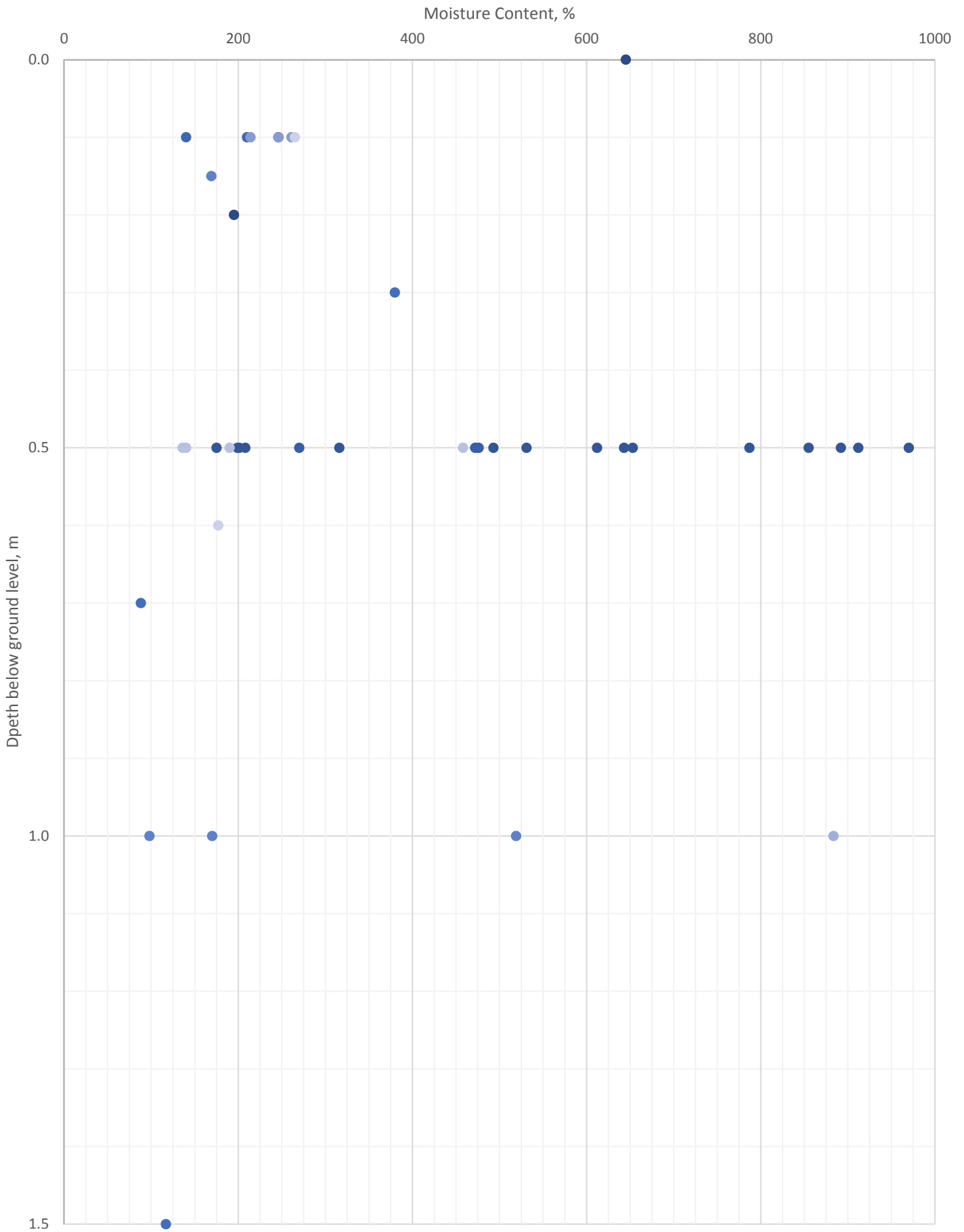


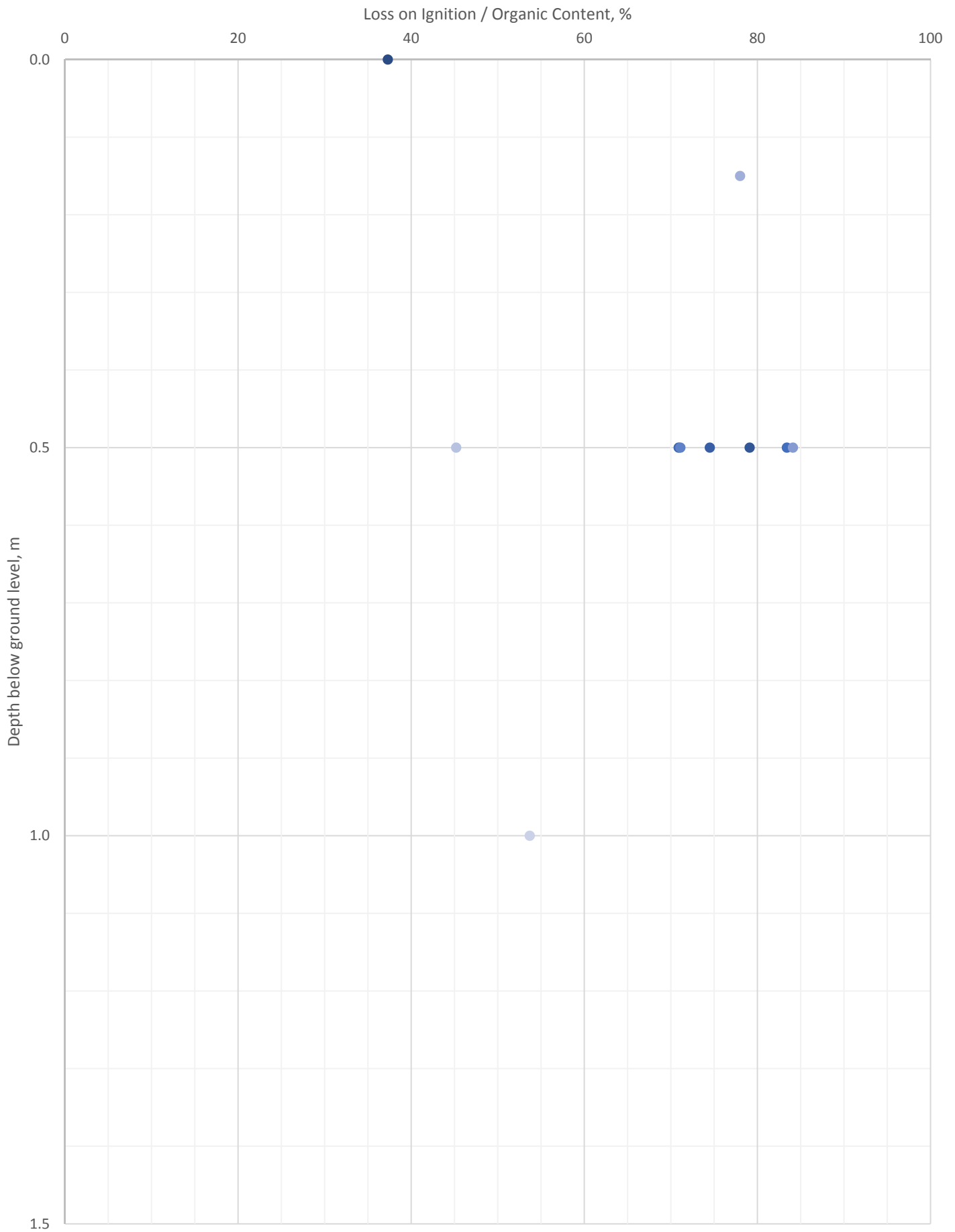
Appendix A.5.4

Geotechnical Figures: Ground Investigation laboratory test results combined

A.5.4



**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**
Peat - Natural Moisture Content vs Depth
D233985-00 **FIGURE 5.01**

