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GEOTECHNICAL INVESTIGATION
PROPOSED SUBDIVISION
NE-36-36-4-W3M
R.M. OF CORMAN PARK NO. 344
NEAR SASKATOON, SASKATCHEWAN
PMEL FILE NO. S09-7106
NOVEMBER 23, 2009

PREPARED FOR:

EAST RIDGE DEVELOPMENTS INC.
GROUP SITE 601
BOX 16, RURAL ROUTE 6
SASKATOON, SK
S7K 3J9

ATTENTION: MR. LANDRY MERKOSKY

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1.0 INTRODUCTION

The following report has been prepared on the subsurface soil conditions existing at the site of the proposed Subdivision to be constructed on the subject property legally described as NE-36-36-4-W3M, in the Rural Municipality (RM) of Corman Park No. 344, near Saskatoon, Saskatchewan.

The Terms of Reference for this investigation were presented in P. Machibroda Engineering Ltd. (PMEL) Proposal No. 0910-5696, dated September 11, 2009. Authorization to proceed with this investigation was provided on September 21, 2009.

The test hole drilling and soil sampling was conducted on October 26 and 27, 2009. Groundwater monitoring was conducted on October 29 and November 6, 2009.

2.0 SITE CHARACTERIZATION

2.1 Site Location, Description

The subject property, which consists of treed areas and pasture land, is located approximately 5 km east of the City of Saskatoon, Saskatchewan. Surrounding land use consists of (predominantly) farmland with sparse residential development. The subject site is bounded along the north side by Highway No. 5. The surrounding land usage has been shown on Drawing No. S09-7106-1A – Surrounding Land Use and Registered Water Wells.

2.2 Physiography

The subject properties lie in the physiographic region known as the Saskatchewan Rivers Plain (Acton et. al., 1960). The Saskatchewan Rivers Plain is characterized as gently undulating to rolling glacial lacustrine-alluvial plains (glacial lake plains), aeolian plains (dunes) and till plains. The surficial soil deposits consist of variable textured lacustrine and alluvial sands, silts and clays, aeolian sands, glacial till and local bedrock exposures in the South Saskatchewan River.

2.3 Topographic Setting

Based on a review of available information, the elevation of the ground surface at the subject property varies between about 565 to 575 metres.

2.4 Geology

The subsurface soil conditions in the area of the proposed development consist of at least 135 metres of glacial and stratified drift overlying Cretaceous aged bedrock of the Lea Park Formation (Christiansen, 1970).

2.5 Hydrogeology

An examination of available hydrogeological information for this region (Christiansen, 1967) revealed that the subject property is located north of the Saskatoon Low, a salt collapse structure located south of the City of Saskatoon. The subject property overlies the Oldman Formation aquifer, a regionally extensive bedrock aquifer system situated between the base of the glacial and stratified drift deposits and the bedrock surface. The primary source of groundwater in the vicinity of the subject property is from drift aquifers above or between glacial till strata. The South Saskatchewan River is located approximately 12 km west of the subject site. The South Saskatchewan River is a discharge receptor for many of the aquifer systems in the subject area. As such, the expected direction of regional groundwater flow at the site is toward the west.

2.6 Groundwater Wells, Dugouts

The results of the groundwater well record file search of the Saskatchewan Water Corporation (SaskWater) Water Well Database have been tabulated and have been presented in Table I while copies of the water well records are presented in Appendix B.

Review of Table I revealed that there 3 registered groundwater well on the subject site and 45 registered groundwater wells located within a 1.5 kilometre radius of the study site. The registered groundwater wells range from large diameter, completed at depths less than 15 metres below ground surface, to small diameter wells, completed at depths greater than 100 metres below ground surface.

The distribution of the registered groundwater wells has been shown on Drawing No. S09-7106-1A – Surrounding Land Use and Registered Water Wells.

TABLE I. SUMMARY OF GROUNDWATER RECORDS

Well ID	Location	Type	Year Installed	Depth (m)	Diameter (m)	Pumping Rate (L/minute)
069678	NE-25-36-04-3M	Domestic	1981	17.7	0.91	---
063950	NE-1-37-04-3M	Domestic	1980	14.0	0.96	---
009520	SE-1-37-4-3M	Domestic	1973	22.6	0.96	43.0
009521	SE-1-37-4-3M	Domestic	1973	100.0	0.10	---
031801	SE-1-37-4-3M	Domestic	1962	35.4	0.10	17.2
060654	SW-1-37-04-3M	Domestic	1979	12.1	1.05	---
064225	SW-1-37-04-3M	Domestic	1980	80.8	0.16	51.6
087135	SW-1-37-04-3M	Domestic	1987	12.8	0.91	---
088787	SW-2-37-04-3M	Domestic	1988	17.4	1.12	---
031569	SE-30-36-03-3M	Domestic	1962	55.5	0.10	34.4
071260	SE-30-36-03-3M	Domestic	1982	22.9	0.15	---
087325	SE-30-36-03-3M	Domestic	1987	13.1	1.12	---
031571	NE-31-36-03-3M	Domestic	---	8.2	---	---
031572	NE-31-36-03-3M	Domestic	---	3.4	---	---
031570	NE-31-36-03-3M	Water Well Test Hole	---	29.9	---	---
031573	NE-31-36-03-3M	Domestic	1961	16.8	0.91	---

TABLE I. SUMMARY OF GROUNDWATER RECORDS (CON'T)

Well ID	Location	Type	Year Installed	Depth (m)	Diameter (m)	Pumping Rate (L/minute)
049908	NE-31-36-03-3M	Domestic	1977	85.3	0.11	21.5
051881	NE-31-36-03-3M	Domestic	1977	18.9	—	—
080264	NE-31-36-03-3M	Domestic	1984	19.8	1.20	—
066371	NW-31-36-03-3M	Domestic	1981	20.7	0.91	—
116933	NW-31-36-03-3M	Research	1997	48.2	0.12	—
056985	SE-31-36-03-3M	Domestic	1978	24.4	—	—
097463	SW-31-36-03-3M	Domestic	1989	17.4	0.91	—
104107	NE-06-37-03-3M	Domestic	1994	20.4	1.07	—
104108	NE-06-37-03-3M	Domestic	1994	19.8	1.07	—
104109	NE-06-37-03-3M	Domestic	1994	18.9	1.07	—
100723	NW-06-37-03-3M	Domestic	1991	21.3	1.12	8.6
107995	NW-06-37-03-3M	Domestic	1997	18.9	1.07	—
056972	SE-06-37-03-3M	Domestic	1978	7.0	—	—
056973	SE-06-37-03-3M	Domestic	1978	7.0	—	—
056984	SE-06-37-03-3M	Domestic	1978	6.3	—	—
056983	SE-06-37-03-3M	Domestic	1978	10.0	—	—
104447	SW-06-37-03-3M	Domestic	1994	18.3	1.07	—
081457	SW-06-37-03-3M	Domestic	1985	12.2	1.07	34.4
092434	SW-06-37-03-3M	Domestic	1988	18.3	1.07	8.6
096259	SW-06-37-03-3M	Domestic	1989	24.4	0.12	34.4
102240	SW-06-37-03-3M	Domestic	1992	20.1	1.07	—
102931	SW-06-37-03-3M	Domestic	1993	19.8	1.10	21.5
103316	SW-06-37-03-3M	Domestic	1993	25.9	1.07	1.3

TABLE I. SUMMARY OF GROUNDWATER RECORDS (CON'T)

Well ID	Location	Type	Year Installed	Depth (m)	Diameter (m)	Pumping Rate (L/minute)
104799	SW-06-37-03-3M	Domestic	1994	13.7	1.07	—
104800	SW-06-37-03-3M	Domestic	1994	19.8	1.07	—
107046	SW-06-37-03-3M	Domestic	1996	20.1	1.07	—
031798	NE-36-36-04-3M	Research	—	129.2	—	—
031799	NE-36-36-04-3M	Domestic	1967	89.9	—	—
031800	NE-36-36-04-3M	Domestic	1968	24.4	0.11	—
049746	NW-06-37-03-3M	Domestic	1977	14.0	0.91	17.2
076636	NW-06-37-03-3M	Domestic	1982	70.1	—	34.4
089341	SE-36-36-04-3M	Domestic	1988	18.3	0.91	—

3.0 FIELD INVESTIGATION

Sixteen test holes, located as shown on the Site Plan, Drawing No. S09-7106-1, were dry drilled using our truck-mounted, continuous flight, solid stem auger drill rig. The test holes were 150 mm in diameter and extended to a nominal depth of 6.0 metres below the existing ground surface.

Test hole drill logs were compiled during test drilling to record the soil stratification, the groundwater conditions, the position of unstable sloughing soils and the depths at which cobblestones and/or boulders were encountered.

Disturbed samples of auger cuttings, collected during test drilling, were sealed in plastic bags to minimize moisture loss. The soil samples were taken to our laboratory for analysis.

Standard penetration tests (N-index), utilizing a rope-cathead and donut hammer, were performed during test drilling.

4.0 FIELD DRILL LOGS

The field drill logs recorded during test drilling have been shown plotted on Drawing Nos. S09-7106-2 to 17, inclusive. The ground surface elevations at the Test Hole locations were established by Catterall and Wright Consulting Engineers (CWCE).

4.1 Soil Profile

The general soil profile consisted of organic topsoil overlying clay and/or glacial till. The glacial till strata extended to a depth of at least 6.0 metres, the maximum depth penetrated with our test holes at this site.

4.2 Groundwater Conditions, Sloughing

Groundwater seepage and sloughing conditions were encountered during test drilling. The depths at which groundwater seepage and sloughing conditions were encountered have been shown on Drawing Nos. S09-7106-2 to 17, inclusive. A summary of the static groundwater levels recorded during this investigation has been presented in Table II.

Review of the groundwater elevations presented in Table II revealed that the groundwater levels ranged from 2.6 to greater than 6 metres below grade, approximately one week following drilling. The water levels in the piezometers do not appear to have stabilized. Higher groundwater levels should be expected following groundwater stabilization or periods of precipitation.

TABLE II. SUMMARY OF RECORDED GROUNDWATER LEVELS

Test Hole No.	Piezometer Rim Elevations (metres)	Ground Surface Elevation (metres)	Recorded Groundwater Elevation (metres)*	
			Oct. 29, 2009	Nov. 6, 2009
09-1	567.6	566.6	563.7	562.8
09-2	568.1	567.1	Dry	561.1
09-3	568.6	567.5	Dry	Dry
09-4	565.3	564.2	561.4	560.7
09-5	568.9	567.7	Dry	Dry
09-6	569.4	569.4	Dry	Dry
09-7	567.5	566.5	564.0	563.1
09-8	569.0	568.0	Dry	562.2
09-9	574.6	573.6	Dry	568.5
09-10	575.7	575.7	Dry	Dry
09-11	574.7	573.4	Dry	Dry
09-12	567.5	566.6	561.8	561.9
09-13	565.8	565.0	562.9	565.0
09-14	574.2	573.0	Dry	Dry
09-15	573.2	572.2	Dry	Dry
09-16	576.1	575.1	Dry	Dry

*Higher static water levels are expected following piezometer stabilization, during or following spring snowmelt, and/or during or following periods of precipitation.

4.3 Cobblestones and Boulders

The glacial till encountered at the site consisted of a heterogeneous mixture of gravel, sand, silt and clay-sized particles. The glacial till also contained sorted deposits of the above particle sizes. In addition to the sorted deposits, a random distribution of larger particle sizes in the cobblestone range (60 to 200 mm) and boulder-sized range (larger than 200 mm) were encountered during test drilling.

It should be recognized that the statistical probability of encountering boulders in the sixteen small diameter test holes drilled at the site is low. Intertill deposits of cobblestones, boulder pavement, boulders and isolated deposits of saturated sand or gravel should be anticipated. The frequency of encountering such deposits will increase proportionately with the number of holes drilled or volume of soil excavated.

5.0 LABORATORY ANALYSIS

The soil classification and index tests performed during this investigation consisted of a visual classification of the soil, water contents, Atterberg limits, unit weights and grain size distribution analysis.

The results of the soil classification and index tests conducted on representative samples of soil have been plotted on the drill logs alongside the corresponding depths at which the samples were recovered, as shown on Drawing Nos. S09-7106-2 to 17, inclusive.

The results of the grain size distribution analyses have been plotted on Drawing Nos. S09-7106-18 to 33, inclusive, and summarized in Table III.

TABLE III. SUMMARY OF LABORATORY TEST RESULTS

Test Hole No.	Depth (metres)	Grain Size Distribution Analysis (percent)			Saskatchewan Health Soil Texture Classification
		Sand & Gravel	Silt	Clay	
09-1	1.0	3	75	22	Silt Loam
09-2	1.0	50	41	9	Sandy Loam
09-3	1.0	50	41	9	Sandy Loam
09-4	1.0	4	76	20	Silt Loam
09-5	1.0	45	45	10	Loam
09-6	1.0	61	29	10	Sandy Loam
09-7	1.0	14	71	15	Silt Loam
09-8	1.0	33	53	14	Silt Loam
09-9	1.0	53	41	6	Sandy Loam
09-10	1.0	19	61	20	Silt Loam
09-11	1.0	61	33	6	Sandy Loam
09-12	1.0	10	69	21	Silt Loam
09-13	1.0	55	31	14	Sandy Loam
09-14	1.0	48	40	12	Loam
09-15	1.0	44	47	9	Sandy Loam
09-16	1.0	42	47	11	Loam

6.0 DESIGN RECOMMENDATIONS

Based on the foregoing outline of soil test results, the following foundation considerations and design recommendations have been presented.

6.1 Design Considerations

6.1.1 Onsite Wastewater Disposal Systems

It is understood that the proposed Subdivision will be approximately 160 acres in size.

The subsurface soil conditions consisted of organic topsoil overlying clay and/or glacial till. These surficial deposits comprise the upper portion of a thick section of glacial and stratified drift, at least 135 metres in thickness, overlying bedrock.

Groundwater seepage and sloughing conditions were encountered during test drilling. The groundwater levels measured in the piezometers installed at the subject site were in the range of 2.7 to in excess of 6 metres below ground surface.

The subject property is located north of the Saskatoon Low, a salt collapse structure located south of the City of Saskatoon. The subject property overlies the Oldman Formation aquifer, a regionally extensive bedrock aquifer system situated between the base of the glacial and stratified drift deposits and the bedrock surface. The primary source of groundwater in the vicinity of the subject property is from drift aquifers above or between glacial till strata. The South Saskatchewan River is located approximately 12 km west of the subject site. The expected direction of regional groundwater flow at the site is toward the west.

Review of the Saskatchewan Watershed Authority Groundwater Well Database revealed that there are 3 registered groundwater wells located within the subject property and 45 registered groundwater wells located within a 1.5 kilometre radius of the study site. The registered groundwater wells range from large diameter, completed at depths less than 15 metres below ground surface, to small diameter wells, completed at depths greater than 100 metres below ground surface.

According to the Saskatchewan Health publication "Saskatchewan Onsite Wastewater Disposal Guide (First Edition 2007)", the proposed development is considered to be a high sensitivity area (16 parcels or greater on a quarter section of land). Potential onsite wastewater disposal systems for high sensitivity areas include holding tanks, pressure chamber systems, Type II pressure mounds or package treatment plants with effluent disposal method.

The above disposal systems are typically designed on the basis of soil texture classification. A summary of soil texture classification for the subgrade soils encountered at the subject site have been presented in Table III, Section 5.0 – Laboratory Analysis.

It is recommended that the disposal systems should be designed in accordance with Saskatchewan Health specifications and recommendations.

6.1.2 Foundation Design

The subsurface soil conditions consisted of organic topsoil overlying clay and/or glacial till. These surficial deposits comprise the upper portion of a thick section of glacial and stratified drift, at least 135 metres in thickness, overlying bedrock.

Groundwater seepage and sloughing conditions were encountered during test drilling. The groundwater levels measured in the piezometers installed at the subject site were in the range of 2.6 to in excess of 6 metres below ground surface. Higher groundwater conditions may be encountered, particularly during or following periods of precipitation or spring thaw, and, within low areas of the subject site.

The subgrade soils are frost susceptible and the average depth of frost penetration for the subject area is approximately 1.8 metres.

The subgrade soil conditions at the typical footing depth (i.e., 1.2 to 2 metres below ground surface) consisted of medium to highly plastic clay or glacial till. Footings and floor slabs based on glacial till deposits should perform satisfactorily. Footings and floor slabs based on medium to highly plastic clay or variable soils (within the footprint of a single building) will be subject to differential movements associated with variations in the soil moisture profile and variable load/settlement characteristics of the soils. If some (30 mm) differential movements cannot be tolerated, then the Residences should be entirely supported on a deep foundation system.

For continually heated residences with basements, footings should be constructed on naturally deposited, undisturbed soil a minimum of 1.2 meters below finished grade. In areas of the site where high groundwater conditions were identified, it is recommended that basement floor elevations should be set as high as practical to minimize the potential for groundwater seepage issues.

Where shallow groundwater conditions exist and it is not possible to provide adequate clearance between the floor slab and the groundwater table (i.e., a minimum distance of 500 mm is recommended), basements are not recommended. In this case, a pile foundation system should be constructed (i.e., at-grade residences). A deep foundation system consisting of drilled, cast-in-place concrete piles should perform satisfactorily.

It is anticipated that site development could induce the development of perched groundwater conditions which will fluctuate on a seasonal basis with the amount of precipitation, surficial drainage, snow melt, irrigation, etc. As such, a perforated drainage pipe (weeping tile) drainage system should be constructed around the exterior of the foundation (for residences with basements). A continuous layer of clean, granular drainage aggregate should be placed beneath the floor slab and drained to a sump pit(s) for controlled discharge (for residences with basements). Roof downspouts should extend well away (3 metres) from the perimeter of the proposed Residences.

Recommendations have been prepared for site preparation; excavations and de-watering; standard strip or spread footings; drilled cast-in-place concrete piles; floor slabs; foundation walls; foundation concrete; grade beams, and, subdivision roads and parking structures.

6.2 Site Preparation

All topsoil, organics and other deleterious materials should be removed from the construction areas. The surface of the subgrade should be levelled and compacted to the following minimum density requirements.

Building Areas	-	96 percent of standard Proctor density at optimum moisture content;
Roadway Areas	-	96 percent of standard Proctor density at optimum moisture content;
Landscape Areas	-	90 percent of standard Proctor density at optimum moisture content.

Subgrade fill, if required, should preferably consist of granular material or locally available glacial till soils (excavation of a borrow pit may be required). The fill should be placed in thin lifts (maximum 150 mm) and compacted to a minimum of 96 percent of standard Proctor density at optimum moisture content. The subgrade fill should be approved by the Geotechnical Consultant prior to placement.

The site should be graded to ensure positive site drainage away from the proposed Residences.

6.3 Excavations and Dewatering

It is anticipated that the proposed excavations at this site will be shallow and completed with unbraced, sloped side walls. The long-term stability of the excavation walls will be affected by wetting and drying of the exposed excavation walls, the depth of excavation, the length of time that the excavation remains open and the consistency and structure (degree of fracturing, slickensiding, etc.) of the subgrade soils. The recommended minimum sideslopes for excavations at this site have been presented in Table IV.

TABLE IV. RECOMMENDED MINIMUM EXCAVATION SIDESLOPES

Soil Type	*Minimum Safe Sideslope	
	Horizontal	Vertical
Clay	3.0	1
Glacial Till	1.0	1

* Slope flattening will be required where groundwater seepage and sloughing conditions are encountered. Dewatering will be required below the groundwater table.

Dewatering will be required where excavations extend below the groundwater table. Groundwater seepage and precipitation runoff should be collected in a drainage system at the base of the excavation (i.e., drainage ditches/interceptors, sump pits). The drainage system should drain positively to a collection sump(s) equipped with a sump pump(s).

6.4 Standard Strip or Spread Footings

The following minimum recommendations should be incorporated into the design of a footing foundation.

1. For a continuously heated dwelling with basement, the footings should be founded on naturally deposited, undisturbed soil at a minimum depth of 1.2 metres below finished ground surface. Footings not protected with an interior heat source and 1.2 metres of soil cover should be based below the average depth of frost penetration (i.e., 1.8 metres) or protected with strategically placed rigid polystyrene insulation. Alternately, insulation could be utilized to prevent frost penetration below the footings. In this case, the Geotechnical Consultant should review the proposed insulation details.

2. Footings based on naturally deposited, undisturbed clay or glacial till soil may be designed to exert an allowable bearing pressure of 90 kPa. The footing excavations should be hand-cleaned to remove all loose, disturbed soil, and, to expose naturally deposited, undisturbed soil. If the subgrade soil at the design footing elevation consists of soft, wet soil, the width of the footing should be increased by fifty (50) percent.

3. Where silt or sand subgrade soils are encountered at the design footing depth, it is recommended that a mud slab be placed as soon as practical after cleaning to minimize the potential for disturbance of the silt or sand subgrade soils. The mud slab should have a minimum thickness of 70 mm and a minimum compressive strength of 15 MPa.

4. A minimum strip footing width of 450 mm is recommended. A minimum dimension of 1,000 mm is recommended for square and rectangular footings.

5. If the subgrade soil is disturbed during excavation below the design depth, then the disturbed soil should be removed to an undisturbed, level surface. Fill, required to raise the subgrade elevation to the underside of the footings, should be concrete.

6. A representative of the Geotechnical Consultant should inspect the excavation prior to the installation of the footings.

7. Footings should not be constructed on desiccated, frozen or wet subgrade soil. Frost should not be allowed to penetrate beneath the footings prior to, during or after construction. In unheated areas, where potential damage due to frost penetration and upheaval could occur, footings should be based below the depth of frost penetration. Alternately, insulation could be utilized to prevent frost penetration below the footings. In this case, the Geotechnical Consultant should review the proposed insulation details.

8. The finished grade should be landscaped to provide for positive site drainage away from the Residences.

6.5 Drilled, Cast-In-Place Concrete Piles

Construction difficulties should be anticipated in some pile holes due to the presence of cobbles and/or boulders.

Drilled, straight shaft, cast-in-place, reinforced concrete piles may be designed on the basis of skin friction only. The allowable skin friction bearing pressures of the undisturbed soil are as follows:

TABLE V. SKIN FRICTION BEARING PRESSURES (DRILLED PILES)

Zone (metres)	Allowable Skin Friction Bearing Pressure (kPa)
0 to 2	0
Below 4	30

Notes:

1. To minimize frost heave potential, skin friction piles should be extended to and reinforced to a minimum depth of 6 metres below finished ground surface.

2. Piles should be reinforced.

3. A minimum pile diameter of 400 mm is recommended for the primary structural loads. Larger pile diameters may be required to allow for the removal of cobbles and boulders in some pile holes, if encountered.

4. The pile holes should be filled with concrete as soon as practical after drilling.

5. Groundwater seepage and sloughing conditions were encountered during test drilling. Casing will be required where groundwater seepage and sloughing conditions are encountered to maintain the pile holes open for placing of the reinforcing steel and concrete. The annular space between the casing and drilled hole must be filled with concrete. As casing is extracted, concrete in casing must have adequate head to displace all water in the annular space.

6. Due to the hard nature of the subgrade soils, high-powered piling equipment is recommended.

7. A minimum centre-to-centre pile spacing of not less than three pile diameters is recommended.

8. A representative of the Geotechnical Consultant should inspect and document the installation of the drilled, cast-in-place concrete piles.

6.6 Floor Slabs

The following minimum provisions should be incorporated into the design of a heated grade-supported, cast-in-place, reinforced concrete slab subject to light floor loading.

1. Prepare the site in accordance with Section 6.2, Site Preparation. Over-excavate the subgrade soil to allow for the placement of a minimum of 200 mm of clean, drainage aggregate below the basement floor slab. Shape the subgrade surface to allow for free drainage to a sump pit(s). The drainage aggregate should meet the following gradation requirements.

Sieve Designation	Percent Passing
25.0 mm	100
9.5 mm	60 - 100
4.75 mm	44 - 90
2.00 mm	20 - 80
0.850 mm	0 - 53
0.425 mm	0 - 32
0.150 mm	0 - 10
0.071 mm	0 - 3

2. For floor slabs constructed at existing grade, over-excavate the subgrade soil to allow for a minimum of 150 mm (increase to 300 mm where clay is encountered) of crushed granular base course material below the floor slab.

3. Excavate soft subgrade areas and replace with suitable, non-expansive fill, placed and compacted to 96 percent of standard Proctor density.

4. Subgrade fill, if required, should preferably consist of granular soil or locally available sand soils, placed in thin lifts (maximum 150 mm loose) and compacted to 96 percent of standard Proctor density at optimum moisture content.

5. All granular fill placed above the subgrade elevation should be compacted to a minimum of 98 percent of standard Proctor density at optimum moisture content.

6. A sump pit(s) is recommended below basement floor slab to collect any free water which may accumulate beneath the floor, and, to collect water from the perimeter drainage system. The surface of the subgrade should be positively graded towards the sump pit(s). The sump pit(s) should be perforated to allow water to drain in from the sub-slab drainage layer. The on-site wastewater disposal system should be independent of the sump pit/weeping tile water disposal system. Any water collected in the sump pit/weeping tile drainage system (i.e., surface runoff water that infiltrates alongside the foundation walls and/or groundwater) should be directed well away from the residence (minimum distance of 10 metres is recommended), and must not be discharged into the on-site wastewater disposal system.

7. Separate the slab from the fill by means of a polyethylene vapour barrier.

8. Provide positive site drainage away from the Residences.

9. Floor slabs should not be constructed on desiccated, wet, or frozen subgrade soil, fill or base.

10. Frost should not be allowed to penetrate beneath the floor slab just prior to, during or after construction.

11. If insulation is to be utilized below the floor slab, a minimum of 1 metre of un-insulated space should be provided around the perimeter of the foundation walls to allow heat loss to the underside of the perimeter strip footing.

