmen y 10 and Ainnesota	t Highway 96	BORING: LOCATIC attached s	DN: N		<b>ST-182</b> 1.842, E: 55439	5.289 See
DRILLE	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/3	3/07	SCALE:	1"=4
Elev. feet 941.8	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
	0.5	SM CL	SILTY SAND, trace of Roots, dark brown, moist. (Topsoil) SANDY LEAN CLAY, trace of Gravel, yellowish to brown, rust lenses scattered, moist, very stiff to (Glacial Till)	/	22 23 29 22 22 26 26			
920.8	21.0	SM	SILTY SAND, fine- to medium-grained, trace of ( reddish-brown, moist, medium dense. (Glacial Till)	Gravel, – –	27			
			END OF BORING. Water not observed with 24 1/2 feet of hollow-ster in the ground.	m auger				
			Boring then grouted.					

Braun Proj Geotecnical E			BORING			ST-183	
TCAAP Rede NE of Highwa Arden Hills, F	velopmen ay 10 and 3	t Highway 96	LOCATIC attached s	ON: N sketch.	: 20524	0.257, E: 55489	98.811 Se
DRILLER: K.	Keek	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/9	9/07	SCALE:	1"=4
Elev. Depth feet feet 933.7 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
933.2 0.5	SM CL SM	SILTY SAND, trace of Roots, dark brown, moist (Topsoil) SANDY LEAN CLAY, light to brown seams of a rather soft to rather stiff. (Glacial Till) Sandy Lean Clay 0.5' to 18' SILTY SAND, fine- to medium-grained, trace of reddish-brown, waterbearing, medium dense. (Glaciofluvium) END OF BORING. Water observed at 18 feet while drilling. Boring then grouted.	/	9 8 6 4 6 5 12 16	$\Sigma$		

LOG OF BORING

BRAUN"



AET JO	DB NO: <b>22-00081</b>						LC	G OF	BOI	RING N	0	ST-	184	(p. 1	of	<u>b</u>
PROJE	CT: TCAAP Redev	velopme	nt; Ard	en Hi	<u>lls,</u>	MN										
DEPTH	SURFACE ELEVATION:	942.1			GE	OLOGY	N	мс	SA	MPLE	REC IN.	FIELI	) & LA	BORAT	ORY	TESTS
IN FEET	MATERIAL I	ESCRIPTIC	DN				IN	MC	T	YPE	IN.	wc	DEN	LL	PL	<b>%-#</b> 200
1 -	FILL, mixture of silty sand clayey sand, a little gravel, roots, dark brown, brown a	surface roo	silt and ots, trace		FILI		15	м	M	SS	14					
2	Tools, dark brown, brown a	nd black					10	м	Ħ	SS	1	9				
3 4							10		Д	دد	1					
5 –	SILTY SAND, fine grained					ARSE		<u> </u>	M							
6 -	brown to brownish gray, w (SM)	et, medium	n dense			JUVIUM	12	W	$\mathbb{N}$	SS	16					
7 -					-				R							
8 -							15	W	M	SS	15					
9 — 10	SANDY LEAN CLAY, a l	ittle gravel	l, brownish		TIL	L			M	<i>c</i> -						
11 -	gray, stiff, laminations of w (CL)	vaterbearin	ig sand				9	M/W	M	SS	18	20				
12 —	CLAYEY SAND, a little g	ravel, gray	, firm (SC)						K							
13							7	М	Ŵ	SS	22	19				
14 — 15 —									R							
16							6	M	M	SS	. 23	18				
17 -									3						1	
18 —	SANDY LEAN CLAY, a l	ittle gravel	l, gray, stif	f ///					ł							
19 20	(CL)															
20							13	М	M	SS	21	15				
22 –									<u>}</u>							
23	CLAYEY SAND, a little g	ravel, gray	, very stiff						Į							
24 – 25 –	(SC)								H							
25 – 26 –							16	M	X	SS	18	14				
	END OF BORING Northing=205236.9 Easting=555364.5				q	• • • • • • • • • • • • • • • • • • •										
DEP	TH: DRILLING METHOD			 	ER L	EVEL MEA	L SUR	L EMEN	ITS	L	1			NOTE:	REF	ER TO
0-24		DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CA	VE-IN PTH	FL	DRILLI JUID LI	NG EVEL	WAT LEV	ER	THE A		
0-24	1/2 JAN HOR	7/3/07	12:50	6.5		4.5	1	5.8				No		SHEE		
	· · · · · · · · · · · · · · · ·	7/3/07	1:15	26.	5	24.5	2	6.5				No	ue			ON OF
BORIN COMPL	G LETED: <b>7/3/07</b>												]ï		NOLO IIS LO	IGY ON
DR: <b>S</b> (	G LG: SB Rig: 91C			<u> </u>										· · · · · · · · · · · · · · · · · · ·	no re	JU

Brau	RTEC n Proj	ect S	P-0	6-05871	BORING	: R	I-10	01-06 ST-1	85
TCAA NE of	cnical E AP Rede Highwa Hills, N	velopi y 10 a	men and ]	t Highway 96	LOCATION: N: 208603.970, E: 552291.002 attached sketch.				
DRILLI		Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/2	4/07	SCALE:	1'' = 4'
Elev. feet 901.0	feet ASTM			Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or N	Votes
				Redrill of Geo Probe Hole. Power Auger to 16 fe	eet.				
					_				
					_				
-					—				
					_				
					-				
					_				
					-				
					_				
					-				
		ĺ			_				
					_				
-					_				
885.0	16.0	G							
		CL		SANDY LEAN CLAY, trace of Gravel, gray, wet medium.	, 				
				(Glacial Till)	_				
Ì					_				
_	ľ								
						7			
875.0	26.0					7			
				END OF BORING.	f	1			
				Water not observed during drilling.					
				Water not observed with 24 1/2 feet of hollow-ster in the ground.	m auger				
-			l	Boring then grouted.					

#### m SP-06-05871

INTE	RTEC					
		ect SP-0	6-05871	BORING	RI-10	07-04 ST-186
TCAA NE of	AP Rede <sup>.</sup> Highwa	valuation velopment ty 10 and 1 Ainnesota	Highway 96	LOCATIC attached s	ON: N: 20757 sketch.	9.028, E: 552738.508 See
DRILL	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/24/07	SCALE: 1'' = 4'
Elev. feet 925.2	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF WL	Tests or Notes
924.2	1.0		FILL: Silty Sand, fine-grained, dark brown, me			
922.2	3.0	FILL	FILL: Silty Sand, fine- to medium-grained, mi Lean Clay, brown, moist.	xed with	M 18	
-	7.0	FILL	FILL: Lean Clay, mixed with Silty Sand, brow	n, moist. 	10 10	
of abbrevi	9.0	SM	SILTY SAND, with Organic fines, black, mois (Buried Topsoil)			
d 914.2	11.0		SILTY SAND, fine- to coarse-grained, trace of brown, wet, rather stiff. (Glacial Till)	Gravel,	M 9	
l for e		CL	SANDY LEAN CLAY, trace of Gravel, brown medium.	, wet,		
logy sheet 000 sheet 011.2	14.0		(Glacial Till)		8	
See Descriptive Terminology sheet for explanation of abbreviations) 7.916 abbreviation of abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 abbreviations 7.916 ab		CL	SANDY LEAN CLAY, trace of Gravel, gray, v stiff to stiff. (Glacial Till)	vet, rather	9	
BRAUN BASIC LOG OF BORING SP0605871.GP1 BRAUN.GD7 10/2/07 14:41 (See 668 668 668 668 668 668 668 668 668 6					13	
SP0605871.GP1 BRA	26.0		END OF BORING.		9	
RING			Water not observed during drilling.	-		
LOG OF BO			Water not observed with 24 1/2 feet of hollow- in the ground.	stem auger 		
BRAUN BASIC			Boring then grouted.			

SP-06-05871

**BRAUN**\*\*

Geotee TCAA NE of Arden	cnical É P Rede Highwa Hills, N	ect SP-0 valuation velopmen y 10 and Jinnesota	t Highway 96	BORING: <b>RI-1007-08 ST-187</b> LOCATION:         N: 208970.244, E: 552766.455           attached sketch.					
DRILLI		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	9/07	SCALE:	1'' = 4	
Elev. feet 914.2	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes	
913.2	1.0	PT 些	PEAT, mixed with Sand, black, moist. (Swamp Deposit)						
		CL	SANDY LEAN CLAY, trace of Gravel, brown staining, moist, medium. (Glacial Till)	with iron	<u> </u>				
					6				
					7				
 902.2	12.0	CL	SANDY LEAN CLAY, trace of Gravel, gray, m wet, medium to rather stiff.	noist to	A M 11				
- - - - - - - - - -	, , , , ,		(Glacial Till)		10				
					7				
	26.0				7				
_			END OF BORING. Water not observed with 24 1/2 feet of hollow-s in the ground.	tem auger					
_			Boring then grouted.						

Geotec TCAA NE of Arden	enical E P Rede Highwa Hills, N	/innesota	t Highway 96	LOCATIC attached s	BORING: <b>RI-4003-03 ST-188</b> LOCATION: N: 209408.636, E: 552935.91 attached sketch.					
DRILLE		Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/23/0	7 SCALE: $1'' = 4'$				
Elev. feet 918.0	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF W	L Tests or Notes				
_917.7	0.3	PAV	√3" of Bituminous	/						
914.0	4.0	FILL CL	FILL: Silty Sand, fine- to medium-grained, tra Gravel, dark brown, moist. SANDY LEAN CLAY, trace of Gravel, brown		28					
			medium to rather stiff. (Glacial Till)		9					
907.0	11.0	CL	SANDY LEAN CLAY, trace of Gravel, redding moist, stiff.	sh-brown,	12					
904.0	14.0		(Glacial Till)	_	16					
-		SM	SILTY SAND, fine- to medium-grained, trace reddish-brown, moist, medium dense. (Glacial Till)	of Gravel,	22					
899.0	19.0	CL	LEAN CLAY, reddish-brown, wet to moist, m	nedium to		-				
			rather stiff. (Glacial Till)		9					
					8	* Water observed at 19 feet while drilling. Water not observed with 29				
889.0	29.0	SM	SILTY SAND, fine- to medium-grained, trace	of Ground		feet of hollow-stem auger in the ground.				
- 887.0	31.0	21V1	reddish-brown, moist, dense. (Glacial Till)	or Graver,	36	Boring then grouted.				
<u></u>	0.10		END OF BORING. *		4					

	n Proje cnical E			6-05871	BORING	RI-40	08-35 ST-189
TCAA NE of	P Rede	velopi y 10 a	men and ]	t Highway 96	LOCATIC attached s	ON: N: 20575 sketch.	55.343, E: 554523.702 See
DRILL	·	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/17/07	SCALE: 1'' = 4'
Elev. feet 952.2	Depth feet 0.0	AST Sym		Description of Materials (ASTM D2488 or D2487)		BPF WL	Tests or Notes
951.5	9.0	SM CL		SILTY SAND, fine-grained, with Organic fines brown, moist. <u>(Topsoil)</u> SANDY LEAN CLAY, brown, moist, medium stiff. (Glacial Till) With Gravel layer at 8 feet.	F	12 8 19	
<u>943.2</u> 	12.0	CL CL		SANDY LEAN CLAY, trace of Gravel, brown staining, moist, very stiff (Glacial Till) SANDY LEAN CLAY, trace of Gravel, brown, stiff.		18 V 14	
- 934.2	18.0			(Glacial Till)		15	
_		SM		SILTY SAND, fine- to medium-grained, trace o reddish-brown, moist, dense. (Glacial Till)	f Gravel, 	35	
926.2	26.0			END OF BORING. Water not observed during drilling.		40	
				Water not observed with 24 1/2 feet of hollow-s in the ground.	tem auger –		

#### SP-06-05871

Geote	ecnical E	valuat	ion	5-05871	BORING				<b>-36 ST-</b> 23, E: 55473		
NE of	AP Rede í Highwa n Hills, N	iy 10 ai	nd l	Highway 96	attached sketch.						
DRILL	ER: K.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	7/07		SCALE:	1'' = 4	
Elev. feet 952.8	Depth feet	ASTI		Description of Materials	-Annun,	BPF	WL	MC	Tests	or Notes	
952.8				(ASTM D2488 or D2487) ¬4" of Bituminous		- 1		%			
950.8		FILL		FILL: Poorly Graded Sand with Silt, fine- to medium-grained, trace of Gravel, brown, moist.	/						
_		SC		CLAYEY SAND, gray with iron staining, moist, (Glacial Till)	stiff.	16					
948.8	4.0	CL	[]]	SANDY LEAN CLAY, trace of Gravel, brown a	ad one.	H.					
		CL		with iron staining, wet, rather soft to medium. (Glacial Till)	ino gray —	6		15			
-				Clayey Sand 2.0' to 4'				-			
-				Sandy Lean Clay 4' to 12'	-	Å 6					
						¥ 5					
- 940.8	12.0				_						
- 938.8	14.0	CL		SANDY LEAN CLAY, trace of Gravel, brown a with iron staining, wet, soft. (Glacial Till)	nd gray –	2					
<u>    938.8  </u>	14.0	CL		SANDY LEAN CLAY, trace of Gravel, brown, medium to very stiff.	moist,						
				(Glacial Till)	-	8					
-					-						
-					-						
,						19					
- 929.8	23.0				_						
-	23.0	SM		SILTY SAND, fine- to medium-grained, trace or reddish-brown, moist, medium dense. (Glacial Till)	f Gravel, -						
- 926.8	26.0					26					
				END OF BORING.	_						
				Water not observed during drilling. Water not observed with 24 1/2 feet of hollow-sta	em auger						
_				in the ground. Boring then grouted.							
-					_						

