GEOTECHNICAL INVESTIGATION:

New House (Alts & Adds) & Pool at **23 Hay Street, Collaroy Plateau**

1. Proposed Development

1.1 Demolish the majority of the house, keeping the S supporting walls and a small portion of the N supporting wall, and construct a larger house by excavating to a maximum depth of ~3.5m.

1.2 Install a new pool on the downhill side of the property by excavating to a maximum depth of ~2.7m.

1.3 Construct a new outhouse on the downhill side of the property.

1.4 Various other internal and external alterations.

1.5 Details of the proposed development are shown on 16 drawings prepared by Sammy Fedele, Job number 41/20, drawings numbered DA01 to DA16, dated 10/6/21.

2. Site Description

2.1 The site was inspected on the 19th May, 2021.

2.2 This residential property is on the low side of the road and has a NE aspect. It is located on the gentle to moderately graded lower middle reaches of a hillslope. From the road frontage to the lower boundary, the slope falls at an average angle of ~9°. The slope above the property increases in grade. The slope below the property falls at gradually decreasing angles.

2.3 At the road frontage, a concrete driveway runs to a carport and garage attached to the N side of the house (Photo 1). Both the carport and garage will be demolished as part of the proposed works. An excavation has been made in the slope

between the road frontage and the house for a gently sloping lawn and garden area (Photo 2). The cut is supported by a concrete block retaining wall that displays stepped cracking and will also be demolished as part of the proposed works (Photo 3). The part three-storey rendered brick house is supported on brick walls and brick piers (Photo 4). The majority of these walls and piers will be demolished as part of the proposed works. The S supporting wall that is to remain displays significant cracking in multiple locations (Photos 5 & 6). We recommend this wall be rebuilt as part of the proposed works. A stone-paved fill extends off the NE corner of the house (Photo 7). The fill and its supporting sandstone block retaining wall (Photo 8) will both be removed as part of the proposed works. A gently sloping lawn falls from the downhill side of the house to the lower common boundary (Photo 9). Portions of the lawn have been filled and are battered to stable angles.

3. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by the Newport Formation of the Narrabeen Group. This is described as interbedded laminite, shale, and quartz to lithic quartz sandstone.

4. Subsurface Investigation

One Auger Hole (AH) was put down to identify the soil materials. Seven Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative density of the overlying soil and the depth to weathered rock. The locations of the tests are shown on the site plan attached. It should be noted that a level of caution should be applied when interpreting DCP test results. The test will not pass through hard buried objects so in some instances it can be difficult to determine whether refusal has occurred on an obstruction in the profile or on the natural rock surface. This is expected to have occurred in DCP5. Excavation and foundation budgets should always allow for the possibility that the interpreted ground conditions in this report vary from those encountered during excavations. See the appended “Important

information about your report" for a more comprehensive explanation. The results are as follows:

AUGER HOLE 1 (~RL27.4) **–** AH1 (Photo 10)

Depth (m)	**Material Encountered**
0.0 to 0.8	**FILL**, disturbed clayey soil, dark brown, medium dense to dense, dry, fine to coarse grained with fine trace organic matter and rock fragments.

End of test @ 0.8m in fill. No water table encountered.

DCP TEST RESULTS – Dynamic Cone Penetrometer

Equipment: 9kg hammer, 510mm drop, conical tip. Standard: AS1289.6.3.2 - 1997

Depth(m) Blows/0.3m	**DCP 1** (~RL26.6)	**DCP 2** (~RL27.5)	**DCP 3** (~RL28.6)	**DCP 4** (~RL28.2)	**DCP 5** (~RL29.9)	**DCP 6** (~RL29.7)	**DCP 7** (~RL32.1)
0.0 to 0.3	4	4	5	9	Refusal on Obstruction Immediately Below Surface	6	4
0.3 to 0.6	13	10	7	17		8F	3
0.6 to 0.9	20	13	18	30		5	7
0.9 to 1.2	11	18	23	#		11	30
1.2 to 1.5	19	12	40			11	#
1.5 to 1.8	35	30	#			17	
1.8 to 2.1	#	#				20	
2.1 to 2.4						37	
2.4 to 2.7						#	
	End of Test @ 1.8m	End of Test @ 1.8m	End of Test @ 1.5m	End of Test @ 0.9m		End of Test @ 2.4m	End of Test @ 1.2m

#refusal/end of test. F = DCP fell after being struck showing little resistance through all or part of the interval.

DCP Notes:

DCP1 – End of test @ 1.8m, DCP still very slowly going down, orange shale on dry tip.
DCP2 – End of test @ 1.8m, DCP still very slowly going down, brown and maroon shale on damp tip.
DCP3 – End of test @ 1.5m, DCP still very slowly going down, grey and maroon shale on dry tip.
DCP4 – End of test @ 0.9m, DCP still very slowly going down, grey shale fragments on dry tip.
DCP5 – Refusal on obstruction immediately below surface.
DCP6 – End of test @ 2.4m, DCP still very slowly going down, maroon shale on dry tip.
DCP7 – End of test @ 1.2m, DCP still very slowly going down, brown shale fragments on dry tip.

5. Geological Observations/Interpretation

The slope materials are colluvial at the near surface and residual at depth. In the location of the proposed works, they consist of a topsoil over silty clays. Filling has been placed across the downhill side of the property for landscaping. In the test locations, the clays merge into the weathered zone of the underlying shale at depths of between 0.9 to 2.1m below the current surface, being deeper due to the presence of filling and a variable weathering profile. The weathered zone is interpreted as Extremely Low Strength Shale. It is to be noted that this material can appear as a mottled stiff clay when it is cut up by excavation equipment. See Type Section attached for a diagrammatical representation of the expected ground materials.

6. Groundwater

Normal ground water seepage is expected to move over the buried surface of the rock and through the cracks. Due to the slope and elevation of the block, the water table is expected to be many metres below the base of the proposed excavation.

7. Surface Water

No evidence of significant surface flows were observed on the property during the inspection. Normal sheet wash from the slope above will be intercepted by the street drainage system for Hay Street above.

8. Geotechnical Hazards and Risk Analysis

No geotechnical hazards were observed below or beside the property. The gentle to moderately graded slope that rises across the property and continues above is a potential hazard (**Hazard One**). The proposed excavations are a potential hazard until retaining structures are installed (**Hazard Two**).