The above recommended floor system should perform satisfactorily if some (30 mm) floor movements resulting in cracking is deemed tolerable. Partition walls, staircases and any other structural elements resting on the floor slab should be designed to accommodate differential movements without imparting stresses on the upper levels of the Residence. If differential movements cannot be tolerated, a structural floor slab should be constructed.

In unheated structures (i.e., garage), frost heaving is a common cause of differential slab movement and cracking. If some slab movements and cracking is not deemed tolerable, increasing the depth of granular fill, thickness of concrete slab and amount of reinforcing steel could be utilized to minimize floor slab distress. Heating the area to about +5 ° C with adequate air circulation would minimize the depth of frost penetration below the slab. Alternately, strategically placed rigid polystyrene insulation could be utilized to limit frost penetration below floor slabs.

6.7 Foundation Walls

Subsurface foundation walls should be designed to resist lateral earth pressure exerted by the backfill as well as the horizontal pressure induced by any surcharge loading. The lateral earth pressure may be calculated on the basis of an equivalent fluid pressure distribution of 9 kN/m^3 for drained conditions (i.e., perforated drainage pipe drainage system and clean, free-draining backfill as discussed below). The surcharge loading should be calculated on the basis of actual loads.

The lateral earth pressure loading of 9 kN/m^3 assumes that the backfill will be free-draining, uniformly placed around the structure and lightly compacted, and, a perforated drainage pipe will be installed alongside the foundation walls with the invert elevation at or below the base of the foundation. The perforated drainage pipe should be at least 100 mm in diameter and installed on non-woven geotextile capable of transmitting a flow of not less than 50 litres per second per square metre (ASTM D-4491). The geotextile should be placed on naturally deposited, undisturbed soil or free-draining sand as may be required for levelling. The geotextile should be used to encapsulate at least 300 mm of clean, granular drainage aggregate above the invert of the drainage pipe. The clean drainage aggregate should meet the following gradation requirements:

Sieve Designation (mm)	Percent Passing
25.0	100
9.5	60 – 100
5.0	44 – 90
2.0	20 – 80
0.850	0 – 53
0.425	0 – 32
0.150	0 – 10
0.071	0 – 3

In the zone 300 mm above the invert of the drainage pipe and extending to within 500 mm of ground surface, clean, free-draining granular material with less than 5 percent material finer than the 0.071 mm size should be used. The uppermost 500 mm should consist of clay or other low permeability material.

6.8 Foundation Concrete

Water soluble sulphate salts (gypsum crystals) exist in the geologic deposits in this region. Sulphate resistant cement is recommended for all foundation concrete in contact with the in-situ soil. All concrete at this site should be manufactured in accordance with current CSA standards.

It should be recognized that water soluble sulphate salts combined with moist soil conditions or low pH soils, could render the soil highly corrosive to some types of metal water lines, elbows, connectors, etc., in contact with the soil.

6.9 Grade Beams

The grade beams should be reinforced at both top and bottom throughout their entire length. Grade beams should be constructed to allow for a minimum of 100 mm of net void space between the underside of the grade beam and the subgrade soil.

6.10 Subdivision Roads and Parking Structures

Suitable borrow soils (i.e., glacial till) exist at the subject site for construction of subdivision roads and parking areas.

It is anticipated that the subdivision roads and parking areas will be subject to predominantly passenger car and light truck traffic and infrequent heavy truck traffic. As a subgrade support, the California Bearing Ratio (CBR) rating of the compacted subgrade soil should be in the order of 3.

Based on the CBR rating, the following pavement and granular surfacing structures have been presented.

TABLE VI. THICKNESS DESIGN FOR ACCESS ROADS

Pavement/Granular Structure	Heavy Truck Traffic Wheel Loading (5,400 kg) (mm)		Light Truck/Passenger Vehicle Traffic Wheel Loading (1,830 kg) (mm)	
Surfacing Gravel	-	50	-	50
Asphalt Concrete	100	-	65	-
Granular Base (Min CBR = 65)	150	150	125	150
Granular Sub-Base (Min. CBR = 20)	250	400	125	170
Prepared Subgrade	(150)	(150)	(150)	(150)
Geotextile	*	*	*	*
Total Thickness	**500**	**600**	**315**	**370**

*Geotextile will be required where soft subgrade soils are encountered. High-strength (1,300 Newtons minimum), permeable, woven geotextile is recommended.

All granular fill placed above the subgrade elevation should be placed in thin lifts (150 mm loose, maximum) and compacted to 98 percent of standard Proctor density. The granular base, sub-base course and surfacing material should meet the following aggregate gradation requirements.

TABLE VII. AGGREGATE GRADATION REQUIREMENTS

Grain Size (mm)	Percent Passing		
	Surfacing Gravel	Base Course	Sub-Base Course
50.0	--	--	100
25.0	100	100	85 – 100
18.0	--	87 – 100	80 – 100
12.5	--	72 – 93	70 – 100
5.0	45 – 80	45 – 77	50 – 85
2.0	25 – 60	26 – 56	35 – 75
0.900	--	18 – 39	25 – 50
0.400	0 – 30	13 – 26	15 – 35
0.160	--	7 – 16	8 – 22
0.071	--	6 – 11	0 – 13
Plasticity Index (%)	0 – 6	0 – 6	0 – 6
CBR (min.)	--	65	20
% Fracture (min.)	40	50	--

The following minimum general recommendations should be incorporated into the design of the proposed subdivision roads and parking structures.

1. Prepare the site in accordance with Section 5.2, Site Preparation.

2. Excavate soft subgrade areas and replace with suitable soil compacted to 96 percent of standard Proctor density at optimum moisture content. Geotextile may be required to reinforce and stabilize the subgrade soils.

3. All borrow material for the subject roadways and parking areas should be placed in thin lifts (maximum 150 mm loose) and compacted to 96 percent of standard Proctor density at optimum moisture content.

4. In cut areas, the subgrade should be scarified (to 150 in light traffic areas and 300 mm in heavy traffic areas) and re-compacted to 96 percent of standard Proctor density.

5. All common borrow used for embankment construction may consist of imported granular material or locally available sand, clay, or glacial till soils.

6. All granular fill above the subgrade elevation should be placed in thin lifts (maximum 150 mm loose) and compacted to at least 98 percent of standard Proctor density.

7. Positive surface drainage is recommended to minimize the potential for moisture infiltration into the subgrade soil. Ditches and culverts should be provided where necessary to provide adequate site drainage. Surface water should be prevented from seeping back under the outer edges of the road structure. The subject roadways should be constructed with a shoulder height of at least 1.2 metres above ditchbottom elevation.

8. For sand or clay borrow materials, roadway embankment slopes should be no steeper than 3.0 Horizontal to 1.0 Vertical (3H:1V). Similarly, ditch sideslopes should be no steeper than 3H:1V.

9. Erosion protection is recommended for all embankment sideslopes. The slopes should be covered with topsoil and seeded to encourage vegetation growth. Alternately, erosion control blankets (North American Green S150 or equivalent) or hydromulch could be installed.

10. Periodic maintenance of the granular/pavement surface will be required (i.e., grading of the gravel surface or crack sealing of the pavement surface). The final road grade should be elevated a minimum of 600 mm above the average terrain to minimize snow accumulation on the road.

7.0 LIMITATIONS

The presentation of the summary of the field drill logs and foundation design recommendations has been completed as authorized. Sixteen, 150 mm diameter test holes were dry drilled using our continuous flight, solid stem auger drill rig. Field drill logs were compiled for the Test Holes during test drilling which, we believe, were representative of the subsurface conditions at the Test Hole locations at the time of test drilling. Variations in the subsurface conditions from that shown on the drill logs at locations other than the exact Test Hole locations should be anticipated. If conditions should differ from those reported here, then we should be notified immediately in order that we may examine the conditions in the field and reassess our recommendations in the light of any new findings.

The Terms of Reference for this geotechnical investigation did not include any environmental assessment of the site. No detectable evidence of environmentally sensitive materials such as hydrocarbon odour was detected during the actual time of the field test drilling program. If, on the basis of any knowledge, other than that formally communicated to us, there is reason to suspect that environmentally sensitive materials may exist, then additional test holes should be drilled and samples recovered for chemical analysis.

The subsurface investigation necessitated the drilling of deep test holes. The test holes were backfilled at the completion of test drilling. Please be advised that some settlement of the backfill materials will occur which may leave a depression or an open hole. It is the responsibility of the client to inspect the site and backfill, as required, to ensure that the ground surface at each Test Hole location is maintained level with the existing grade.

This report has been prepared for the exclusive use of East Ridge Development Inc., Mr. Landry Merkosky and their agents for specific application to the proposed subdivision to be constructed in a portion of NE¼-36-36-4-W3M, located within the R.M. of Corman Park No. 344, near Saskatoon, Saskatchewan. It has been prepared in accordance with generally accepted geotechnical engineering practices and no other warranty, express or implied, is made.

Any use which a Third Party makes of this report, or any reliance on decisions to be made based on it, are the responsibility of such Third Parties. PMEL accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

The acceptance of responsibility for the design/construction recommendations presented in this report are contingent on adequate and/or full time inspection (as required, based on site conditions at the time of construction) by a representative of the Geotechnical Consultant. PMEL will not accept any responsibility on this project for any unsatisfactory performance if adequate and/or full time inspection is not performed by a representative of PMEL.

If this report has been transmitted electronically, it has been digitally signed and secured with personal passwords to lock the document. Due to the possibility of digital modification, only originally signed reports and those reports sent directly by PMEL can be relied upon without fault.

We trust that this report fulfills your requirements for this project. Should you require additional information, please contact us.

P. MACHIBRODA ENGINEERING LTD.

Frank Hynes, M. Eng., P. Eng.

Paul Machibroda, P. Eng., FCSCE

FH/FH/clb

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
P. MACHIBRODA ENGINEERING LTD.
Number 172
Permission to Consult held by:

Discipline	Sk. Reg. No.	Signature
Geotechnical	01365	

09-11-24

PROFESSIONAL ENGINEER
F.G. HYNES
MEMBER 9670
09 11 24
YR. MN. DAY
SASKATCHEWAN

P. MACHIBRODA
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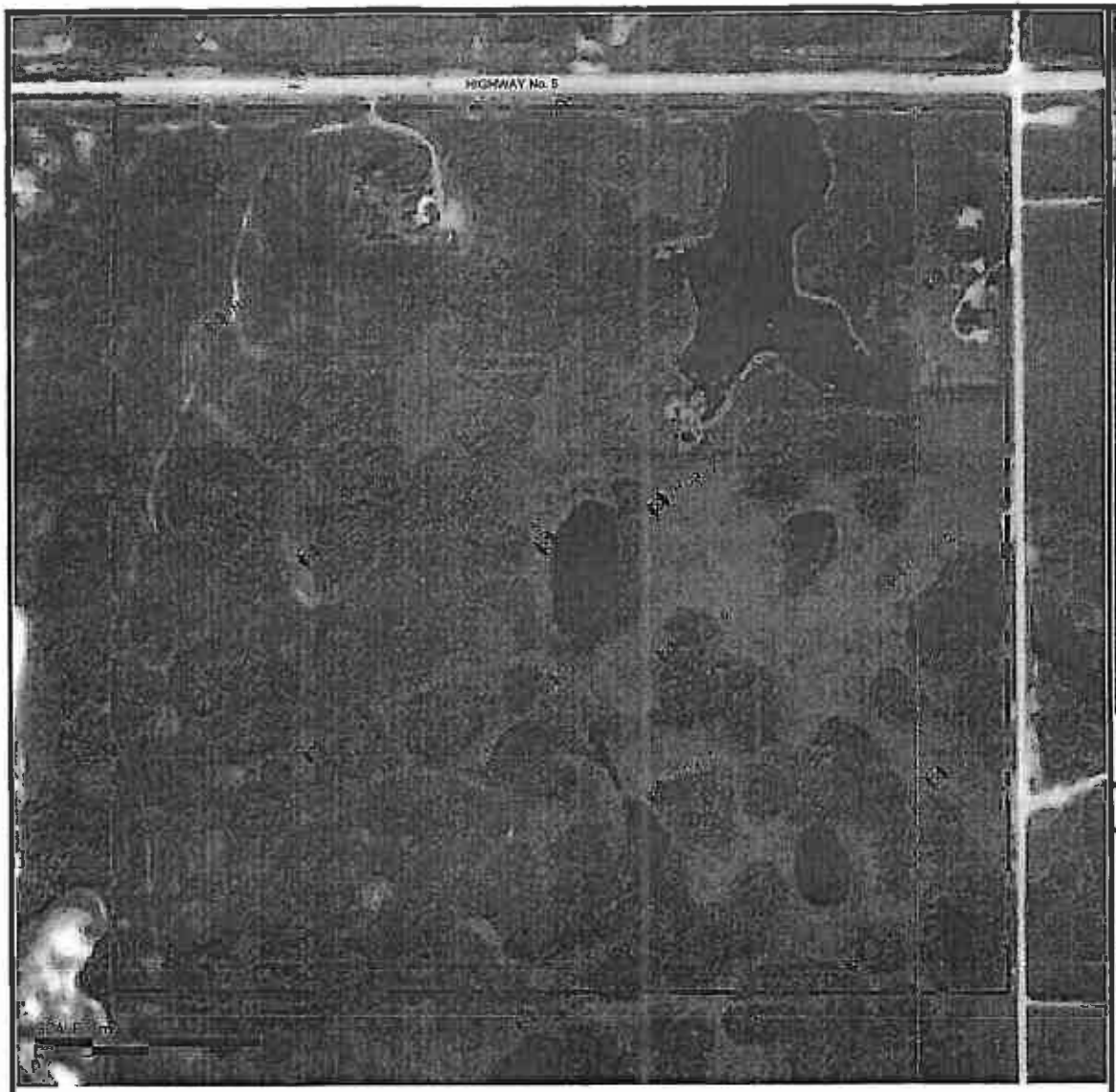
CONSULTING
GEOTECHNICAL/GEOENVIRONMENTAL
ENGINEERS

DRAWINGS



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4. PMEL TEST HOLE ELEVATIONS PROVIDED BY CATTERALL & WRIGHT CONSULTING ENGINEERS

KEY PLAN
NOT TO SCALE

LEGEND

- PMEL TEST HOLE
- PMEL TEST HOLE (PIEZOMETER INSTALLED)
- BENCHMARK
- PL – PROPERTY LINE

P. MACHIBRODA ENGINEERING LTD.

CONSULTING
GEOENVIRONMENTAL
GEOTECHNICAL
ENGINEERS

606 – 48th STREET EAST
SASKATOON, SK
S7K 3Y4

DRAWING TITLE:
SITE PLAN - TEST HOLE LOCATIONS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION
NE-36-38-4-W3M, NEAR SASKATOON, SK

APPROVED BY:	DRAWN BY:
F. HYNES	G. SOLTYS
DATE: NOVEMBER, 2009	DRAWING NUMBER:
SCALE: 1:4000	S09-7106-1

NOTE:
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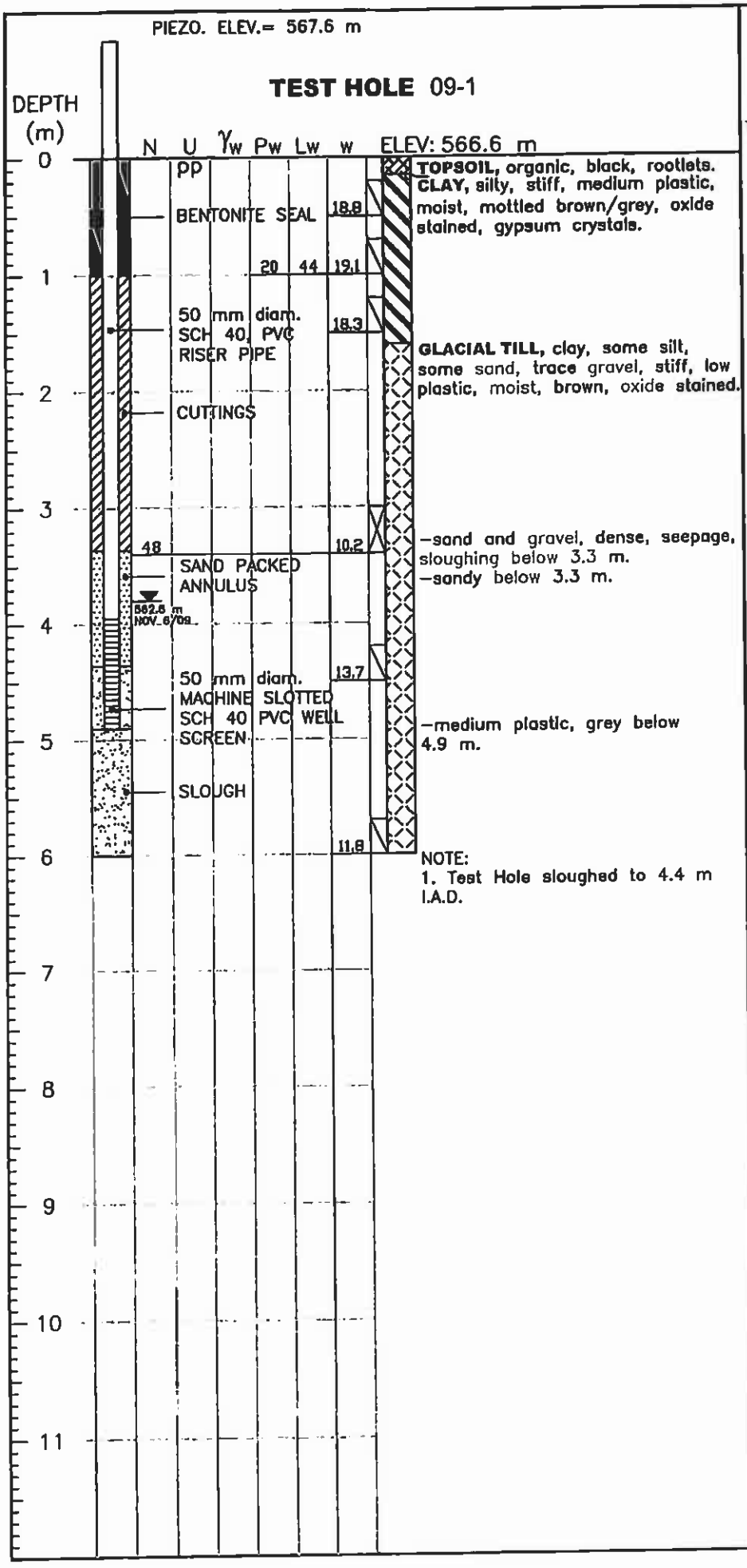
CONSULTING GEOENVIRONMENTAL GEOTECHNICAL ENGINEERS 806 – 48th STREET EAST SASKATOON, SK S7K 3Y4	
DRAWING TITLE: SURROUNDING LAND AND REGISTER WATER WELLS	
PROJECT: PROPOSED RESIDENTIAL SUBDIVISION NE-36-36-4-W3M, NEAR SASKATOON, SK	
APPROVED BY: F. HYNES	DRAWN BY: G. SOLTYS
DATE: NOVEMBER, 2009 SCALE: NOT TO SCALE	DRAWING NUMBER: S09-7106-1A



LEGEND:

TOPSOIL, FILL, GRAVEL, SAND, SILT, CLAY, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m³)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm²)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

LIMITATIONS: THE FIELD DRILL LOG IS A SUMMARY OF THE SUBSURFACE CONDITIONS ENCOUNTERED AT THE SPECIFIC TEST HOLE LOCATION AT THE TIME OF TEST DRILLING. SUBSURFACE CONDITIONS MAY VARY AT OTHER LOCATIONS OF THIS SITE AND, IN TIME, MAY CHANGE AT THIS SPECIFIC TEST HOLE LOCATION.

P. MACHIBRODA ENGINEERING LTD.

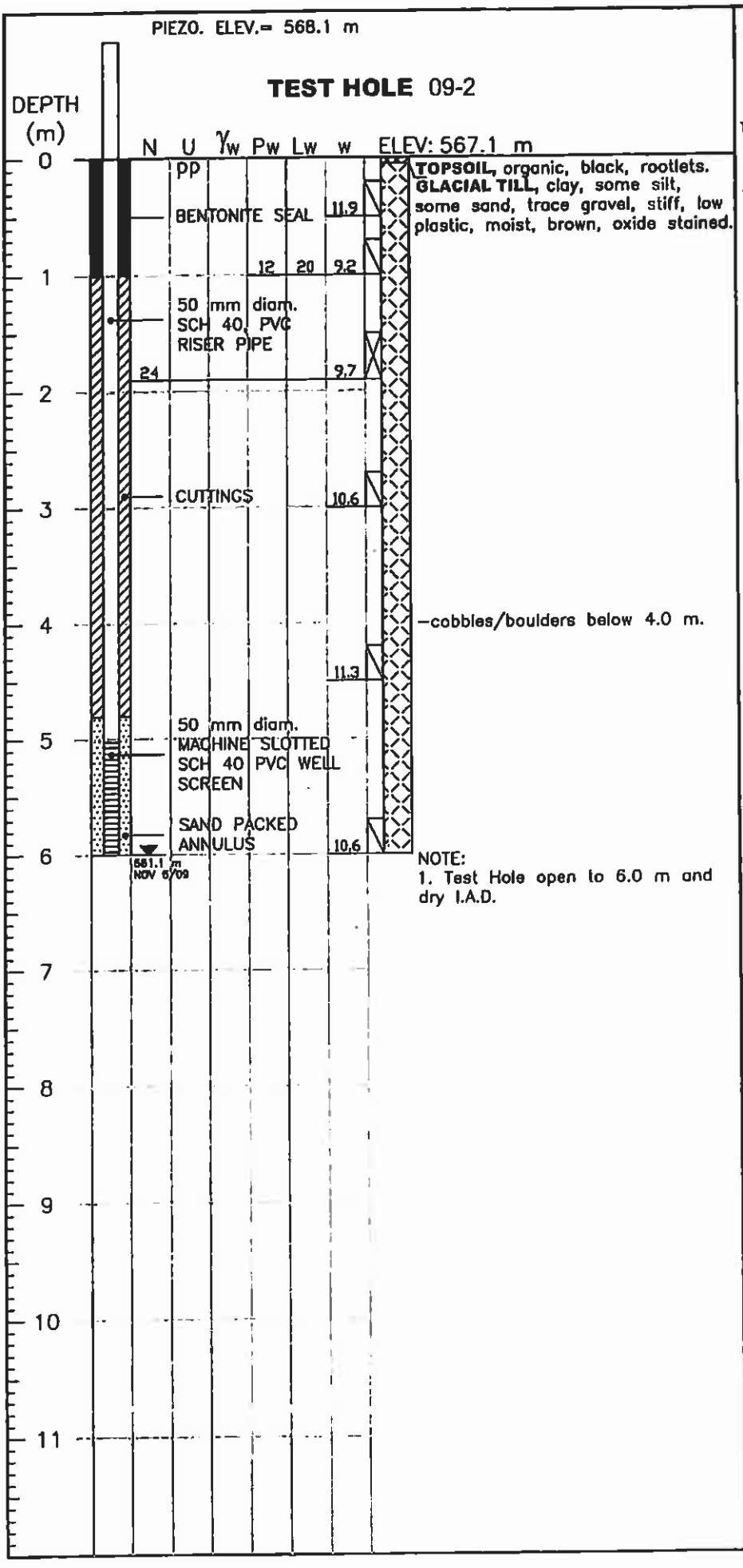
FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 26/09	S09-7106-2



TOPSOIL, organic, black, rootlets.
GLACIAL TILL, clay, some silt, some sand, trace gravel, stiff, low plastic, moist, brown, oxide stained.

—cobbles/boulders below 4.0 m.

NOTE:
1. Test Hole open to 6.0 m and dry I.A.D.

LEGEND:

TOPSOIL, FILL, GRAVEL, SAND, SILT, CLAY, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m³)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm²)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

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P. MACHIBRODA ENGINEERING LTD.

FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 26/09	S09-7106-3

PIEZO. ELEV.= 568.6 m

TEST HOLE 09-3

ELEV: 567.5 m

DEPTH (m)	N	U	γ_w	Pw	Lw	w	
0		pp					**TOPSOIL**, organic, black, rootlets. **GLACIAL TILL**, clay, some silt, some sand, trace gravel, stiff, low plastic, moist, brown, oxide stained.
						7.2	BENTONITE SEAL
1	9	16				7.1	
						7.2	—cobbles/boulders below 1.3 m.
2							50 mm diam. SCH 40 PVC RISER PIPE
							—cobbles/boulders below 2.8 m.
3						7.9	CUTTINGS
4							
5	21					10.2	SAND-PACKED ANNULUS
							50 mm diam. MACHINE SLOTTED SCH 40 PVC WELL SCREEN
6	DRY NOV 6/09					11.3	
7							
8							
9							
10							
11							

NOTE:
1. Test Hole open to 6.0 m and dry I.A.D.

LEGEND:

FILL, SAND, CLAY, TOPSOIL, GRAVEL, SILT, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m³)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm²)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

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P. MACHIBRODA ENGINEERING LTD.

FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 26/09	S09-7106-4

PIEZO. ELEV.= 565.3 m

TEST HOLE 09-4

ELEV: 564.2 m

DEPTH (m)	N	U	γ_w	Pw	Lw	w	
0		pp					**TOPSOIL**, organic, black, rootlets. **CLAY**, some silt, trace sand, stiff, medium plastic, moist, mottled brown/grey, gypsum crystals.
						22.7	
1				17	35	21.3	
						13.2	**GLACIAL TILL**, clay, some silt, some sand, trace gravel, stiff, medium plastic, moist, brown, oxide stained.
2							
3							
						10.7	
4							–trace seepage below 4.2 m.
						10.4	
5							–medium plastic, below 5.0 m.
6						10.7	
7							
8							
9							
10							
11							

BENTONITE SEAL

50 mm diam. SCH 40 PVC RISER PIPE

CUTTINGS

24

560.7 m NOV 6/09

50 mm diam. MACHINE SLOTTED SCH 40 PVC WELL SCREEN

SAND PACKED ANNULUS

NOTE:
1. Test Hole open to 6.0 m I.A.D.