# LOG OF BORING

			06-05871	BORING	: <b>RI-4</b> (	008-40 ST-191
TCAA NE of	cnical E AP Rede Highwa Hills, N	velopmo vy 10 an	nt I Highway 96	LOCATIC attached s	ON: N: 2057 sketch.	'45.555, E: 555106.431 See
DRILLI	E <b>R</b> : K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/16/07	SCALE: 1'' = 4'
Elev. feet 956.3	Depth feet 0.0	ASTM Symbo	Description of Materials (ASTM D2488 or D2487)		BPF WL	Tests or Notes
955.3	1.0	FILL	FILL: Silty Sand, fine- to medium-grained, wi	th Organic		7.002.0m
		FILL	fines, dark brown, moist. FILL: Silty Sand, fine- to medium-grained, tra Gravel and Roots, brown, moist.		33	
<u>952.3</u> -	4.0	CL	SANDY LEAN CLAY, trace of Gravel, browr loose to medium dense. (Glacial Till)	n, moist, 	9	
				-	17	
					14	
942.3	14.0	SM	SILTY SAND, fine- to medium-grained, trace	-	13	
-			reddish-brown, moist, medium dense to dense. (Glacial Till)		23	
-				_ 	34	
				-		
930.3	26.0				25	
			END OF BORING.	_		
			Water not observed during drilling. Water not observed with 24 1/2 feet of hollow- in the ground.	stem auger		
_			Boring then grouted.			

#### SP-06-05871

Geote	cnical E	lvalua	tion	i	BORING			<b>)8-42 ST-</b> 5.630, E: 55513		
NE of	AP Rede Highwa Hills, N	ıy 10 a	and	t Highway 96	attached sketch.					
DRILL		Keck			DATE:	7/16/07		SCALE:	1'' = 4'	
Elev. feet 959.1	Depth feet 0.0	AS] Sym		Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes	
				Soil samples taken with Geoprobe to 6 foot depth.						
- 953.1	6,0	SM		SILTY SAND, fine-grained, trace of Gravel,						
				reddish-brown, moist, medium dense. (Glacial Till)		16	· · ·			
948.1	11.0	SP				29				
-		Sr		POORLY GRADED SAND, fine- to medium-grain brown,moist, loose to medium dense. (Glacial Outwash)	ned,	24				
941.1	18.0				_	8				
_		SM		SILTY SAND, fine-grained, trace of Gravel, reddish-brown, moist, medium dense. (Glacial Till)		13				
938.1	21.0	SP		POORLY GRADED SAND, fine- to coarse-grained of Gravel, brown,moist, medium dense. (Glacial Outwash)	l, trace 					
933.1	26.0	:		END OF BORING.		26				
				Water not observed during drilling.						
				Water not observed with 24 1/2 feet of hollow-stem in the ground.	auger _					
-				Boring then grouted.						

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# LOG OF BORING

Geotee TCAA NE of	cnical É P Rede	valua velopi iy 10 a	tion nent ind I	6-05871 Highway 96		BORING: <b>RI-4008-43 ST-193</b> LOCATION: N: 206148.097, E: 555162.879 attached sketch.						
DRILLE		Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/10	5/07	SCALE:	1'' = 4'			
Elev. feet 961.9	Depth feet 0.0	AST Sym		Description of Materials (ASTM D2488 or D2487)	-	BPF	WL	Tests or	Notes			
- 957.9	4.0	SM		FILL: Silty Sand, fine- to medium-grained, with fines, trace of Gravel, dark brown, moist. SILTY SAND, fine- to medium-grained, trace of reddish-brown, moist, medium dense to dense. (Glacial Till) Cobble at 10 1/2 feet.	-	<ul> <li>40</li> <li>17</li> <li>44</li> <li>38</li> </ul>						
	16.0			Cobbles at 13 feet.	- - -	37						
943.9	16.0       SP       POORLY GRADED SAND, fine- to mediate the formation of trace of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the formation of Gravel, brown, moist, mediate the				dense	16	dr W fee the	Water not observition illing. ater not observite et of hollow-ste ground. pring then grout	ed with 29 1 m auger in			
930.9	31.0			END OF BORING. *		30		ang men grou				

ATIC	ON: Se	<u>ST-1</u>				
::	7/1	16/0	07	SCAL	E:	1" = 4
	BPF	w	VL	Tes	sts or N	lotes
	25 25 25 56 68 * 83 83 32 32 35 33		* dı	Irilling.	observ	ved duri
				33 y	Water not drilling.       33       Water not o feet of holic the ground.	Water not observed     * Water not observed       33     Water not observed       Water not observed     feet of hollow-ster

Geote TCAA	cnical E AP Rede	5-05871 Highway 96	LOCATIO	BORING: <b>RI-4009-06 ST-195</b> LOCATION: N: 206589.315, E: 553291.605 attached sketch.						
Arden	Hills, N	Ainne					<u> </u>			
DRILL		Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	8/07	1	SCALE:	1'' = 4'
Elev. feet 942.2	Depth feet 0.0	AST Sym		Description of Materials (ASTM D2488 or D2487)		BPF	WL	MC %	Tests	or Notes
941.9		PAV		3" of Bituminous				70		
937.7	4.5	FILL CL		FILL: Poorly Graded Sand with Silt, fine-grai moist. SANDY LEAN CLAY, brown, wet, rather sof (Lacustrine)		8		15		
000.0	0.0				-	4				
933.2	9.0	CL		SANDY LEAN CLAY, trace of Gravel, brown staining, moist, rather stiff. (Glacial Till)	a with iron	v 10				
930.2	12.0				_	1				
-				moist, stiff to very stiff. (Glacial Till)		26 I				
924.2	18.0									
 921.2	21.0	CL		SANDY LEAN CLAY, trace of Gravel, grayis moist, very stiff. (Glacial Till)	h-brown, –	17				
		Ì		END OF BORING.						
				Water not observed during drilling. Water not observed with 19 1/2 feet of hollow in the ground. Boring then grouted.	-stem auger	1				
-						-				

## LOG OF BORING

Geote TCAA	n Proj cnical E P Rede	valuati velopm	on ent		BORING LOCAT attached	ION: N	√: 20640	<b>09-07 ST-</b> 07.349, E: 55344	
Arden	Hills, N	Ainnes		1way 96					
DRILLI		Keek		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/	18/07	SCALE:	1'' = 4'
Elev. feet 943.4	Depth feet 0.0	ASTN Symb		Description of Materials (ASTM D2488 or D2487)	ŀ	BPF	WL	Tests or	Notes
943.1	0.3	PAV FILL	$\times \times \times$			_			
939.4	4.0		8		Fill (poorly graded Fill (sandy lean cla Sandy Lean Clay	ay) 4' to	9.3' to 4' 7'		
936.4	7.0	FILL	FII	L: Sandy Lean Clay, with topsoil chur	ıks, olive, wet. –	4			
	7.0	CL	SA rati	NDY LEAN CLAY, brown with iron s her soft. (Lacustrine)	taining, wet,	-X 4 -X 4			
931.4	12.0	CL	SA wit	NDY LEAN CLAY, trace of Gravel, b h iron staining, moist, rather soft to stif (Glacial Till)	rown and gray f.	5			
925.4	18.0	CL	SA	NDY LEAN CLAY trace of Gravel by	own wet stiff	8	Ţ		
922.4	21.0			NDY LEAN CLAY, trace of Gravel, bi (Glacial Till)		13			
			Wa	D OF BORING. ter observed at 18 feet while drilling. ing then grouted.					
-									
-					- 				

**BRAUN**<sup>\*\*</sup>

		ect SP-( valuation	6-05871	BORING			9-08 ST-197
TCAA NE of	.P Rede <sup>.</sup> Highwa	velopmer	t Highway 96	LOCATIOn attached s	ON: N: sketch.	206255	5.301, E: 553565.997 S
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	8/07	SCALE: 1'' =
Elev. feet 944.3	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or Notes
<u>944.0</u> .  	0.3	PAV FILL	3" of Bituminous FILL: Silty Sand, fine- to medium-grained, trac Gravel, reddish-brown, moist. Fill (silty sand) 0.3' to 4' Fill (sandy lean clay) 4' to 7				
940.3	4.0	FILL	Organic Clay 7' to 9 FILL: Sandy Lean Clay, trace of Gravel, brown olive, moist.	n, gray and 	7		
937.3 935.3 933.3 - - 930.3	<u>7.0</u> 9.0	OL	ORGANIC CLAY, black, wet. (Swamp Deposit)	 	2		
933.3	9.0	SM	SILTY SAND, fine-grained, gray, waterbearing loose. (Lacustrine)	·····	2	Σ	
- - 930.3		CL	SANDY LEAN CLAY, gray with iron staining, (Lacustrine)	, wet, soft. 	3		
	14.0	CL	SANDY LEAN CLAY, trace of Gravel, brown, to medium. (Glacial Till)	, wet, soft 	3		
923.3	21.0		END OF BORING. Water observed at 9 feet while drilling. Water down 9 feet with 19 1/2 feet of hollow-st in the ground.	em auger	6		
- - -			Boring then grouted.				

LOG OF BORING

**BRAUN**\*\*

Geote TCA NE of	ecnical E AP Rede f Highwa	valuation velopmen	nt Highway 96	BORING LOCATIC attached s	DN: N				<b>ST-198</b> 553728.185 Se
DRILL	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	7/07		SCAI	.E: 1'' = 4
Elev. feet 944.4	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL 1	MC	P200 %	Tests or No
<u>944.1</u> - -	1	PAV FILL	4" of Bituminous FILL: Silty Sand, fine- to medium-grained, trace Gravel, brown, moist.	e of	¥ 19		70	70	
			No sample recovery at 5 1/2 feet.		х б				
<u>936.4</u>	8.0	FILL	FILL: Clayey Sand, gray, brown and olive, mois	t	1				
<u>936.4</u> 					7		17	47	
- - 930.4	14.0				5		15		
930.4 		CL	SANDY LEAN CLAY, with Organic fines, blacl (Swamp Deposit)	k, wet. 	3				
925.4	19.0	CL	SANDY LEAN CLAY, gray, wet, soft. (Lacustrine)		3				
- 920.4	24.0	CL	SANDY LEAN CLAY, trace of Gravel, gray, we	- t. verv	-				
918.4	26.0		stiff. (Glacial Till) END OF BORING.		19				
			Water not observed during drilling. Water not observed with 24 1/2 feet of hollow-stee in the ground.	em auger			van		
			Boring then grouted.						

Brau	n Proj	ect SP- valuatio	06-05	871			BORIN					-10 S		
TCAA NE of	P Rede Highwa	velopme iy 10 and Ainnesol	nt I High	way 96			LOCA' attache	TIOI d sk	N: N: etch.	2058	827.0	00, E: 5	53879.	890 See
DRILLI		Keck		METHOD:	3 1/4" HSA, A	utohmr	DATE:	:	7/1′	7/07		SCAL	E:	1'' = 4'
Elev. feet 944.2	Depth feet 0.0	ASTM Symbol			scription of M TM D2488 or				BPF	WL	MC %	P200 %	Tests	or Note
943.7		FILL 🔀		.: Silt, brown,	moist.						70	70		
940.2	4.0	FILL		.: Sandy Lean		-	wn, moist.	- - -X 	20 4		7	20		
937.2	7.0		8											
		CL	SAN med	IDY LEAN CL. ium to stiff.	AY, trace of C (Glacial Til		, wet,		8					
-							_		7 7 11					
923.2	21.0		END Wate Wate in the	ample recovery OF BORING. r not observed r not observed ground. ng then grouted.	during drilling with 19 1/2 fe		stem auger		16					
-														

		ect SP- valuatio	06-05871	BORING			)9-11 ST-	
TCAA NE of	P Rede Highwa	velopme	nt Highway 96	LOCATI attached s	ON: N ketch.	: 205748	3.933, E: 55415	6.383 See
DRILLI	ER: K.	Keck	METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	7/07	SCALE:	1" = 4'
Elev. feet 949.2	Depth feet 0.0	ASTM Symbol	Description of Materials (ASTM D2488 or D2487)		BPF	WL	Tests or	Notes
948.0	1.2	FILL	FILL: Silty Sand, fine- to medium-grained, the Gravel, dark brown, moist. FILL: Poorly Graded Sand with Silt, fine- to medium-grained, trace of Gravel, brown, moi					
945.2	4.0	FILL	FILL: Sandy Lean Clay, trace of Gravel and to dark brown, wet.	- wood, brown	21			
-					8			
_					5			
935.2	14.0	SC	CLAYEY SAND, black, wet. (Swamp Deposit)		₩ ₩ 4			
933.2	16.0	SC	CLAYEY SAND, gray, wet, soft. (Lacustrine)					
927.2	22.0	CL	SANDY LEAN CLAN AND SO 1		2	₽		
			SANDY LEAN CLAY, trace of Gravel, gray, soft. (Glacial Till)	wei, rainer –				
923.2	26.0		END OF BORING.		2			
			Water down 20 feet with 24 1/2 feet of hollow in the ground. Boring then grouted.	v-stem auger 				
-								