Risk Analysis Summary

HAZARDS	Hazard One	Hazard Two
TYPE	The gentle to moderate slope that rises across the site and continues above failing and impacting on the proposed works.	The excavations collapsing onto the work site and impacting the neighbouring structures and properties.
LIKELIHOOD	'Unlikely' (10^{-4})	'Possible' (10^{-3})
CONSEQUENCES TO PROPERTY	'Medium' (12%)	'Medium' (30%)
RISK TO PROPERTY	'Low' (2×10^{-5})	'Moderate' (2×10^{-4})
RISK TO LIFE	5.5×10^{-7}/annum	5.0×10^{-4}/annum
COMMENTS	This level of risk is 'ACCEPTABLE'.	'UNACCEPTABLE' level of risk to life and property. To move risk to 'ACCEPTABLE' levels, the recommendations in **Section 13** are to be followed.

(See Aust. Geomech. Jnl. Mar 2007 Vol. 42 No 1, for full explanation of terms)

9. Suitability of the Proposed Development for the Site

The proposed development is suitable for the site. No geotechnical hazards will be created by the completion of the proposed development provided it is carried out in accordance with the requirements of this report and good engineering and building practice.

10. Stormwater

It is recommended a drainage easement be obtained from the downhill neighbouring property and all stormwater or drainage runoff from the proposed development be piped to the street below. If this option is not feasible, a spreader/dispersion trench is suitable as a last resort, provided flows are kept close to natural runoff for the site. All stormwater is to be piped through any tanks that may be required by the regulating authorities.

11. Excavations

An excavation to a maximum depth of ~3.5m is required to construct the lower ground floor of the house. Another excavation to a maximum depth of ~2.7m is required to install the proposed pool. Both excavations are expected to be through manmade fill over a topsoil and silty clays with Extremely Low Strength Shale expected at depths of between 0.9 to 2.1m below the current surface. Excavations through fill, soil, clay, and Extremely Low Strength Shale can be carried out with an excavator and bucket.

12. Vibrations

Possible vibrations generated during excavations through fill, soil, clay, and Extremely Low Strength Shale will be below the threshold limit for building damage.

13. Excavation Support Requirements

Bulk Excavation for Lower Ground Floor of Proposed House

The excavation for the proposed lower ground floor will reach a maximum depth of ~3.5m and, allowing for back-wall drainage, will be set back ~1.3m from the N neighbouring house and ~1.7m from the S neighbouring house. The N and S neighbouring houses will be within the zone of influence of the excavation. In this instance, the zone of influence is the area above a theoretical 45^{o} line from the base of the excavation through the clay and Extremely Low Strength Shale towards the surrounding boundaries or structures. This line reduces to 30^{o} through the fill and sandy soil.

Due to the depth of the proposed excavation and to ensure the integrity of the subject and neighbouring houses and properties, ground support will need to be installed along all sides of the excavation with the support installed before, or as the excavation commences. See the site plan attached for the minimum extent of the required shoring. Following the removal of the fill off the NE corner of the existing house, a spaced piled retaining wall is one of the suitable methods of support. Pier spacing is typically ~2.0m but can vary between 1.6 to 2.4m depending on the design. The piers can be supported by embedment or propping installed as the excavation is lowered.

To drill the pier holes for the wall, a pilling rig that can excavate through Medium Strength Rock will be required. If a machine of this type is not available, we recommend carrying out core drilling before the construction commences to confirm the strength of the rock and to ensure the excavation equipment is capable of reaching the required depths. As the excavation is lowered in 1.5m lifts, infill sprayed concrete panels or similar are added between the piers to form the wall. Drainage is installed behind the panels. The walls are to be tied into the concrete floor and ceiling slabs of the proposed structure after which any temporary support can be released.

The geotechnical consultant is to inspect the drilling process of the entire first pile and the ground materials at the base of all pier holes/excavations for ground support purposes.

Bulk Excavation for Proposed Pool

The excavation for the proposed pool will reach a maximum depth of ~2.7m and will be set back ~1.4m from the S common boundary. The S neighbouring house is sufficiently set back from the edge of the excavation so only the S common boundary will be within the zone of influence of the excavation.

The S common boundary fence is to be braced before the excavation commences.

To ensure the integrity of the S neighbouring property, we recommend the S side of the excavation be temporarily supported with typical pool shoring such as sacrificial form ply,

until the pool structure is in place. See the minimum extent of temporary shoring shown on the site plan attached.

The remaining cut batters for the pool may stand at near-vertical angles for a very short period of time until the pool structure is installed provided the cut batter is kept from becoming saturated. If the cut batters remain unsupported for more than a day before the pool construction commences, they are to be supported with typical pool shoring as above, until the pool structure is in place.

Upslope runoff is to be diverted from the cut faces by sandbag mounds or other diversion works. Unsupported cut batters through fill, soil, and clay are to be covered to prevent access of water in wet weather and loss of moisture in dry weather. The covers are to be tied down with metal pegs or other suitable fixtures so they can't blow off in a storm. The materials and labour to construct the pool structure are to be organised so on completion of the excavation it can be constructed as soon as possible. The excavations are to be carried out during a dry period. No excavations are to commence if heavy or prolonged rainfall is forecast.

All excavation spoil is to be removed from site following the current Environmental Protection Agency (EPA) waste classification guidelines.

14. Retaining Structures

For cantilever or singly-propped retaining structures, it is suggested the design be based on a triangular pressure distribution of lateral pressures using the parameters shown in Table 1.

TABLE 1 IS ON THE NEXT PAGE

Table 1 – Likely Earth Pressures for Retaining Structures

Unit	Earth Pressure Coefficients			
	Unit weight (kN/m³)	**'Active' K_a**	**'At Rest' K_0**	**Passive**
Fill, Soil, and Residual Clays	20	0.40	0.55	N/A
Extremely Low Strength Shale	22	0.25	0.35	Kp 2.5 ultimate

For rock classes refer to Pells et al "Design Loadings for Foundations on Shale and Sandstone in the Sydney Region". Australian Geomechanics Journal 1978.

It is to be noted that the earth pressures in Table 1 assume a level surface above the structure, do not account for any surcharge loads, and assume retaining structures are fully drained. It should be noted that passive pressure is an ultimate value and should have an appropriate safety factor applied. No passive resistance should be assumed for the top 0.4m to account for any disturbance from the excavation. Rock strength and relevant earth pressure coefficients are to be confirmed on site by the geotechnical consultant.