LEGEND:

FILL, SAND, CLAY, TOPSOIL, GRAVEL, SILT, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m³)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm²)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

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FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
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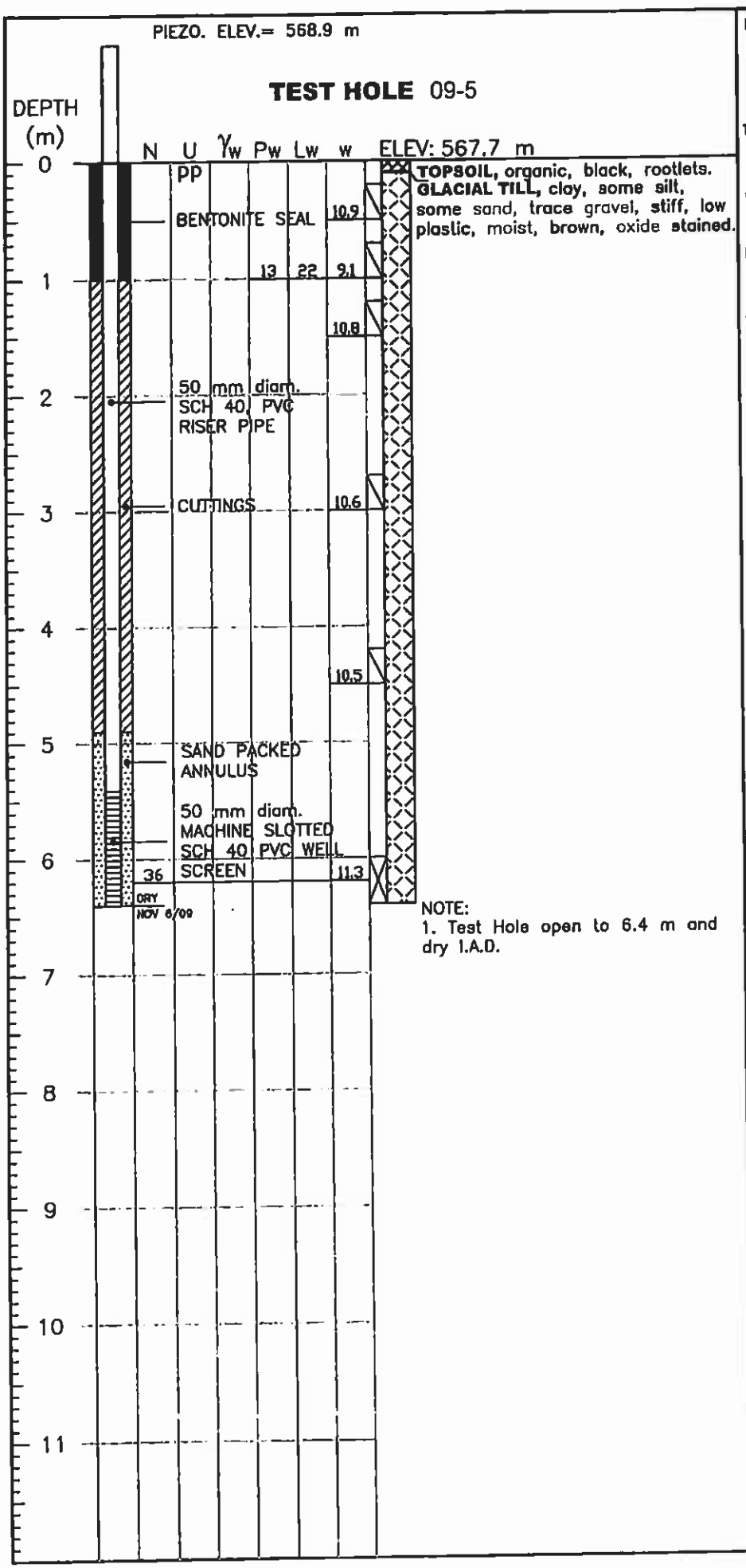


LEGEND:

FILL, SAND, CLAY, TOPSOIL, GRAVEL, SILT, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m³)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm²)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

LIMITATIONS: THE FIELD DRILL LOG IS A SUMMARY OF THE SUBSURFACE CONDITIONS ENCOUNTERED AT THE SPECIFIC TEST HOLE LOCATION AT THE TIME OF TEST DRILLING. SUBSURFACE CONDITIONS MAY VARY AT OTHER LOCATIONS OF THIS SITE AND, IN TIME, MAY CHANGE AT THIS SPECIFIC TEST HOLE LOCATION.

P. MACHIBRODA ENGINEERING LTD.

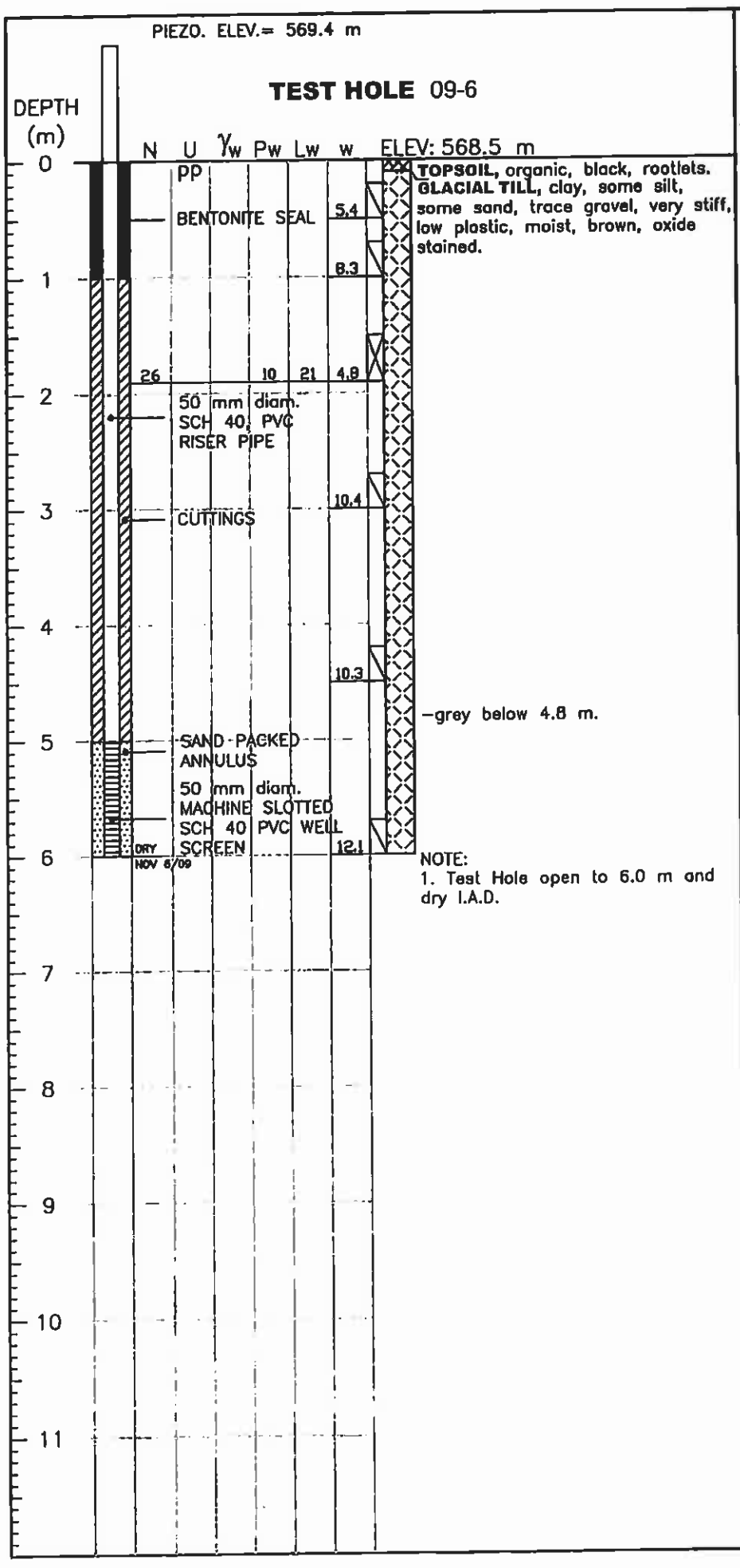
FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 26/09	S09-7106-6



LEGEND:

FILL, SAND, CLAY, TOPSOIL, GRAVEL, SILT, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m^3)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm^2)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

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P. MACHIBRODA ENGINEERING LTD.

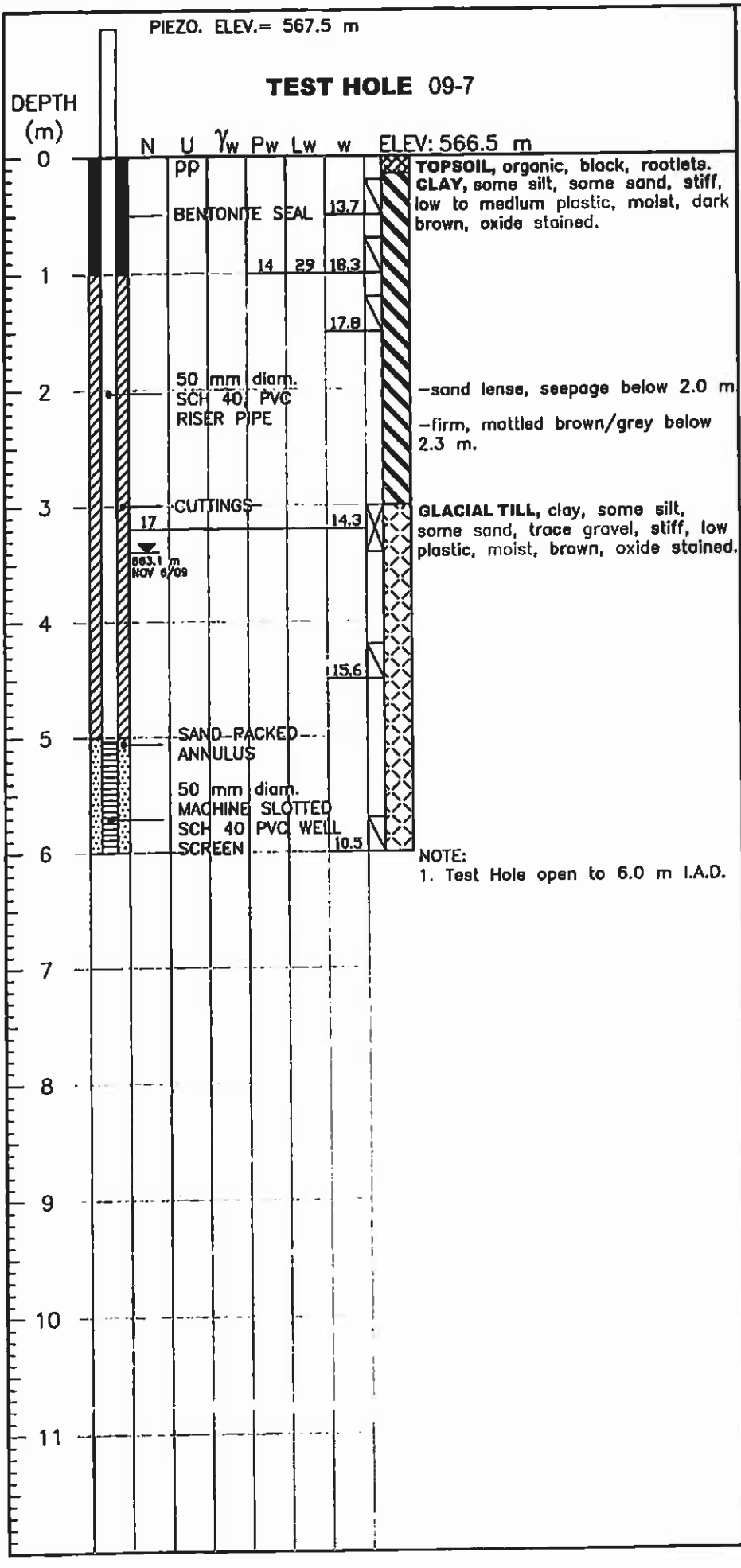
FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 26/09	S09-7106-7



LEGEND:

FILL, SAND, CLAY, TOPSOIL, GRAVEL, SILT, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m^3)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm^2)

N.....STANDARD PENETRATION TEST (ROPE-CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

LIMITATIONS: THE FIELD DRILL LOG IS A SUMMARY OF THE SUBSURFACE CONDITIONS ENCOUNTERED AT THE SPECIFIC TEST HOLE LOCATION AT THE TIME OF TEST DRILLING. SUBSURFACE CONDITIONS MAY VARY AT OTHER LOCATIONS OF THIS SITE AND, IN TIME, MAY CHANGE AT THIS SPECIFIC TEST HOLE LOCATION.

P. MACHIBRODA ENGINEERING LTD.

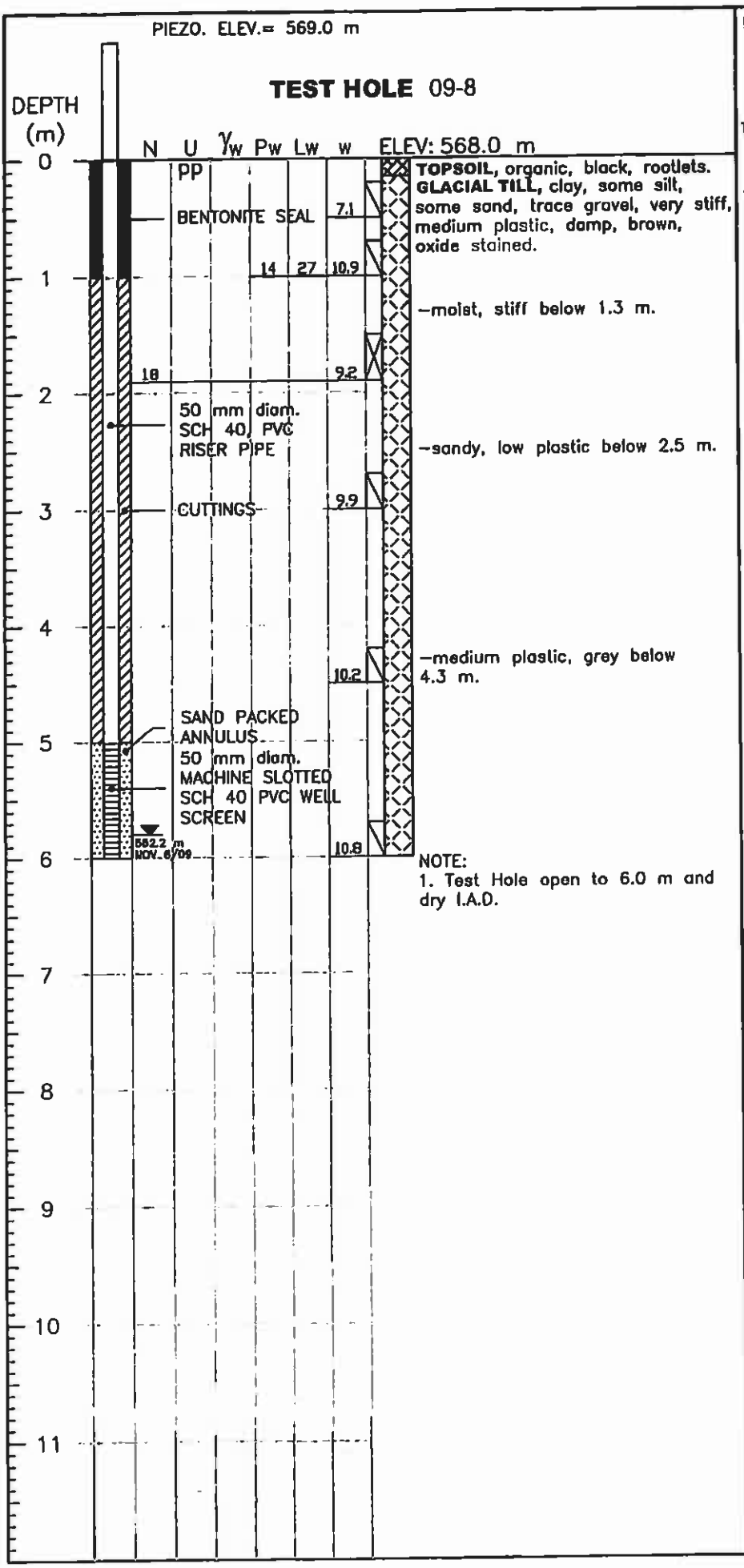
FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 26/09	S09-7106-8



LEGEND:

FILL, SAND, CLAY

TOPSOIL, GRAVEL, SILT, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m³)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm²)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

LIMITATIONS: THE FIELD DRILL LOG IS A SUMMARY OF THE SUBSURFACE CONDITIONS ENCOUNTERED AT THE SPECIFIC TEST HOLE LOCATION AT THE TIME OF TEST DRILLING. SUBSURFACE CONDITIONS MAY VARY AT OTHER LOCATIONS OF THIS SITE AND, IN TIME, MAY CHANGE AT THIS SPECIFIC TEST HOLE LOCATION.

P. MACHIBRODA ENGINEERING LTD.

FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

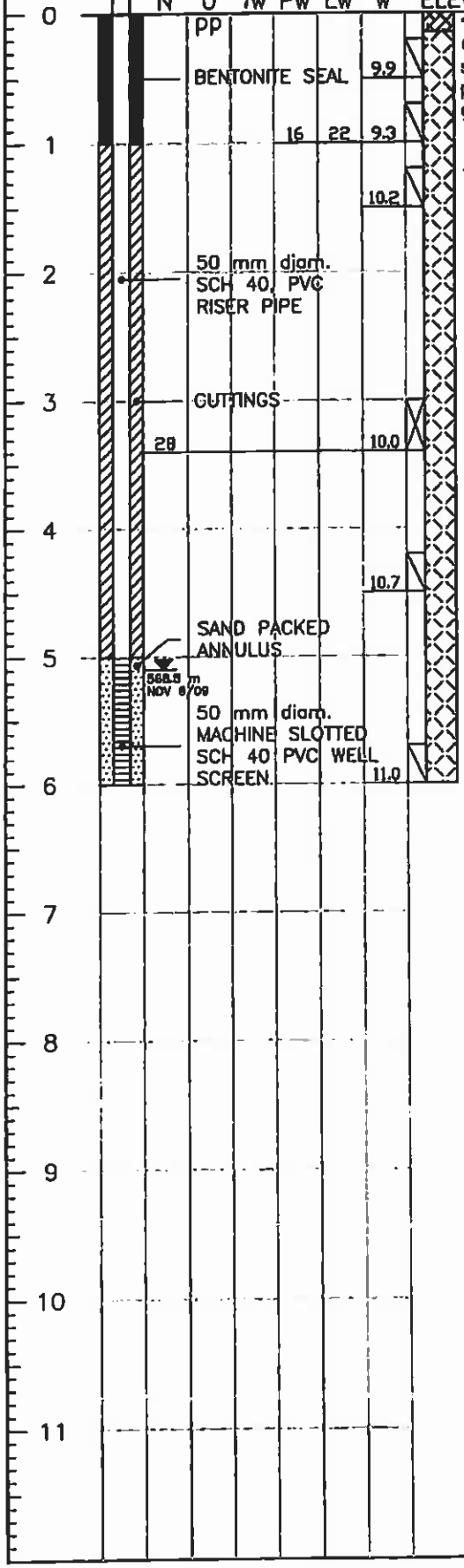
NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 26/09	S09-7106-9

PIEZO. ELEV.= 574.6 m

TEST HOLE 09-9

ELEV: 573.6 m



TOPSOIL, organic, black, rootlets.
GLACIAL TILL, clay, some silt, some sand, trace gravel, stiff, low plastic, moist, brown, oxide stained, gypsum crystals.

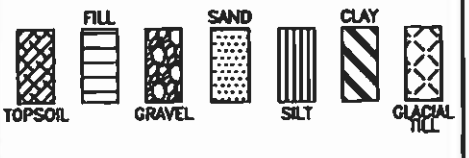
–cobbles/boulders below 1.2 m.

–sand lense, trace seepage below 4.0 m.

–grey below 5.7 m.

NOTE:
1. Test Hole open to 6.0 m and dry I.A.D.

LEGEND:



w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m³)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm²)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

LIMITATIONS: THE FIELD DRILL LOG IS A SUMMARY OF THE SUBSURFACE CONDITIONS ENCOUNTERED AT THE SPECIFIC TEST HOLE LOCATION AT THE TIME OF TEST DRILLING. SUBSURFACE CONDITIONS MAY VARY AT OTHER LOCATIONS OF THIS SITE AND, IN TIME, MAY CHANGE AT THIS SPECIFIC TEST HOLE LOCATION.

P. MACHIBRODA ENGINEERING LTD.

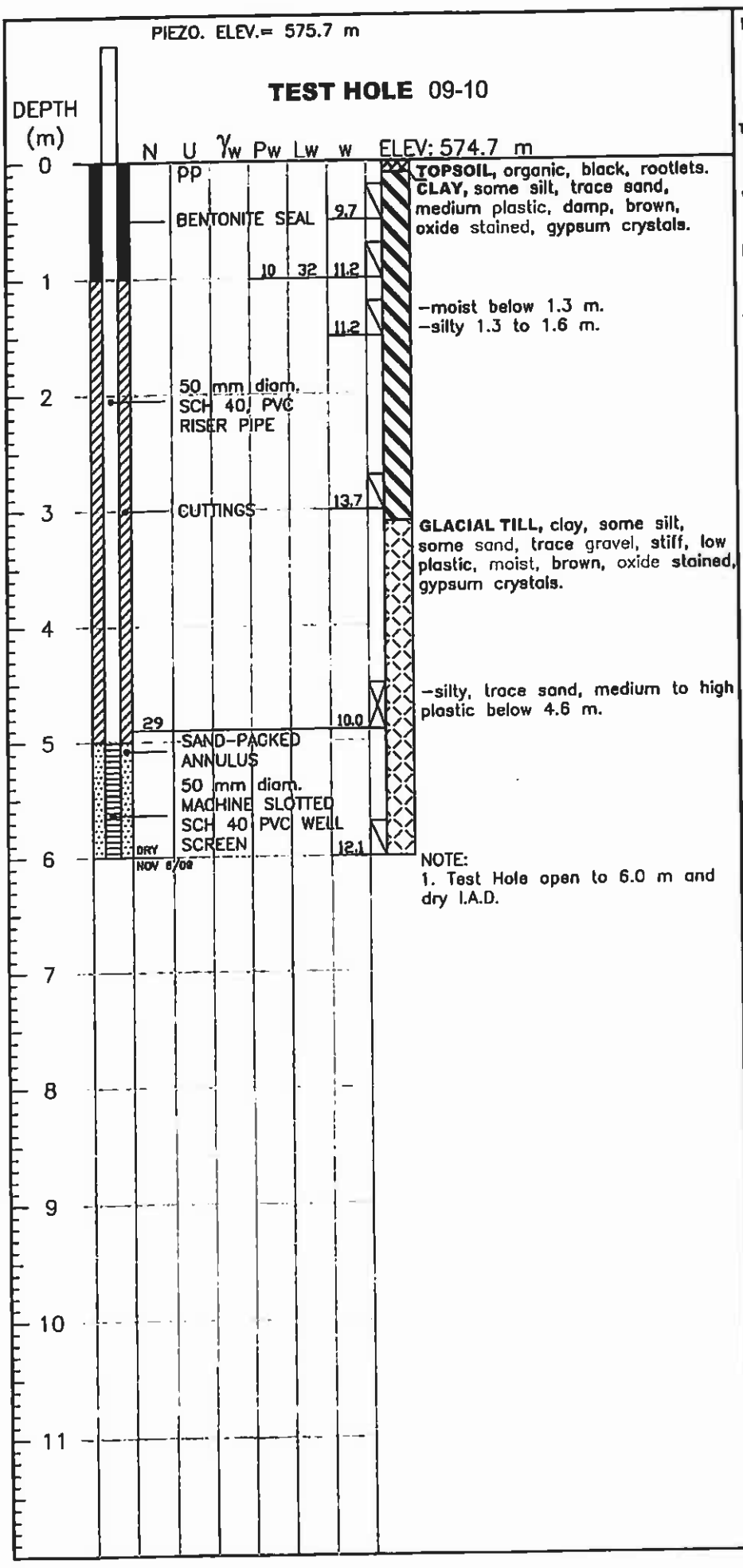
FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 27/09	S09-7106-10



LEGEND:

FILL, SAND, CLAY, TOPSOIL, GRAVEL, SILT, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m^3)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm^2)

N.....STANDARD PENETRATION TEST (ROPE-CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

LIMITATIONS: THE FIELD DRILL LOG IS A SUMMARY OF THE SUBSURFACE CONDITIONS ENCOUNTERED AT THE SPECIFIC TEST HOLE LOCATION AT THE TIME OF TEST DRILLING. SUBSURFACE CONDITIONS MAY VARY AT OTHER LOCATIONS OF THIS SITE AND, IN TIME, MAY CHANGE AT THIS SPECIFIC TEST HOLE LOCATION.

P. MACHIBRODA ENGINEERING LTD.

FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 27/09	S09-7106-11

PIEZO. ELEV.= 574.7 m

TEST HOLE 09-11

ELEV: 573.4 m

DEPTH (m)	N	U	γ_w	Pw	Lw	w
0			pp			
1				NON PLASTIC	19	6.8, 4.1, 4.0
2						
3						7.3
4						9.1
5						
6	50					8.5
7						
8						
9						
10						
11						

BENTONITE SEAL

50 mm diam. SCH 40 PVC RISER PIPE

CUTTINGS

SAND-PACKED ANNULUS

50 mm diam. MACHINE SLOTTED SCH 40 PVC WELL SCREEN

DRY NOV 6/09

TOPSOIL, organic, black, rootlets.
GLACIAL TILL, clay, some silt, some sand, trace gravel, very stiff, non plastic, moist, brown, oxide stained, gypsum crystals.