LOG OF BORING

**BRAUN**\*\*



# SUBSURFACE BORING LOG

AET J	OB NO: <b>22-00081</b>				<u></u>						1 301	/		4	
PROJE		levelopn	nent; Ard	en Hi	ills. MN	L	OG OF	< BO	RING N	10.5 <u>1</u>	-201	/ <u>AB</u>	<u>~ 1 (</u>	<u>p. 1</u>	<u>of 2</u> )
DEPTH IN FEET	SURFACE ELEVATION:		.8		GEOLOGY	N	мс	SĄ	AMPLE FYPE	REC IN.	FIELI	D & LA	BORA		1
1 - 2 -	FILL, mixture of silty sa little gravel, surface root dark brown	nd and clay s, trace roo	yey sand, a ts, brown an	d	FILL	12	м	M	SS	7	wc	DEN		PL	%-#200
- 3 4	FILL, mixture of sand w a little gravel, brown, a li brown	ith silt and ittle gray ar	clayey sand, nd light			14	М	V c	andy Le		7 1y				
5 — 6 —	SANDY LEAN CLAY, little light brown and dar laminations of silt and sil	k brown, st ty sand (C	tiff, L)		WEATHEREI TILL TILL	14	М		.5' to 7' SS	23	15				
7	SANDY LEAN CLAY, a little light brown and dar laminations of silt and sil CLAYEY SAND, a little	k brown, st ty sand (Cl gravel, bro	tiff, L) own, a little			29	м	R	SS	16	8				
10 11	light brown, very stiff, la	minations (	or silt (SC)			24	М	R	SS	18	7				
12 13 14						21	м	R	SS	22	7				
14 15 16 17	SAND WITH SILT AND fine grained, brown, mois	GRAVEL st, dense (S	., medium to P-SM)		COARSE ALLUVIUM	40	м		SS	7					
18	SAND WITH SILT, a litt. medium grained, light bro dense to dense (SP-SM)	le gravel, f wn, moist,	ine to medium			26	м		SS	22					
22 - 23 - 24															
25 26 27 28						47	М		SS	19				2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
DEPTI	H: DRILLING METHOD							Ľ							
0-341	······································	DATE		WATEI AMPLE DEPTH	ELEVEL MEAS	CAVE DEP		DF	RILLING	g v	VATER		DTE: F		
0-347;	<u>2' 3.25" HSA</u>	7/26/07	8:52	31.5	34.5	DEP 36.		FLU	DLEV	EL I	LEVEL None	—	HE AT HEETS		
BORING COMPLE												EX	PLAN. RMINC		
DR: SG /04	LG: BR Rig: 91C												THIS	LOG	

06/04



AET JC	OB NO:	22-00081	_				LC	OG OF	BO	RING N	0. <u>ST</u>	-201	<u>/AB-</u>	<u>1</u> (]	p. 2 (	<u>of 2)</u>
PROJE	ECT:	TCAAP R	edevelopmer	nt; Arden	Hi	lls, MN									<u></u>	
DEPTH				· · · · · · · · · · · ·		GEOLOGY			SA	MPLE	REC	FIELD	& LAI	BORAT	ORY T	ESTS
DEPTH IN FEET		MATERI	AL DESCRIPTIO	N		0	N	MC	Ĩ	MPLE YPE	ĪN.	wc	DEN	LL	PL	<b>%-#</b> 200
30 —	SAND mediu	WITH SILT, a m grained, light to dense (SP-SM	little gravel, fin brown, moist, m	e to iedium			40	М	R	SS	24					
31 -		10 dense (61 -614	1) (commuca)						Μ	00	27					
32	-			•					ß							
33 —									H							
34 -				ľ					꿤							
35 -				- - -			45	М	M	SS	20					
36 -	Northi	<b>OF BORING</b> ng=206215.3 g=554201.0	· · · · · · · · · · · · · · · · · · ·													
												1				



# SUBSURFACE BORING LOG

	OB NO: 22-00081	<b>.</b> .				LC	OG OF	BOR	ING N	ю. <b>S</b> ]	ſ <b>-20</b> 2	/AB	-2 (	p. 1	<u>of 2</u> )
PROJE	ECT: TCAAP Rede	evelopme	ent; Ard	len Hi	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION:	955.0 DESCRIPTIO			GEOLOGY	N	мс	SAN	APLE (PE	REC IN.	<u> </u>	D&LA	BORAT	-	TESTS %-#200
1 -	FILL, mostly silty sand, a roots, brown	little grave	l, trace		FILL	57	м	M	SS	7					
2 -								Д							
3 -	SANDY SILT, a little grav medium dense (ML)	vel, brown,	moist,		TILL	24	М	X	SS	17	11				
4 ~ 5 -	CLAYEY SAND, a little g stiff (SC)	gravel, brov	wn, very					E							
6 -	SILTY SAND, a little grave structure fine to medium grained, but the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the structure of the struc			- []]		19	М	M	SS	15					
7	dense (SM) SAND, a little gravel, brow				COARSE ALLUVIUM	-		E							
8	dense (SP) (possible fill) SAND WITH GRAVEL,					20	М	$\mathbb{N}$	SS	16					
9 – 10 –	brown, moist, medium der SAND WITH GRAVEL,	ise (SP)						R							
11 -	medium to fine grained, br (SP)	rown, mois	t, dense			37	M	$\mathbb{N}$	SS	14					
12 — 13 —	GRAVEL WITH SAND, dense (GP)	brown, moi	ist, mediur					K K		~					
13 -				1 1 1 1 1		27	M	Д	SS	8					
15 —	SAND, fine to medium gra moist, dense, laminations	ained, light	brown, d (SP)			40	м	M	SS	14					
16 17			,						55	1.4					
17	SAND, a little gravel, med		d Baba					ł							
19 —	brown, moist, dense (SP)	num graine	a, ngni					Ĩ							
20 21						43	М	M	SS	17					
21 - 22 -								R							
23 —	SAND, a little gravel, fine	to medium	grained,					H							
24 – 25 –	light brown, moist, very de	ense (SP)						Ц Ц							
25 26 -						51	М	$\mathbb{X}$	SS	18					
27 –								3							
28 —								Ĭ							
DEP	TH: DRILLING METHOD			WATE	R LEVEL MEA	SURE	EMEN	TS					NOTE:	REFE	R TO
0-39	0½' 3.25" HSA	DATE	TIME	SAMPL DEPT	ED CASING H DEPTH	CAV DE	/E-IN PTH	DI FLU	NILLIN ID LE	∛G VEL	WAT LEVI	ER EL	THE A		
		7/26/07	10:55	41.5	39.5	41	1.0				Non		SHEET		
BOBIN	£												EXPLA		
BORING COMPL													ERMIN		
DR: SC	G LG: BR Rig: 91C												113	IS LOO	L L

06/04



## SUBSURFACE BORING LOG

#### LOG OF BORING NO.ST-202/AB-2 (p. 2 of 2) 22-00081 AET JOB NO: TCAAP Redevelopment; Arden Hills, MN PROJECT: FIELD & LABORATORY TESTS DEPTH IN FEET REC IN. SAMPLE TYPE GEOLOGY MC N wc DEN PL MATERIAL DESCRIPTION LL **%-#**200 Ł SAND, a little gravel, medium to fine grained, light brown, moist, very dense (SP) (continued) 30 SS 19 55 Μ 31 32 33 SAND, fine grained, light brown, moist, dense, laminations of silt (SP) 34 35 48 SS 18 Μ 36 37 38 SAND WITH GRAVEL, medium grained, brown, moist, very dense (SP) 39 40 SS 19 54 Μ 41 -**END OF BORING** Northing=206823.0 Easting=554162.7



## SUBSURFACE BORING LOG

AET JO	**************************************					LC	)G OF	во	RING N	10. <b>S</b> ]	[-203	/AB	- 3 (	<u>р. 1</u>	of 2)
PROJE				en Hi		γ.	 T				EIEL T	) & LA		rony	
DEPTH IN FEET	SURFACE ELEVATION: _ MATERIAL	954.4 DESCRIPTI			GEOLOGY	N	мс	SA 1	MPLE TYPE	REC IN.	WC	DEN	LL		12515
1 -	FILL, mostly silty sand, s roots, dark brown	urface root	s, trace		FILL	8	м	M	SS	14	10				
2 -	FILL, mostly clayey sand roots, light brown, dark br	, a little gra rown and b	ivel, trace rown	-				Ĥ			1.0				
3 -						13	M	M	SS	24	12				
4 – 5 –	CLAYEY SAND, a little	grave, brov	vn, very stiff	f	TILL	-		R			11				
6 -	(SC)					22	М	M	SS	17	11				
7 -								R			7				
8 - 9 -						27	М	$\mathbb{N}$	SS	19					
10 -						_		K			6				
11 -						28	М	Ň	SS	19					
12	SAND WITH SILT AND fine grained, brown, moist	GRAVEL	, medium to		COARSE ALLUVIUM			K			7				
13 14	very dense (SP-SM)	, mealum (	uense to		ALLOVION	47	М	Ň	SS	10	'				
15 -								K							
16 -						26	М	Ň	SS	14					
17 -								Ħ							
18 – 19 –								ł							
20 -								붜							
21 -						33	М	M	SS	16					
22 –								3							
23 -								Į							
24 – 25 –								EL A							
26 -						74	М	M	SS	12					
27 -								F							
28 -	SAND, medium to fine gra medium dense to dense (SI	ained, brow P)	vn, moist,					H							
DEPT	H: DRILLING METHOD			WATE	ER LEVEL MEA	SURE	MEN			. <u> </u>	I	N	IOTE:	REFE	IR TO
0-495	½' 3.25" HSA	DATE	TIME <sup>S</sup>	SAMPL DEPT	ED CASING H DEPTH	CAV DEI	E-IN PTH	E FL	RILLIN UID LE	IG VEL	WATE LEVE	ER .	THE A	TTAC	HED
··		7/27/07	2:47	51.5	49.5	51	.5				Non	•	SHEET		
BORING	· · · · · · · · · · · · · · · · · · ·												XPLAN		
BORING								<u> </u>							GY ON
DR: <b>SG</b>	LG: BR Rig: 91C												1113	IS LO	J .

06/04



AET JO	DB NO: <u>22-00081</u>			LO	G OF	BO	RING N	io. <b>ST</b>	-203	/AB-	3 (	p. 2	o <u>f 2</u> )
PROJE	CT: TCAAP Redevelopment; Arder	ı Hi	lls, MN	<u></u>									
DEPTH IN FEET			GEOLOGY	N	мс	SĄ	MPLE TYPE	REC		) & LAI	BORAT	'ORY '	TESTS
FEET	MATERIAL DESCRIPTION	P. C.		••			YPE	ĪN.	WC	DEN	LL	PL	%-#200
30 —	SAND, medium to fine grained, brown, moist, medium dense to dense (SP) <i>(continued)</i>			24	м	Y	SS	19					
31 —				2.		Δ							
32						ł							
33 —						\$							
34 -						1							
35 -				39	м	V	SS	16					
36 -						$\square$							
37						ł							
39 -	SAND WITH GRAVEL, fine to medium grained, light brown, moist, medium dense (SP)					1							
40 -				26	м	$\bigvee$	SS	17					
41 -				20		$\square$	33	17				:	
42						ł							
43 -						Į							
44 -						1	:						
45 -				23	м	X	SS	20					
46 47						/\ ਸ							
47						ł							
49 -						ł							
50 -	SILTY CLAY, brown, very stiff (CL-ML)		FINE			H H			19				
51 -	SAND WITH SILT, fine to medium grained, brown, moist, medium dense (SP-SM)		ALLUVIUM COARSE ALLUVIUM	23	М	X	SS	16					
	END OF BORING Northing=206974.8 Easting=553863.2		ALLUVIUM										
	·						· · · · · · · · · · · · · · · · · · ·						
												[	I