All retaining structures are to have sufficient back-wall drainage and be backfilled immediately behind the structure with free-draining material (such as gravel). This material is to be wrapped in a non-woven Geotextile fabric (i.e., Bidim A34 or similar), to prevent the drainage from becoming clogged with silt and clay. If no back-wall drainage is installed in retaining structures, the likely hydrostatic pressures are to be accounted for in the structural design.

15. Foundations

A raft or thickened concrete slab supported on the underlying Extremely Low Strength Shale is a suitable footing for the proposed house. This ground material is expected to be exposed across the majority of the base of the proposed excavation. Where it is not exposed at the base of the excavation and where the footprint of the house does not fall over the footprint

of the excavation, piers will be required to maintain a uniform bearing material across the structure.

The foundation material of the existing house is unknown. Ideally, footings should be founded on the same footing material across the old and new structures. Where the footing material changes across the structure, construction joints or similar are to be installed to prevent differential settlement, where the structure cannot tolerate such movement.

The pool is expected to be partially seated in Extremely Low Strength Shale with areas in the firm to hard clays. To ensure a uniform bearing material, bucket piers may be required where weathered shale is not exposed.

Due to its proximity to the proposed pool, the proposed outhouse is to be supported on piers taken to the underlying Extremely Low Strength Shale. This ground material is expected at depths of between 1.2 to 1.5m below the current surface in this location.

A maximum allowable bearing pressure of 600kPa can be assumed for footings on Extremely Low Strength Shale. It should be noted that this material is a soft rock and a rock auger will cut through it so the builders should not be looking for refusal to end the footings.

As the bearing capacity of clay and shale reduces when it is wet, we recommend the footings be dug, inspected, and poured in quick succession (ideally the same day if possible). If the footings get wet, they will have to be drained and the soft layer of wet clay or shale on the footing surface will have to be removed before concrete is poured.

If a rapid turnaround from footing excavation to the concrete pour is not possible, a sealing layer of concrete may be added to the footing surface after it has been cleaned.

NOTE: If the contractor is unsure of the footing material required, it is more cost-effective to get the geotechnical consultant on site at the start of the footing excavation to advise on footing depth and material. This mostly prevents unnecessary over-excavation in clay-like shaly-rock but can be valuable in all types of geology.

16. Inspections

The client and builder are to familiarise themselves with the following required inspections as well as council geotechnical policy. We cannot provide certification for the regulating authorities or the owner if the following inspections have not been carried out during the construction process.

- The geotechnical professional is to inspect the drilling process of the entire first pile of the retaining wall and the ground materials at the base of all the piers before any concrete is placed.

- All footings are to be inspected and approved by the geotechnical professional while the excavation equipment is still onsite and before steel reinforcing is placed or concrete is poured.

White Geotechnical Group Pty Ltd.

Ben White M.Sc. Geol.,
AusIMM., CP GEOL.
No. 222757
Engineering Geologist

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10 – AH1: Downhole is from left to right

Important Information about Your Report

It should be noted that Geotechnical Reports are documents that build a picture of the subsurface conditions from the observation of surface features and testing carried out at specific points on the site. The spacing and location of the test points can be limited by the location of existing structures on the site or by budget and time constraints of the client. Additionally, the test themselves, although chosen for their suitability for the particular project, have their own limiting factors. The testing gives accurate information at the location of the test, within the confines of the test's capability. A geological interpretation or model is developed by joining these test points using all available data and drawing on previous experience of the geotechnical consultant. Even the most experienced practitioners cannot determine every possible feature or change that may lie below the earth. All of the subsurface features can only be known when they are revealed by excavation. As such, a Geotechnical report can be considered an interpretive document. It is based on factual data but also on opinion and judgement that comes with a level of uncertainty. This information is provided to help explain the nature and limitations of your report.

With this in mind, the following points are to be noted:

- If upon the commencement of the works the subsurface ground or ground water conditions prove different from those described in this report, it is advisable to contact White Geotechnical Group immediately, as problems relating to the ground works phase of construction are far easier and less costly to overcome if they are addressed early.

- If this report is used by other professionals during the design or construction process, any questions should be directed to White Geotechnical Group as only we understand the full methodology behind the report's conclusions.

- The report addresses issues relating to your specific design and site. If the proposed project design changes, aspects of the report may no longer apply. Contact White Geotechnical if this occurs.

- This report should not be applied to any other project other than that outlined in section 1.0.

- This report is to be read in full and should not have sections removed or included in other documents as this can result in misinterpretation of the data by others.

- It is common for the design and construction process to be adapted as it progresses (sometimes to suit the previous experience of the contractors involved). If alternative design and construction processes are required to those described in this report, contact White Geotechnical Group. We are familiar with a variety of techniques to reduce risk and can advise if your proposed methods are suitable for the site conditions.

SITE PLAN – showing test locations

NOTES

1. Do not scale off drawings. (If in doubt ask)
2. All measurements to be checked on site prior to commencement of construction.
3. Check all levels, roof pitch, location of windows and boundary lines, site and building conditions before commencing work or ordering materials.
4. Supply & install selected smoke alarm system to comply with AS3786.
5. All storm water to be connected to existing system.
6. The work shown on this and associated drawings shall be carried in a trademanlike manner and shall be in accordance with the standards, codes, ordinances,regulations, of the Standards Association of Australia, the Building Code of Australia and any statutory authority having jurisdiction over the works.
7. Setting out dimensions shown on the drawings shall be verified by the builder
8. During construction the structure shall be maintained in a stable condition, and no part shall be overstressed.
9. Plantings and dampcoff course to be placed in accordance with good building practise whether shown on the details or not.
10. Supply and install lift off hinges to all wet area doors.