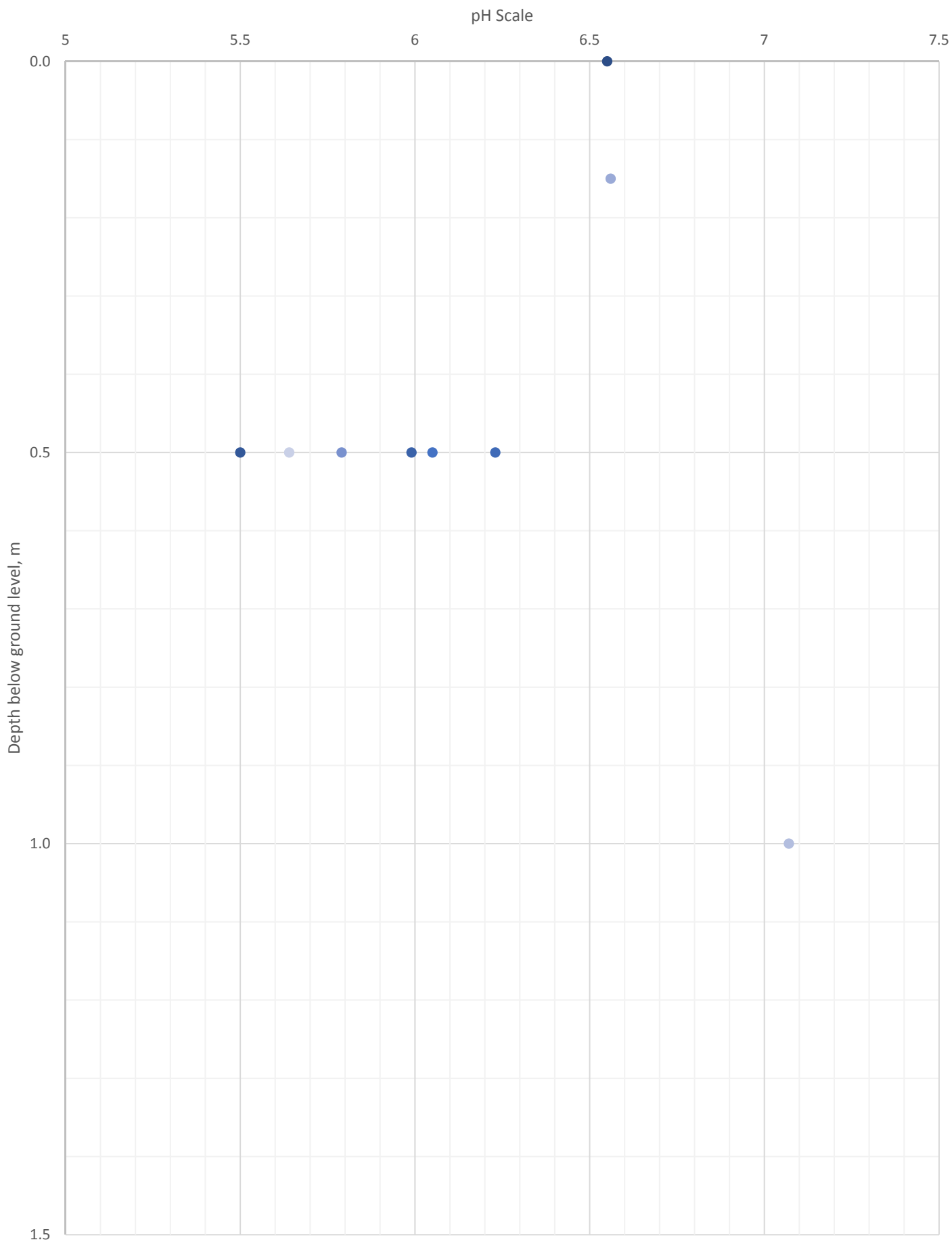


**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

Peat - Organic Content vs Depth

D233985-00

FIGURE 5.02



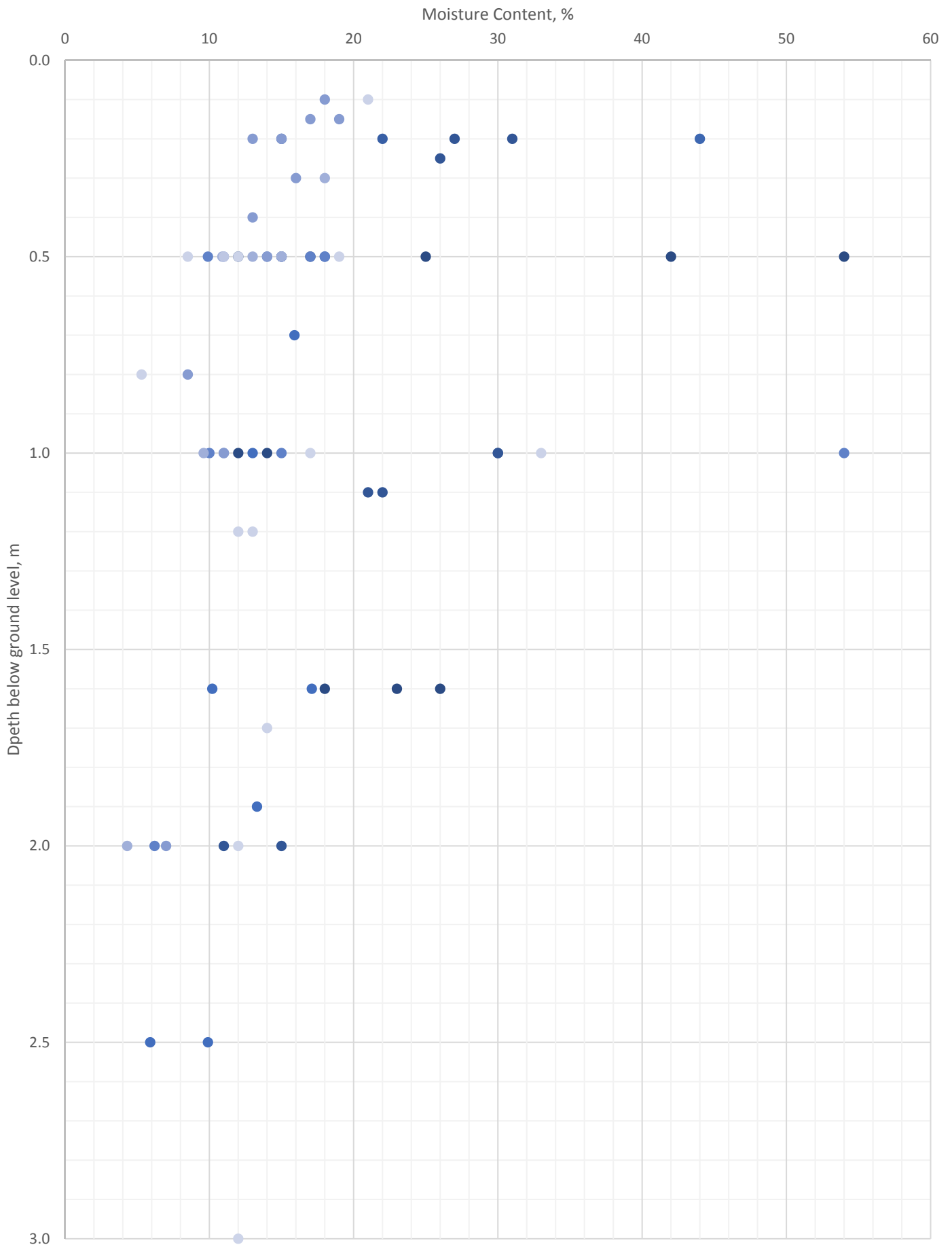
- EW01, TP3/01, 0m
- EW02, TP3/29, 0.5m
- EW02, TP3/34, 0.5m
- EW08, TP3/20, 0.15m
- N59 Link, TP3/09, 0.5m
- EW02, TP3/04, 0.5m
- EW02, TP3/06, 0.5m
- EW02, TP3/35, 0.5m
- EW08, TP3/20, 1m