AET	JOB NO: 22-00081						LC	)G OF	BO	RING N	ю. <b>ST</b>	<b>20</b> 4	/AB	• 4 (	<u>р. 1</u>	of 2)
PROJ	ECT: TCAAP Red	evelopm	ent; Ard	len Hi	lls, MN	ſ								-		
DEPTH	SURFACE ELEVATION:	938.6			GEOLO	GV			<b>S A</b>		REC	FIELI	) & LA	BORAT	TORY	TESTS
IN FEET	MATERIAL	DESCRIPTI	ON			U I	N	MC		MPLE YPE	IN.	wc	DEN	LL	PL	%-#200
1 -					FILL		31	м	M	SS	10	7				
2 -	FILL, mixture of clayey sand silty sand, a little grav light brown, dark brown a	el, trace ro	lean clay ots, brown	,					H			9			-	
3 -		ind gray					42	M	M	SS	18					
5 -	-								R							
6-							13	М	M	SS	17	19				
7 -	-								团							
8 -							2	м	X	SS	NR					
9 10									团							
10 -							3	м	XI	SS	9	14				
12 -	-							$\overline{\Delta}$	E							
13 -							4	w	M	SS	12					
14 -	-				:				H							
15 -							2	w	$\mathbb{N}$	SS	17	17				
16 -							-		Д		17					
17 18							10		M			19			:	
10 -	CLAYEY SAND, a little s gravel, brown, stiff (SC)	sandy silt, a	little		TILL		10	М	М	SS	17					
20 —	SANDY LEAN CLAY, a	little grave	l, light						K			27				
21 -	brown, a little brown, stiff (CL)	, laminatioi	ns of silt				11	М	M	SS	20	27				
22 -	SAND WITH SILT AND	GRAVEL.	medium to		COARSE				E							
23 -	fine grained, brown, a little very dense, lense of clayey	e dark brow / sand at 24	vn, moist,		ALLUVI	JM	52	М	X	SS	14					
24 -	dense to medium dense (S)	P-SM)	-						E							
25 - 26							22	М		SS	7					
20 27 –									R							
28 –									I							
DEP	TH: DRILLING METHOD			WATE	R LEVEL	MEA	SURE	MEN	비비 TS			<u> </u>			ייייים	
0.2		DATE	TIME	SAMPL	ED CASI	NG	CAV DEF			RILLIN JID LE	IG.	WATE		NOTE: THE A'		
0-34	4½' 3.25" HSA	7/30/07	10:00	DEPT 14.0			DEF 12		rLi	JID LE	VEL	Non	,	SHEET		
		7/30/07	10:30	36.5			36		-		$\rightarrow$	Non	<u> </u>	XPLAI		
BORIN COMPL	G LETED: <b>7/30/07</b>		~ 0100									1 101	-			JY ON
DR: SC									-		-+			TH	IS LO	G



AET JO	DB NO: 22-00081		LC	G OF	BORING N	ю. <u>ST</u>	-204	<u>/AB-</u>	· 4 (j	<u>р. 2 с</u>	<u>of 2)</u>
PROJE	CT: TCAAP Redevelopment; Arden Hi	ills, MN									
DEPTH		GEOLOGY			SAMPLE	REC	FIELI	& LAI	BORAT	ORY T	ESTS
DEPTH IN FEET	MATERIAL DESCRIPTION	OLOLOGI	N	MC	SAMPLE TYPE	IN.	wc	DEN	LL	PL	%-#200
30 -	SAND WITH SILT AND GRAVEL, medium to fine grained, brown, a little dark brown, moist, very dense, lense of clayey sand at 24' very	COARSE ALLUVIUM (continued)	18	М	ਸ X ss	13					
31	dense to medium dense (SP-SM) (continued)										
32 -		•		:	Ħ						
33 -		- - -			Ð						
34 35		• •									
		- - -	21	м	X ss	12					
36 -	END OF BORING Northing=207058.0 Easting=553053.9										



# SUBSURFACE BORING LOG

AET JO	DB NO: 22-00081		<del></del>			LC	) G OF	BOR	RING N	ю. <b>S</b> ]	-205	/AB	-5(	p. 1	of 2)
PROJE	CT: TCAAP Red	<u>evelopm</u>	ent; Ard	<u>en Hi</u>	ills, MN									<u>p</u>	<u> </u>
DEPTH	SURFACE ELEVATION:	937.1			GEOLOGY			SAT	MPLE	REC	FIELI	)&LA	BORA	FORY	TESTS
DEPTH IN FEET	MATERIAL	DESCRIPT			GLOLOGI	N	MC	T	YPE	IN.	wc	DEN	LL	PL	%-#200
1 -	FILL, mixture of clayey s little gravel, surface roots	and and sil	ty sand, a s. brown an	d	FILL	27	м	М	SS	12	6		*******		
2 -	light brown	,	,	-		21	IVI	$\square$	22	12	0				
3 -						39	м	M	SS	15	6				
4 -						57	144	Д	00	15					
5	SILTY CLAY, brown, ve	ry stiff to h	lard		FINE	1		M			1.2				
6 -	(CL-ML)				ALLUVIUM	22	M	X	SS	20	13				
7								E							
8 -						17	м		SS	24	23				
9 –								Å							
10 -					3 3 -	20	м	$\square$	SS	24	18				
11 -						20	IVI	$\square$	22	24					
12 -								K							
13 -						20	М	X	SS	24	17				
14 -								य							
15 - 16 -	SAND WITH SILT AND	GRAVEI	medium to		COARSE	33	М	M	SS	14	12				
10 -	fine grained, brown, moist	t, dense (SI	P-SM)		ALLUVIUM			И И							
18 -								ł							
19 -								ł							
20 —								H							
21 -						47	М	XI.	SS	10					
22 -								R							
23	GRAVELLY SAND WIT	H SILT m	edium to												
24 -	fine grained, brown, moist (SP-SM)	, dense to v	ery dense												
25 -								M	00	10					
26 -						44	М	$\mathbb{N}$	SS	10					
27 -								\$							
28 -								Ħ		:					
DEPT	H: DRILLING METHOD			WATE	R LEVEL MEA	SURE	I MENI	עצו רא	<u></u> ł				IOTE:	BEEL	
0-443	4' 3.25" HSA	DATE	TIME	SAMPLI DEPTI	ED CASING H DEPTH	CAV DEF	E-IN TH	DF	RILLIN ID LEV	G	WATE LEVE		THE AT		
		7/30/07	8:50	46.5		46			····		None		SHEET		4
DODATO													XPLAN	JATIO	N OF
BORING COMPLE												TE	RMIN		1
DR: SG	LG: SB Rig: 91C												THI	S LOC	·]

06/04



## SUBSURFACE BORING LOG

#### LOG OF BORING NO.ST-205/AB-5 (p. 2 of 2) 22-00081 AET JOB NO: **TCAAP Redevelopment; Arden Hills, MN** PROJECT: FIELD & LABORATORY TESTS DEPTH IN FEET SAMPLE TYPE REC IN. GEOLOGY Ν MC WC DEN LL PL **%-#20** MATERIAL DESCRIPTION GRAVELLY SAND WITH SILT, medium to fine grained, brown, moist, dense to very dense 30 -(SP-SM) (continued) SS 60 Μ 14 31 32 33 34 35 SS 50+ Μ 8 36 37 38 SAND WITH SILT, fine to medium grained, brown, moist, very dense (SP-SM) 39 40 · SS 57 Μ 16 41 42 43 44 45 63 М SS 17 46 **END OF BORING** Northing=207537.6 Easting=553124.1



	DB NO: <u>22-00081</u>					LC	G OF	BOł	RING N	o. <b>ST</b>	-206	j/AB	-6 (	<u>р. 1</u>	of 2)
PROJE	CT: TCAAP Rede	evelopme	ent; Arde	n Hi	lls, MN		1								<u> </u>
DEPTH IN FEET	SURFACE ELEVATION: _	916.0			GEOLOGY	N	мс	SA	MPLE YPE	REC IN.		) & LA	r	r	1
FEET	MATERIAL FILL, mostly silty sand, su			-	FILL						wc	DEN	LL	PL	<b>%-#</b> 20
1 -				/	TIDE	32	М	X	SS	14	5				
2 - 3 -	little gravel, trace roots, da		•			26	М	$\square$	SS	13	12				
4	SANDY LEAN CLAY, a	little grave	l grou and		WEATHERED			Ш							
5 -	brown mottled, a little blac silt (CL)	ck, stiff, lan	ninations of		TILL	12	м	M	SS	17	18				
6 -							ļ	H							
7 8	SANDY LEAN CLAY, a brown and brown mottled	little grave , stiff (CL)	l, dark		TILL	15	м	M	SS	20	18				
9 10	SANDY LEAN CLAY, a	little grave	l, dark					E							
11 -	brown, very stiff (CL)	-				16	М	Å	SS	22	16				
12 - 13 -	SANDY LEAN CLAY, a stiff to very stiff (CL)	little grave	l, dark gray,			15	м	M	SS	19	14				
14 -								Д							
15 —						12	М	M	SS	20	15				
16 —								Д	00						
17 18								H							
19 —								H							
20 —						14	м	$\square$	SS	22	16				
21 22								R							
22 -								H							
24 -								H						1	
25 -						13	м	M	SS	24	16	1			
26 27								R							
28 -								H							
DEP	TH: DRILLING METHOD			<u></u> WAT	ER LEVEL MEA			_I∐ ∏S				1			
		DATE	TIME	SAMPI DEP1			/E-IN PTH		DRILLI UID LE	NG	WAT LEV		NOTE: THE A		
0-29	0½' 3.25" HSA	7/30/07	12:00	DEP1		-	ртн <b>1.2</b>	FL	UIDLE	VEL	Nor		SHEE		
		1.50/07	12,00	<i>J</i> 1.,	<i>, 1</i> ,7,3						1101		EXPLA		
BORINO	G LETED: <b>7/30/07</b>		+					-				T	ERMD	NOLO	GY O
	G LG: SB Rig: 91C			·		1			·				Τŀ	IS LC	G



AET J	юв NO; <u>22-00081</u>			LC	)G OF	во	RING N	ю. <b>S</b> Т	<b>-206</b>	6/AB	-6 (	р. 2	of 2)
PROЛ		n Hi	ills, MN										
DEPTH IN FEET			GEOLOGY	N	мс	sĄ	AMPLE TYPE	REC IN.		D&LA		TORY	TESTS
FEET		V///				ष्ठ	IYPE	IN.	wc	DEN	LL	PL	<b>%-#200</b>
30 -	SANDY LEAN CLAY, a little gravel, dark gray, stiff to very stiff (CL) (continued)			10		M			13				
31				18	М	Ŵ	SS	23					
	END OF BORING Northing=207925.7 Easting=552804.2												
	Easting=552804.2												
		ļ											
							ŀ						ĺ
						Ì			:				
												i	
/04													



AET JC	DB NO: 22-00081		· · · · ·			LC	OG OF	BO	RING N	10. <b>S</b> ]	[- <b>20</b> 7	//AB	-7 (	p. 1	<u>of 1</u> )
PROJE	CT: TCAAP Red	<u>evelopm</u>	<u>ent; Ard</u>	en Hi	ills, MN										
DEPTH	SURFACE ELEVATION: _	908.5	;		GEOLOGY	N	MC	SA	MPLE TYPE	REC IN.	FIELI	) & LA	BORA	FORY	TESTS
IN FEET	MATERIAL					- 14			ГҮРЕ	IN.	wc	DEN	LL	PL	<b>%-#</b> 20
1	FILL, mixture of clayey s little gravel, surface roots brown and brown	and and sil , trace roots	ty sand, a s, dark		FILL	33	м	M	SS	12	4				
3 -						22	м	M	SS	9	6				
4 5	SANDY LEAN CLAY, a	little grave	el, dark		TILL	-	5	म							
6 -	brown, a little brown, stiff (CL)	f, laminatio	ns of silt			15	М	X	SS	17	16				
7 - 8 -						14	м	K	SS	18	17				
9	SANDY LEAN CLAY, a stiff (CL)	little grave	l, dark gray	, ///				R							
11						10	М	Ķ	SS	20	17				
12 – 13 –	· · · ·					11	м	X	SS	20	15	:			
14 - 15 -								E							
16 -						10	M	Å	SS	19	16				
17 - 18 -													-		
19 — 20 —								ł							
21 -						10	м	X	SS	20	16				
22 - 23 -								Į							
24 -								H							
25 - 26 -	_					10	м	M	SS	24	16				
	END OF BORING Northing=208187.8 Easting=552129.6				4.411 4										
DEPTI	H: DRILLING METHOD			 WATI	ER LEVEL MEA	L ASURE	I EMEN	⊥ I TS		L <u></u>	<b>I</b>		VOTE:	 	
n 3 <i>4</i> 1	/! 3 75!! LICA	DATE	TIME	SAMPL DEPT					ORILLIN UID LE		WATE LEVE		THE A		
0-245	4' 3.25" HSA	7/30/07	1:30	26.5		<u>+</u>	.9	rL	UDEE	VEL	Non		SHEET		
											1101		XPLA		
BORING COMPLE	TED: 7/30/07											T	ERMIN	IOLOG	10 YE
DR: SG													TH	IS LO	G