LEGEND

UNDISTURBED VEGETATION

SILT FENCE

STOCK PILE

BARRIER FENCE

FABRIC FILLED WITH GRAVEL

SAND AND SOIL STOCKPILE

SOIL AND WATER MANAGEMENT NOTES

01. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE INSPECTED AND MAINTAINED DAILY BY SITE FOREMEN
02. PHASE DISTURBED AREAS
03. ALL STOCKPILES TO BE CLEAR FROM DRAINS, GUTTERS AND WATERWAYS.
04. DRAINAGE TO BE CONNECTED TO STORMWATER SYSTEM AS SOON AS POSSIBLE
05. ROADS AND FOOTPATHS TO BE SWEPT DAILY AND KEPT CLEAN AT ALL TIMES
06. INSTALL TEMPORARY SEDIMENT BARRIERS TO ALL INLET PITS LIKELY TO COLLECT SILT LADEN WATER, TO COUNCIL'S REQUIREMENTS.
07. NOT WITHSTANDING DETAILS SHOWN, IT IS THE SITE MANAGERS SOLE RESPONSIBILITY TO ENSURE THAT ALL SITE ACTIVITIES COMPLY WITH THE REQUIREMENTS OF THE CLEAN WATERS ACT.

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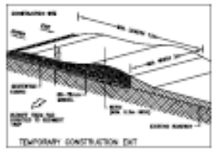
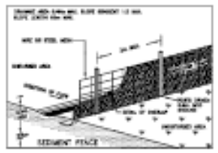
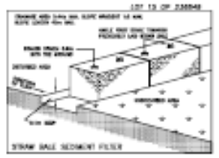
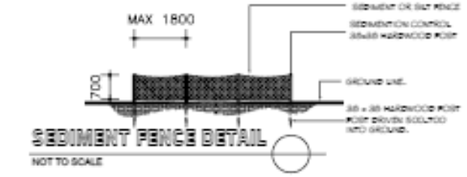

TEMPORARY CONSTRUCTION EXIT


SEDIMENT FENCE

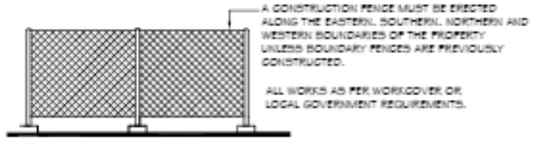

STRAW BALE SEDIMENT FILTER

STANDARD DETAILS



SEDIMENT FENCE DETAIL

NOT TO SCALE


A CONSTRUCTION FENCE MUST BE ERECTED ALONG THE EASTERN, SOUTHERN, NORTHERN AND WESTERN BOUNDARIES OF THE PROPERTY UNLESS BOUNDARY FENCES ARE PREVIOUSLY CONSTRUCTED.

ALL WORKS AS PER WORKCOVER OR LOCAL GOVERNMENT REQUIREMENTS.

ARCHITECTURAL PLANS ARE TO BE READ IN CONJUCTION WITH.

WHITE GEOTECHNICAL GROUP.

BASIX REPORT
PERPARED BY SAMMY FEDELE

GOLLARDY PLATEAU PUBLIC SCHOOL

MONA VALE SHOPS

NORTH EAST BREEZES IN SUMMER

SOUTH WEST WINDS AND STORMS

9AM 21ST SHADOW JUNE

3PM 21ST SHADOW JUNE

12NOON 21ST SHADOW

GOLLARDY TENNIS CLUB AND BEACH

DEE SHOPS

4000mm INHEIGHT AND 45° SIDE BOUNDARY ENVELOPE AT NATURAL GROUND LEVEL. AT POINT (F.E)

4000mm INHEIGHT AND 45° SIDE BOUNDARY ENVELOPE AT NATURAL GROUND LEVEL. AT POINT (F.D)

4000mm INHEIGHT AND 45° SIDE BOUNDARY ENVELOPE AT NATURAL GROUND LEVEL. AT POINT (F.D)

PROPOSED ALTERATIONS AND ADDITIONS. TO EXISTING DWELLING

REMOVE CARPORT TIMBER PERGOLA & MAKE GOOD ADJOINING SURFACES AS NECESSARY.

REMOVE TREES

REMOVE TREES

PROPOSED OUTHOUSE

4000mm INHEIGHT AND 45° SIDE BOUNDARY ENVELOPE AT NATURAL GROUND LEVEL. AT POINT (F.A)

4000mm INHEIGHT AND 45° SIDE BOUNDARY ENVELOPE AT NATURAL GROUND LEVEL. AT POINT (F.B)

DCP1
DCP2
DCP3
DCP4
DCP5
DCP6
DCP7
AH 1

APPROX LOCATION SEDIMENTION CONTROL SEE DETAIL X.

HAY STREET

D.P. 10519

SITE AREA 667.5m²

7062 19719 3800 10832 3000 1930

1000 6340 3425 2921 1150 7035 5800 2000

6210 EXISTING 17082 14632 3000 5418

PROPOSED
SEDIMENT CONTROL PLAN / SOIL AND WASTE MANAGEMENT / AND SITE PLAN

SCALE 1:200

Sammy Fedele	Architectural Drafting Services 0404 037 606 email:sammyfedele@primus.com.au	C AND A PARISI PROPOSED : ALTERATIONS AND ADDITIONS AND POOL TO EXISTING RESIDENCE ADDRESS : 23 HAY STREET GOLLARDY NSW 2087 DP 10646 LOT 36 SEC 12	PLAN SCALE: 1:100 DATE: 10.06.2021 REV: - JOB: 41/20 SHEET No : DA01