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

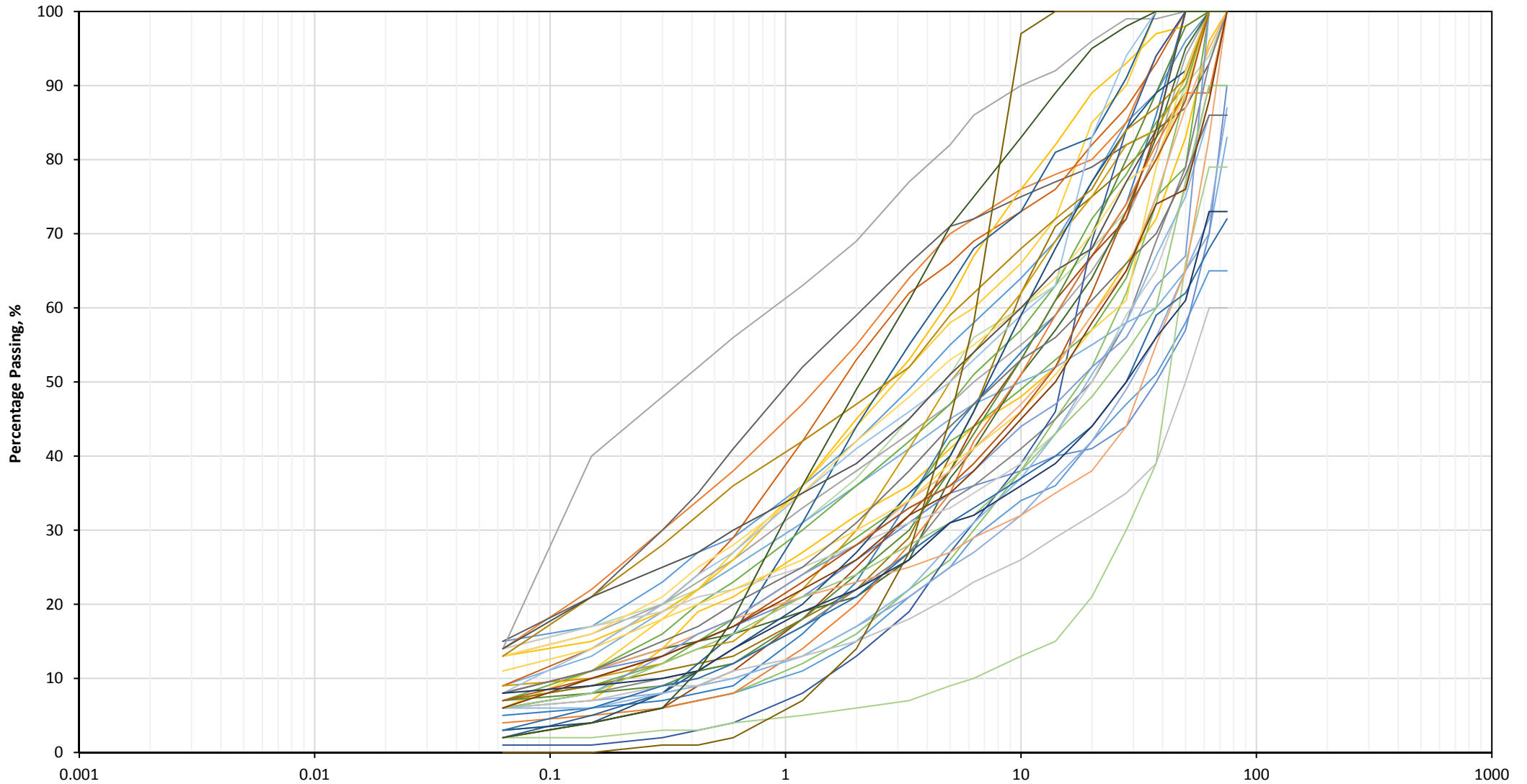
Peat - pH vs Depth

D233985-00

FIGURE 5.03



**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)
Glacial Gravels derived from Granite
Natural Moisture Content vs Depth**



CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		

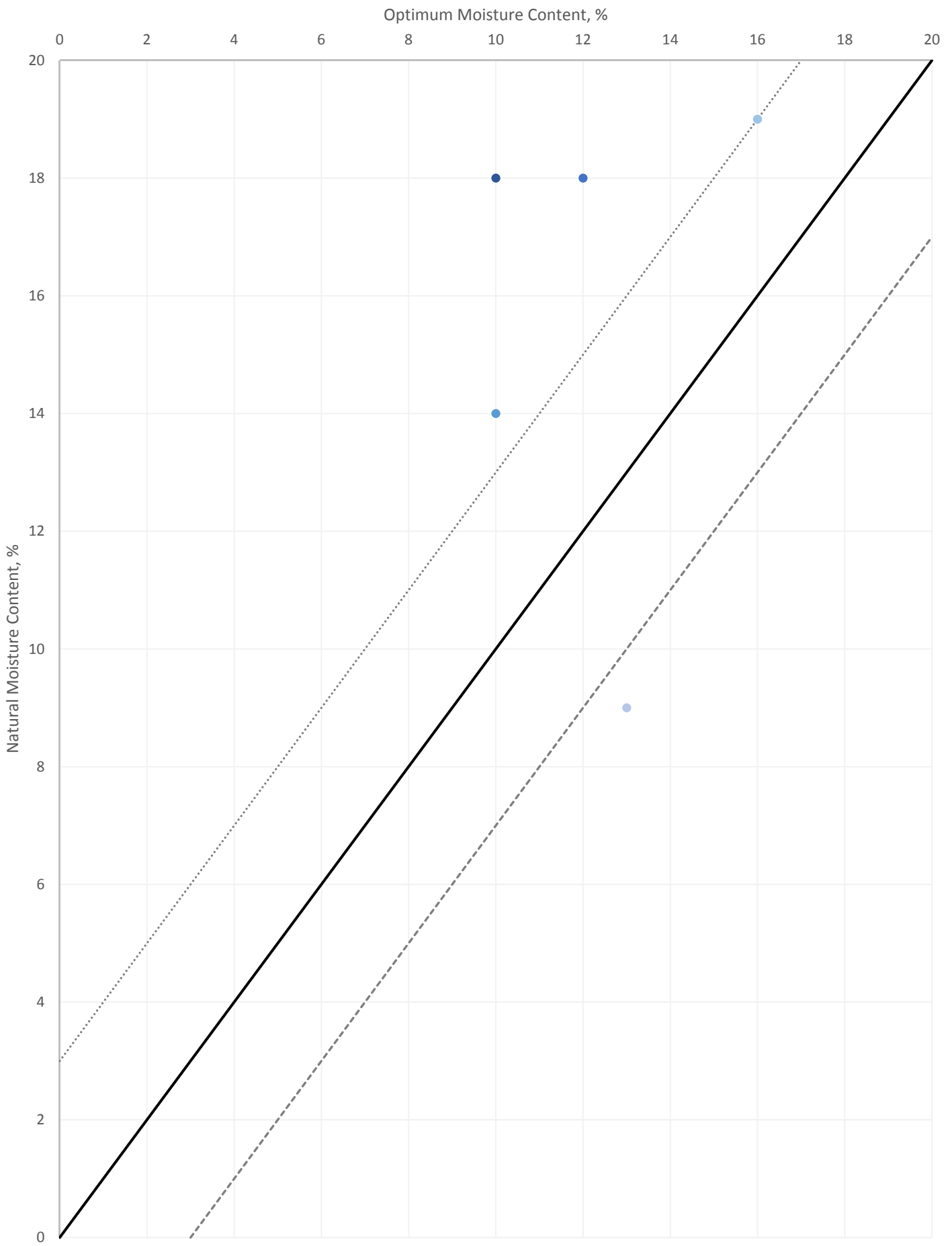
Particle Size, mm

- EW01, TP3/01, 1m
- EW01, TP3/37, 0.5m
- EW01, TP3/02, 0.5m
- EW01, TP319A, 0.5m
- EW01, TP3/03, 0.5m
- EW01, TP3/03, 1.6m
- EW02, TP3/05, 1m
- EW02, TP3/07, 0.2m
- EW02, TP3/06, 1.1m
- EW02, TP3/34, 2m
- EW02, TP3/11, 0.25m
- EW03, TP3/14, 0.2m
- EW05, TP3/43, 0.45m
- EW05, BH3/06, 0.5m
- EW05, TP423, 1m
- EW05, BH424, 0.8m
- EW05, TP419, 1m
- EW05, TP716, 1.6m
- EW05, TP719, 1.6m
- EW06, TP3/17, 0.5m
- EW06, BH3/09, 1m
- EW06, TP3/39, 0.5m
- EW06, TP3/18, 1m
- EW07, TP3/40, 0.3m
- EW08, TP3/21, 0.2m
- EW08, BH3/14, 0.1m
- EW08, BH3/15, 0.2m
- EW08, BH3/15, 0.5m
- EW08, BH3/15, 0.8m
- EW10, BH3/17, 2m
- EW11, BH3/18, 0.5m
- EW11, BH3/19, 0.3m
- EW11, BH3/19, 0.5m
- EW12, BH3/22, 0.3m
- EW13, BH3/23, 3m
- N59 Link, TP3/08, 0.5m
- N59 Link, TP3/08, 1.2m
- N59 Link, BH3/21, 0.5m
- N59 Link, BH3/21, 1m
- N59 Link, BH3/21, 1.7m
- EW02, TP322A, 0.3m
- EW04, TP3/16, 0.2m
- EW05, TP717, 0.7m
- EW08, TP3/19, 0.5m
- EW10, BH3/17, 1m
- EW13, BH3/23, 2m

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**
**Glacial Gravels derived from Granite
Particle Size Distribution**