# SUBSURFACE BORING LOG

ł	OB NO: 22-00081					L	DG OF	F BO	RING N	10. <b>S</b> ]	-208	AB	-8 (	р. 1	of 2
PROJE	CT: <u>TCAAP Rec</u>	levelopn	nent; Ard	len Hi	lls, MN										
DEPTH IN FEET	SURFACE ELEVATION:				GEOLOGY	N	мс	SĄ	MPLE FYPE	REC		) & LA		TORY	TESTS
1 -	FILL, mixture of silty sa	L DESCRIPT	vev sand, a		FILL			M			wc	DEN	LL	PL	%-#2(
2 —	dark brown and black	5, 1100 IOO	., 010 11,			27	M	$\mathbb{A}$	SS	12	4				
3 —						16	M	M	SS	18	9				
4 -								Д							
5	SANDY LEAN CLAY, a brown and gray, firm (Cl	a little grav L)	el, light		WEATHEREI TILL	5	м	X	SS	17	19				
7 -								H							
8 -						7	м	$\mathbb{N}$	SS	19	16				
9-	SANDY LEAN OF AN	1.441	-1 1		(1)X X	l	ļ	团							
10	SANDY LEAN CLAY, a stiff (CL)	i nule grave	el, brown,		TILL	10	м	M	ss	22	15				
12	SANDY LEAN CLAY, a	little grave	el, dark grav					मि							
13 -	stiff (CL)	-				13	М	XI	SS	22	15	:			
14 -								R							
15 -						9	м	M	SS	20	15				
16 - 17 -		·													
18 -								ł							
19								ł	i						
20								비							
21 –						12	M	X	SS	23	15				
22 -							ľ	स्रो							!
23 -															
24								<u>}</u>							
25 -						11	м	$\mathbb{N}$	SS	24	16				
26 -						- •									
27 28							•	]							
20	- <u></u>						•								
DEPTI	I: DRILLING METHOD		r		R LEVEL MEA	SURE	MENT	S	(	L	I		J DTE: F	LEFER	 1 то
0-341/	2' 3.25" HSA	DATE	TIME <sup>S</sup>	SAMPLE DEPTH	D CASING DEPTH	CAV DEP	E-IN TH	DI FLU	RILLIN ID LEV	G EL	VATEI LEVEI		HE AT		
		7/30/07	2:35	36.5	34.5	36					None		HEETS	FOR	AN
BORING													PLAN		
BORING COMPLE								;				TE	RMINC		
<u>DR: <b>SG</b></u> )4	LG: SB Rig: 91C												THIS	LOG	<del>.</del>

06/04



AET JO	DB NO: 22-00081			LO	G OF	BO	RING N	10. <b>ST</b>	-208	AB-	• 8 (	р. 2 (	of 2)
PROJE	CT: TCAAP Redevelopment; Arde	<u>n Hi</u>	lls, MN										
DEPTH IN FEET			GEOLOGY	N	мс	SA	MPLE YPE	REC IN.		) & LA		ORY 1	TESTS
FEET	MATERIAL DESCRIPTION	V////					YPE	IN.	WC	DEN	LL	PL	<b>%-#20</b> 0
30 —	SANDY LEAN CLAY, a little gravel, dark gray, stiff (CL) (continued)			14	м	M	SS	20	16				
31 -				14		$\square$	33	20					
32 –					ŧ	Ŧ							
33 -						ł							
34 35						1							
36 -				14	м	X	SS	24	17				
36	END OF BORING Northing=208345.2 Easting=552536.3												
(104	·····	لحسبه			1					<u>ا</u>			



	DB NO: <u>22-00081</u>	01000				L	og of	BORING	NO. <b>S</b> ]	[-209	)/AB	-9 (	p. 1	of 1
PROJE DEPTH	CT: <b>TCAAP Red</b>			den H	1				1	FIELI	D&LA	BORA	ORY	TEST
DEPTH IN FEET		L DESCRIPT			GEOLOGY	N	MC	SAMPLE TYPE	REC IN.		DEN			%-#2
1	FILL, mostly silty sand v	with gravel,	trace roots	\$,	FILL	36			10					
2 -	FILL, mixture of silty sa little gravel, trace roots, l	nd and clay	ey sand, a	/   		30	M	X ss	13	4				
3	brown and black	nown, ngin	. 010 wii, uz			10	м	ss 🕅	16	11				
4 –								त्र स						
5 -						18	м	M ss	16	6				
6 7														
8 -	SAND WITH SILT, a lit medium grained, brownis	tle gravel, fi sh gray, wat	ine to erbearing,		COARSE ALLUVIUM	16	W/M	$\sqrt{3}$ ss	14					
9 -	medium dense (SP-SM)		Ċ,						14					
10 -			·			-	117							
11 -						7	W	X ss	14					
12 <u>-</u> 13 -	SANDY LEAN CLAY, a firm to stiff (CL)	little grave	l, dark gra	y, ///	TILL			М К		16				
14 -						6	М	X ss	16	10				
15 —								R		10				
16 -						9	м	X ss	20	16				
17 -								<b>F</b>						
18 19								Ħ						
20 ~								Ц Ц						
21 -						9	м	X ss	23	16				
	END OF BORING Northing=210352.9 Easting=552356.5		<u> </u>											
DEPTH	H: DRILLING METHOD				R LEVEL MEA	SURE	MENT	S		I	N	OTE: ]	REFEI	R TO
0-19½	2' 3.25" HSA	DATE	TIME	SAMPL DEPTI	ED CASING H DEPTH	CAV DEF	E-IN 'TH	DRILLIN FLUID LE	IG VEL	WATE LEVE		HE AT		
		7/31/07	7:46	9.0	7.0	7.				None	·	HEET		
SORING	TED: 7/31/07	7/31/07 7/31/07	7:43	11.0 21.5	<u>9.5</u> 19.5	9. 20				9.1 None		(PLAN RMIN(		
	1892 1131/07	1 //J1/0/	1.33	- 21.5	1 19.5	20	41 1		1	None	, 11D	1.71ATT A{	JUUU	IUI



### SUBSURFACE BORING LOG

AET J	OB NO: 22-00081					L	OG OF	во	RINGN	10 <b>S</b> ]	Г <u>-2</u> 10	/AB	-10 (	(p. 1	of 1)
PROJE	ECT: TCAAP Red	levelopn	nent; Ard	en H	ills, MN										,
DEPTH IN FEET	SURFACE ELEVATION:	898.	.8		GEOLOGY			SA	MPLE	REC	FIELI	) & LA	BORA	FORY	TESTS
FEET		L DESCRIPT				N	MC	]	MPLE TYPE	ÎN.	wc	DEN	LL	PL,	%-#200
1	FILL, mixture of silty sa little gravel, trace roots, and dark brown	nd and clay pieces of b	ey sand, a / / / / / / / / / / / / / / / / / /		FILL	37	м	M	SS	15				1	
3						11	M	M	SS	12					
4 -	SILT WITH ORGANIC	S traca rea	to black		TOPROV	4	$ \nabla$	म							
5 - 6 -	loose (ML)				TOPSOIL	5	W/M	М	SS	19	19				
7	SILTY SAND, fine grain gray, waterbearing, loose	ed, trace ro to medium	oots, dark 1 dense (SM)		COARSE ALLUVIUM			E							
8 -					• • •	11	w	M	SS	2					
9 — 10 —	SANDY LEAN CLAY,	a little grav	el, brown		WEATHERE	D		E							
11 -	and gray mottled, a little laminations of silt (CL)	dark brown	ı, firm,		TILL	6	w	X	SS	16	14				
12 — 13 —	SANDY LEAN CLAY, a stiff to very stiff (CL)	ı little grav	el, dark gray,		TILL	-		R			14				
14 -						9	М	Å	SS	16	14				
15						9	N	М		10	16				
16 17					2	9	М	Å	SS	18					
18 -									-						
19 -								Ĭ							ĺ
20 - 21 -						20	м	$\overline{\mathbb{N}}$	SS	19	15				
.	END OF BORING		······	-			- /	4							
	Northing=210578.9 Easting=553291.9											E			
DEPTH	H: DRILLING METHOD		······································	WATE	R LEVEL MEA	SUREN	MENT:	 S					OTE: 1		
0-19½	2' 3.25" HSA	DATE	TIME S.	AMPLI DEPTI	ED CASING I DEPTH	CAVE DEP	-IN TH I	DI FLU	RILLING ID LEV	G EL	WATEF LEVEL		HE AT		
		8:35	6.5	4.5	4.9					None	┥_	HEETS	FOR	AN	
BORING		7/31/07	8:50	21.5	19.5	21.	5						PLAN		
BORING COMPLE												TE	RMINC		ON
DR: SG	LG: SB Rig: 91C								_				THIS	LOG	



### SUBSURFACE BORING LOG

AET J	OB NO: <u>22-00081</u>				····	L	OG OF	BC	ORING 1	√0 <b>S</b> T	-211	/AB	<b>6-1</b> 1	(p. 1	of 1)
РКОЛ	ECT: TCAAP Red	levelopn	nent; Ard	len H	ills, MN										
DEPTH IN FEET	SURFACE ELEVATION:			11 <b>11 11</b> 11	GEOLOGY	/ N	мс	s	AMPLE	REC	FIELI	D&L.	ABORA	TORY	TESTS
FEET		L DESCRIPT				N	MC		AMPLE TYPE	ÎN.	wc	DEN	I LL	PL	<b>%-#200</b>
1-		nd, clayey trace roots.	sand and , brown, dar	k	FILL	20	м	M	SS	15					
2 -	brown and gray			ľ		20	141	$\square$	00	1.5	1				
3	Ť			ļ		14	м	M	SS	14				:	
4 –							141	$\square$	55	14					
5								K							
6-						12	M	X	SS	18	19				
7-								R							
8						17	I ↓ Ŵ	M	SS	18	20				
9	SILTY CLAY, brown, ve	ery stiff (C	L-ML)		FINE	-		Д	55	10					
10 -	CLAYEY SAND, a little	gravel, da	rk gray, stiff		ALLUVIUN TILL			K							
11 -	to firm (SC)					10	М	X	SS	14	13				
12 -								2					ł		
13 —						7	м	M	SS	21	15				
. 14								Д							
15 -	SANDY LEAN CLAY, a stiff to firm (CL)	little grav	el, dark gray	, ///				M		•	17				
16 -						9	М	Ň	SS	23	17				
17 -								Ł							
18 -								ł							
19 -								ł							
20 -								$\nabla$			16				
21 -						8	М	Ŵ	SS	22			i		
	END OF BORING Northing=210737.1														
	Easting=552615.0														
								1							
							[								ĺ
DEPT	H: DRILLING METHOD			WATF	R LEVEL ME	ASURF	MENT	<u> </u> S				<u> </u>			
0 101	/! 2 25" TTO A	DATE	TIME	SAMPL DEPT			·	D	RILLIN	G	WATE LEVE		NOTE:		
0-195	2' 3.25" HSA	7/31/07	9:30	DEPT: 9.0	H DEPTH 7.0	DEP		FLU	JID LEV	/EL			THE A' SHEET		1
		7/31/07	9:40	21.5		21					7.6 None	<u> </u>	XPLAN		
BORING COMPLE	TED: 7/31/07						-					<u></u>	ERMIN		1
DR: SG				·					·				THI	S LOG	



### SUBSURFACE BORING LOG

AET J	OB NO: <b>22-00081</b>					L	DG OF	BO	RING N	юST	-212	/AB	-12	(p. 1	of 1)
PROJE	ECT: TCAAP Red	levelopn	nent; Ar	den Hi	lls, MN									<b></b>	
DEPTH	SURFACE ELEVATION:	895.	1		GEOLOGY	<u> </u>		SA	MPLE	REC	FIELI	D&LA	BORA	TORY '	TESTS
IN FEET		. DESCRIPT	TION		GLODEGUI	N	MC	Ĩ	MPLE YPE	IN.	WC	DEN	LL	PL	6-#200
1 -	3.5" Bituminous paveme	nt			FILL	1		R	SU						
2	FILL, mostly silty sand v FILL, mixture of clayey s					26	M	Х	SS	14	5				
-	little gravel, organic clay.	, brown, da	irk brown,					Щ							
3 -	gray and black					25	M	Ň	SS	15	10				
4 - 5 -								E							
6-						23	W/M	ιXI	SS	16	11		-		
7-								R							
8-						33	w	М	SS	NR					
9 -								Д							
10 -	SILT WITH ORGANICS moist, very loose (ML)	, trace roo	ts, black,		SWAMP DEPOSIT OR			$\square$	00		25 23				
11-	LEAN CLAY WITH OR	GAINCS.	trace roots.	111111	TOPSOIL	2	М	M	SS	17	26				
12 –	black, very soft to soft (C	L)	,					R							
13 -	SILTY SAND, trace roots	s, fine grain	ned, dark		COARSE	5	W/M	X	SS	16	114				
14 —	gray, waterbearing, loose	(SM)			ALLUVIUM			R							
15 –			•			9	w	M	SS	7					
16 -								Д		•					
								ł							
19 -	CLAYEY SAND, a little (SC)	gravel, dar	k gray, firn	n	TILL			ł							
20 -								۲Į							
21 -						8	м	X	ss	16	17				
	END OF BORING							4							
	Northing=211046.0 Easting=553106.0														
	Dasting 555100.0														
									F						
DEPTI	H: DRILLING METHOD			WATE	R LEVEL MEA	SURE	MENT	TS I	1	!			OTE:	REFER	
0-241⁄	2' 3.25" HSA	DATE	TIME	SAMPLE DEPTH	D CASING DEPTH	CAV	E-IN TH	DI FLU	RILLIN ID LEV	G ÆL	WATE LEVEI		'HE AT		
		7/31/07	10:50	9.0	7.0	8.					7.3		HEET	SFOR	AN
BORING		7/31/07	11:10	21.5	19.5	19	.5				18.9	E	(PLAN	IOITA	V OF
COMPLE		• 										TE	RMIN	DLOG	Y ON
DR: SG	LG: SB Rig: 91C												THI	S LOG	