A2

LOWER GROUND FLOOR PLAN – showing minimum required extents of shoring

Minimum extent of required shoring shown in blue

Minimum extent of temporary shoring shown in red

NOTES

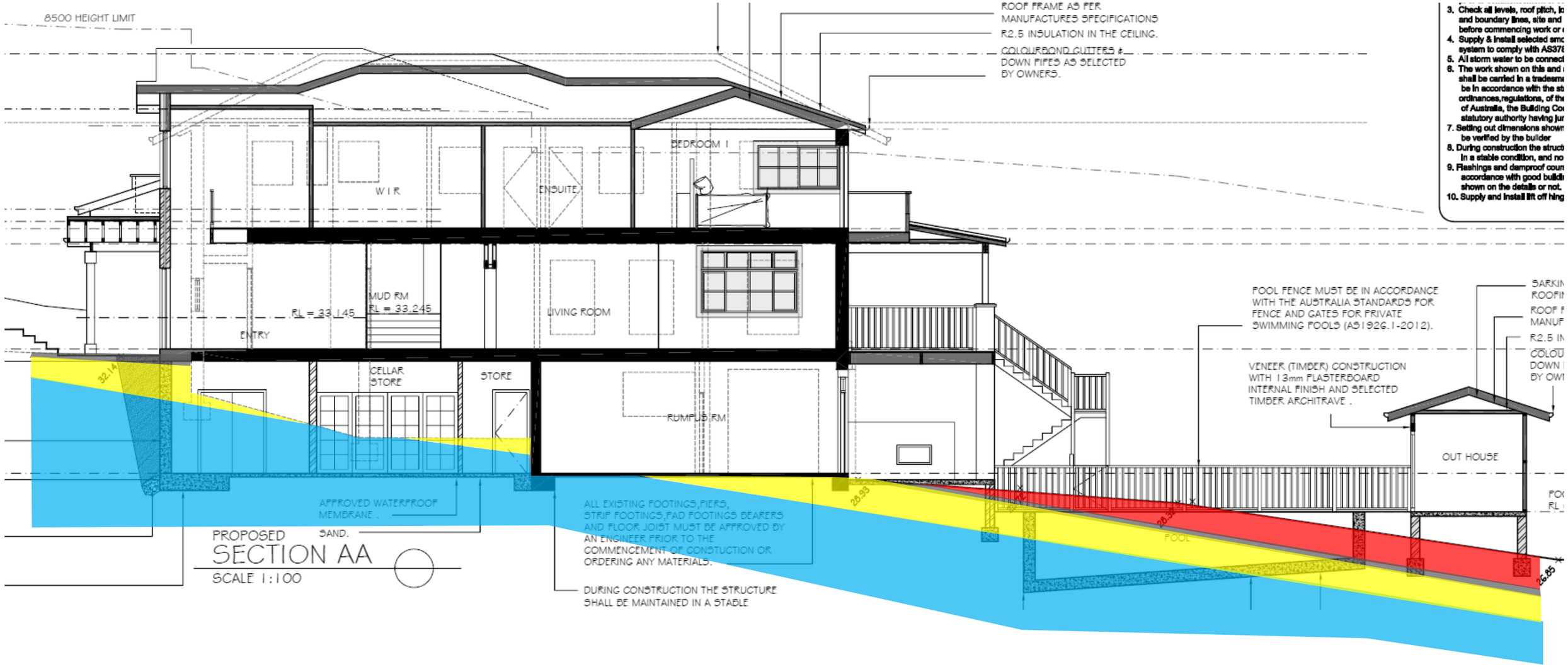
1. Do not scale off drawings. (If in doubt- ask)
2. All measurements to be checked on site prior to commencement of construction.
3. Check all levels, roof pitch, location of services and boundary lines, site and building conditions before commencing work or ordering materials.
4. Supply & Install selected smoke alarm system to comply with AS3786.
5. All storm water to be connect to existing system .
6. The work shown on this and associated drawings shall be carried in a tradesmanlike manner and shall be in accordance with the standards, codes, ordinances,regulations, of the Standards Association of Australia, the Building Code of Australia and any statutory authority having jurisdiction over the works.
7. Setting out dimensions shown on the drawings shall be verified by the builder
8. During construction the structure shall be maintained in a stable condition, and no part shall be overstressed.
9. Plantings and dampcourse to be placed in accordance with good building principles whether shown on the details or not.
10. Supply and install 20 off hinges to all pool area doors.

PROPOSED
LOWER GROUND FLOOR PLAN
SCALE 1:100

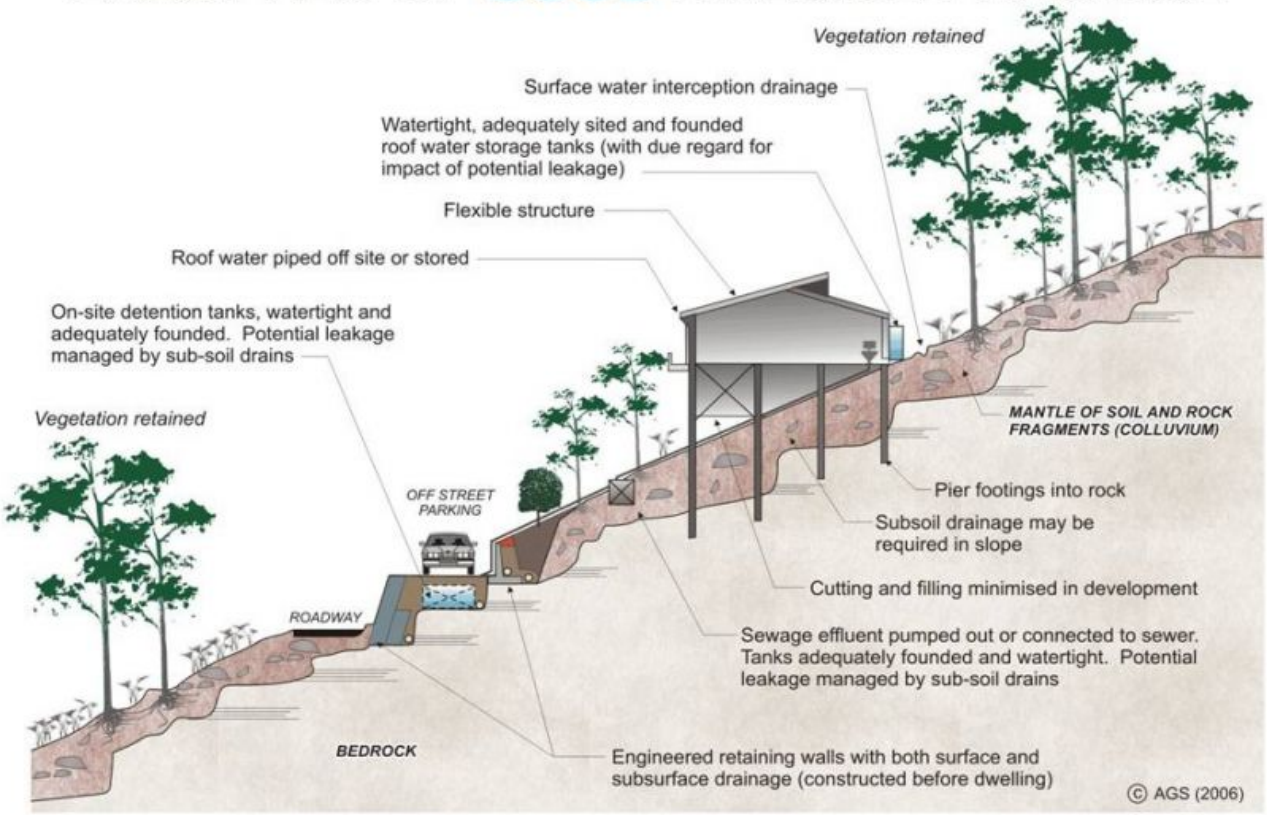
Sammy Fedele	Architectural Drafting Services 0404 037 606 email:sammyfedele@primus.com.au	C AND A PARISI PROPOSED ALTERATIONS AND ADDITIONS AND POOL TO EXISTING RESIDENCE ADDRESS : 23 HAY STREET COLLAROY NSW 2097 DP 10646 LOT 36 SEC 12	PLAN SCALE: 1:100 DATE: 10.06.2021 REV: – JOB: 41/20	SHEET No : DA04	A2