D233985-00

FIGURE 5.05



..... OMC +3%

----- OMC -3%

———— OMC

● EW01, TP3/03, 1.6m

● EW06, TP3/17, 0.5m

● EW08, TP3/19, 0.5m

● EW08, TP3/21, 0.15m

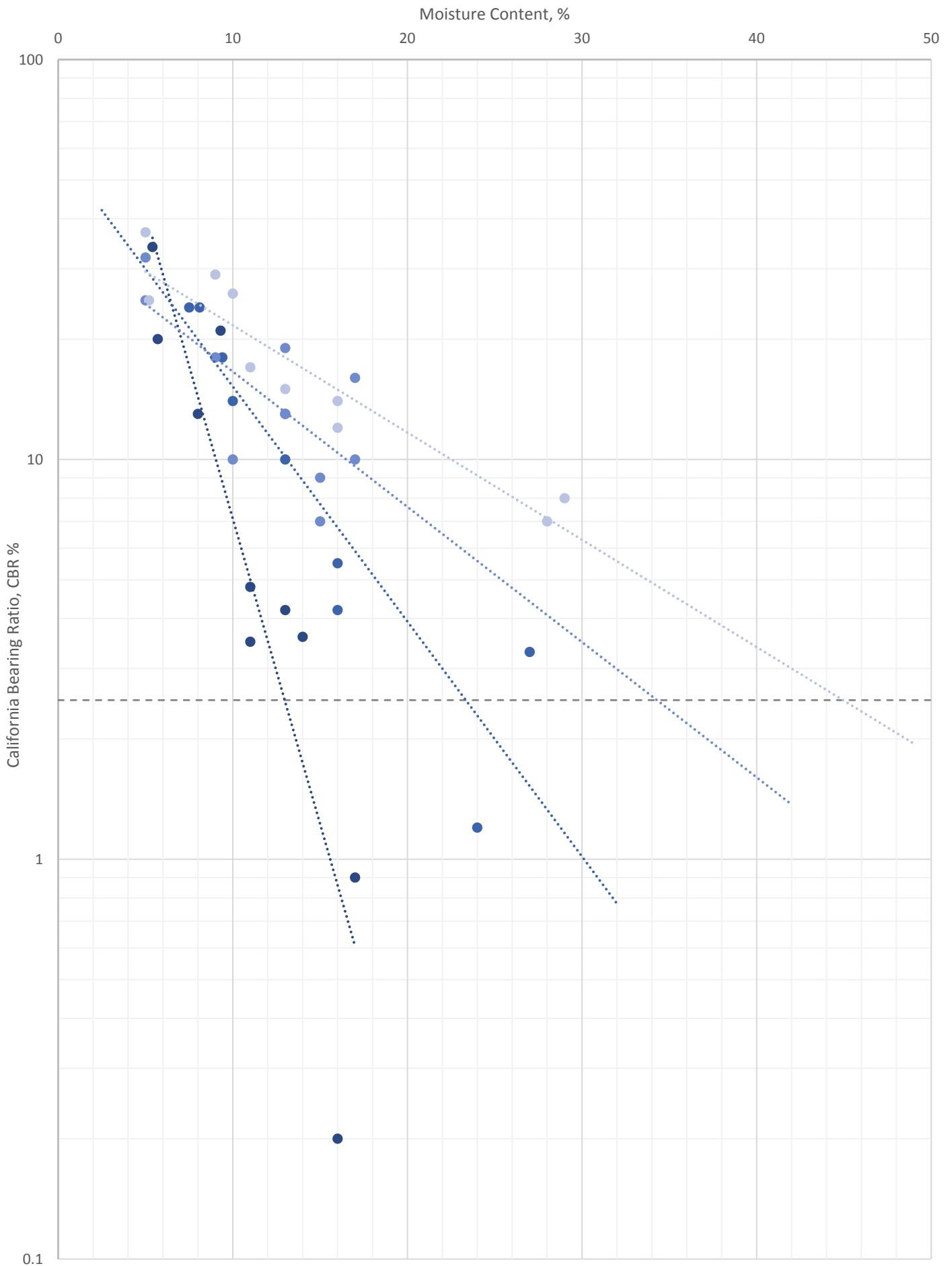