—cobbles/boulders below 1.5 m.

NOTE:
1. Test Hole open to 6.4 m and dry I.A.D.

LEGEND:

TOPSOIL, FILL, GRAVEL, SAND, SILT, CLAY, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m³)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm²)

N.....STANDARD PENETRATION TEST (ROPE-CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

LIMITATIONS: THE FIELD DRILL LOG IS A SUMMARY OF THE SUBSURFACE CONDITIONS ENCOUNTERED AT THE SPECIFIC TEST HOLE LOCATION AT THE TIME OF TEST DRILLING. SUBSURFACE CONDITIONS MAY VARY AT OTHER LOCATIONS OF THIS SITE AND, IN TIME, MAY CHANGE AT THIS SPECIFIC TEST HOLE LOCATION.

P. MACHIBRODA ENGINEERING LTD.

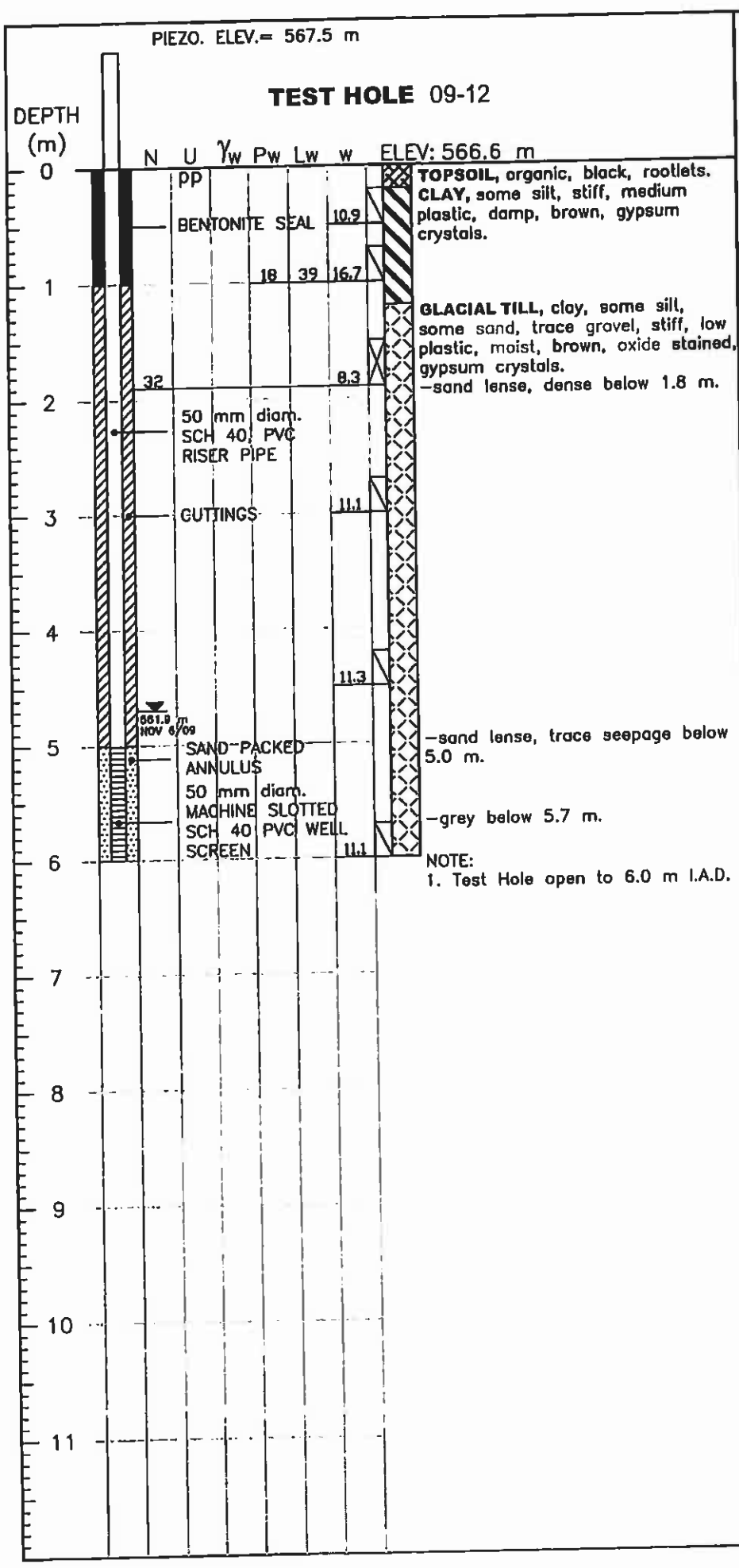
FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 27/09	S09-7106-12



LEGEND:

TOPSOIL, FILL, GRAVEL, SAND, SILT, CLAY, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m^3)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm^2)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

LIMITATIONS: THE FIELD DRILL LOG IS A SUMMARY OF THE SUBSURFACE CONDITIONS ENCOUNTERED AT THE SPECIFIC TEST HOLE LOCATION AT THE TIME OF TEST DRILLING. SUBSURFACE CONDITIONS MAY VARY AT OTHER LOCATIONS OF THIS SITE AND, IN TIME, MAY CHANGE AT THIS SPECIFIC TEST HOLE LOCATION.

P. MACHIBRODA ENGINEERING LTD.

FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

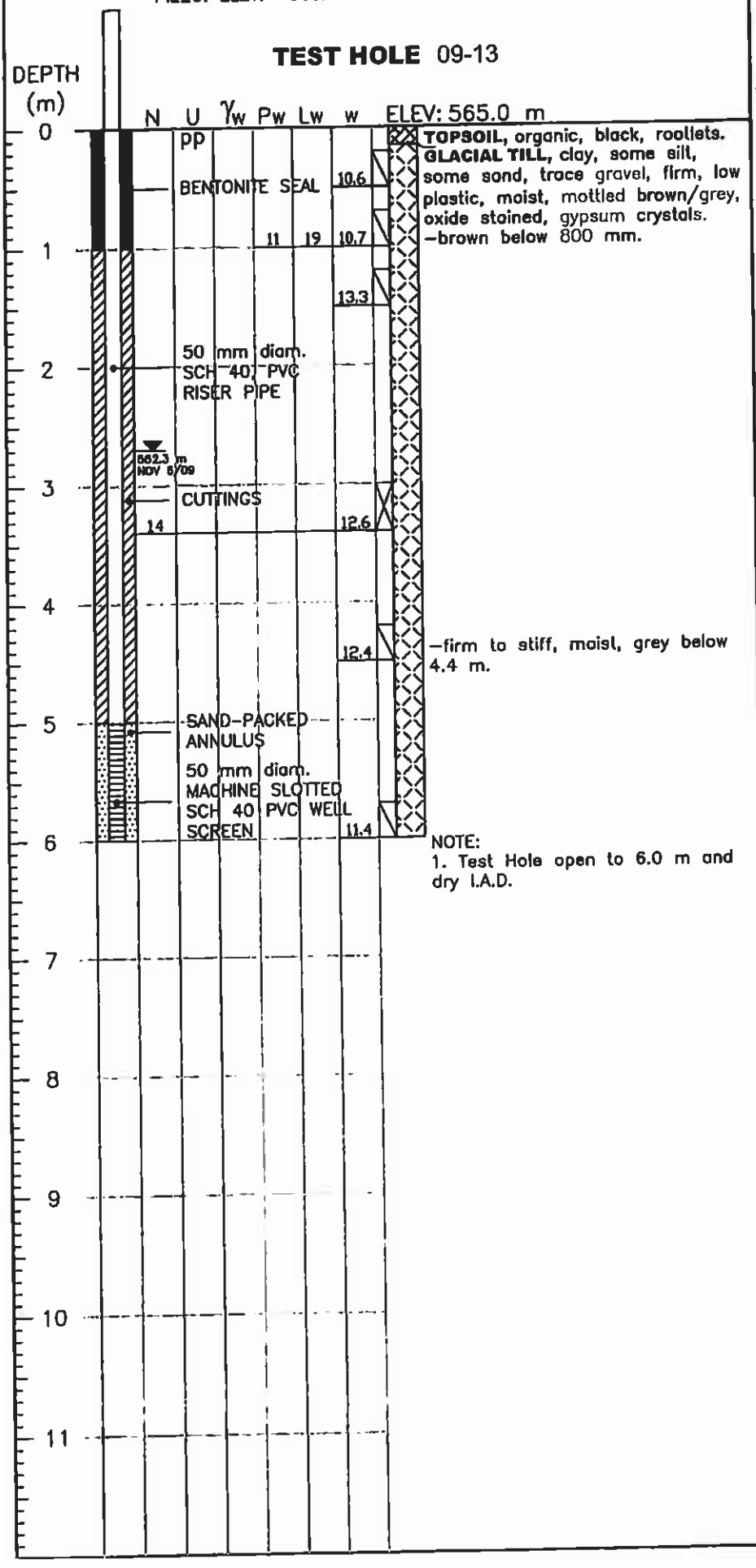
LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 27/09	S09-7106-13

PIEZO. ELEV.= 565.8 m

TEST HOLE 09-13



LEGEND:

TOPSOIL, FILL, GRAVEL, SAND, SILT, CLAY, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m³)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm²)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

LIMITATIONS: THE FIELD DRILL LOG IS A SUMMARY OF THE SUBSURFACE CONDITIONS ENCOUNTERED AT THE SPECIFIC TEST HOLE LOCATION AT THE TIME OF TEST DRILLING. SUBSURFACE CONDITIONS MAY VARY AT OTHER LOCATIONS OF THIS SITE AND, IN TIME, MAY CHANGE AT THIS SPECIFIC TEST HOLE LOCATION.

P. MACHIBRODA ENGINEERING LTD.

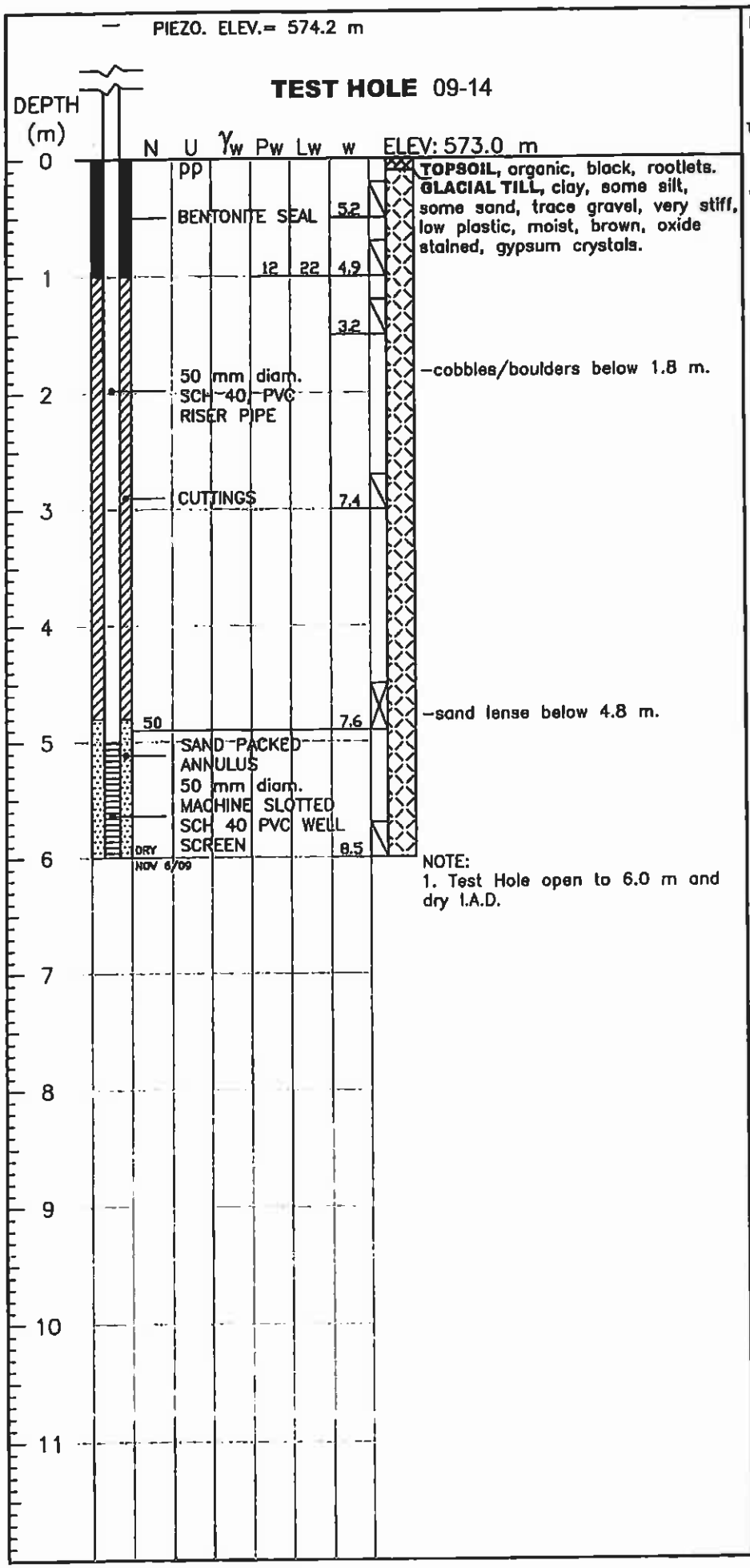
FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 27/09	S09-7106-14



LEGEND:

TOPSOIL, FILL, GRAVEL, SAND, SILT, CLAY, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m³)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm²)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

LIMITATIONS: THE FIELD DRILL LOG IS A SUMMARY OF THE SUBSURFACE CONDITIONS ENCOUNTERED AT THE SPECIFIC TEST HOLE LOCATION AT THE TIME OF TEST DRILLING. SUBSURFACE CONDITIONS MAY VARY AT OTHER LOCATIONS OF THIS SITE AND, IN TIME, MAY CHANGE AT THIS SPECIFIC TEST HOLE LOCATION.

P. MACHIBRODA ENGINEERING LTD.

FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 27/09	S09-7106-15

PIEZO. ELEV.= 573.2 m

TEST HOLE 09-15

ELEV: 572.2 m

DEPTH (m)	N	U	γ_w	Pw	Lw	w
0		PP				
1				15	22	13.3
2	22					12.3
3						10.7
4						11.9
5						
6						11.2

BENTONITE SEAL

22.0

TOPSOIL, organic, black, rootlets.
CLAY, some silt, stiff, medium to high plastic, moist, brown, oxide stained, gypsum crystals.

GLACIAL TILL, clay, some silt, some sand, trace gravel, stiff, low plastic, moist, brown, oxide stained.

50 mm diam. SCH 40 PVC RISER PIPE

CUTTINGS

SAND PACKED ANNULUS

50 mm diam. MACHINE SLOTTED SCH 40 PVC WELL SCREEN

DRY NOV 6/09

NOTE:
1. Test Hole open to 6.0 m and dry I.A.D.

LEGEND:

FILL, SAND, CLAY, TOPSOIL, GRAVEL, SILT, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m³)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm²)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

LIMITATIONS: THE FIELD DRILL LOG IS A SUMMARY OF THE SUBSURFACE CONDITIONS ENCOUNTERED AT THE SPECIFIC TEST HOLE LOCATION AT THE TIME OF TEST DRILLING. SUBSURFACE CONDITIONS MAY VARY AT OTHER LOCATIONS OF THIS SITE AND, IN TIME, MAY CHANGE AT THIS SPECIFIC TEST HOLE LOCATION.

P. MACHIBRODA ENGINEERING LTD.

FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

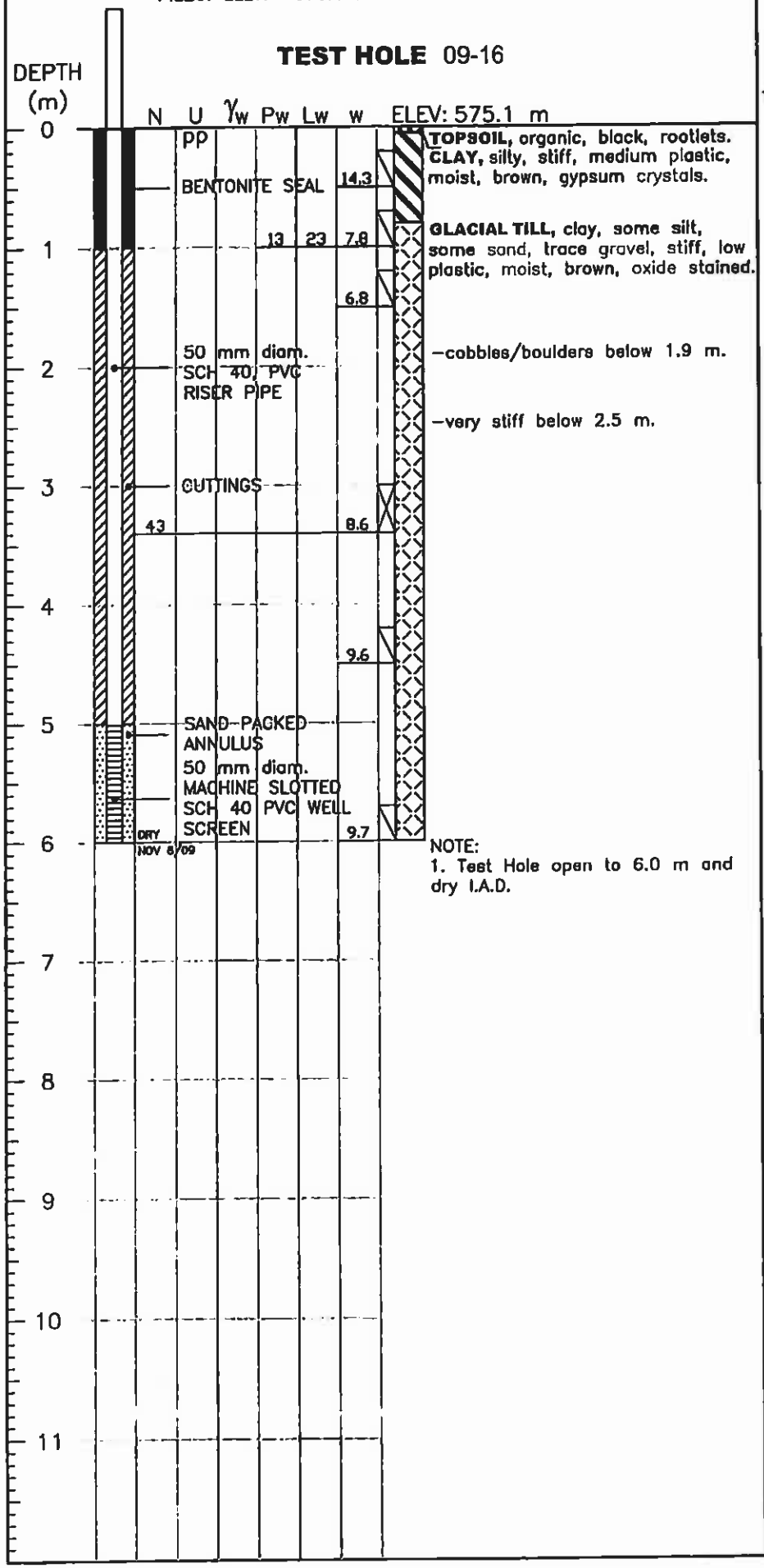
LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 27/09	S09-7106-16

PIEZO. ELEV.= 576.1 m

TEST HOLE 09-16



LEGEND:

FILL, SAND, CLAY

TOPSOIL, GRAVEL, SILT, GLACIAL TILL

w.....WATER CONTENT (PERCENT OF DRY SOIL WEIGHT)

Lw...LIQUID LIMIT

Pw...PLASTIC LIMIT

γ_w...WET UNIT WEIGHT (kN/m^3)

U.....UNCONFINED COMPRESSIVE STRENGTH (kPa)

pp...POCKET PENETROMETER (kg/cm^2)

N.....STANDARD PENETRATION TEST (ROPE–CATHEAD & DONUT HAMMER) (50/125 = BLOWS/SAMPLER PENETRATION [mm])

SO_4 .....SULPHATE CONTENT (PERCENT OF DRY SOIL WEIGHT)

P200...% PASSING No. 200 SIEVE

I.A.D.....IMMEDIATELY AFTER DRILLING

▽...RECORDED WATER LEVEL (TEST HOLE I.A.D.)

▼...RECORDED WATER LEVEL (PIEZO)

SHELBY TUBE, SPLIT SPOON, CUTTINGS

LIMITATIONS: THE FIELD DRILL LOG IS A SUMMARY OF THE SUBSURFACE CONDITIONS ENCOUNTERED AT THE SPECIFIC TEST HOLE LOCATION AT THE TIME OF TEST DRILLING. SUBSURFACE CONDITIONS MAY VARY AT OTHER LOCATIONS OF THIS SITE AND, IN TIME, MAY CHANGE AT THIS SPECIFIC TEST HOLE LOCATION.

P. MACHIBRODA ENGINEERING LTD.

FIELD DRILL LOG AND SOIL TEST RESULTS

PROJECT:
PROPOSED RESIDENTIAL SUBDIVISION

LOCATION:
NE-36-36-4-W3M
NEAR SASKATOON, SK

NORTHING: **EASTING:**

DATE DRILLED:	DRAWING NUMBER:
OCT 27/09	S09-7106-17

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 2, 2009

Test Hole No.: 09-1

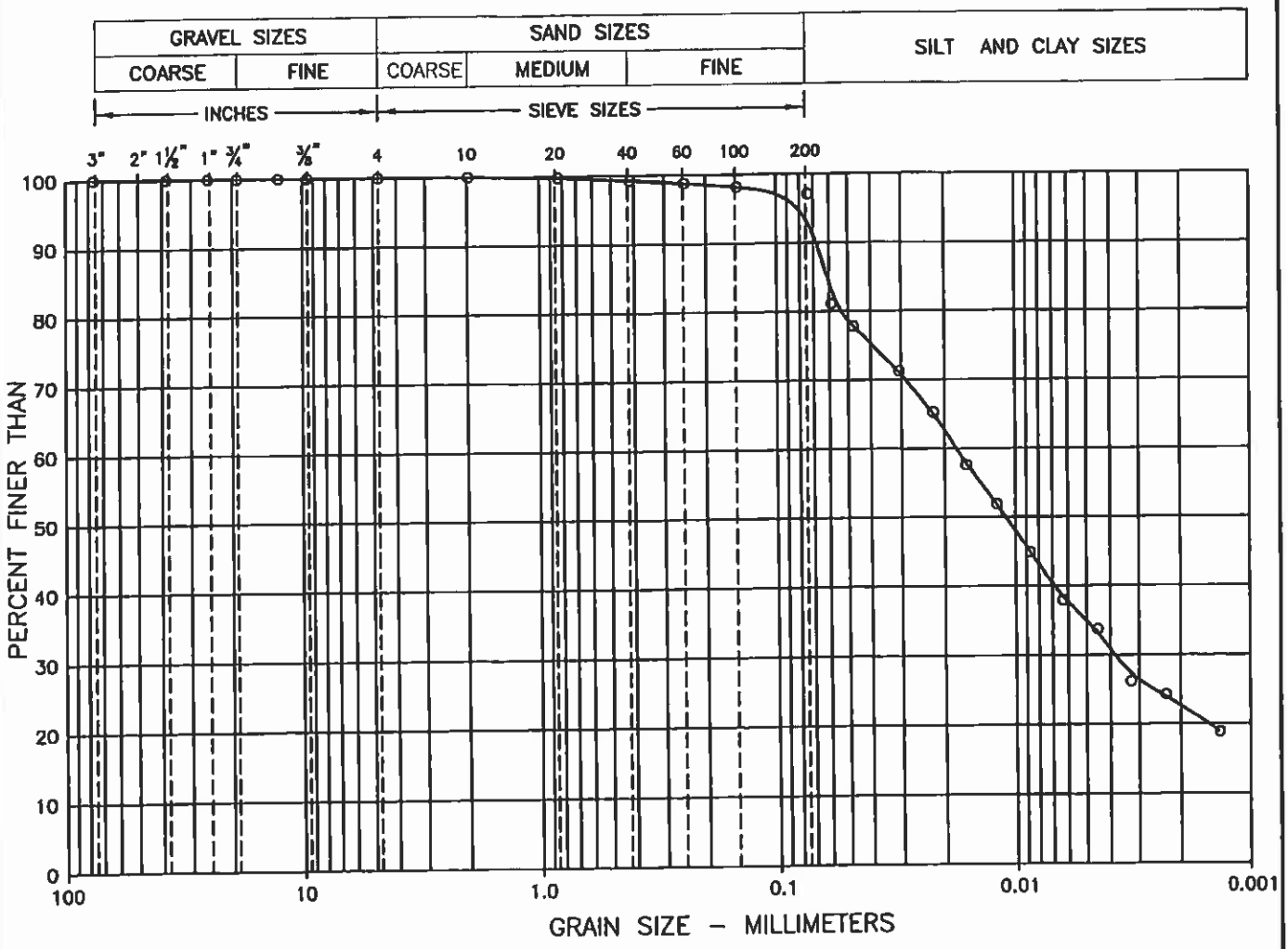
Sample No.: 2

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
0	3	75	22



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-18

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 2, 2009

Test Hole No.: 09-2

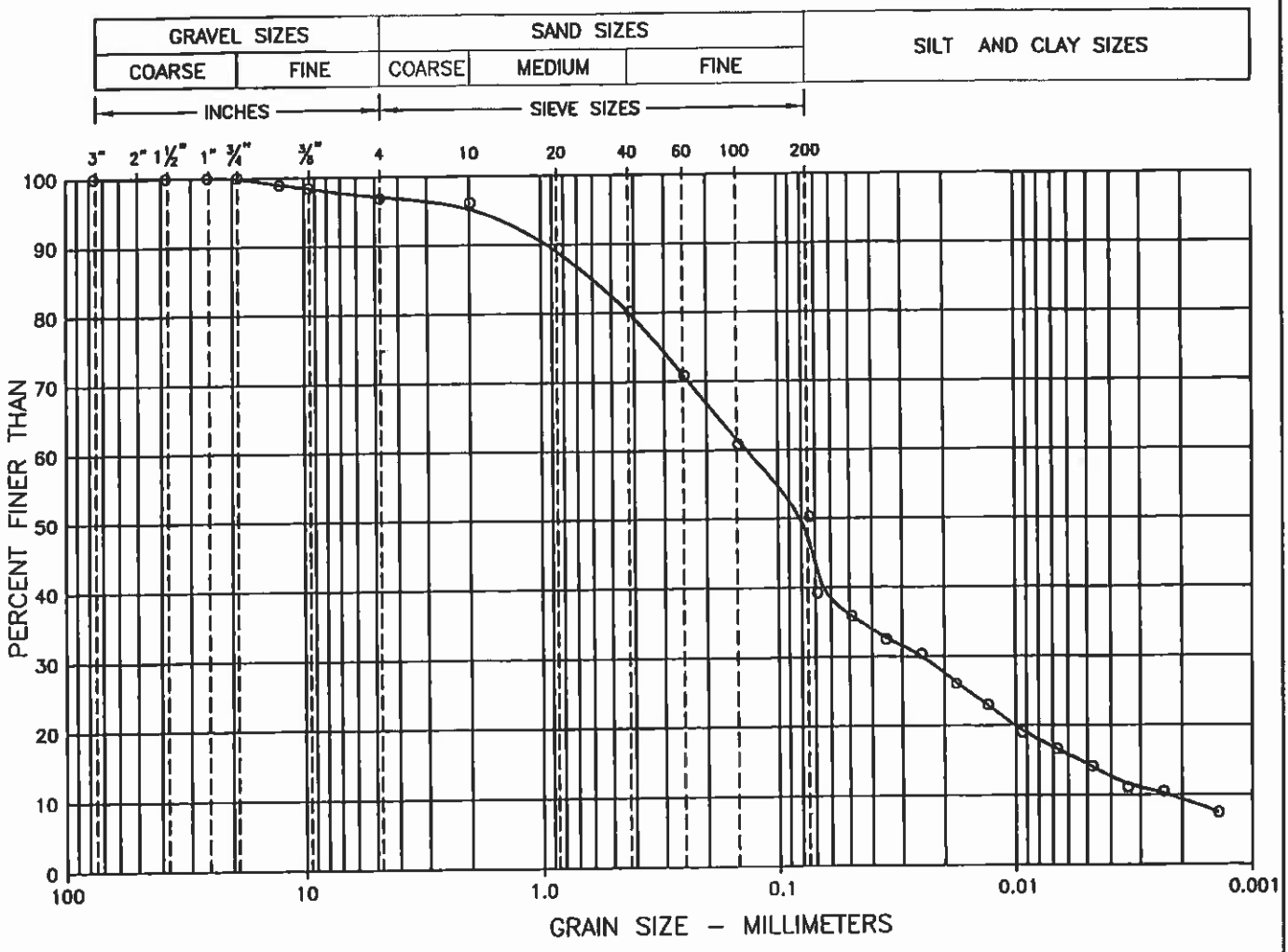
Sample No.: 8

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
3	47	41	9



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-19

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE–36–36–4–W3M, NEAR SASKATOON, SK