TYPE SECTION – Diagrammatical Interpretation of expected Ground Materials

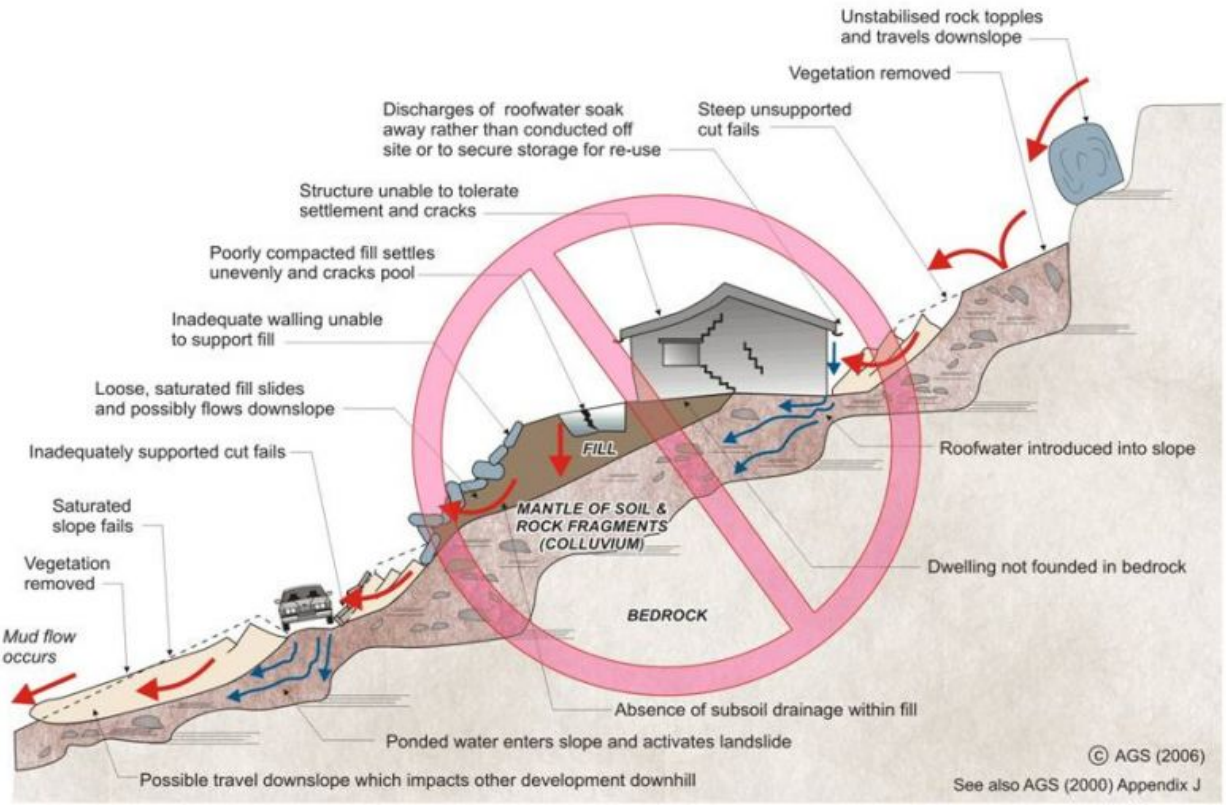
- Fill
- Topsoil
- Silty Clay – Firm to Stiff
- Narrabeen Group Rocks – Extremely Low Strength Shale - after being cut up by excavation equipment can resemble a stiff to hard clay.



EXAMPLES OF **GOOD** HILLSIDE PRACTICE



EXAMPLES OF **POOR** HILLSIDE PRACTICE



INFILTRATION TESTING:

For Proposed Infiltration Trench at **23 Hay Street, Collaroy**

1. Site Description

The site was inspected on the 19th May, 2021.

This residential property is on the low side of the road and has a NE aspect. The land surface surrounding the house and driveway is mostly lawn-covered with some paved areas. The proposed infiltration trench will be in the lawn area on the downhill side of the property. In the weeks prior, the weather had been mostly dry and the soil was dry at the time of the inspection.

2. Geology

The Sydney 1:100 000 Geological sheet indicates the site is underlain by the Newport Formation of the Narrabeen Group. This is described as interbedded laminite, shale, and quartz to lithic quartz sandstone.

3. Subsurface Investigation

One Hand Auger Hole (AH) was put down for the stand pipe used in the infiltration testing. Seven Dynamic Cone Penetrometer (DCP) tests were put down to determine the relative density of the overlying soil and the depth to weathered rock. The locations of the tests are shown on the site plan attached. It should be noted that a level of caution should be applied when interpreting DCP test results. The test will not pass through hard buried objects so in some instances it can be difficult to determine whether refusal has occurred on an obstruction in the profile or on the natural rock surface. This is expected to have occurred in DCP5. Excavation and foundation budgets should always allow for the possibility that the interpreted ground conditions in this report vary from those encountered during excavations. See the appended “Important information about your report” for a more comprehensive explanation. The results are as follows:

AUGER HOLE 1 (~RL27.4) **–** AH1 (Photo 1)

Depth (m)	**Material Encountered**
0.0 to 0.8	**FILL**, disturbed clayey soil, dark brown, medium dense to dense, dry, fine to coarse grained with fine trace organic matter and rock fragments.

End of test @ 0.8m in fill. No water table encountered.