● N59 Link, BH3/20, 0.5m

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

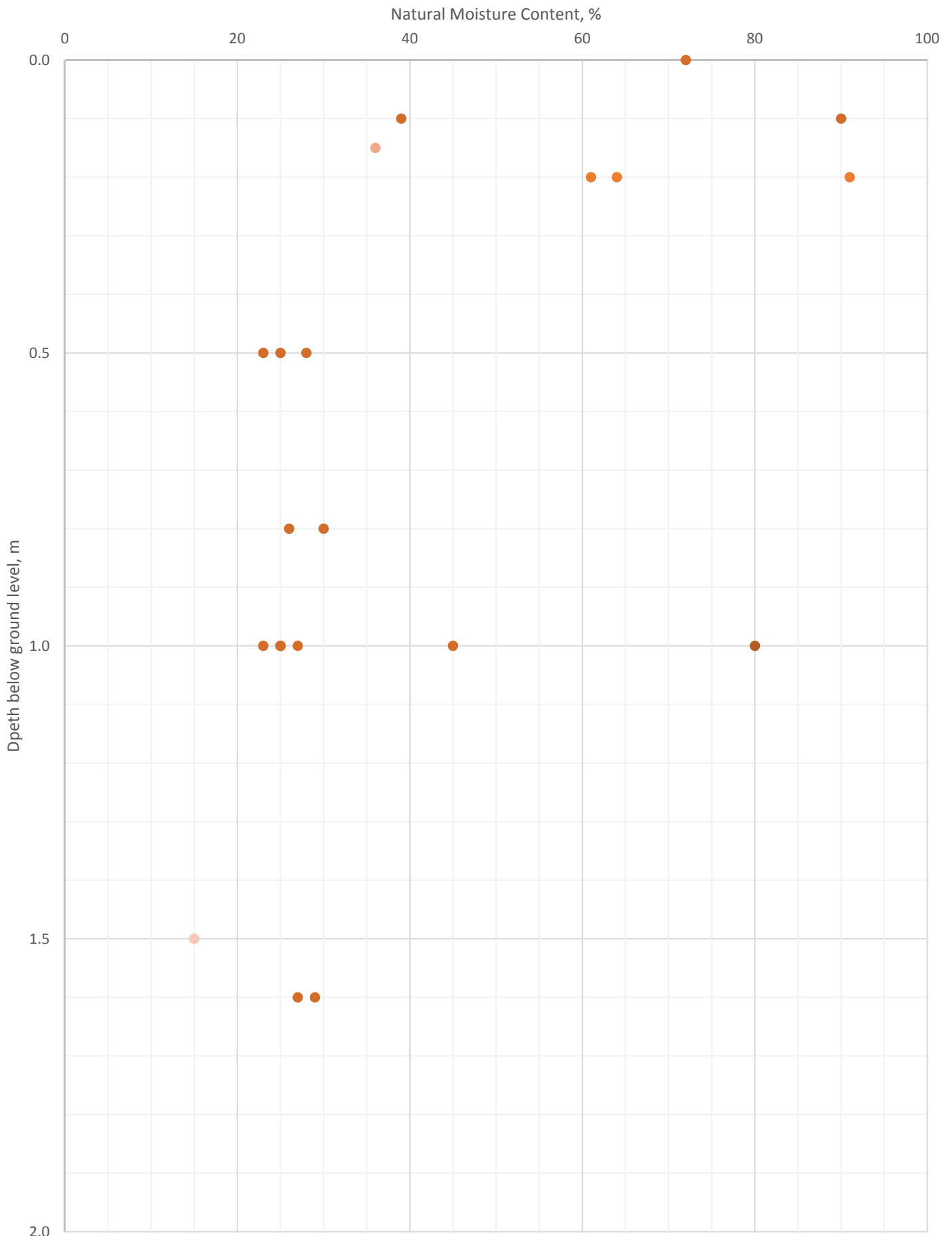
**Glacial Gravels derived from Granite
Optimum vs Natural Moisture Content**