Project No.: S09–7106

Date Tested: NOVEMBER 2, 2009

Test Hole No.: 09–3

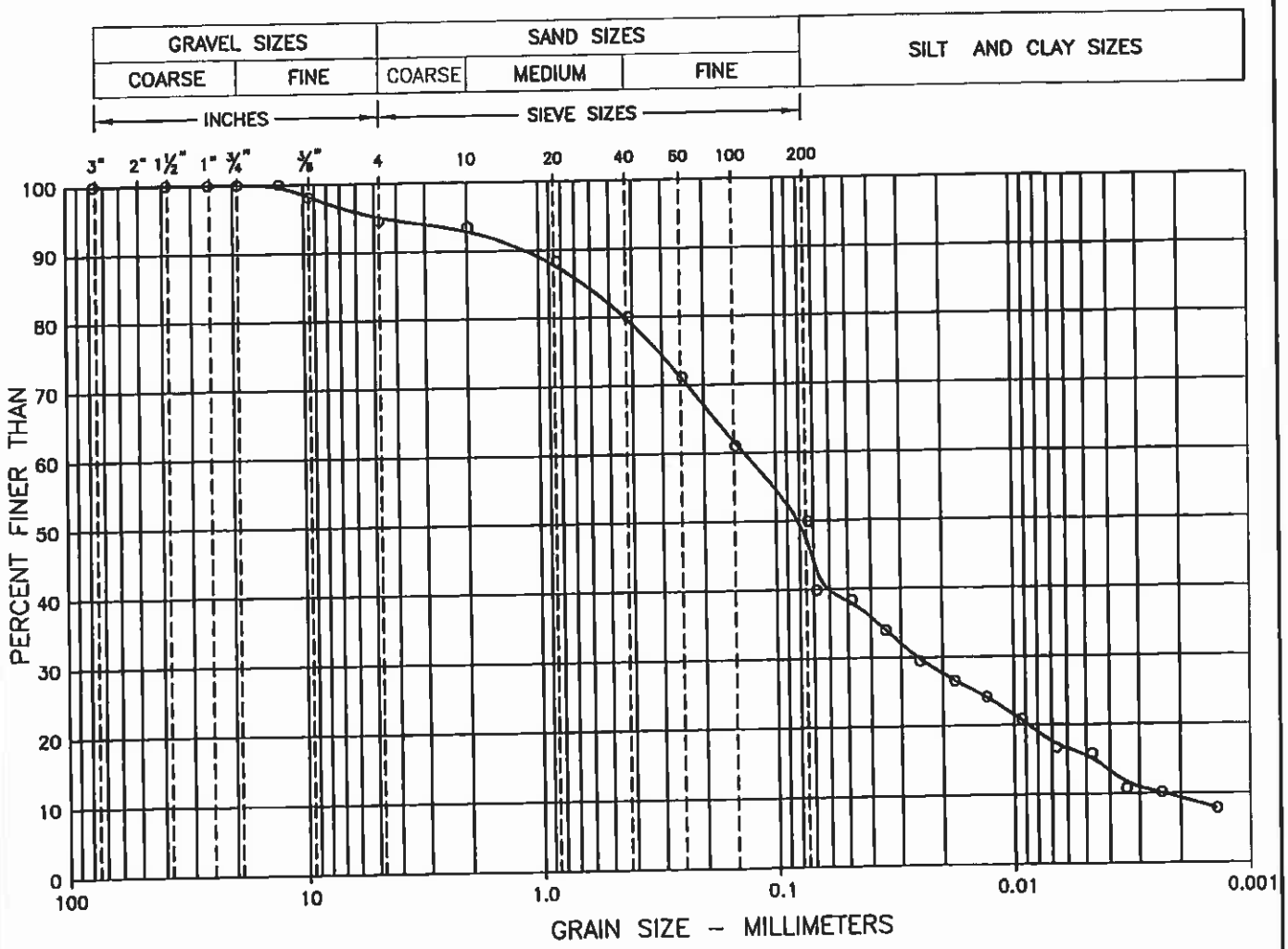
Sample No.: 14

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
5	45	41	9



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-20

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 2, 2009

Test Hole No.: 09-4

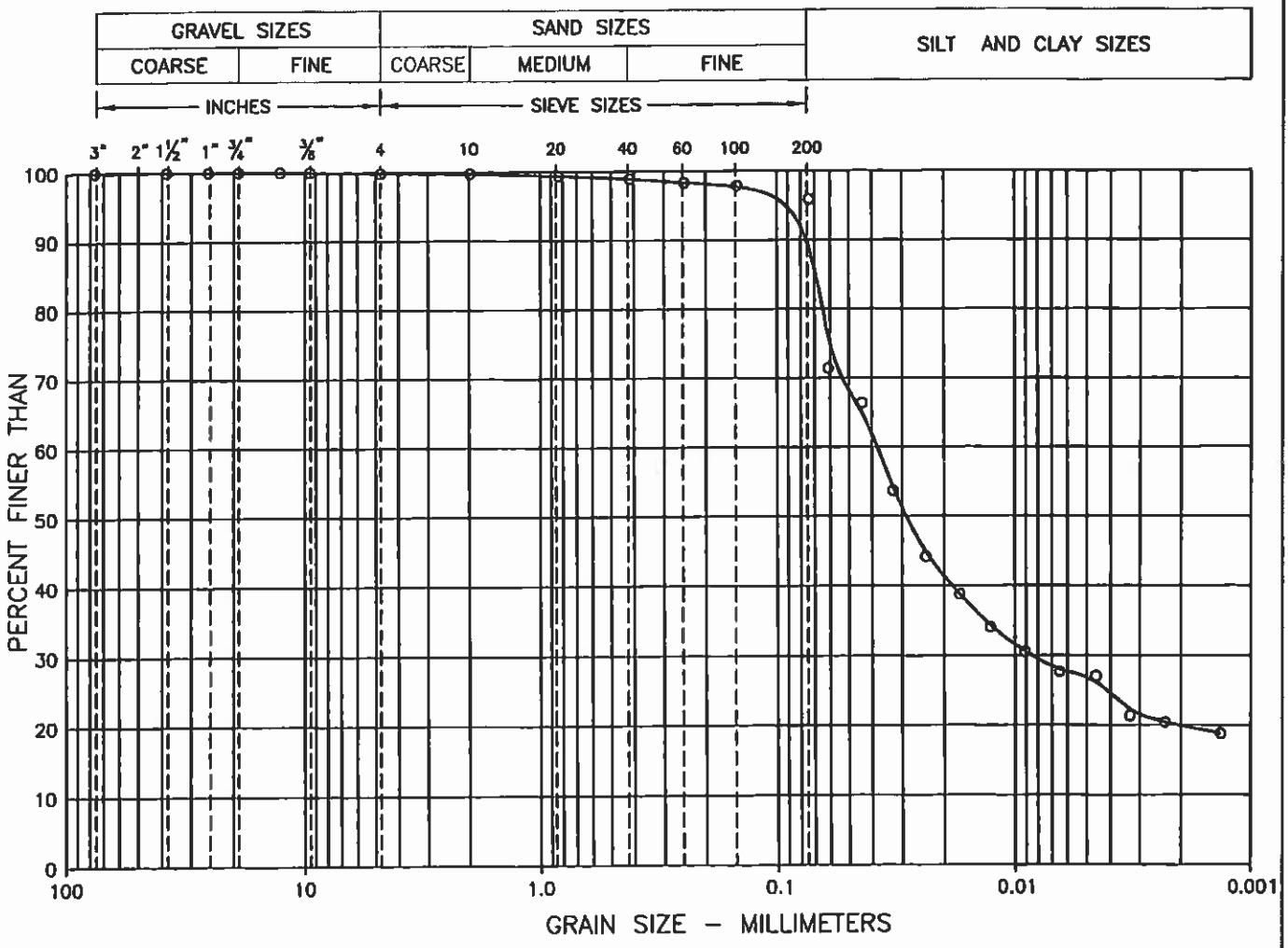
Sample No.: 20

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
0	4	76	20



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-21

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 2, 2009

Test Hole No.: 09-5

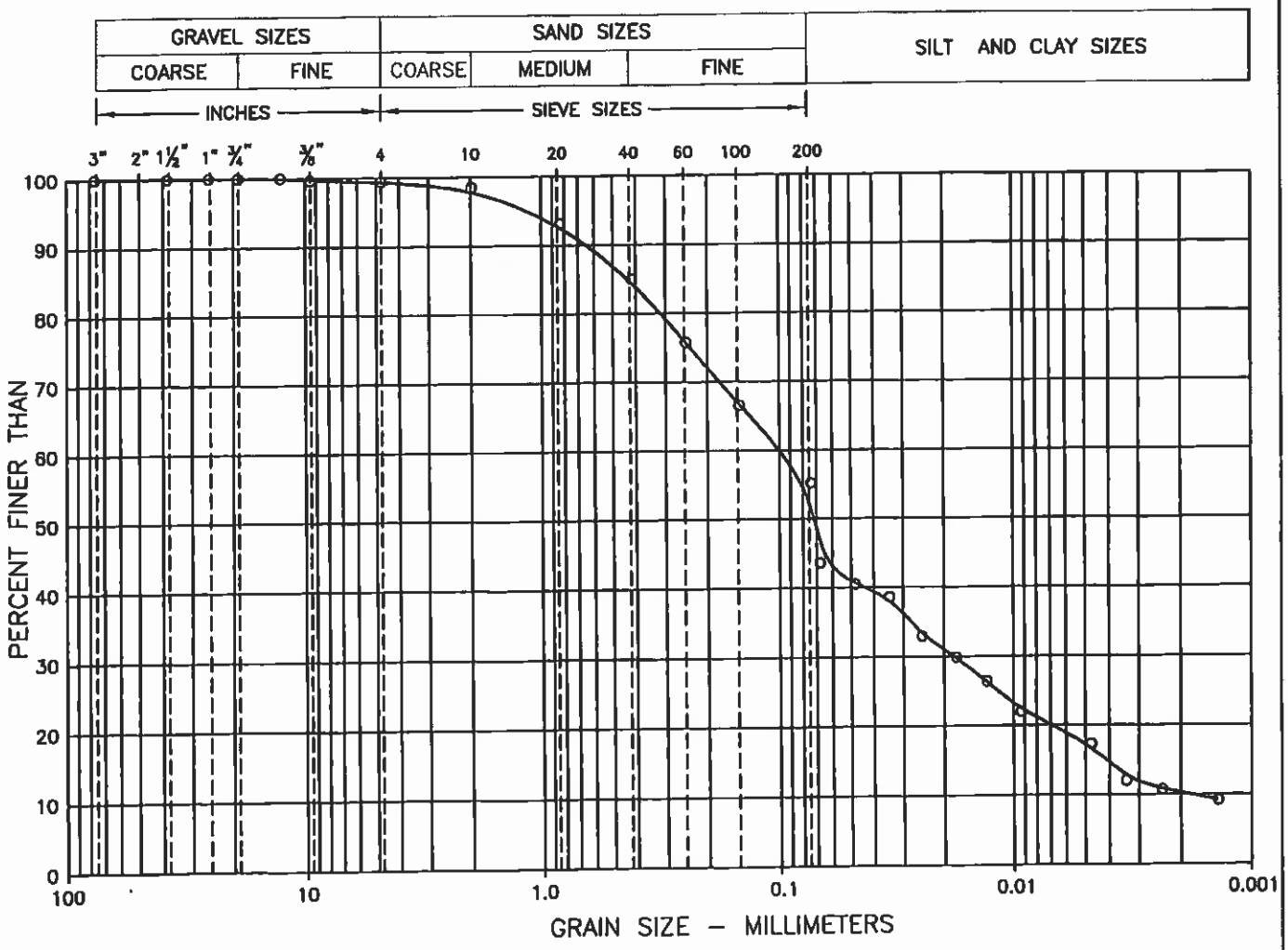
Sample No.: 26

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
1	44	45	10



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-22

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 2, 2009

Test Hole No.: 09-6

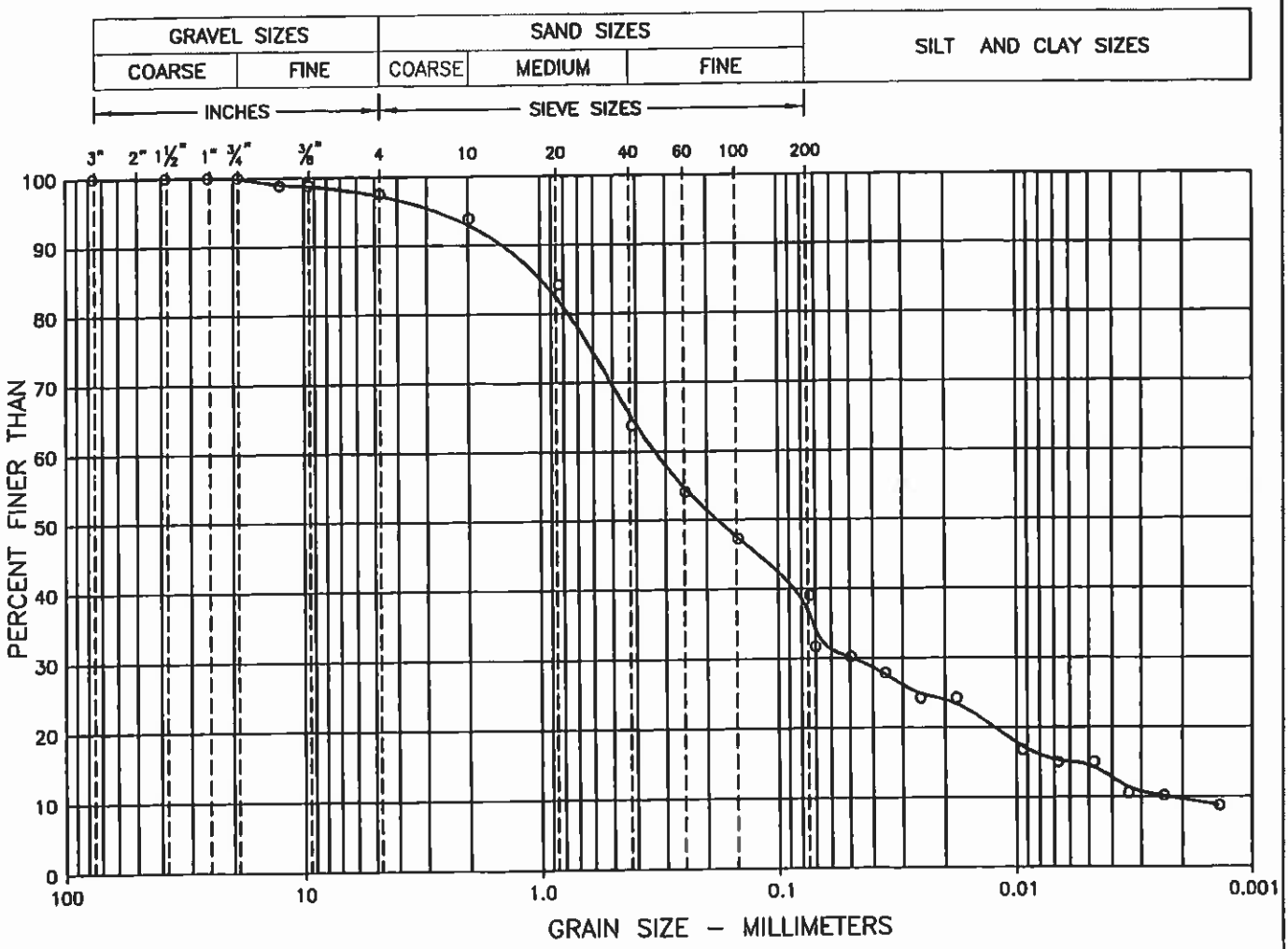
Sample No.: 32

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
3	58	29	10



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-23

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 16, 2009

Test Hole No.: 09-7

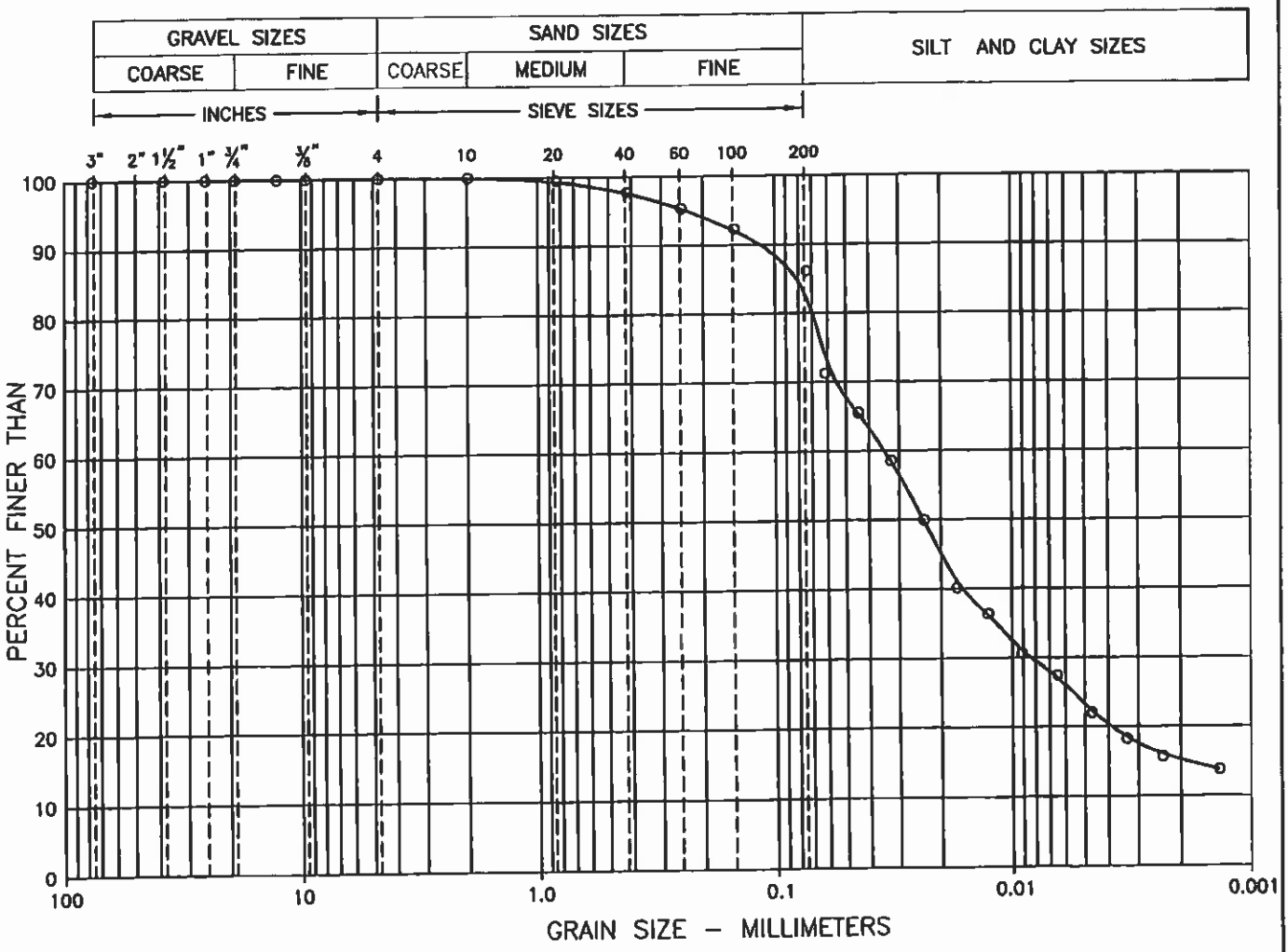
Sample No.: 38

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
0	14	71	15



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-24

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 2, 2009

Test Hole No.: 09-8

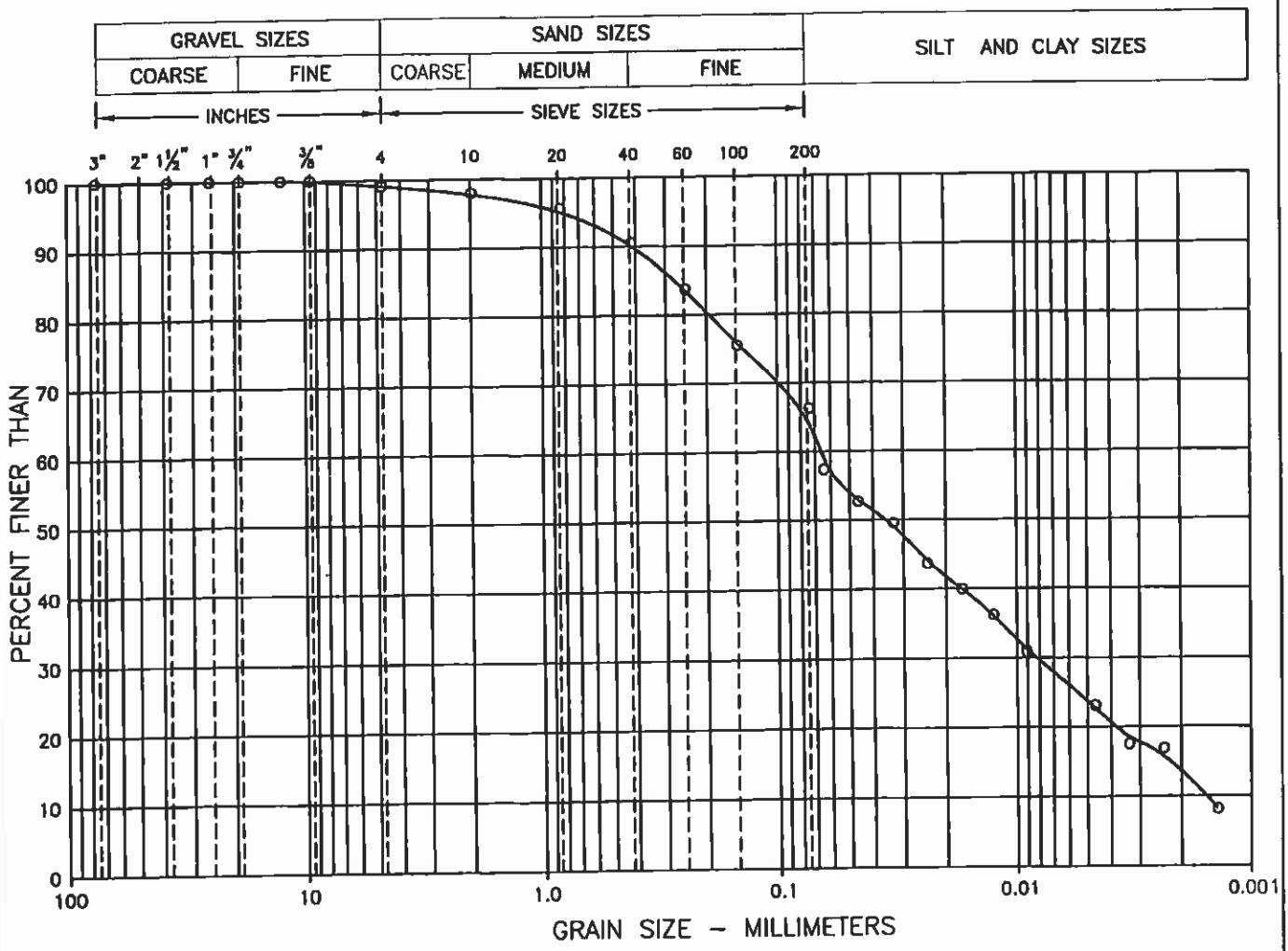
Sample No.: 44

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
0	33	53	14



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-25

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 2, 2009