### SUBSURFACE BORING LOG

AET J	юв NO: <u>22-00081</u>					L	OG OI	F BC	ORING 1	NOS7	Г <b>-21</b> 3	/AB	-13	(p. 1	of 1)
PROJ	ECT: TCAAP Re	develop	ment; Arc	len Hi	lls, MN									1	<u> </u>
DEPTH IN FEET	· · · · · · · · · · · · · · · · · · ·	· <u></u>			GEOLOGY		1	1	A N 4101 17	DEC	FIELI	) & LA	BORA	TORY	TESTS
FËET		L DESCRIP			0EOLOG1	N	MC	101	AMPLE TYPE	REC	wc	DEN	F	r	%-#200
1 -	FILL, mixture of silty sa sand, a little gravel, surf	ind, sandy	silt and claye	ey	FILL			$\overline{\Lambda}$	1			<u> </u>			
2 -	brown, dark brown and	black	race roots,			26	M	Ň	SS	16	4		:		
]								$\left\{ \right\}$	Ĭ						
3 -						10	M	X	SS	16	9				
4 -								R							
5	SAND WITH SHIT C					- 10	м	M	SS	16	18				
6 -	SAND WITH SILT, fine brownish gray, a little gr	av. waterh	n grained, earing, loose		COARSE ALLUVIUM			$\wedge$	55	10					
7 -	laminations of sandy silt	(SP-SM)					Į.Ţ	R							
8 -	SILTY SAND, a little gr gray, waterbearing, medi	um dense.	lenses and			12	w	X	SS	14	24				
9-	laminations of lean clay $(SM)$	and sandy I	lean clay					A							
10 -	SANDY LEAN CLAY	a little grav	el, dark gray	, ,,,,,,	TILL			M.	~ *		19				
11 -	loose, lense of medium to at 10', laminations of san	o fine grain	ned silty sand			8	M/W	ΊÅ	SS	15					
12 -			()					E							
13 -						3	M/W	γV	SS	20	17				
14 –								Д							
15 -								M			1.0				
16 -						4	M·	X	SS	19	17				
17 -								R							
18 -								Ħ							
19 -								Ħ							
20 -								H H							
21 -						4	Μ	X	SS	20	18				
Ţ	END OF BORING Northing=211044.1		<u>u</u>						-	-					
	Easting=552565.3														
											i i				
											Ì				
		1													
DEPTH	H: DRILLING METHOD	 	J		LEVEL MEA	SURE	MENT	`S	·				DTE: F	EFER	то
0-191/	2' 3.25" HSA	DATE	TIME S	SAMPLE DEPTH	D CASING DEPTH	CAVI DEP	E-IN TH		RILLIN ID LEV	G Y	WATER	E E	HEAT		
		8/2/07	9:45	9.0	7.0	7.2					7.1		HEETS		
BUND		8/2/07	10:00	21.5	19.5	19.	5				None	EX	PLAN	ATION	OF
BORING COMPLE										.	<u> </u>	TEF	RMINC	LOGY	ON
DR: SG	LG: SB Rig: 91C											-	THIS	LOG	



### SUBSURFACE BORING LOG

ļ	OB NO: <b>22-00081</b>					L	OG OF	BO	RING N	10 <b>S</b> <u>T</u>	-214	/AB	-14	(p. 1	of 1
PROJE	CT: TCAAP Red	developn	nent; Ar	den H	ills, MN		<u>_</u>								
DEPTH IN FEET	SURFACE ELEVATION:				GEOLOGY	N	мс	SA	MPLE	REC	FIELI	D & LA	BORA	TORY	TEST
FEET		L DESCRIP				IN	MC	T	YPE	ĪN.	wc	DEN	LL	PL	6-#20
1 — 2 —	FILL, mixture of sandy sand and sand with silt, a roots, trace roots, brown black	a little grav	el surface	3	FILL	51	М	M	SS	10	6				
3. –						53	м	M	SS	19	1				
4								Д	55	15					
5 -						35		M	50	20					
6 7						35	M	Å	SS	20					
8						19	м	X	SS	18					
9 -								F							
10 – 11 –	SAND WITH SILT, fine dark gray, waterbearing, laminations of silty sand	medium de	ray, a little mse,		COARSE ALLUVIUM	WН	w	$\mathbb{N}$	⁺SS	17					
12	SILTY SAND, trace root gray, a little black, waterl organic clay at 15.5' (SM	pearing, loc	ned, dark ose, lense o	f		5	<b>X</b> W	R	SS	14					
15	SAND WITH SILT, fine waterbearing, medium de	grained, gr	ay,					N							
16 17 -	SAND WITH SILT AND fine grained, dark gray, w dense (SP-SM)	GRAVEI		0		12	W	X FI	SS	17					
18 — 19 —	SANDY LEAN CLAY, a (CL)	little grave	el, gray, fir	n	TILL		•	ł.							
20								년 (/			18				
21 -					i	6	M	Ň	SS	15	10				
1	END OF BORING Northing=211075.3 Easting=551748.2														
I DEPTH	: DRILLING METHOD		<u>.</u>	WATE	R LEVEL MEA	SUBEN	AEVIL'					1			•••
0-19½		DATE	TIME	SAMPLE DEPTH	·····	CAVE			ILLIN( D LEV		VATE	1	DTE: H		
0-13/2	<u>' 3.25" HSA</u>	8/2/07	8:15	DEPTH 11.5	DEPTH 9.5			LUI	DLĒV		VATEF LEVEL		HE AT HEETS		
		8/2/07	8:15	11.5	9.5	9.5 12.					None		PLAN		
3ORING COMPLET	ED: <b>8/2/07</b>	8/2/07	8:25	16.0	14.5	12.	i~_				None 12.7		2 MINC		
DR: SG	LG: SB Rig: 91C	8/2/07	8:30	21.5	19.5	19.			<u></u>		12.7	-		LOG	



# SUBSURFACE BORING LOG

AET J	OB NO: <b>22-00081</b>					L	OG OI	FBC	DRING 1	NOS	Γ-215	/AB	-15	(p. 1	of 1)
PROJ	ECT: TCAAP Ree	levelopr	nent; Ar	<u>den H</u>	ills, MN									* <u>*</u>	=
DEPTH IN FEET	SURFACE ELEVATION:	894	.5		GEOLOGY			s	AMPI F	REC	FIELI	) & LA	BORA	TORY	TESTS
FEET		L DESCRIP				N	MC		AMPLE TYPE	N.	wc	DEN	LL	PL	<b>%-#20</b> (
1 -	FILL, surface roots with FILL, mostly sand with	silty sand,	dark brown	n	FILL			$\overline{\mathbf{N}}$	1	-					
2 -	roots, light brown	sin, a indie	gravel, trac	e		5	M	Ň	SS	1	11		[		
3 -						21	M	$\overline{\mathbf{N}}$	SS	0					
4								Δ	55						
5 -	FILL, mixture of silty sa sandy lean clay, a little g	ravel, trace	roots dark					M							
6 -	brown, brown, light brow	vn and gray	y Y			9	M	Ŵ	SS	12					
7 -								R							
8						9	М	X	SS	14	15				
9	LEAN CLAY, trace root	s, organics	, black, a		TOPSOIL	_	$ \overline{\Sigma} $	B							
10 -	little dark gray, stiff, lam (CL)					9	м	M	SS	15	21				
12	SILTY SAND, a little gra grained, gray, a little dark	corav wat	erhearing		COARSE ALLUVIUM	-		H							
13 -	loose, laminations of lear	)			17	w	M	00	10						
14 —		•			17	w	М	SS	12						
15 —								凶							
16 -						16	W	XI	SS	5					
17 -								स							
18	SANDY LEAN CLAY, a	little grave	al gray fim		TILL	4	V	Ħ							
19 -	(CL)	mile grave	ei, gray, mi					Į							
20 -								M			17				
21 -						5	M	ХL	SS	16	17				
	END OF BORING Northing=211443.2 Easting=553634.2				<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>										
 DEPTH	H: DRILLING METHOD	<u>, , , , , , , , , , , , , , , , , , , </u>													
				R LEVEL MEA	r							OTE: I	REFER	то	
0-19%	2' 3.25" HSA	TIME	SAMPLE DEPTH	I DEPTH	CAVI DEP	1-IN TH	D] FLU	RILLIN ID LEV	EL	WATEF LEVEL	Т	HE AT	TACH	ED	
		12:15	11.5	9.5	9.9		-			9.3			FOR		
BORING COMPLE	TED: <b>8/1/07</b>	12:34	21.5	19.5	20.	0		<u></u>		18.3	_		ATION	l l	
DR: SG	LG: SB Rig: 91C			<u> </u>					<u> </u>					)LOGY LOG	UN
10.4														200	



AET J	OB NO: <u>22-00081</u>					LC	DG OF	во	RING N	vo <b>S</b> 7	[-216	AB-	-16	(p. 1	of 1
PROJ	ECT: TCAAP Rec	levelopn	nent; Ar	den Hil	ls, MN									` <b>4</b>	
DEPTH IN FEET	SURFACE ELEVATION: MATERIA	895. L DESCRIPT			GEOLOGY	N	мс	SA	MPLE FYPE	REC IN.		D&LA	BORA <sup>.</sup> LL	T	T
	3" Bituminous pavement				FILL			12	SU			DEN		PL.	<b>%-#</b> 20
1-	FILL, mostly silty sand	with gravel				32	м	M	SS	14	8				
2	FILL, mixture of clayey and silty sand, a little gra brown, dark brown, gray	vel, pieces	y lean clay of concret	e,		36	м	Ŵ	SS	17	8				
4						46	м	R	SS	15	6				
6								八 招							
9 10						26	M	R	SS	17					
11 -	ORGANIC CLAY, trace	roots, blac	k, stiff		WAMP		<u>M</u> ⊻	X स	SS	16	15				
13 — 14 —	(OL/OH) ORGANIC CLAY, trace black, a little gray, stiff, l (OL/OH)	aminations	of silty sar	, , , , , , , , , , , , , , , , , , ,	DEPOSIT COARSE	15	w	N F	SS	18	74				
15 16 17	SAND WITH SILT, fine waterbearing, medium de (SP-SM)	grained, gr nse to very	ay, loose			7	w		SS	19					
18 19 20 21						3	м	X	SS	17	16				
	CLAYEY SAND, a little (SC) END OF BORING Northing=211426.9 Easting=553105.1	gravel, darl	k gray, soft												
DEPTH	H: DRILLING METHOD			WATER	LEVEL MEA	SIDEN						<u> </u>	<u>İ</u>		]
0-19½	2' 3.25" HSA	DATE	TIME	SAMPLEI		CAVE	r	DF	RILLING ID LEV	G EL	WATEI		DTE: F HE AT		
		8/1/07	11:00	11.5	9.5	11.					None		EETS	FOR	AN
		8/1/07	11:10	14.0	12.0	12.	-				None		PLAN	ATION	OF
BORING COMPLE	TED: 8/1/07											TEI	RMINC	LOGY	ON
DR: SG	LG: SB Rig: 91C								•, 				THIS	LOG	



AET JC				•		L	OG OF	BORI	NG N	0S <u>T</u>	-217	/AB-	17	(p. 1	of
PROJE	CT: TCAAP Red	levelopn	nent; Ar	den Hi	ills, MN							<u> </u>			
DEPTH IN FEET		L DESCRIPT	TION		GEOLOGY	N	мс	SAM TY	PLE PE	REC IN.		D&LA	·	TORY PL	TES
1	CLAYEY SAND, surface brown, moist, medium d	ense (SC)			TOPSOIL	14	м	M	ss	15				112	
2 - 3 -	SAND WITH SILT, find little brown, moist, medi of silt (SP-SM)	e grained, li um dense, l	ight brown, laminations	a	COARSE ALLUVIUM			Ĥ							
4 -	SAND WITH SUT 6		1		- -	17	M	R N	SS	16					
5 - 6 -	SAND WITH SILT, fine brown, waterbearing, me of silt (SP-SM)	dium dense	ray, a little e, laminatio	ns		28	MÆW	M :	ss	15					
8 -	CLAYEY SAND, a little (SC)	gravel, dar	rk gray, firr	n	TILL	8	м	X Y Y	s	14	13				
	CLAYEY SAND, a little (SC)	gravel, bro	wn, stiff			10	м	₽ ₩	s	13	14				
11 - 12	CLAYEY SAND, a little	gravel, dar	k gray, firm				.*1	∧।` स्र		13					
13 14	to stiff (SC)	_ ,	U ,,			8	М	∦ s ₽	s	17	15				
15 16						10	м	a X s	s	16	16				
17 - 18 -							ľ	Ħ							
19 20															
21 -	END OF BORING					11	м	X s	s	24	15				
1	Northing=211423.6 Easting=552556.4														
DEPTH	DRILLING METHOD		<u> </u>	WATE	LEVEL MEAS	UREN	/ENT	<u> </u>							-
0-19½	3.25" HSA	DATE	TIME	SAMPLE DEPTH		CAVE		DRIL LUID	LING LEVE		VATEF .EVEL		DTE: F HE AT		
	······································	8/2/07	9:00	9.0	7.0	7.0	)				3.3	SI	HEETS	FOR	AN
ORING		8/2/07	9:10	21.5	19.5	20.	9				None	EX	PLAN	ATION	1 O I
OMPLET.	ED: <b>8/2/07</b>											TEF	RMINC		7 O1
<u>R: <b>SG</b></u> 4	LG: SB Rig: 91C											7	THIS	LOG	