DCP TEST RESULTS – Dynamic Cone Penetrometer

Equipment: 9kg hammer, 510mm drop, conical tip. Standard: AS1289.6.3.2 - 1997

Depth(m) Blows/0.3m	**DCP 1** (~RL26.6)	**DCP 2** (~RL27.5)	**DCP 3** (~RL28.6)	**DCP 4** (~RL28.2)	**DCP 5** (~RL29.9)	**DCP 6** (~RL29.7)	**DCP 7** (~RL32.1)
0.0 to 0.3	4	4	5	9	Refusal on Obstruction Immediately Below Surface	6	4
0.3 to 0.6	13	10	7	17		8F	3
0.6 to 0.9	20	13	18	30		5	7
0.9 to 1.2	11	18	23	#		11	30
1.2 to 1.5	19	12	40			11	#
1.5 to 1.8	35	30	#			17	
1.8 to 2.1	#	#				20	
2.1 to 2.4						37	
2.4 to 2.7						#	
	End of Test @ 1.8m	End of Test @ 1.8m	End of Test @ 1.5m	End of Test @ 0.9m		End of Test @ 2.4m	End of Test @ 1.2m

#refusal/end of test. F = DCP fell after being struck showing little resistance through all or part of the interval.

DCP Notes:

DCP1 – End of test @ 1.8m, DCP still very slowly going down, orange shale on dry tip.
DCP2 – End of test @ 1.8m, DCP still very slowly going down, brown and maroon shale on damp tip.

DCP3 – End of test @ 1.5m, DCP still very slowly going down, grey and maroon shale on dry tip.
DCP4 – End of test @ 0.9m, DCP still very slowly going down, grey shale fragments on dry tip.
DCP5 – Refusal on obstruction immediately below surface.
DCP6 – End of test @ 2.4m, DCP still very slowly going down, maroon shale on dry tip.
DCP7 – End of test @ 1.2m, DCP still very slowly going down, brown shale fragments on dry tip.

4. Geological Interpretation

The slope materials are colluvial at the near surface and residual at depth. In the location of the proposed trench, they consist of a topsoil over silty clays. Filling has been placed across the downhill side of the property for landscaping. In the location of the proposed trench, the clays merge into the weathered zone of the underlying shale at an average depth of ~1.5m below the current surface. The weathered zone is interpreted as Extremely Low Strength Shale. It is to be noted that this material can appear as a mottled stiff clay when it is cut up by excavation equipment.

5. Water Table

No water table was encountered in the testing that extended to a depth of 2.4m below the surface. Given the site's elevation and slope the water table is expected to be metres below the extent of the testing.

6. Infiltration Rate

A constant head infiltration test was carried out within a slotted PVC stand pipe. The stand pipe was filled with water and a constant head maintained until the flow rate of water into the borehole equalled the flow rate out of the borehole into the ground.

To create a saturated bulb in the testing zone, the hole was repeatedly filled with water and the drop in water level measured relative to time. This process was repeated until successive tests gave different readings by <5%. It was this run that was used to determine the infiltration rate.

The results of the testing are as follows:

Auger Location	Depth of Test (m)	Measured Infiltration Rate L/m²/s	Design Infiltration Rate (long term) L/m²/s
AH1	0.6	0.012	0.010
Note: The Design Infiltration Rate is based on bore hole geometry.			

7. Recommendations

Minimum Distance from Boundaries

Trenches should follow the natural slope contours (i.e., run perpendicular to the slope) and be at least 3.0m from the common boundaries and at least 3.0m upslope of any structures.

Impact on Surrounding Structures

We are not aware of any existing seepage issues from the subject property that are impacting on the surrounding neighbouring properties.

In our opinion the site is suitable for infiltration provided the rate of infiltration determined in this report is used in the design. The trench is unlikely to detrimentally impact on the neighbouring properties/structures provided good engineering and building practises are carried out in its design and construction.

Subsurface Waterproofing

No subsurface water proofing will be required.

Design Requirements for walls or Footings

There are no special design requirements for footings.

White Geotechnical Group Pty Ltd.

Ben White M.Sc. Geol.,
AusIMM., CP GEOL.
No. 222757
Engineering Geologist.

Photo 1: AH1 – Downhole is from top to bottom

SITE PLAN – showing test locations

NOTES

1. Do not scale off drawings. (If in doubt ask)
2. All measurements to be checked on site prior to commencement of construction.
3. Check all levels, roof pitch, location of windows and boundary lines, site-and building conditions before commencing work or ordering materials.
4. Supply & install selected smoke alarm system to comply with AS3786.
5. All storm water to be connected to existing system.
6. The work shown on this and associated drawings shall be carried in a trademanlike manner and shall be in accordance with the standards, codes, ordinances,regulations, of the Standards Association of Australia, the Building Code of Australia and any statutory authority having jurisdiction over the works.
7. Setting out dimensions shown on the drawings shall be verified by the builder
8. During construction the structure shall be maintained in a stable condition, and no part shall be overstressed.
9. Plantings and dampcoff course to be placed in accordance with good building principles whether shown on the details or not.
10. Supply and install lift off hinges to all wet area doors.

LEGEND

UNDISTURBED VEGETATION

SILT FENCE

STOCK PILE

BARRIER FENCE

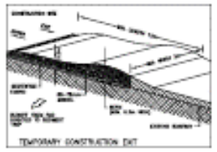
FABRIC FILLED WITH GRAVEL

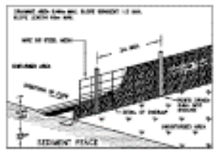
SAND AND SOIL STOCKPILE

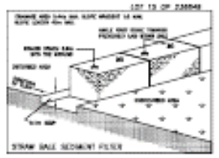
MINIMISE YOUR RISK AND DIAL BEFORE YOU DIG.