Test Hole No.: 09-9

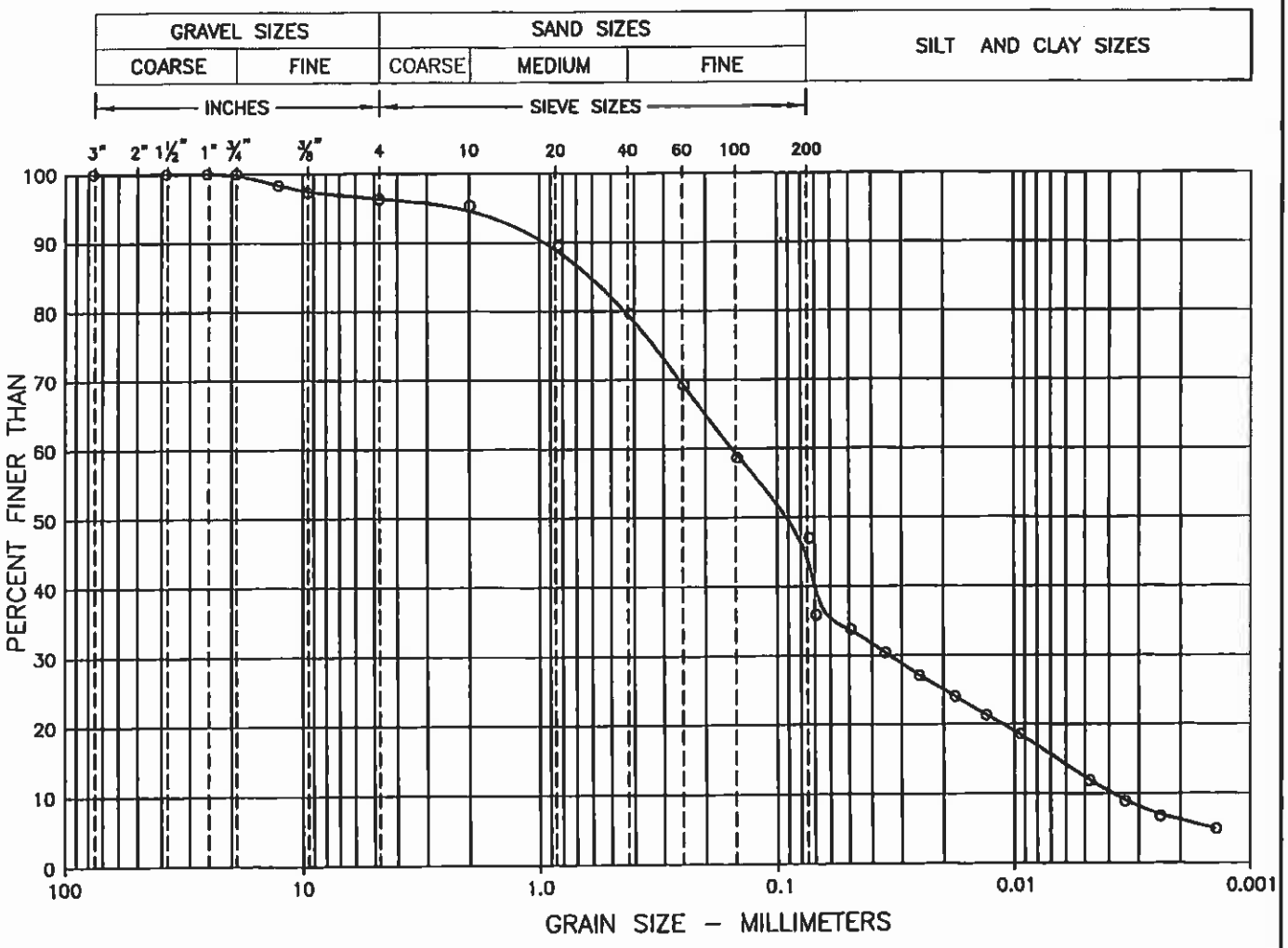
Sample No.: 50

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
4	49	41	6



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-26

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 6, 2009

Test Hole No.: 09-10

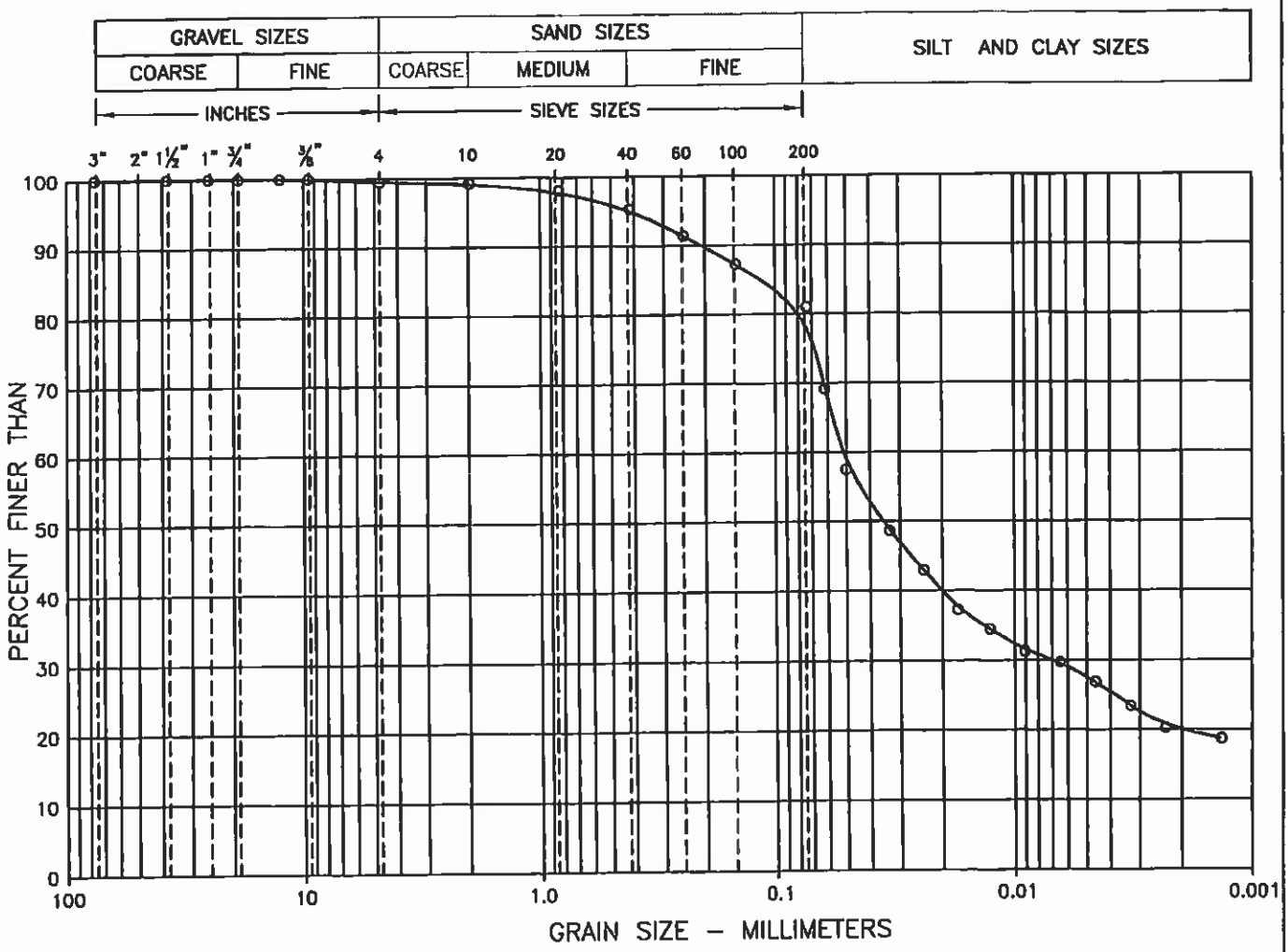
Sample No.: 56

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
1	18	61	20



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-27

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 6, 2009

Test Hole No.: 09-11

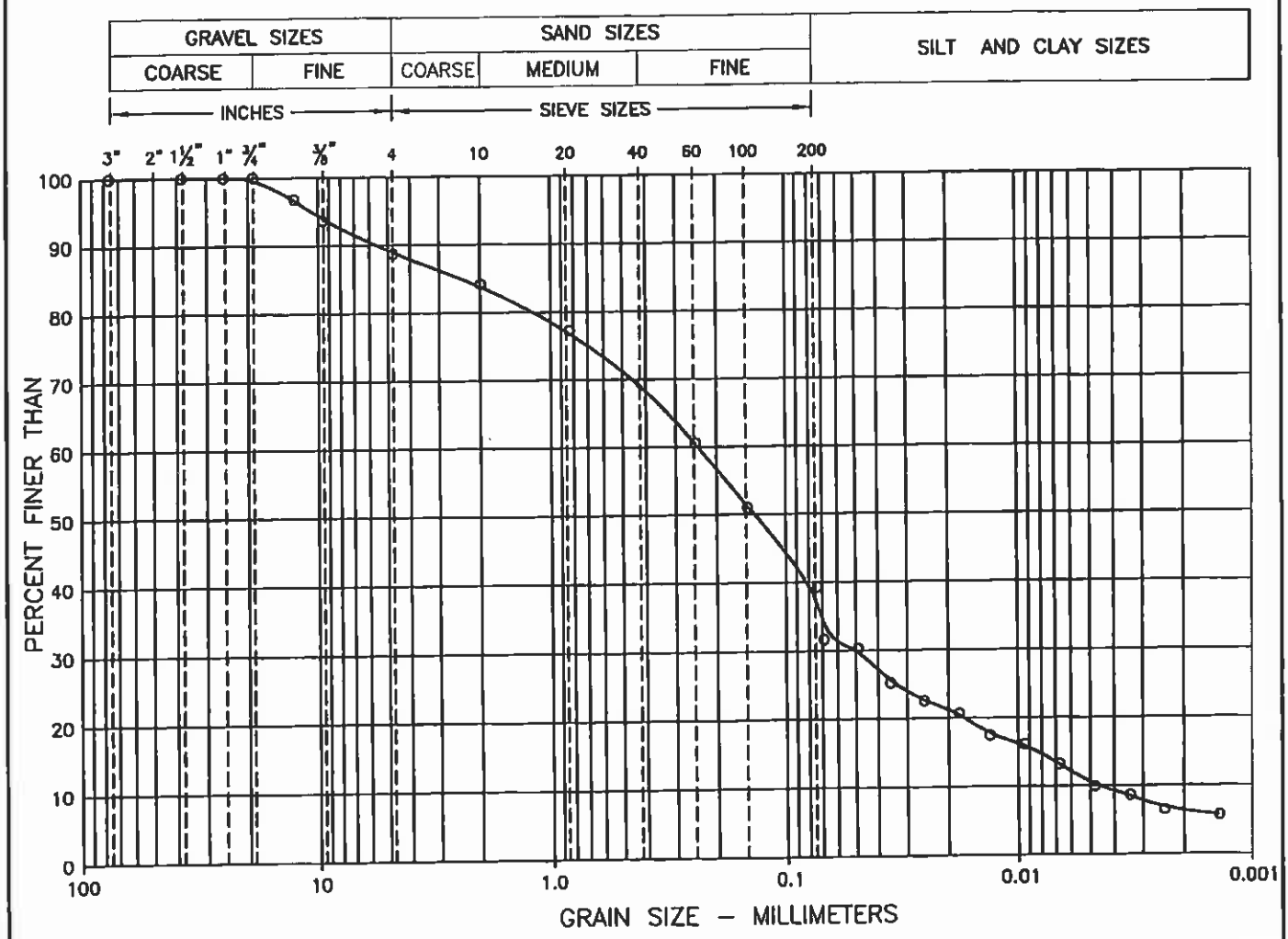
Sample No.: 62

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
11	50	33	6



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-28

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 6, 2009

Test Hole No.: 09-12

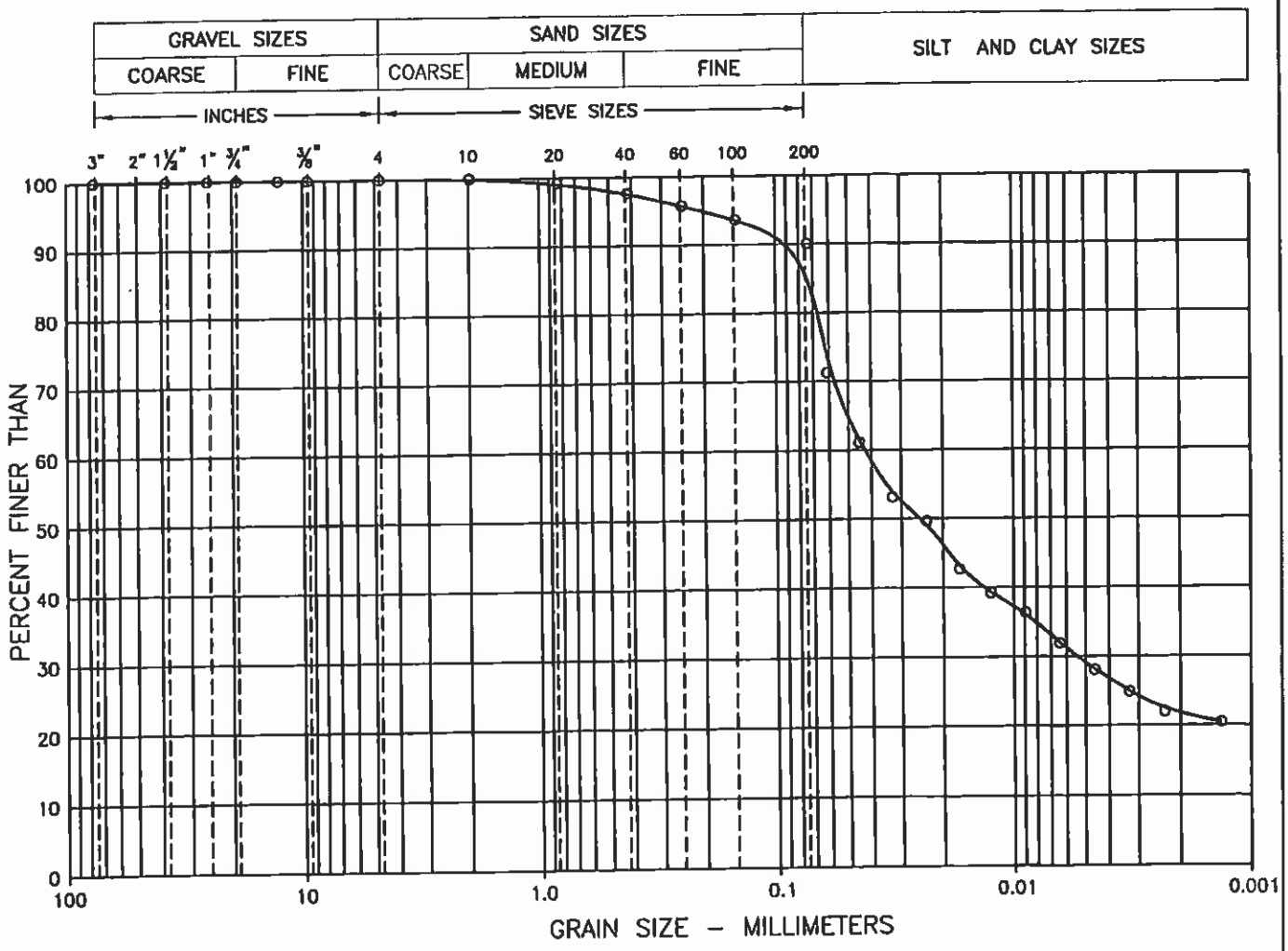
Sample No.: 68

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
0	10	69	21



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-29

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 6, 2009

Test Hole No.: 09-13

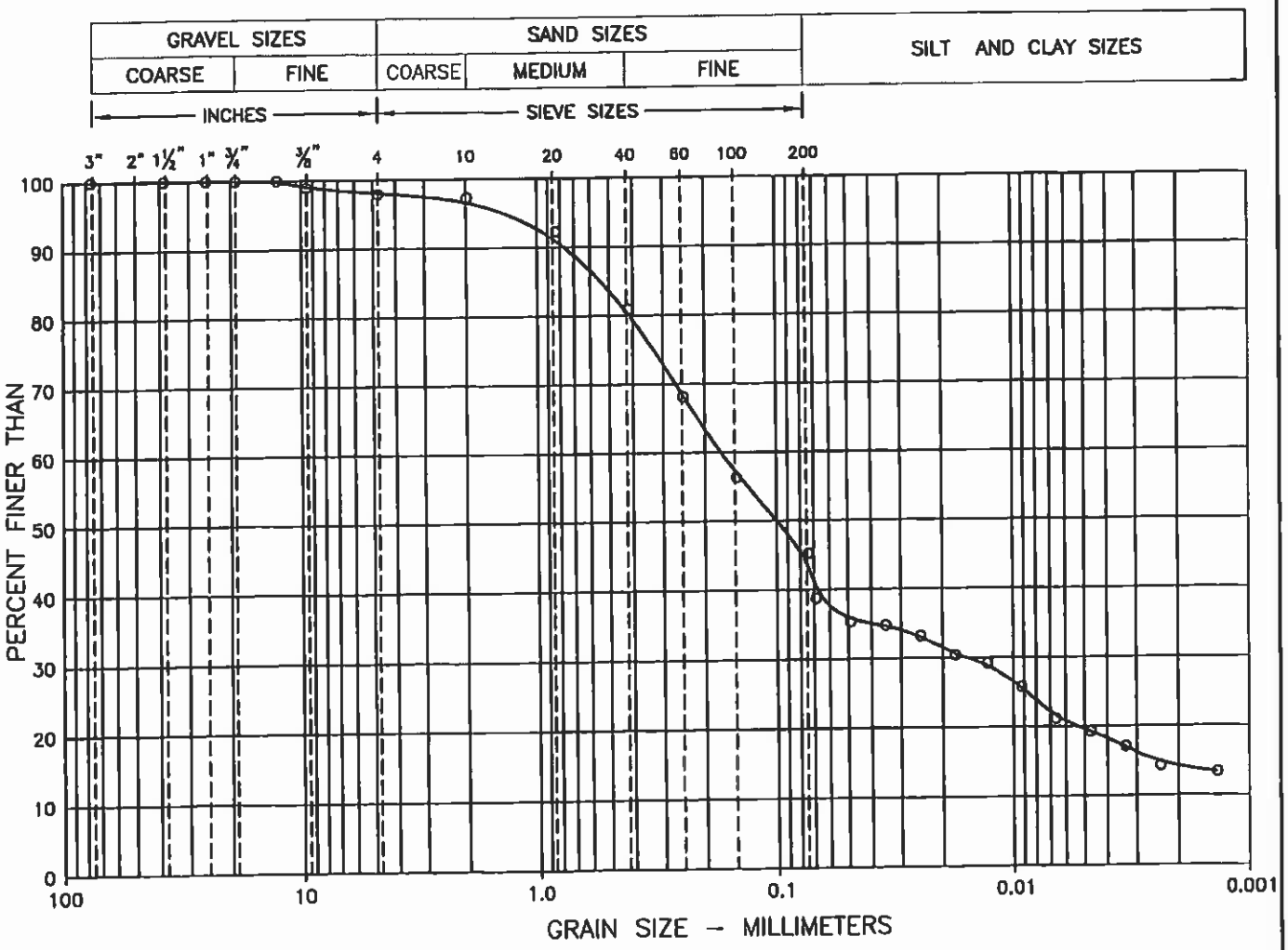
Sample No.: 74

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
2	53	31	14



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-30

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 6, 2009

Test Hole No.: 09-14

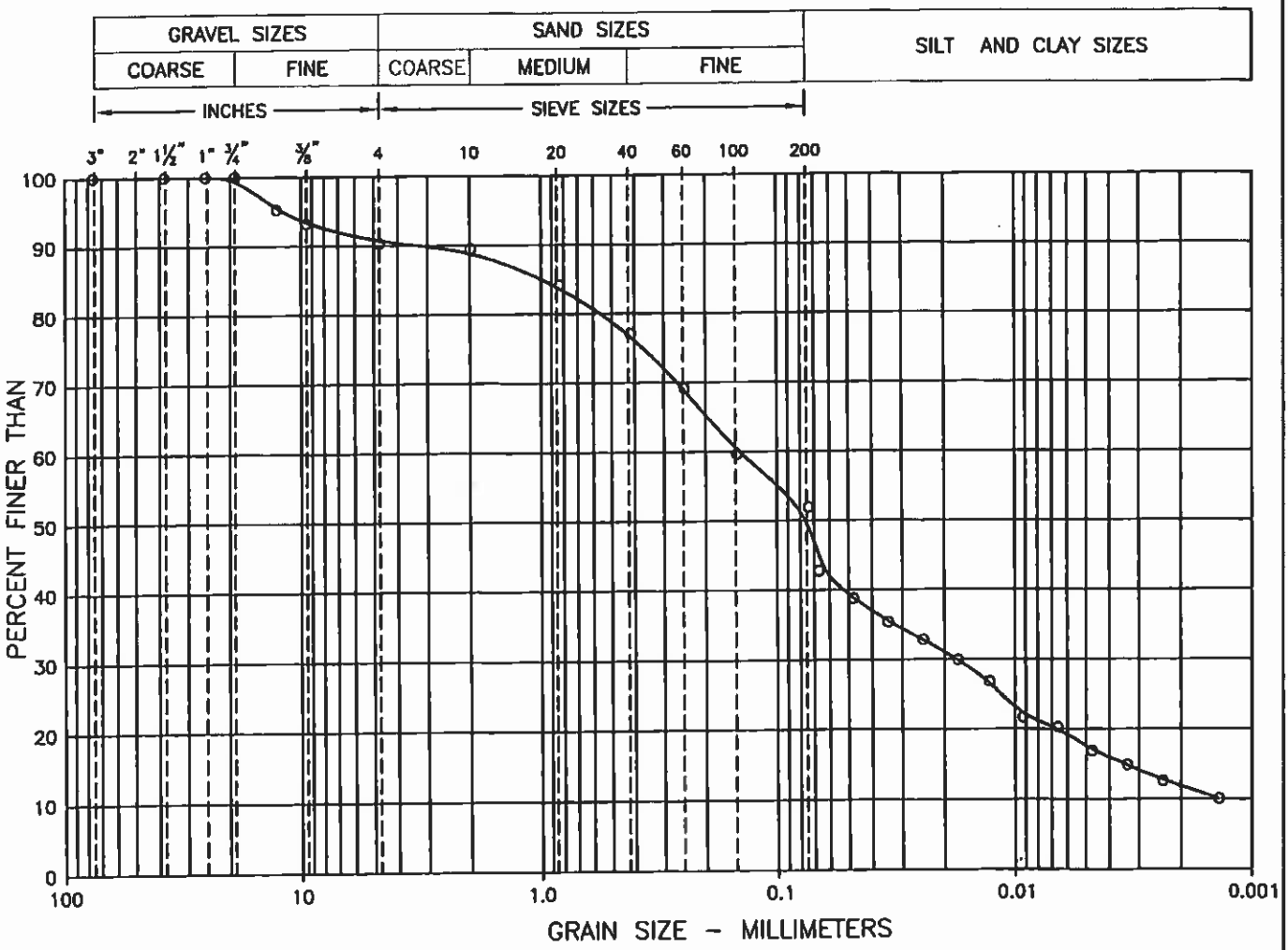
Sample No.: 80

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
10	38	40	12



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-31

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE-36-36-4-W3M, NEAR SASKATOON, SK