# SUBSURFACE BORING LOG

AET J	IOB NO: 22-00081						00.0				710	/ 4 75	10		
PROЛ		develop	ment; Ar	den H	ills, MN	L	00 01	гBC	RING 1		-218	AB	-18	(p. 1	<u>of 1</u> )
DEPTH IN FEET	SURFACE ELEVATION	·	5.7		GEOLOGY	/ N	мс	SA	AMPLE TYPE	REC		D&LA	· · · · · ·	1	
	FILL, mixture of sand y	vith silt and	d silty sand	a	FILL			$\frac{1}{1}$			wc	DEN	LL	PL	\$%-#20(
1 - 2 -	little gravel, trace roots, dark brown	brown, lig	ht brown ar	nd		22	M	Х	SS	4					
3 -								Ħ							
4						20	M	Ň	SS	16					
5								R							
6						6	М	X	SS	18					
7 -	SILTY SAND, fine to m	edium are	inad		COARSE			R							
8	brownish gray, waterbea	ring, loose	(SM)		ALLUVIUM	10	w	M	SS	17					
9 –		<u></u>						Д							
10 -	SANDY LEAN CLAY, little light brown, firm, la	a little grav aminations	vel, brown, of silty san	a d	TILL	7	м	М	00	10	17				
11 – 12 –	(CL)					1	IVI	Ш	SS	18					
13 -	CLAYEY SAND, a little (SC)	gravel, da	rk gray, stif	ĩ				K			1.0				
14						9	М	W	SS	19	13				
15 —								R							
16 -						10	M	X	SS	17	15				
17								स							
18 -								H							
19 -								ł							
20 21						9	М	$\mathbb{N}$	ss	24	16				
-	END OF BORING							Δ_					_		
	Northing=211416.5 Easting=552009.6														
	8														
DEPTH	I: DRILLING METHOD		<u>_</u>	 WATER	LEVEL MEA	SUREN	1ENTS					-			
0-19½	' 3.25" HSA	DATE	TIME	SAMPLE DEPTH	_ <u>_</u>	CAVE	· · · · · ·		ILLINC D LEV	) V	VATER EVEL		TE: R		1
		8/1/07	2:05	9.0	7.0	7.4		-LUI			None	-	EETS		1
BORING		21.5	19.5	19.8					None		PLANA		1		
BORING COMPLET												TER	MINO		ON
DR: SG	LG: SB Rig: 91C		L		1	I							THIS	LOG	



# SUBSURFACE BORING LOG

AET JO PROJE	OB NO: 22-00081 CT: TCAAP Red	developr	nent: Ai	rden Hi	lls MN	L	OG OF	7 BOR	ING N	oS <u>T</u>	-219	/AB	19 (	(p. 1	of 1
DEPTH IN FEET	SURFACE ELEVATION:		.3		GEOLOGY	N	мс	SAN TY	APLE YPE	REC IN	FIELI WC	D & LA	·	<b>1</b>	-1
1 - 2 -	SILTY SAND, surface r brown and brown, moist SAND WITH SILT, find	oots, trace , dense (SM	roots, ligh	بليلل ا	TOPSOIL COARSE ALLUVIUM	- 37	м	M	SS	15	WC	DEN		PL	<b>%</b> -#2(
3 - 4 -	loose to medium dense (	5P-5M)				18	М	$\square$	SS	14					
5 6						9	М	X	SS	16			ĺ		
7 - 8 -						18	M	R M	SS	18					
9 10						10	141	N RA	00	10					
11 – 12 –	SILTY SAND, fine grain	ed arouich	hrow			16	м	X R	SS	18					
13 – 14 –	little brown, waterbearing laminations of silt (SM)	g, medium	dense,			14	w	M :	ss	16					
15 - 16 -						23	.▼ ₩		SS	14					
17 - 18 19	SAND WITH SILT, fine waterbearing, dense (SP-5	grained, gr	ay,												
20 - 21 -	3, (					31	w	돼 X s	ss	19					
22 - 23 -															
24 – 25 –														, ,	
1	END OF BORING Northing=211642.1 Easting=551067.3					36	W	X s	SS	21					
DEPTH		1													
		DATE	TIME	WATER SAMPLE DEPTH	LEVEL MEA		r_			1 1	VATE		DTE: F		
0-241/2	2' 3.25" HSA	7/30/07	12:15	DEPTH 14.0	D CASING DEPTH 12.0	CAVE DEP		FLUID	LLING D LEVI	·	VATER LEVEL		IE AT IEETS		
		7/30/07	12:15	14.0	12.0	<u>12.</u> 15.					None 15.0		PLAN		
BORING COMPLET	TED: 7/30/07	7/30/07	1:00	26.5	24.5	24.					15.0 23.1		MINC		
DR: SG	LG: SB Rig: 91C		<u> </u>											LOG	



ALI JUG NO:       LOG OF BORING NO ST-220/AB-20 (         PROJECT:       TCAAP Redevelopment; Arden Hills, MN         DEFTH       SURFACE ELEVATION:       397.0         SILTY SAND WITH GRAVEL, surface roots, moist, medium dense (SM)       GEOLOGY       N       MC       SAMPLE       REC       FIELD & LABORAT         1       trace roots, light brown, frown and dark brown, moist, medium dense (SM)       GEOLOGY       N       MC       SAMPLE       REC       FIELD & LABORAT         2       SLTY SAND, fine grained, brown, moist, medium dense (SM)       GOARSE:       ALLUVIUM       20       M       SS       14       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H       H	2	22	2-0	008	81	-									LO	GOF	во	RINGN	TZ OF	[-22(	0/A	<b>B</b> -'	20	(n. 1	
DEPTH FEET       SURFACE ELEVATION:       897.0 MATERIAL DESCRIPTION       GEOLOGY       N       MC       SAMPLE TUPE       REC FIEL & LABORAT         1       SALTY SAND, WITH GRAVEL, surface roots, trace roots, light brown, brown and dark brown, moist, medium dense (SM)       I       TOPSOIL       18       M       SS       14       I       I       I         2       SLITY SAND, fing grained, brown, moist, medium dense (SM)       I       OOARSE ALLUVIUM       20       M       SS       14       I       I       I       I         3       Month Sample       SS       IA       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I       I	T	<u>ТС</u>	<u>CA</u>	AP	Re	deve	elop	men	<u>t; A</u>	<u>rde</u> ı	<u>1</u> <b>F</b>	Hill	s, MN					01	·~~ <u>~</u> _			<u> </u>		(h• 1	
SILTY SAND WITH GRAVEL, surface roots, moist, medium dense (SM)       18       M       SS       14         SILTY SAND, fine grained, brown, moist, medium dense (SM)       COARSE       20       M       SS       14         SAND WITH SILT, fine grained, light brown, moist, medium dense (SM)       17       M       SS       14         SAND WITH SILT, fine grained, light brown, moist, medium dense (SP-SM)       17       M       SS       14         M       SS       14       17       M       SS       14         SAND WITH SILT, fine grained, light brown, moist, medium dense (SP-SM)       17       M       SS       10         11       10       M       SS       18       19       10         12       SILTY SAND, fine grained, brown, waterbearing, medium dense to loose (SM)       15       W       SS       17         16       7       W       SS       16       15       SILT, gray, wet, medium dense (ML)       15       W       SS       16         12       W       SS       17       30       30       30       30         13       DepTH:       DRILLING METHOD       WATER LEVEL MEASUREMENTS       NOTE: RI       NOTE: RI			ELE	EVAT	TION	;	897	.0					,. <u></u>	7 1	V	мс	SA ]	MPLE TYPE	REC		- <u> </u>	T		1 <u> </u>	-
SULTY SAND, fine grained, brown, moist, medium dense (SM)       Image: Coarse in the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec	ots, ned	ots, . iedi	ligh um	t bro dens	own, se (S	brow M)	vn and	i dark	c brov	ts, vn,			OPSOIL	1	8	М	X	SS	14	me		44		PL	<b>*</b> /0-1
6       -       19       M       SS       14         7       SAND WITH SILT, fine grained, light brown, moist, medium dense (SP-SM)       17       M       SS       20         9       -       14       M       SS       19       10         10       -       14       M       SS       19         11       -       14       M       SS       19         12       -       10       M       SS       19         14       M       SS       19       10       M       SS       19         12       -       10       M       SS       18       10       M       SS       17       10       M       SS       17       10       M       SS       18       15       W       SS       17       10       15       W       SS       16       15       15       W       SS       16       16       16       12       W       SS       16       12       W       SS       16       12       12       W       SS       16       12       12       W       SS       17       30       30       12       12       W       SS	SA 1 de	SAN den	ND, 1se (	fine SM)	grai )	ined,	brown	ì, mo	oist,	· · · · ·		C	OARSE ALLUVIUN	1 2	0	м	$\overline{\mathbb{A}}$	SS	14						
SAND WITH SILT, fine grained, light brown, moist, medium dense (SP-SM)       17       M       SS       20         9       10       11       14       M       SS       19         10       14       M       SS       19         11       10       M       SS       19         12       10       M       SS       19         13       10       M       SS       18         14       M       SS       18       10         14       M       SS       18       10         14       M       SS       18       10       M         15       SILTY SAND, fine grained, brown, waterbearing, medium dense to loose (SM)       15       W       SS       17         16       15       W       SS       16       15       W       SS       16         19       20       21       7       W       SS       16       16       16       16       16       16       17       17       10       16       17       17       10       16       16       16       16       16       16       16       16       16       16       16       16										:				1	9	м	R	ss	14						
10       14       M       SS       19         11       10       M       SS       19         13       10       M       SS       18         14       M       SS       18       10       M         15       SILTY SAND, fine grained, brown, waterbearing, medium dense to loose (SM)       15       W       SS       17         16       -       7       W       SS       16       17         18       -       -       7       W       SS       16         19       -       -       7       W       SS       16         20       -       -       7       W       SS       16         21       -       -       7       W       SS       16         22       -       -       -       7       W       SS       16         22       -       -       -       12       W       SS       17       30         24       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - <td>WIT</td> <td>/ITI ediu</td> <td>H Si Jm c</td> <td>ILT, lens</td> <td>, fine e (Sl</td> <td>e grai P-SM</td> <td>ned, 1 I)</td> <td>ight ł</td> <td>orown</td> <td>l,</td> <td></td> <td></td> <td></td> <td>12</td> <td>7</td> <td>м</td> <td>E X</td> <td>SS</td> <td>20</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	WIT	/ITI ediu	H Si Jm c	ILT, lens	, fine e (Sl	e grai P-SM	ned, 1 I)	ight ł	orown	l,				12	7	м	E X	SS	20						
12       10       M       SS       18         14       10       M       SS       18         15       SILTY SAND, fine grained, brown, waterbearing, medium dense to loose (SM)       15       W       SS       17         16       7       W       SS       16       16       16       17       16         19       20       7       W       SS       16       16       16       16         21       22       7       W       SS       16       16       16       16         22       23       SILT, gray, wet, medium dense (ML)       17       10       12       W       SS       16         24       25       26       12       W       SS       17       30       17         26       27       28       12       W       SS       17       30       16         DEPTH:       DRILLING METHOD       WATER LEVEL MEASUREMENTS       NOTE: RI       NOTE: RI       16       17       10				·						344						M	2	66	10						
14 -       10       M       SS       18         15 -       SILTY SAND, fine grained, brown, waterbearing, medium dense to loose (SM)       15       W       SS       17         16 -       15       W       SS       17       16       17         18 -       19 -       20 -       21 -       7       W       SS       16         21 -       22 -       23       SILT, gray, wet, medium dense (ML)       FINE       7       W       SS       16         22 -       23       SILT, gray, wet, medium dense (ML)       FINE       ALLUVIUM       12       W       SS       17       30         24 -       25 -       26 -       21       28       12       W       SS       17       30         DEPTH:       DRILLING METHOD       WATER LEVEL MEASUREMENTS       NOTE: RU       NOTE: RU														14			\ 7	22	19						
16 -       15       W       SS       17         17 -       18       19       20       7       W       SS       16         19 -       20 -       7       W       SS       16       16       16         20 -       21 -       7       W       SS       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       17       16       17       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16       16	4	<u>A NI</u>	<u>D</u> . #	ine		ad 1			······					10		м Į		SS	18						
18       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	rinį	ing,	, me	diur	n de	ense to	o loos	e (SI	M)					15		w )		SS	17						
21 -       7       W       SS       16         22 -       SILT, gray, wet, medium dense (ML)       FINE       12       W       SS       16         24 -       12       W       SS       17       30         25 -       12       W       SS       17       30         26 -       12       W       SS       17       30         27 -       28       SS       17       30       NOTE: RI         DEPTH:       DRILLING METHOD       WATER LEVEL MEASUREMENTS       NOTE: RI															-	<b>▼</b>									
23       SILT, gray, wet, medium dense (ML)       FINE         24       ALLUVIUM       II         25       II       ALLUVIUM         26       II       II         27       II       II         28       III       IIII         DEPTH:       DRILLING METHOD       WATER LEVEL MEASUREMENTS       NOTE: RE												•		7		w X		SS	16						
26 -     27 -       28     Image: Coarse and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	y, v	', W	et, n	nedi	um	dense	e (ML	)								*****	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2								
DEPTH: DRILLING METHOD WATER LEVEL MEASUREMENTS NOTE: RE														12		w N		SS	17	30					
NOTE: RE	LIN	.INC	 G ME	ETHO	 	 [						AL	LUVIUM												
	' <u>H</u>	HS	<u>S</u> A			DA	ATE	TI	ME					T			DR JUI	ILLING D LEVI		VATEI .EVEL					
8/1/07 9:05 16.5 14.5 14.6 None SHEETS H								9:	:05	1	6.5		14.5	14	1.6							SHI	EETS	FOR	AN
8/1/07         9:10         21.5         19.5         19.5         17.8         EXPLANA				<del>_</del>								+									E				
OMPLETED:         8/1/07         8/1/07         9:25         31.5         29.5         29.5         26.3         TERMINOL           R: SG         LG:         SB         Rig:         91C         THIS I         THIS I						0/1	////	9:	25	3	1.5	-	29.5	29	9.5					26.3					10 \

#### A <sup>A</sup> <sup>E</sup> T

AMERICAN ENGINEERING TESTING, INC.