SOIL AND WATER MANAGEMENT NOTES

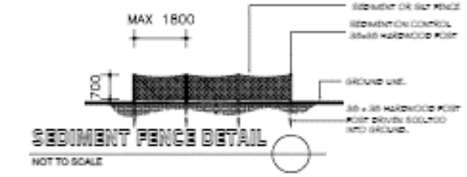
1. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE INSPECTED AND MAINTAINED DAILY BY SITE MANAGER.
2. PHASE DISTURBED AREAS.
3. ALL STOCKPILES TO BE CLEAR FROM DRAINS, GUTTERS AND FOOTPATHS.
4. DRAINAGE TO BE CONNECTED TO STORMWATER SYSTEM AS SOON AS POSSIBLE.
5. ROADS AND FOOTPATHS TO BE SWEPT DAILY AND KEPT CLEAN AT ALL TIMES.
6. INSTALL TEMPORARY SEDIMENT BARRIERS TO ALL INLET PITS LIKELY TO COLLECT SILT LADEN WATER, TO COUNCIL'S REQUIREMENTS.
7. NOT WITHSTANDING DETAILS SHOWN, IT IS THE SITE MANAGERS SOLE RESPONSIBILITY TO ENSURE THAT ALL SITE ACTIVITIES COMPLY WITH THE REQUIREMENTS OF THE CLEAN WATERS ACT.

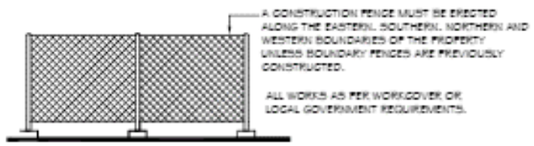

TEMPORARY CONSTRUCTION EXIT


SEDIMENT FENCE


STRAW BALE SEDIMENT FILTER

STANDARD DETAILS



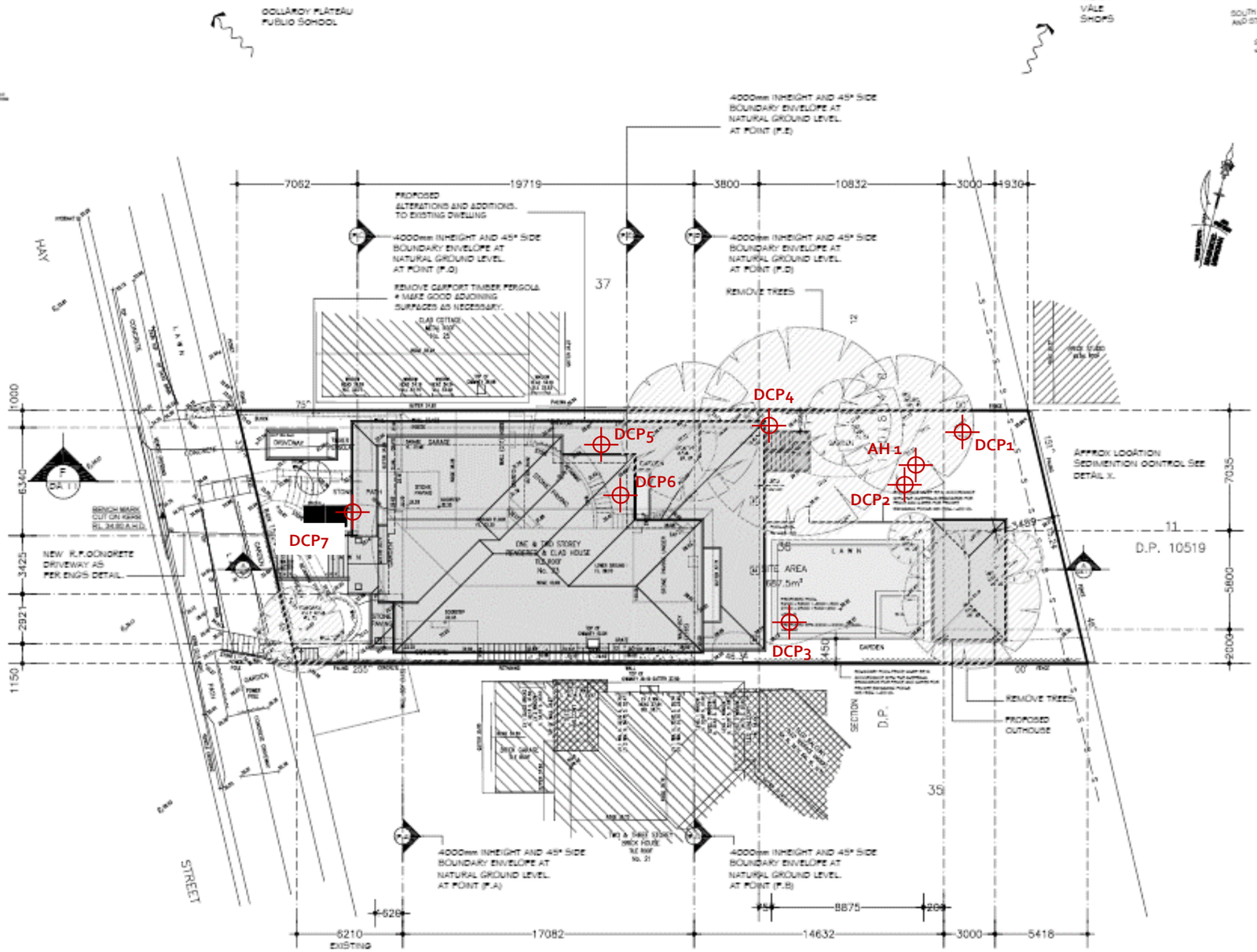

A CONSTRUCTION FENCE MUST BE ERECTED ALONG THE EASTERN, SOUTHERN, NORTHERN AND WESTERN BOUNDARIES OF THE PROPERTY UNLESS BOUNDARY FENCES ARE PREVIOUSLY CONSTRUCTED.

ALL WORKS AS PER WORKCOVER OR LOCAL GOVERNMENT REQUIREMENTS.

ARCHITECTURAL PLANS ARE TO BE READ IN CONJUCTION WITH.

WHITE GEOTECHNICAL GROUP.

BASIX REPORT
PERPARED BY SAMMY FEDELE



PROPOSED
SEDIMENT CONTROL PLAN / SOIL AND WASTE MANAGEMENT / AND SITE PLAN

SCALE 1:200

Sammy Fedele
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Architectural Drafting Services
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C AND A PARISI

PROPOSED : ALTERATIONS AND ADDITIONS AND POOL TO EXISTING RESIDENCE

ADDRESS : 23 HAY STREET GOLLARDY NSW 2097 DP 10646 LOT 36 SEC 12

PLAN

SCALE: 1:100

DATE: 10.06.2021

REV: - JOB: 41/20

SHEET No : DA01

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