Project No.: S09-7106

Date Tested: NOVEMBER 6, 2009

Test Hole No.: 09-15

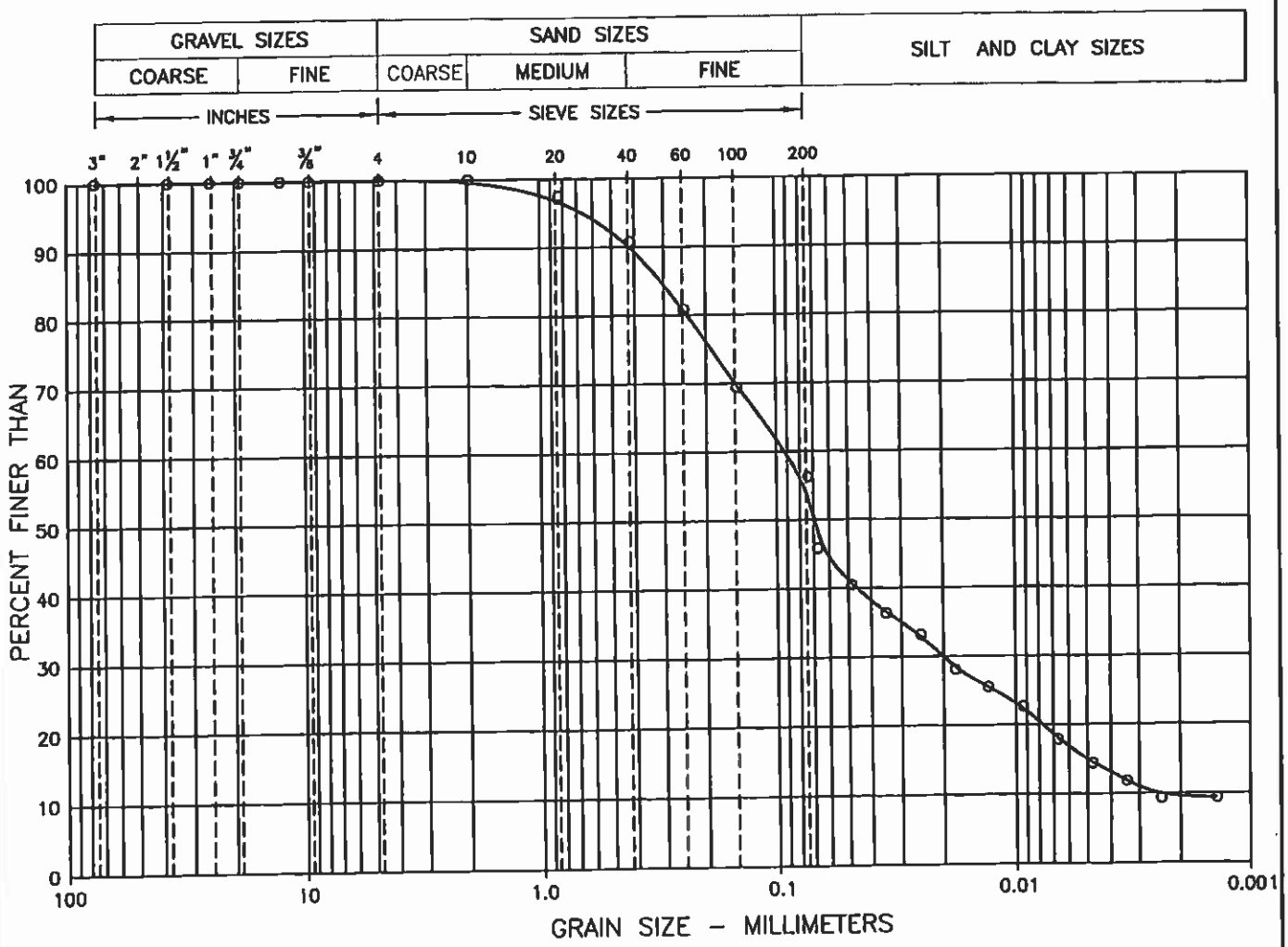
Sample No.: 86

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
0	44	47	9



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-32

GRAIN SIZE DISTRIBUTION TEST REPORT

Project: PROPOSED RESIDENTIAL SUBDIVISION
NE–36–36–4–W3M, NEAR SASKATOON, SK

Project No.: S09–7106

Date Tested: NOVEMBER 6, 2009

Test Hole No.: 09–16

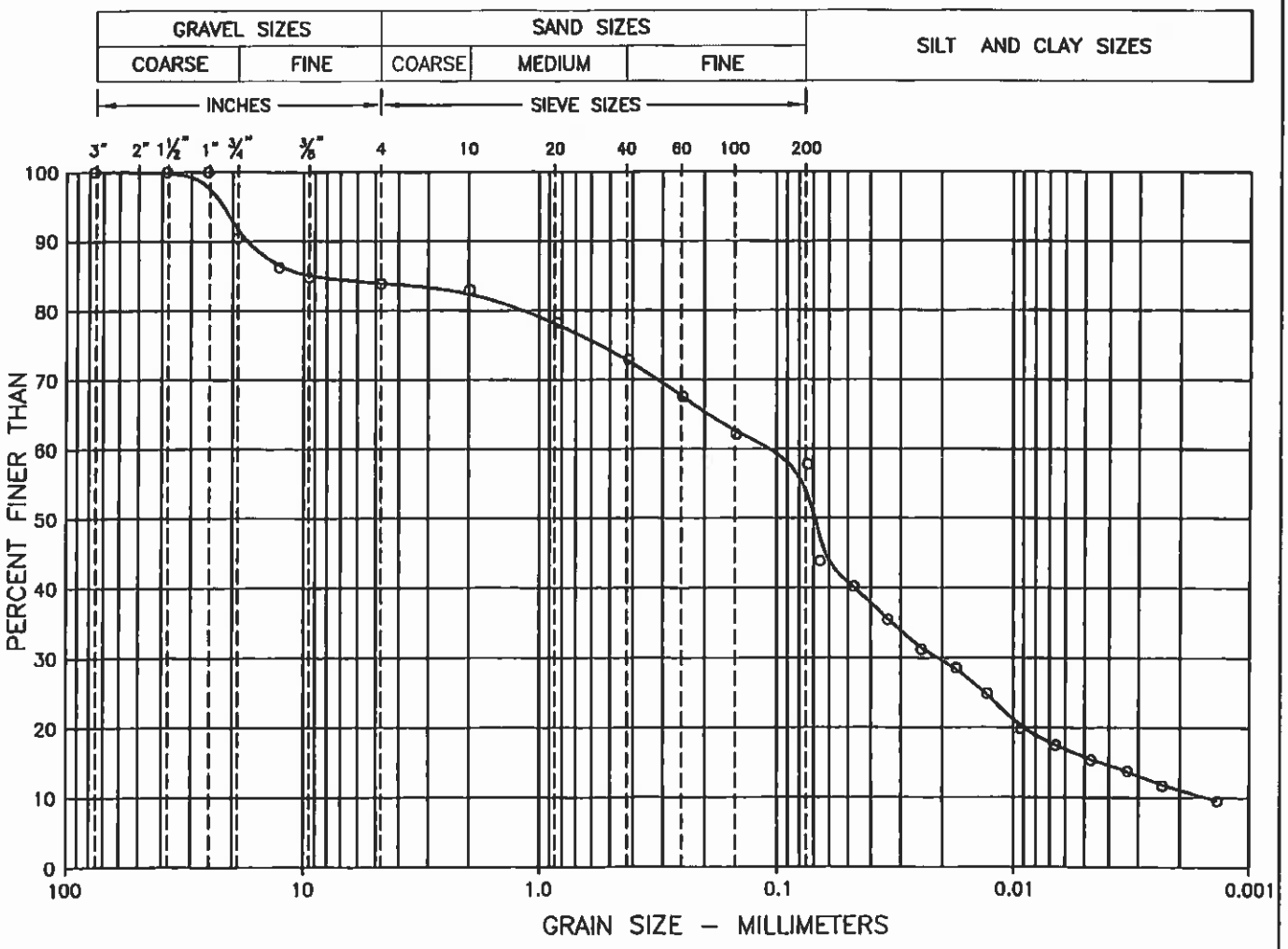
Sample No.: 92

Depth (m): 1.0

Remarks:

Material Description

% Gravel Sizes	% Sand Sizes	% Silt Sizes	% Clay Sizes
16	26	47	11



P. MACHIBRODA ENGINEERING LTD.

DRAWING NO.

S09-7106-33

APPENDIX A

EXPLANATION OF TERMS ON TEST HOLE LOGS

CLASSIFICATION OF SOILS

Coarse-Grained Soils: Soils containing particles that are visible to the naked eye. They include gravels and sands and are generally referred to as cohesionless or non-cohesive soils. Coarse-grained soils are soils having more than 50 percent of the dry weight larger than particle size 0.080 mm.

Fine-Grained Soils: Soils containing particles that are not visible to the naked eye. They include silts and clays. Fine-grained soils are soils having more than 50 percent of the dry weight smaller than particle size 0.080 mm.

Organic Soils: Soils containing a high natural organic content.

Soil Classification By Particle Size

Clay – particles of size	< 0.002 mm
Silt – particles of size	0.002 – 0.060 mm
Sand – particles of size	0.06 – 2.0 mm
Gravel – particles of size	2.0 – 60 mm
Cobbles – particles of size	60 – 200 mm
Boulders – particles of size	>200 mm

TERMS DESCRIBING CONSISTENCY OR CONDITION

Coarse-grained soils: Described in terms of compactness condition and are often interpreted from the results of a Standard Penetration Test (SPT). The standard penetration test is described as the number of blows, N, required to drive a 51 mm outside diameter (O.D.) split barrel sampler into the soil a distance of 0.3 m (from 0.15 m to 0.45 m) with a 63.5 kg weight having a free fall of 0.76 m.

Compactness Condition	SPT N-Index (blows per 0.3 m)
Very loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very dense	Over 50

Fine-Grained Soils: Classified in relation to undrained shear strength.

Consistency	Undrained Shear Strength (kPa)	N Value (Approximate)	Field Identification
Very Soft	<12	0-2	Easily penetrated several centimetres by the fist.
Soft	12-25	2-4	Easily penetrated several centimetres by the thumb.
Firm	25-50	4-8	Can be penetrated several centimetres by the thumb with moderate effort.
Stiff	50-100	8-15	Readily indented by the thumb, but penetrated only with great effort.
Very Stiff	100-200	15-30	Readily indented by the thumb nail.
Hard	>200	>30	Indented with difficulty by the thumbnail.

Organic Soils: Readily identified by colour, odour, spongy feel and frequently by fibrous texture.

DESCRIPTIVE TERMS COMMONLY USED TO CHARACTERIZE SOILS

Poorly Graded	- predominance of particles of one grain size.
Well Graded	- having no excess of particles in any size range with no intermediate sizes lacking.
Mottled	- marked with different coloured spots.
Nuggety	- structure consisting of small prismatic cubes.
Laminated	- structure consisting of thin layers of varying colour and texture.
Slickensided	- having inclined planes of weakness that are slick and glossy in appearance.
Fissured	- containing shrinkage cracks.
Fractured	- broken by randomly oriented interconnecting cracks in all 3 dimensions.

APPENDIX B

SASKATCHEWAN WATERSHED AUTHORITY
WATER WELL RECORDS

WWDR # 092434

Client # 892434

Completion	10/11/1988
EM	373
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002190 EARTH DRILLING CO LTD
Water Use	Domestic
Hole #	000
Installation Method	Bored
Depth	60 ft
Water Level	27 ft
Bit	42.0 inches
Struck	40 ft
Flowing Head	ft
Completion Method	Perforated Casing

Well Use Withdrawal

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	62	60	30.0	Galvanized Iron

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	25	60	30.0	375	Steel Casing

Pump Test

Draw Down	33.0 ft
Duration	2 hrs
Pumping Rate	5.0 igpm
Temp	deg. F
Elevation	1875 ft

Recommended

Rec Pumping Rate	2.0 igpm
Intake	57 ft
Aquifer	
E-Log	No
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
16	Till	Yellow	Unknown
40	Till	Grey	Unknown
41	Sand	Yellow	Water
57	Till	Grey	Unknown
58	Sand	Grey	Water
60	Till	Grey	Unknown

WWDR # 096259

Client # 896259

Completion	10/08/1989
RM	373
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

500 ft from N/S Boundary N N/S Boundary

800 ft from E/W Boundary E E/W Boundary

Well Information

Driller #	002199
Water Use	Domestic
Hole #	000
Installation Method	Drilled
Depth	80 ft
Water Level	18 ft
Bit	4.8 inches
Struck	40 ft
Flowing Head	ft
Completion Method	Well Screen And Gravel Pack

MITCHELL DRILLING (1979) LTD

Well Use Withdrawal

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	60	58	5.0	P.V.C.

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	5	63	4.0	25	Stainless Steel

Pump Test

Draw Down	21.0 ft
Duration	2 hrs
Pumping Rate	10.0 igpm
Temp	41 deg. F
Elevation	1875 ft

Recommended Rec Pumping Rate 8.0 igpm

Intake 55 ft

Aquifer

E-Log SCANNED

Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
3	Silt	Brown	Unknown
21	Till	Brown	Unknown
43	Gravel	Unknown	Coarse
48	Clay	Blue	Unknown
52	Sand	Unknown	Medium-coarse
80	Till	Grey	Silty

WWDR # 102240

Client # 309781

Completion	20/10/1992
RM	373
MB	06
SB	30
NTSMAP	73B01

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002115
Water Use	Domestic
Hole #	000
Installation Method	Bored
Depth	66 ft
Water Level	40 ft
Bit	42.0 inches
Struck	40 ft
Flowing Head	ft
Completion Method	Perforated Casing

WELLEN BORING LTD
Well Use Withdrawal

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	68	66	30.0	Fiberglass

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	25	65	30.0	70	Fiberglass

Pump Test		Recommended	
Draw Down	ft	Rec Pumping Rate	igpm
Duration	hrs	Intake	ft
Pumping Rate	igpm	Aquifer	
Temp	deg. F	E-Log	No
Elevation	1875 ft	Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
28	Till	Brown	Unknown
40	Till	Grey	Unknown
58	Sand	Grey	Clay Streaks
62	Gravel	Grey	Coarse
66	Till	Grey	Clayey

WWDR # 102931

Client # 900349

Completion	05/05/1993
RM	373
MB	06
SB	30
NTSMAP	73B01

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002115 NELLEN BORING LTD
Water Use	Domestic
Hole #	000
Installation Method	Bored
Depth	65 ft
Water Level	30 ft
Bit	44.0 inches
Struck	48 ft
Flowing Head	ft
Completion Method	Perforated Casing

Well Use Withdrawal

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	67	65	30.0	Fiberglass

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	25	65	30.0	70	Fiberglass

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	7.0 igpm
Temp	deg. F
Elevation	1875 ft

Recommended

Rec Pumping Rate	5.0 igpm
Intake	62 ft
Aquifer	
E-Log	Unknown
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
26	Till	Brown	Unknown
48	Till	Grey	Unknown
60	Sand & Gravel	Unknown	Unknown
65	Till	Grey	Unknown

WNDR # 103316

Client # 900668

Completion	02/10/1993
RM	373
MB	06
SB	30
NTSMAP	73B01

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002115 WELLEN BORING LTD
Water Use	Domestic
Hole #	000
Installation Method	Bored
Depth	85 ft
Water Level	50 ft
Bit	42.0 inches
Struck	73 ft
Flowing Head	ft
Completion Method	Perforated Casing

Well Use Withdrawal

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	87	85	30.0	Fiberglass

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	25	85	30.0	70	Fiberglass

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	igpm
Temp	deg. F
Elevation	1875 ft

Recommended

Rec Pumping Rate	0.3 igpm
Intake	ft
Aquifer	
E-Log	No
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
25	Till	Brown	Unknown
73	Till	Grey	Unknown
75	Sand	Unknown	Unknown
78	Till	Grey	Sandy
80	Gravel	Unknown	Cobblestones
85	Till	Grey	Boulders

WWDR # 104799

Client # 901703

Completion	21/10/1994
RM	373
MB	06
SB	30
NTSMAP	73B01

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002115	WELLEN BORING LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #	000		
Installation Method	Bored		
Depth	45 ft		
Water Level	30 ft		
Bit	42.0 inches		
Struck	35 ft		
Flowing Head	ft		
Completion Method	Perforated Casing		

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	47	45	30.0	Fiberglass

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	20	45	30.0	70	Fiberglass

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	5.0 igpm
Temp	deg. F
Elevation	1875 ft

Recommended

Rec Pumping Rate	igpm
Intake	ft
Aquifer	
E-Log	Unknown
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
18	Till	Brown	Stoney
30	Till	Grey	Stoney
35	Till	Brown	Unknown
42	Till	Grey	Sand Streaks
45	Gravel & Rocks	Grey	Unknown

WWDR # 104800

Client # 901704

Completion	21/10/1994
RM	373
MB	D6
SB	30
NTSMAP	73B01

Well Location

L&D	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002115	WELLEN BORING LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #	000		
Installation Method	Bored		
Depth	65 ft		
Water Level	ft		
Bit	42.0 inches		
Struck	56 ft		
Flowing Head	ft		
Completion Method	Perforated Casing		

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	67	65	30.0	Fiberglass

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	30	63	30.0	70	Fiberglass

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	1.0 igpm
Temp	deg. F
Elevation	1875 ft

Recommended

Rec Pumping Rate	igpm
Intake	ft
Aquifer	
E-Log	Unknown
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
22	Till	Brown	Stoney
56	Till	Grey	Clayey
62	Till	Grey	Sand Streaks
65	Till	Grey	Stoney

WWDR # 107046

Client # 904088

Completion	08/10/1996
RM	373
MB	06
SB	30
NTSMAP	73B01

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002115	WELLEN BORING LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #	001		
Installation Method	Bored		
Depth	66 ft		
Water Level	35 ft		
Bit	42.0 inches		
Struck	47 ft		
Flowing Head	ft		
Completion Method	Perforated Casing		

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	68	66	30.0	Fiberglass

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	20	63	30.0	70	Fiberglass

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	12.0 igpm
Temp	deg. F
Elevation	1870 ft

Recommended

Rec Pumping Rate	igpm
Intake	ft
Aquifer	Glac
E-Log	Unknown
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
23	Till	Brown	Unknown
47	Till	Grey	Unknown
60	Gravel	Grey	Fine
66	Gravel	Grey	Clayey

WWDR # 031798

Client # 831798

Completion / /
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	36	36	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 002122 ELK POINT DRILLING CORP
Water Use Research
Hole # 001
Installation Method Drilled
Depth 424 ft
Water Level ft
Bit inches
Struck ft
Flowing Head ft
Completion Method

Well Use Water Test Hole

Well Casings	Length (ft)	Btm (ft)	Dia (in)	Description

Screens	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test
Draw Down ft
Duration hrs
Pumping Rate igpm
Temp deg. F
Elevation 1870 ft

Recommended
Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log SCANNED
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
34	Till	Unknown	Oxidized
49	Till	Unknown	Unoxidized
65	Till	Unknown	Sand-gravel Streaks
83	Till	Unknown	Unoxidized
119	Till	Unknown	Sand-gravel Streaks
149	Till	Unknown	Unoxidized
155	Silt	Unknown	Unoxidized
228	Till	Unknown	Oxidized
260	Till	Unknown	Unoxidized
272	Sand	Unknown	Unknown
303	Till	Unknown	Sand-gravel Streaks
313	Till	Unknown	Oxidized
395	Till	Unknown	Unoxidized
400	Gravel & Rocks	Unknown	Unknown
424	Clay	Unknown	Noncalcareous

WWDR # 031799

Client # 831799

Completion	24/11/1967
RM	
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	36	36	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002122	ELK POINT DRILLING CORP	
Water Use	Domestic	Well Use	Water Test Hole
Hole #	002		
Installation Method	Drilled		
Depth	295 ft		
Water Level	ft		
Bit	inches		
Struck	ft		
Flowing Head	ft		
Completion Method			

Well Casings: Length (ft) | Btm (ft) | Dia (in) | Description

Screens: Length (ft) | Btm (ft) | Dia (in) | Slot (in) | Description

Pump Test		Recommended	
Draw Down	ft	Rec Pumping Rate	igpm
Duration	hrs	Intake	ft
Pumping Rate	igpm	Aquifer	
Temp	deg. F	E-Log	No
Elevation	1870 ft	Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
25	Till	Unknown	Oxidized
48	Till	Unknown	Sandy.
53	Gravel	Unknown	Coarse
241	Till	Grey	Unknown
245	Sand	Unknown	Dirty
295	Sand	Unknown	Fine-medium

WWDR # 031800

Client # 831799

Completion 17/07/1968
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	36	36	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
600 ft from N/S Boundary N N/S Boundary
150 ft from E/W Boundary E E/W Boundary

Well Information

Driller # 002185 PEDERSON DRILLING
Water Use Domestic
Role #
Installation Method Drilled
Depth 80 ft
Water Level ft
Bit 4.5 inches
Struck ft
Flowing Head ft
Completion Method

Well Use Water Test Hole

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test
Draw Down ft
Duration hrs
Pumping Rate igpm
Temp deg. F
Elevation 1870 ft

Recommended
Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
33	Unknown	Unknown	Unknown
55	Clay	Black	Soft
58	Gravel	Unknown	Medium-coarse
66	Clay	Black	Hard
80	Clay	Brown	Hard

WWDR # 049746

Client # 849746

Completion	10/06/1977
RM	
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NW1/4	36	36	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	043232	WIG'S SANDPOINT DRILLING	
Water Use	Domestic	Well Use	Withdrawal
Hole #	001		
Installation Method	Bored		
Depth	46 ft		
Water Level	ft		
Bit	30.0 inches		
Struck	10 ft		
Flowing Head	ft		
Completion Method	Curbed		

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description
46		30.0	Steel Curbing

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	4.0 igpm
Temp	deg. F
Elevation	1750 ft

Recommended

Rec Pumping Rate	4.0 igpm
Intake	ft
Aquifer	
E-Log	No
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
2	Topsoil	Unknown	Unknown
10	Clay	Unknown	Unknown
13	Unknown	Unknown	Water
46	Clay	Unknown	Unknown

WWDR # 076636

Client # 876636

Completion 26/04/1982
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NW1/4	36	36	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 043114 MITCHELL DRILLING (1979) LTD
Water Use Domestic
Hole #
Installation Method Drilled
Depth 230 ft
Water Level 145 ft
Bit inches
Struck ft
Flowing Head ft
Completion Method Well Screen

Well Use Withdrawal

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings		215	5.0	Plastic

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	10	225	4.0	15	Stainless Steel

Pump Test
Draw Down 30.0 ft
Duration 8 hrs
Pumping Rate 10.0 igpm
Temp deg. F
Elevation 1800 ft

Recommended
Rec Pumping Rate 8.0 igpm
Intake 210 ft
Aquifer
E-Log SCANNED
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
22	Clay	Brown	Unknown
35	Sand	Unknown	Boulders
78	Till	Grey	Unknown
82	Sand	Unknown	Fine
210	Till	Grey	Unknown
226	Sand	Unknown	Fine
230	Till	Grey	Unknown

WWDR # 089341

Client # 089341

Completion	19/07/1988
RM	
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SE1/4	36	36	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002117	PRAIRIE WATER LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #	1		
Installation Method	Bored		
Depth	60 ft		
Water Level	ft		
Bit	36.0 inches		
Struck	41 ft		
Flowing Head	ft		
Completion Method	Curbed		

Well Casings	Length (ft)	Btm (ft)	Dia (in)	Description
	62	60	36.0	Porous Concrete

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test		Recommended	
Draw Down	ft	Rec Pumping Rate	igpm
Duration	hrs	Intake	ft
Pumping Rate	1.0 igpm	Aquifer	
Temp	deg. F	E-Log	No
Elevation	1850 ft	Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
25	Clay	Brown	Unknown
30	Gravel	Unknown	Unknown
41	Clay	Grey	Unknown
46	Clay	Grey	Sand Streaks
60	Clay	Grey	Unknown

WWDR # 069678

Client # 869678

Completion 10/11/1981
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	25	36	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 002117 PRAIRIE WATER LTD
Water Use Domestic
Well Use Withdrawal
Hole #
Installation Method Bored
Depth 58 ft
Water Level ft
Bit 36.0 inches
Struck 52 ft
Flowing Head ft
Completion Method Curbed

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	60	58	36.0	Porous Concrete

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens					

Pump Test

Draw Down ft
Duration hrs
Pumping Rate igpm
Temp deg. F
Elevation 1800 ft

Recommended

Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
36	Clay	Brown	Unknown
52	Clay	Grey	Unknown
57	Sand & Gravel	Grey	Unknown
58	Clay	Grey	Unknown

WWDR # 063950

Client # 863950

Completion	28/10/1980
RM	
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	01	37	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

700 ft from N/S Boundary S N/S Boundary

1200 ft from E/W Boundary E E/W Boundary

Well Information

Driller #	002163	CENTRAL CAISSONS LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #	001		
Installation Method	Augered		
Depth	46 ft		
Water Level	ft		
Bit	38.0 inches		
Struck	34 ft		
Flowing Head	ft		
Completion Method	Curbed		

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	47	45	30.0	Galvanized Iron

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens					

Pump Test		Recommended	
Draw Down	ft	Rec Pumping Rate	igpm
Duration	hrs	Intake	ft
Pumping Rate	igpm	Aquifer	
Temp	deg. F	E-Log	No
Elevation	1850 ft	Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
12	Silt	Yellow	Sandy
20	Clay	Yellow	Sandy
33	Clay	Grey	Unknown
42	Sand & Gravel	Unknown	Wet
46	Clay	Blue	Hard

WWDR # 009520

Client # 809520

Completion	25/04/1973
RM	
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SE1/4	01	37	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

400 ft from N/S Boundary S N/S Boundary

850 ft from E/W Boundary E E/W Boundary

Well Information

Driller #	002245	HAYTER DRILLING LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #	002		
Installation Method	Drilled		
Depth	74 ft		
Water Level	43 ft		
Bit	4.0 inches		
Struck	38 ft		
Flowing Head	ft		
Completion Method	Well Screen		

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings		67	4.0	Steel

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	5	72	4.0	12	Unknown

Pump Test

Draw Down	ft
Duration	3 hrs
Pumping Rate	12.0 igpm
Temp	deg. F
Elevation	1875 ft

Recommended

Rec Pumping Rate	10.0 igpm
Intake	67 ft
Aquifer	Glac
E-Log	Unknown
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
28	Till	Brown	Unknown
30	Till	Grey	Unknown
33	Sand & Gravel	Unknown	Unknown
38	Till	Grey	Unknown
74	Sand & Gravel	Unknown	Unknown

WWDR # 009521

Client # 809521

Completion 25/04/1973
RM
MB 06
BB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SE1/4	01	37	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
400 ft from N/S Boundary S N/S Boundary
600 ft from E/W Boundary E E/W Boundary

Well Information

Driller # 002245 HAYTER DRILLING LTD
Water Use Domestic Well Use Withdrawal
Hole #
Installation Method Drilled
Depth 328 ft
Water Level 102 ft
Bit 4.0 inches
Struck 269 ft
Flowing Head ft
Completion Method Well Screen

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings		277	4.0	Steel

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	10	287	4.0	10	Stainless Steel

Pump Test
Draw Down ft
Duration hrs
Pumping Rate igpm
Temp deg. F
Elevation 1875 ft