AE	т јов no: <u>22-00081</u>			L	OG OF	F BORIN		T-220	)/A B.	.20	(n )	of 2
PR	DIECT: TCAAP Redevelopment; Ard	en H	ills, MN				<u></u>		<u>, , , , D.</u>	-20	(p. <u>2</u>	<u> </u>
DEP7 IN FEE			GEOLOGY	N	мс	SAMP	LE REC		D&LA		1	1
3(	SILTY SAND, fine grained, gray, waterbearing, very loose (SM) (continued)	,	COARSE ALLUVIUM	<u> </u>	·	P		WC	DEN		PL.	%-#200
31	END OF BORING		(continued)	4	w	X s	S 20					
	Northing=211992.3 Easting=550710.8											
									-			
									-			
<u>04</u>			d				L F	1	1		- 1	1

# SUBSURFACE BORING LOG

AET J PROJE	OB NO:	22-00081 TCAAP Rec	levelopr	nent: A-	den U	ILC MAN	L	OG OF	F BO	RING N	io <b>S</b> T	-221	/ <u>A</u> B	-21	(p. 1	of 1
DEPTH IN FEET		CE ELEVATION:		.0		GEOLOGY	N	мс	SAMPLE TYPE		REC IN		) & LA	····		1
1	medium	SAND, a little gr own, dark brown dense (SM)	avel, surfa and black	ce roots, tra , moist,		TOPSOIL	19	м	M	SS	16	wc	DEN	LL	PL	<b>%-#2</b> 0
2 3 4	SILTY S to mediu	SAND, fine grain im dense (SM)	ned, brown	, moist, loc	ose	COARSE ALLUVIUM	[ 9	М	$\left[ \right]$	SS	15					
5 6				Sand	Sand 0' to w Silt 7' to Sand 17' to	o 17'	13	М	K	SS	18					
7 8 9	SAND W moist, lo	VITH SILT, fine ose (SP-SM)	grained, li	ght brown,		· ·	10	м	R	SS	17					
10 - 11 -		K	/				9	М	R	SS	18					
12 13 14							9	м	R	SS	20			9		
14 – 15 – 16 – 17 –	SILT WI wet, medi (ML)	TH SAND, light ium dense, lamir	brown, a lations of l	little brown ean clay		FINE ALLUVIUM	17	w		SS	17	26				
18 -	SILTY SA waterbear	AND, fine graind ing, loose (SM)	ed, brown,	<u>.                                    </u>		COARSE ALLUVIUM		<b>_</b>								
20 - 21 - 22 -							10	w		SS	17					
23	CLAYEY (SC)	SAND, a little į	gravel, darl	k gray, stif	f	FILL										
25 - 26 -							9	м		SS	8	15				
1	END OF Northing=2 Easting=55	212465.7														
DEPTH	I: DRILL	ING METHOD			WATER	LEVEL MEA	SURE	/ENT:	 S	L		1				
0-241/2	<u>2' 3.25''</u>	HSA	DATE	TIME	SAMPLE DEPTH	D CASING DEPTH	CAVE	E-IN TH I		ULLINC ID LEV	) EL I	VATEF LEVEL		DTE: R HE AT		
	<u>_</u>	·····	8/1/07	7:55	16.5	14.5	14.				<u> </u> -{	None		<b>IEETS</b>	FOR	AN
BORING			8/1/07	8:00	21.5	19.5	19.	2				18.3		PLAN/		
COMPLET	TED: 8/1/	· · · · · · · · · · · · · · · · · · ·	8/1/07	8:10	26.5	24.5	24.	5				23.9	TEF	RMINO		ON
<u>PR: SG</u> 94	LG: SB	Rig: 91C												THIS	LOG	

# SUBSURFACE BORING LOG

AET J	OB NO: 22-00081		<u> </u>	v	·····	L	OG OF	F BO	RING N	io <b>ST</b>	-222	/AB-	-22	(n. 1	of 1)
РRОЛ	ECT: TCAAP Re	developn	nent; Ar	den Hi	lls, MN									<u></u>	<u> </u>
DEPTH IN FEET	JOIN ACE ELEVATION:	898 L DESCRIP			GEOLOGY	N	мс	SA 1	MPLE TYPE	REC IN.	FIELI WC	) & LA DEN	<u> </u>		· · · · ·
1	FILL, mostly silty sand, roots, dark brown	a little grav			FILL	21	м	M	SS	15	we	DEN		PL	<b>%-#200</b>
2 3 4		/	Fill (c	ilty sand) 0 layey sand w Silt 9.5' Sand 14.5'	) 7' to 9.5' to 14.5'	7	м		SS	14					
5 - 6 - 7 -	K					4	м	R A A	SS	16					
8 — 9 —	FILL, mixture of clayey trace roots, brown and li	ght brown				9	М	Ŋ	SS	14	11				
10 11 12	SAND WITH SILT, fine light brown and brown, n (SP-SM)	noist, medi	um dense		COARSE ALLUVIUM	14	м		SS	16					
12	SAND WITH SILT, fine moist, medium dense (SF	-SM)				27	м		SS	19					
15 - 16 - 17 - 18 -	SILTY SAND, fine grain waterbearing, medium de	ed, brown, nse to loos	e (SM)			30	W/M		SS	24					
19 20 21	END OF BORING					6	.▼ w		SS	16					
	Northing=212964.6 Easting=550545.4					a									
DEPTH	I: DRILLING METHOD			WATER	LEVEL MEA	SUREN	MENT:	 s			[				
0-19½	2' 3.25" HSA	DATE	TIME	SAMPLEI DEPTH	D CASING DEPTH	CAVE	S-IN IH	DR FLU	ULLING	J V	VATEF LEVEL		DTE: F HE AT		
		7/31/07	3:22	21.5	19.5	20.					18.9		HEETS		
BORING													PLAN		
<u>COMPLET</u> DR: <b>SG</b>				,,,,					<u> </u>				MINC		ON
DK OG	LG: SB Rig: 91C				1 [								THIS	LOG	



# SUBSURFACE BORING LOG

AET JOB NO:						]	LOG	OF BO	ORING N	10ST	Γ-223	/AB	-23	(p. 1	of 2)
PROJECT:	TCAAP R	edevelop	<u>ment; A</u>	<u>rden Hi</u>	lls, MN	<u></u>	<u>_</u>							\ <u>F''</u>	<u> </u>
DEPTH IN FEET	RFACE ELEVATION		···		GEOLOG	Y .			AMPI F	REC	FIELI	) & LA	BORA	TORY	TESTS
		AL DESCRI				I N	M	C	AMPLE TYPE	IN.	wc	DEN	LL	1	%-#200
	, mostly silty sand , pieces of wood a	i, surface ro it 5', brown,	oots, trace , light brow	vn	FILL	27	, ,	N				i	<u> </u>		
2 - and c	lark brown		-				'   N	1Λ	SS	15					
3						10		$\overline{N}$					ĺ		
4						10	)   M	'M	SS	12					
5 -				ill (silty sand and w Silt 9.				R							
6				and 23' to 33		4	М	r  X	SS	12					
7 -								A		ĺ					
8		K						M							
9						3	M	M	SS	13					
10 - SANI	WITH SILT, fin	e grained, l	ight brown	ı, a	COARSE			P							
1 111100	prown, moist, loos ations of silt (SP-S	e to mediun	n dense,		ALLUVIUM	[ 5	M	X	SS	15					
12 -								R							
13 —						17	М	M							
14 -						1	M	Μ	SS	17					
15 —								R							
16 —						9	М	X	ss	17		l			
17 -								म							
18 -								H							
19 -								Ľ1							
20								R							
21 -	•					27	м	X	ss	19					
22 -								स							
23 + SAND.	fine to medium g	rained lich	+ husses					1							
	own and grav more	ist medium	damaa					Ĭ.							
	ions of silt and silt	ty sand (SP	)					R							
26 -						17	Μ	X	ss	16					
27 -								स							
28			<u> </u>					Ï							
DEPTH: DR	ILLING METHOD		<u> </u>					1							
	······································	<u> </u>			LEVEL MEA	<del>,</del> .						NO	TE: RI	EFER 7	ro
0-341/2' 3.2	<u>5" HSA</u>	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE DEP	s-IN TH	DR FLUI	ILLING D LEVE		'ATER EVEL	TH	EATT	ACHE	D
		7/31/07	2:15	31.5	29.5	29.	5				28.9	SHI	EETS I	FOR A	N
BORING COMPLETED: 7/	/31/07	7/31/07	2:25	36.5	34.5	34.	5				33.9	_		TION (	
DR: SG LG: S								<del>.</del>				-		.OGY (	ИС
<u>10.00 L0.0</u>	- 10g. 71U	l										1	THIS I	.0G	I I



AET J	LOG OF BORING NOST-223/AB-23 (p. 2 of 2)												
PROJE	CT: TCAAP Redevelopment; Arde	n H	lills, MN								_		······································
DEPTH IN FEET		GEOLOGY				SA			FIEL	.D & LA	BORA	TORY	TESTS
FEET	MATERIAL DESCRIPTION	<u> </u>		N	MC		MPLE FYPE	REC IN.	wc	DEN	LL	PL	<b>%-#20</b> 0
30 -	SAND, fine to medium grained, gray, waterbearing, loose (SP) (continued)					R							
31				9	w	X	SS	17					
32 -				}		H							
33 -						H							
34 —	CLAYEY SAND, a little gravel, dark gray, firm (SC)		TILL	]		H							
35 -						꿤							
36 -				6	М	IXI	SS	23	18				
36 -	END OF BORING Northing=213465.1 Easting=550540.6												

Brau Geote	n Proj cnical E	ect S value	SP-Ö ation	6-05871	BORING			09-5 ST-2	224
TCAA NE of	AP Rede	velop vy 10	men and [	Highway 96	LOCATI	UN: S	ee attaci	hed sketch.	
DRILL	ER: K.	Keck		METHOD: 3 1/4" HSA, Autohmr	DATE:	7/1	8/07	SCALE:	1'' = 4'
Elev. feet	Depth feet	AS		Description of Materials		BPF	WL	Tests or	Notes
938.6 938.3		Syn PAV		(ASTM D2488 or D2487) ¬3" Bituminous.			<u> </u>		
	VZ.	FILL		FILL: Clayey Sand, fine- to medium-grained, Gravel, mixed dark brown to grayish-brown, r	trace of – noist. –				
934.6	4.0				-	21			
-	()	CL		SANDY LEAN CLAY, trace of Roots, dark g rather stiff to stiff. (Buried Topsoil)	ray, moist, —	¥ 13			
932.6	6.0	CL		SANDY LEAN CLAY, reddish-brown, moist. (Glacial Till)					
929.6	9.0				_	56			
-		SP- SM		POORLY GRADED SAND with SILT, fine- medium-grained, yellowish-brown, moist, loos (Glaciofluvium)	to se	<b>V</b> 6			
926.6	12.0	CL		SANDY LEAN CLAY, trace of Gravel, reddi grayish-brown, moist to wet, rather soft to rath (Glacial Till)	sh-brown to her stiff	5			
						4			
					-				
		:			-	10			· · ·
915.6	23.0	SP		POORLY GRADED SAND, fine- to medium- trace of Gravel, reddish-brown, moist, medium (Glacial Outwash)	grained, 1 dense.				
912.6	26.0			END OF BORING.		19			
				Water not observed with 24 1/2 feet of hollow- in the ground.	-stem auger				
				Boring then grouted.					

# BRAUN

### LOG OF BORING