Recommended
Rec Pumping Rate igpm
Intake ft
Aquifer Glac
E-Log SCANNED
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
15	Till	Yellow	Sandy
25	Silt	Grey	Unknown
86	Sand & Gravel	Unknown	Unknown
100	Till	Brown	Sandy
110	Clay	Brown	Unknown
124	Till	Grey	Unknown
152	Till	Brown	Unknown
159	Clay	Grey	Unknown
185	Clay	Grey	Unknown
197	Gravel	Unknown	Coarse
210	Till	Brown	Sandy
251	Till	Grey	Sandy
262	Sand	Unknown	Unknown
269	Till	Unknown	Sandy
302	Till	Unknown	Sandy
310	Till	Grey	Unknown
328	Till	Brown	Unknown

WWDR # 064225

Client # 864225

Completion 25/07/1980
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	01	37	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
150 ft from N/S Boundary S N/S Boundary
500 ft from E/W Boundary W E/W Boundary

Well Information

Driller # 043114 MITCHELL DRILLING (1979) LTD
Water Use Domestic
Hole # 001
Installation Method Drilled
Depth 265 ft
Water Level 94 ft
Bit 6.2 inches
Struck 205 ft
Flowing Head ft
Completion Method Well Screen

Well Use Withdrawal

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	230		4.5	Plastic

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	10	240	4.0	12	Stainless Steel

Pump Test

Draw Down 61.0 ft
Duration 24 hrs
Pumping Rate 15.0 igpm
Temp 41 deg. F
Elevation 1825 ft

Recommended

Rec Pumping Rate 12.0 igpm
Intake 180 ft
Aquifer
E-Log SCANNED
Phys E03

Lithology List

Depth to Base of (ft)	Material	Colour	Description
24	Till	Brown	Stoney
34	Clay	Blue	Unknown
37	Sand	Unknown	Oxidized
85	Till	Grey	Stoney
205	Clay	Grey	Hard
244	Sand	Unknown	Clay Streaks
265	Till	Grey	Unknown

WWDR # 087135

Client # 887135

Completion 24/09/1987
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	01	37	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 002117 PRAIRIE WATER LTD
Water Use Domestic
Well Use Withdrawal
Hole # 1
Installation Method Bored
Depth 42 ft
Water Level ft
Bit 36.0 inches
Struck 23 ft
Flowing Head ft
Completion Method Curbed

Well Casings	Length (ft)	Btm (ft)	Dia (in)	Description
	44	42	36.0	Porous Concrete

Screens	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test

Draw Down ft
Duration hrs
Pumping Rate 2.0 igpm
Temp deg. F
Elevation 1825 ft

Recommended

Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
17	Clay	Brown	Unknown
23	Clay	Grey	Unknown
27	Clay	Grey	Gravel Streaks
29	Gravel	Unknown	Unknown
42	Clay	Grey	Unknown

WWDR # 088787

Client # 888787

Completion 16/06/1988
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	02	37	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 002115 WELLEN BORING LTD
Water Use Domestic
Hole # 1
Installation Method Bored
Depth 57 ft
Water Level 15 ft
Bit 44.0 inches
Struck 20 ft
Flowing Head ft
Completion Method Perforated Casing

Well Use Withdrawal

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	60	57	30.0	Plastic

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens					

Pump Test

Draw Down ft
Duration hrs
Pumping Rate 3.0 igpm
Temp deg. F
Elevation 1800 ft

Recommended
Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
10	Till	Brown	Unknown
20	Till	Brown	Sandy
24	Sand	Brown	Coarse
45	Till	Grey	Sandy
57	Till	Grey	Unknown

WWDR # 031569

Client # 831569

Completion 15/12/1962
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SE1/4	30	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 043180 J & D DRILLING
Water Use Domestic
Well Use Withdrawal
Hole #
Installation Method Drilled
Depth 182 ft
Water Level 90 ft
Bit 4.0 inches
Struck 170 ft
Flowing Head ft
Completion Method Well Screen

Well Casings	Length (ft)	Btm (ft)	Dia (in)	Description
	177		4.0	Steel

Screens	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
	5	182	4.0	25	Unknown

Pump Test

Draw Down 15.0 ft
Duration 8 hrs
Pumping Rate 8.0 igpm
Temp deg. F
Elevation 1775 ft

Recommended

Rec Pumping Rate 8.0 igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
50	Clay	Brown	Unknown
170	Clay	Grey	Unknown
182	Sand & Gravel	Unknown	Unknown

WWDR # 031801

Client # 831801

Completion 01/03/1962
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SE1/4	01	37	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
600 ft from N/S Boundary S N/S Boundary
1200 ft from E/W Boundary W E/W Boundary

Well Information

Driller # 002245 HAYTER DRILLING LTD
Water Use Domestic
Well Use Withdrawal
Hole #
Installation Method Drilled
Depth 116 ft
Water Level 80 ft
Bit 4.0 inches
Struck 86 ft
Flowing Head ft
Completion Method Well Screen

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings		111	4.0	Steel

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	5	116	4.0	30	Unknown

Pump Test

Draw Down 6.0 ft
Duration 24 hrs
Pumping Rate 4.0 igpm
Temp 40 deg. F
Elevation 1875 ft

Recommended

Rec Pumping Rate 4.0 igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
60	Clay	Brown	Unknown
80	Clay	Blue	Unknown
116	Sand & Gravel	Unknown	Unknown

WWDR # 060654

Client # 860654

Completion	11/11/1979
RM	
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	01	37	04	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	043125	TWEIDT WELLBORING SERVICING LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #			
Installation Method	Bored		
Depth	40 ft		
Water Level	8 ft		
Bit	42.0 inches		
Struck	8 ft		
Flowing Head	ft		
Completion Method	Curbed		

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	42	40	30.0	Galvanized Iron

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens					

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	igpm
Temp	deg. F
Elevation	1875 ft

Recommended

Rec Pumping Rate	igpm
Intake	ft
Aquifer	
E-Log	No
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
8	Clay	Yellow	Boulders
22	Sand & Gravel	Unknown	Water
40	Clay	Blue	Boulders

WWDR # Q71260

Client # 871260.

Completion	22/04/1982
RM	
MB	Q6
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SE1/4	30	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	043125	TWEIDT WELLBORING SERVICING LTD	
Water Use	Domestic	Well Use	Water Test Hole
Hole #			
Installation Method	Augered		
Depth	75 ft		
Water Level	ft		
Bit	6.0 inches		
Struck	ft		
Flowing Head	ft		
Completion Method			

Hole: Length (ft) | Btm (ft) | Dia (in) | Description

Well Casings

Length (ft) | Btm (ft) | Dia (in) | Slot (in) | Description

Screens

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	igpm
Temp	deg. F
Elevation	1800 ft

Recommended

Rec Pumping Rate	igpm
Intake	ft
Aquifer	
E-Log	No
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
55	Gravelly Clay	Yellow	Dry
75	Gravelly Clay	Blue	Dry

WWDR # 087325

Client # 087325

Completion	04/12/1987
RM	
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SE1/4	30	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002115	NELLEN BORING LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #	1		
Installation Method	Bored		
Depth	43 ft		
Water Level	22 ft		
Bit	44.0 inches		
Struck	22 ft		
Flowing Head	ft		
Completion Method	Perforated Casing		

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	45	43	30.0	Steel

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens					

Pump Test		Recommended	
Draw Down	ft	Rec Pumping Rate	igpm
Duration	hrs	Intake	ft
Pumping Rate	2.0 igpm	Aquifer	
Temp	deg. F	E-Log	No
Elevation	1800 ft	Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
16	Till	Brown	Unknown
22	Till	Grey	Unknown
27	Sand	Grey	Silty
43	Till	Grey	Unknown

WWDR # 031571

Client # 831570

Completion / /
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	31	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 002185 PEDERSON DRILLING
Water Use Domestic
Hole # 002
Installation Method Drilled
Depth 27 ft
Water Level ft
Bit inches
Struck ft
Flowing Head ft
Completion Method

Well Use Water Test Hole

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test

Draw Down ft
Duration hrs
Pumping Rate igpm
Temp deg. F
Elevation 1850 ft

Recommended
Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Unknown	Unknown	Unknown
25	Silt	Unknown	Fine-medium
27	Clay	Grey	Unknown

WWDR # 031572

Client # 831570

Completion / /
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	31	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 002185 PEDERSON DRILLING
Water Use Domestic
Hole # 003
Installation Method Drilled
Depth 11 ft
Water Level ft
Bit inches
Struck ft
Flowing Head ft
Completion Method

Well Use Water Test Hole

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test
Draw Down ft
Duration hrs
Pumping Rate igpm
Temp deg. F
Elevation 1850 ft

Recommended
Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Clay	Unknown	Soft
8	Gravelly Clay	Unknown	Unknown
10	Boulders	Unknown	Coarse
11	Clay	Grey	Unknown

WWDR # 031570

Client # 031570

Completion / /
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	31	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 002185 PEDERSON DRILLING
Water Use Domestic
Hole # 001
Installation Method Drilled
Depth 98 ft
Water Level ft
Bit inches
Struck ft
Flowing Head ft
Completion Method

Well Use Water Test Hole

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test
Draw Down ft
Duration hrs
Pumping Rate igpm
Temp deg. F
Elevation 1850 ft

Recommended
Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
16	Clay	Brown	Unknown
37	Clay	Grey	Unknown
39	Gravel	Grey	Fine
88	Clay	Grey	Unknown
98	Clay	Brown	Soft

WWDR # 031573

Client # 031573

Completion	25/08/1961
RM	
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	31	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

150 ft from N/S Boundary S N/S Boundary

1500 ft from E/W Boundary W E/W Boundary

Well Information

Driller #	002117	PRAIRIE WATER LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #			
Installation Method	Bored		
Depth	55 ft		
Water Level	47 ft		
Bit	36.0 inches		
Struck	47 ft		
Flowing Head	ft		
Completion Method	Curbed		

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description
	55	36.0	Porous Concrete

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	igpm
Temp	deg. F
Elevation	1850 ft

Recommended

Rec Pumping Rate	igpm
Intake	ft
Aquifer	
E-Log	No
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
7	Gravel	Unknown	Unknown
45	Clay	Brown	Unknown
52	Clay	Unknown	Unknown
55	Sand	Unknown	Coarse

WWDR # 049908

Client # 849908

Completion 17/03/1977
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	31	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 002245 HAYTER DRILLING LTD
Water Use Domestic Well Use Withdrawal
Hole # 001
Installation Method Drilled
Depth 280 ft
Water Level ft
Bit 4.5 inches
Struck 220 ft
Flowing Head ft
Completion Method Well Screen And Gravel Pack

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	252	252	5.5	Plastic

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	10	262	4.0	12	Stainless Steel

Pump Test

Draw Down 65.0 ft
Duration 4 hrs
Pumping Rate 10.0 igpm
Temp deg. F
Elevation 1850 ft

Recommended

Rec Pumping Rate 5.0 igpm
Intake 220 ft
Aquifer
E-Log SCANNED
Phys E03

Lithology List

Depth to Base of (ft)	Material	Colour	Description
3	Till	Brown	Unknown
17	Gravel & Rocks	Unknown	Unknown
97	Till	Grey	Unknown
100	Sand	Unknown	Unknown
106	Clay	Grey	Unknown
117	Till	Brown	Unknown
218	Clay	Grey	Unknown
226	Sand	Unknown	Unknown
235	Till	Grey	Unknown
247	Till	Grey	Sand Streaks
259	Sand	Unknown	Unknown
280	Till	Grey	Unknown

WWDR # 051881

Client # 851881

Completion 12/09/1977
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	31	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 044143 COMPUTER RESOURCES
Water Use Domestic Well Use Water Test Hole
Hole # 001
Installation Method Augered
Depth 62 ft
Water Level ft
Bit inches
Struck ft
Flowing Head ft
Completion Method

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test

Draw Down ft
Duration hrs
Pumping Rate igpm
Temp deg. F
Elevation 1810 ft

Recommended

Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log No
Phys E03

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
20	Clay	Brown	Unknown
62	Clay	Blue	Unknown

WWDR # 080264

Client # 080264

Completion 26/06/1984
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	31	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 043125 TWEIDT WELLBORING SERVICING LTD
Water Use Domestic Well Use Withdrawal
Hole #
Installation Method Bored
Depth 65 ft
Water Level ft
Bit 48.0 inches
Struck 50 ft
Flowing Head ft
Completion Method Curbed

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	67	65	30.0	Steel

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens					

Pump Test
Draw Down ft
Duration hrs
Pumping Rate igpm
Temp deg. F
Elevation 1025 ft

Recommended
Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
45	Till	Yellow	Boulders
65	Clay	Blue	Sand Streaks

WWDR # 066371

Client # 866371

Completion	01/05/1981
RM	
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NW1/4	31	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002117	PRAIRIE WATER LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #	001		
Installation Method	Bored		
Depth	68 ft		
Water Level	ft		
Bit	36.0 inches		
Struck	53 ft		
Flowing Head	ft		
Completion Method	Curbed		

Well Casings	Length (ft)	Btm (ft)	Dia (in)	Description
	70	68	36.0	Porous Concrete

Screens	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	igpm
Temp	deg. F
Elevation	1875 ft

Recommended

Rec Pumping Rate	igpm
Intake	ft
Aquifer	
E-Log	No
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
29	Clay	Brown	Unknown
47	Clay	Grey	Unknown
53	Sandy Clay	Brown	Unknown
66	Sand & Gravel	Unknown	Unknown
68	Clay	Grey	Unknown

WWDR # 116933

Completion	17/09/1997
RM	343
MB	06
SB	30
NTSMAP	73B01

Client # 064642

SASK HIGHWAYS & TRANS - MATERIALS BRANCH
1610 PARK STREET
RE: UNIVERSITY OF SASK (EAGLE)

REGINA SASKATCHEWAN S4N 2G1

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
14	NW1/4	31	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	000000	UNKNOWN	
Water Use	Research	Well Use	Soil Test Hole
Hole #	184		
Installation Method	Drilled		
Depth	158 ft		
Water Level	ft		
Bit	4.8 inches		
Struck	ft		
Flowing Head	ft		
Completion Method			

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test		Recommended	
Draw Down	ft	Rec Pumping Rate	igpm
Duration	hrs	Intake	ft
Pumping Rate	igpm	Aquifer	
Temp	deg. F	E-Log	SCANNED
Elevation	1860 ft	Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
5	Unknown	Brown	Sandy
20	Till	Grey	Sandy
52	Till	Grey	Stoney
55	Sand & Gravel	Grey	Coarse
61	Till	Grey	Sandy
126	Till	Grey	Calcareous
131	Silt	Grey	Clayey
158	Till	Grey	Calcareous

WWDR # 056985

Client # 856972

Completion 01/05/1978
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SE1/4	31	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 002265 INTERNATIONAL WATER SUPPLY LTD
Water Use Domestic Well Use Water Test Hole
Hole # 013
Installation Method Drilled
Depth 80 ft
Water Level ft
Bit inches
Struck ft
Flowing Head ft
Completion Method

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test

Draw Down ft
Duration hrs
Pumping Rate igpm
Temp deg. F
Elevation 1850 ft

Recommended

Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
16	Till	Brown	Boulders
21	Till	Blue	Boulders
22	Gravel	Unknown	Unknown
80	Till	Blue	Unknown

WWDR # 097463

Client # 847554

Completion 27/10/1989
RM
MB 06
SB 30
NTSMAP 73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	31	36	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 002117 PRAIRIE WATER LTD
Water Use Domestic Well Use Withdrawal
Hole # 1
Installation Method Bored
Depth 57 ft
Water Level ft
Bit 36.0 inches
Struck 48 ft
Flowing Head ft
Completion Method Curbed

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	58	57	36.0	Porous Concrete

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens					

Pump Test

Draw Down ft
Duration hrs
Pumping Rate 2.0 igpm
Temp deg. F
Elevation 1850 ft

Recommended

Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
34	Clay	Brown	Unknown
48	Clay	Grey	Unknown
53	Sand	Grey	Unknown
57	Clay	Grey	Unknown

WWDR # 104107

Client # 901258

Completion	22/04/1994
RM	373
MB	06
SB	30
NTSMAP	73B01

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002115	NELLEN BORING LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #			
Installation Method	Bored		
Depth	67 ft		
Water Level	41 ft		
Bit	42.0 inches		
Struck	56 ft		
Flowing Head	ft		
Completion Method	Perforated Casing		

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	69	67		Fiberglass

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	25	65	30.0	70	Fiberglass

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	8.0 igpm
Temp	deg. F
Elevation	1875 ft

Recommended

Rec Pumping Rate	igpm
Intake	ft
Aquifer	
E-Log	Unknown
Phys	E03

Lithology List

Depth to Base of (ft)	Material	Colour	Description
22	Till	Brown	Unknown
45	Till	Grey	Stoney
56	Till	Grey	Sand Streaks
62	Gravel	Grey	Clayey
64	Till	Grey	Sand Streaks
67	Till	Grey	Unknown

WWDR # 104108

Client # 901259

Completion	26/05/1994
RM	373
MB	06
SB	30
NTSMAP	73B01

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002115	WELLEN BORING LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #			
Installation Method	Bored		
Depth	65 ft		
Water Level	32 ft		
Bit	42.0 inches		
Struck	48 ft		
Flowing Head	ft		
Completion Method	Perforated Casing		

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	68	65	30.0	Fiberglass

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	15	62	30.0	70	Fiberglass

Pump Test		Recommended	
Draw Down	ft	Rec Pumping Rate	igpm
Duration	hrs	Intake	ft
Pumping Rate	8.0 igpm	Aquifer	
Temp	deg. F	E-Log	Unknown
Elevation	1875 ft	Phys	E03

Lithology List

Depth to Base of (ft)	Material	Colour	Description
20	Till	Brown	Unknown
48	Till	Grey	Unknown
55	Clay	Grey	Coarse
65	Till	Grey	Sand Streaks

WWDR # 104109

Client # 901260

Completion	25/05/1994
RM	373
MB	06
SB	30
NTSMAP	73B01

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NE1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller # 002115 WELLEN BORING LTD

Water Use Domestic Well Use Withdrawal

Hole #

Installation Method Bored

Depth 62 ft

Water Level 41 ft

Bit 42.0 inches

Struck 41 ft

Flowing Head ft

Completion Method Perforated Casing

Well Casings	Length (ft)	Btm (ft)	Dia (in)	Description
	64	62	30.0	Fiberglass

Screens	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
	18	59	30.0	70	Fiberglass

Pump Test

Draw Down ft

Duration hrs

Pumping Rate 1.0 igpm

Temp deg. F

Elevation 1875 ft

Recommended

Rec Pumping Rate igpm

Intake ft

Aquifer

E-Log Unknown

Phys E03

Lithology List

Depth to Base of (ft)	Material	Colour	Description
22	Till	Brown	Unknown
28	Till	Grey	Sandy
34	Clay	Brown	Sandy
42	Till	Grey	Sand Streaks
44	Clay	Grey	Gravelly
62	Till	Grey	Sandy

WWDR # 100723

Client # 307666

Completion	12/08/1991
RM	373
MB	06
SB	30
NTSMAP	73B01

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NW1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002115 WELLEN BORING LTD
Water Use	Domestic
Hole #	000
Installation Method	Bored
Depth	70 ft
Water Level	ft
Bit	44.0 inches
Struck	42 ft
Flowing Head	ft
Completion Method	Perforated Casing

Well Use Withdrawal

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	72	70	30.0	Fiberglass

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	40	70	30.0	70	Fiberglass

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	igpm
Temp	deg. F
Elevation	1900 ft

Recommended

Rec Pumping Rate	2.0 igpm
Intake	ft
Aquifer	
E-Log	No
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
25	Till	Brown	Unknown
30	Till	Brown	Unknown
42	Till	Grey	Unknown
55	Till	Grey	Sand Streaks
70	Till	Grey	Unknown

WWDR # 107995

Client # 904740

Completion	19/05/1997
RM	373
MB	06
SB	30
NTSMAP	73B01

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	NW1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002115	WELLEN BORING LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #	001		
Installation Method	Bored		
Depth	62 ft		
Water Level	30 ft		
Bit	42.0 inches		
Struck	35 ft		
Flowing Head	ft		
Completion Method	Perforated Casing		

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	64	62	30.0	Fiberglass

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	15	59	30.0	70	Fiberglass

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	7.0 igpm
Temp	deg. F
Elevation	1870 ft

Recommended

Rec Pumping Rate	igpm
Intake	ft
Aquifer	
E-Log	No
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
15	Till	Brown	Silty
18	Till	Brown	Hard
20	Till	Brown	Hard
35	Till	Grey	Hard
45	Till	Grey	Sand Streaks
49	Sand	Grey	Coarse
55	Till	Grey	Hard
62	Till	Grey	Sand Streaks

WWDR # 056972

Client # 056972

Completion	20/04/1978
RM	373
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SE1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002265
Water Use	Domestic
Hole #	000
Installation Method	Drilled
Depth	23 ft
Water Level	ft
Bit	inches
Struck	ft
Flowing Head	ft
Completion Method	

INTERNATIONAL WATER SUPPLY LTD
Well Use Water Test Hole

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	igpm
Temp	deg. F
Elevation	1850 ft

Recommended
Rec Pumping Rate igpm
Intake ft
Aquifer
E-Log No
Phys E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
1	Topsoil	Unknown	Unknown
6	Clay	Brown	Unknown
18	Boulders	Unknown	Gravelly
23	Clay	Blue	Unknown

WWDR # 056973

Client # 856972

Completion	20/04/1978
RM	373
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SE1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002265	INTERNATIONAL WATER SUPPLY LTD	
Water Use	Domestic	Well Use	Water Test Hole
Hole #	000		
Installation Method	Drilled		
Depth	23 ft		
Water Level	ft		
Bit	inches		
Struck	ft		
Flowing Head	ft		
Completion Method			

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test		Recommended	
Draw Down	ft	Rec Pumping Rate	igpm
Duration	hrs	Intake	ft
Pumping Rate	igpm	Aquifer	
Temp	deg. F	E-Log	No
Elevation	1850 ft	Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
6	Topsoil	Unknown	Unknown
15	Gravel	Unknown	Boulders
23	Clay	Blue	Unknown

WWDR # 056984

Client # 856979

Completion	01/05/1978
RM	373
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SE1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002265	INTERNATIONAL WATER SUPPLY LTD	
Water Use	Domestic	Well Use	Water Test Hole
Hole #	000		
Installation Method	Drilled		
Depth	21 ft		
Water Level	ft		
Bit	inches		
Struck	ft		
Flowing Head	ft		
Completion Method			

Length (ft) Btm (ft) Dia (in) Description

Well Casings

Length (ft) Btm (ft) Dia (in) Slot (in) Description

Screens

Pump Test		Recommended	
Draw Down	ft	Rec Pumping Rate	igpm
Duration	hrs	Intake	ft
Pumping Rate	igpm	Aquifer	
Temp	deg. F	E-Log	No
Elevation	1850 ft	Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
12	Gravel	Unknown	Boulders
16	Till	Brown	Boulders
21	Till	Blue	Boulders

WWDR # 056983

Client # 856979

Completion	01/05/1978
RM	373
MB	06
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SE1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002265
Water Use	Domestic
Hole #	000
Installation Method	Drilled
Depth	30 ft
Water Level	ft
Bit	inches
Struck	ft
Flowing Head	ft
Completion Method	

INTERNATIONAL WATER SUPPLY LTD
Well Use Water Test Hole

Well Casings

Length (ft)	Btm (ft)	Dia (in)	Description

Screens

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	igpm
Temp	deg. F
Elevation	1850 ft

Recommended

Rec Pumping Rate	igpm
Intake	ft
Aquifer	
E-Log	No
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
16	Sand & Gravel	Unknown	Boulders
30	Till	Blue	Boulders

WWDR # 104447

Client # 870499

Completion	01/09/1994
EM	373
MB	06
SB	30
NTSMAP	73B01

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)

0 ft from N/S Boundary N/S Boundary

0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	002115	WELLEN BORING LTD	
Water Use	Domestic	Well Use	Withdrawal
Hole #			
Installation Method	Bored		
Depth	60 ft		
Water Level	32 ft		
Bit	42.0 inches		
Struck	32 ft		
Flowing Head	ft		
Completion Method	Perforated Casing		

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	62	60	30.0	Fiberglass

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	30	58	30.0	70	Fiberglass

Pump Test		Recommended	
Draw Down	ft	Rec Pumping Rate	igpm
Duration	hrs	Intake	ft
Pumping Rate	1.0 igpm	Aquifer	
Temp	deg. F	E-Log	Unknown
Elevation	1875 ft	Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
16	Till	Brown	Unknown
32	Till	Grey	Stoney
48	Till	Grey	Sand Streaks
50	Sand	Grey	Fine-medium
60	Till	Grey	Unknown

WWDR # 081457

Client # 081457

Completion	09/07/1985
RM	373
MB	05
SB	30
NTSMAP	73B00

Well Location

LSD	Qtr	Sec	Twp	Rge	M	Reserve	RL
	SW1/4	06	37	03	3		

Zone Easting Northing Source Accuracy

Location of Well (in Quarter)
0 ft from N/S Boundary N/S Boundary
0 ft from E/W Boundary E/W Boundary

Well Information

Driller #	043125 TWEIDT WELLBORING SERVICING LTD
Water Use	Domestic
Well Use	Withdrawal
Hole #	000
Installation Method	Bored
Depth	40 ft
Water Level	ft
Bit	42.0 inches
Struck	12 ft
Flowing Head	ft
Completion Method	Well Screen And Gravel Pack

	Length (ft)	Btm (ft)	Dia (in)	Description
Well Casings	42	40	30.0	Steel

	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
Screens	30	40	30.0	125	Stainless Steel

Pump Test

Draw Down	ft
Duration	hrs
Pumping Rate	igpm
Temp	deg. F
Elevation	1860 ft

Recommended

Rec Pumping Rate	8.0 igpm
Intake	ft
Aquifer	
E-Log	No
Phys	E22

Lithology List

Depth to Base of (ft)	Material	Colour	Description
12	Till	Unknown	Wet
30	Rock	Unknown	Water
40	Clay	Unknown	Unknown