D233985-00

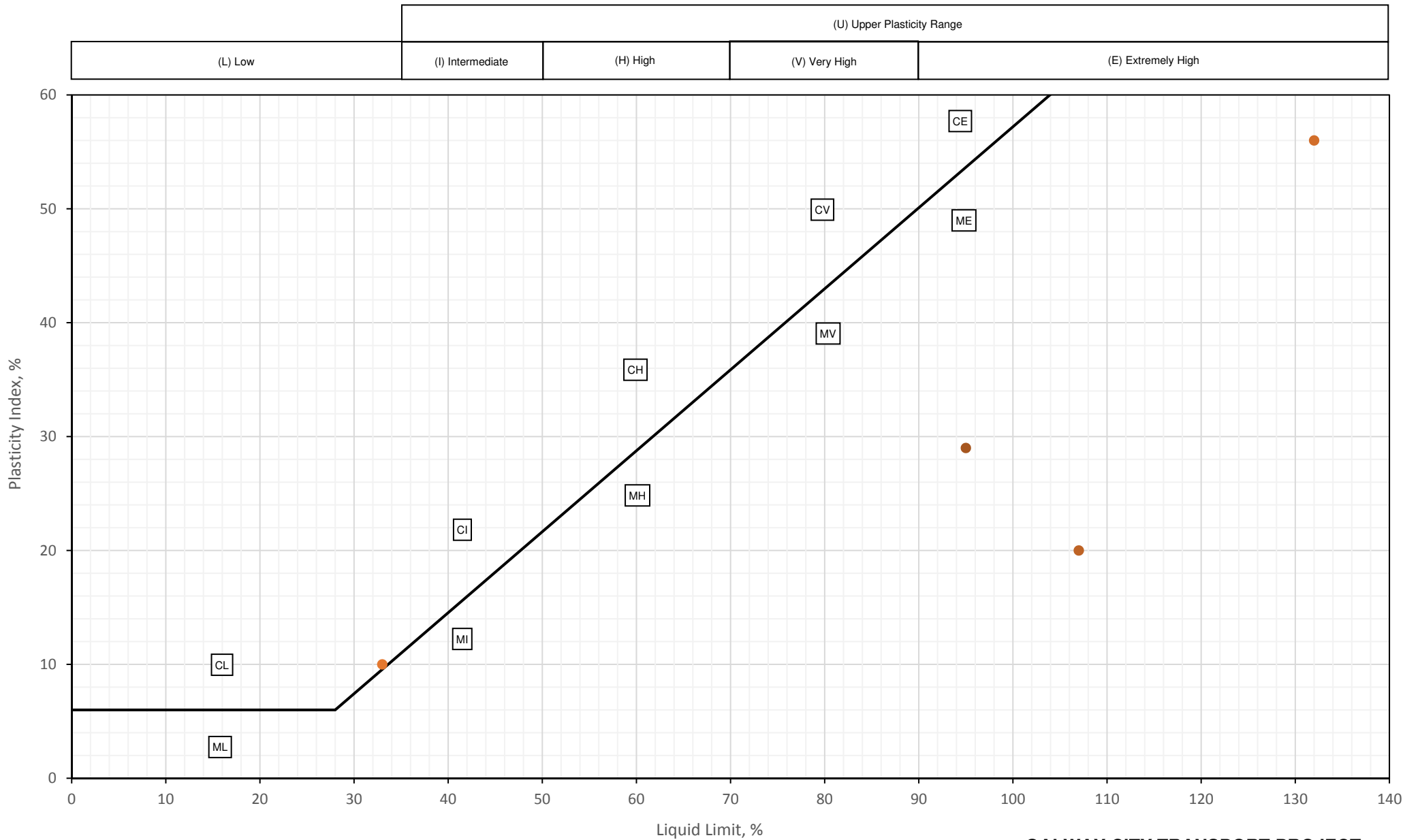
FIGURE 5.06



**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**
Glacial Gravels derived from Granite
Moisture Content vs California Bearing Ratio



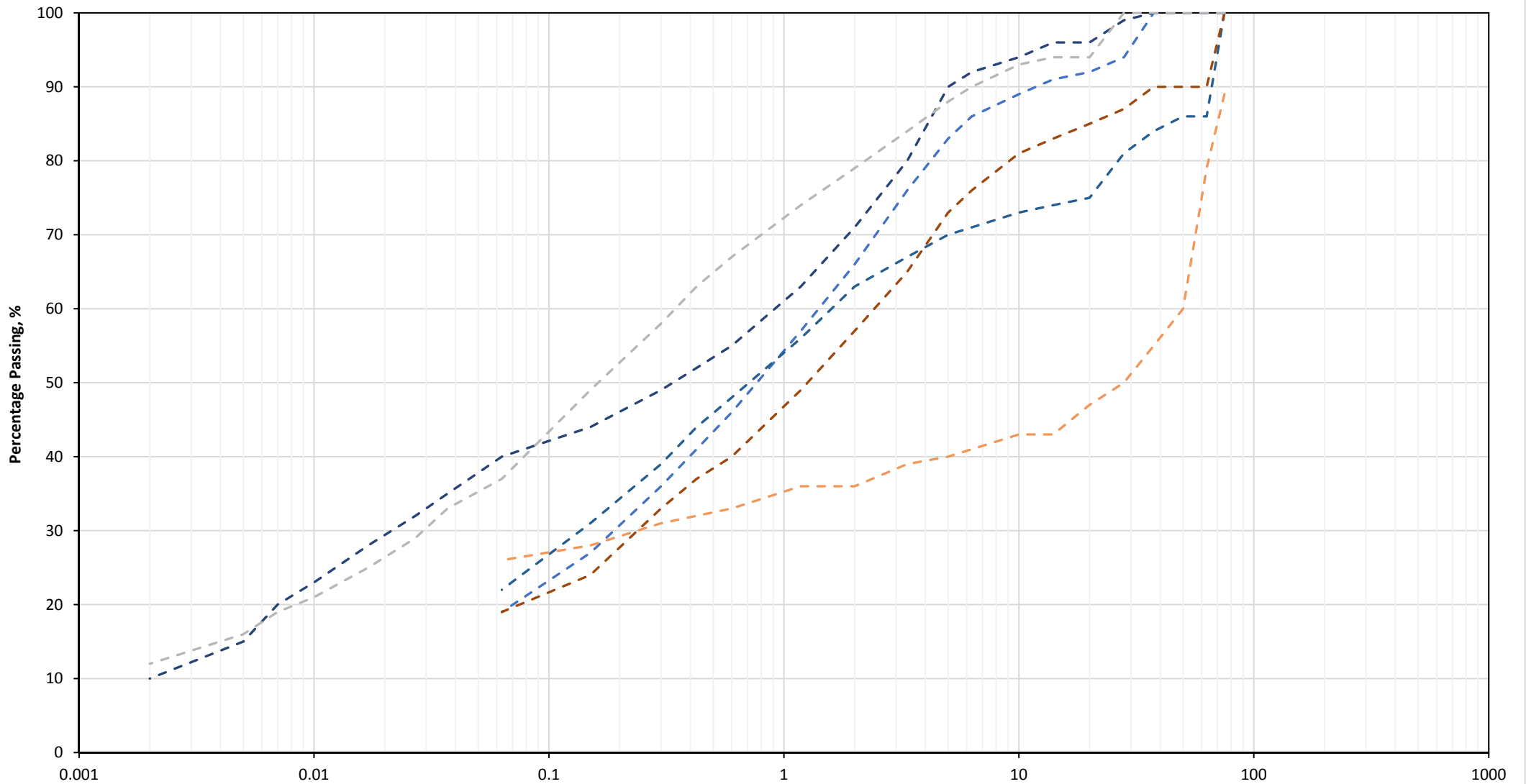
**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**
Glacial Till derived from Granite
Natural Moisture Content vs Depth



● EW01, TP319A, 0.5m ● EW01, TP1402, 0.3m ● EW02, TP322A, 0.5m ● EW05, TP419, 1m

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

**Glacial Till derived from Granite
Casagrande Plasticity Chart**



CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		

Particle Size, mm

--- EW02, TP3/04, 0.8m

--- EW02, TP3/29, 1m

--- EW02, TP3/29, 1.6m

--- EW02, TP3/34, 1m

--- EW02, TP3/13, 0.1m

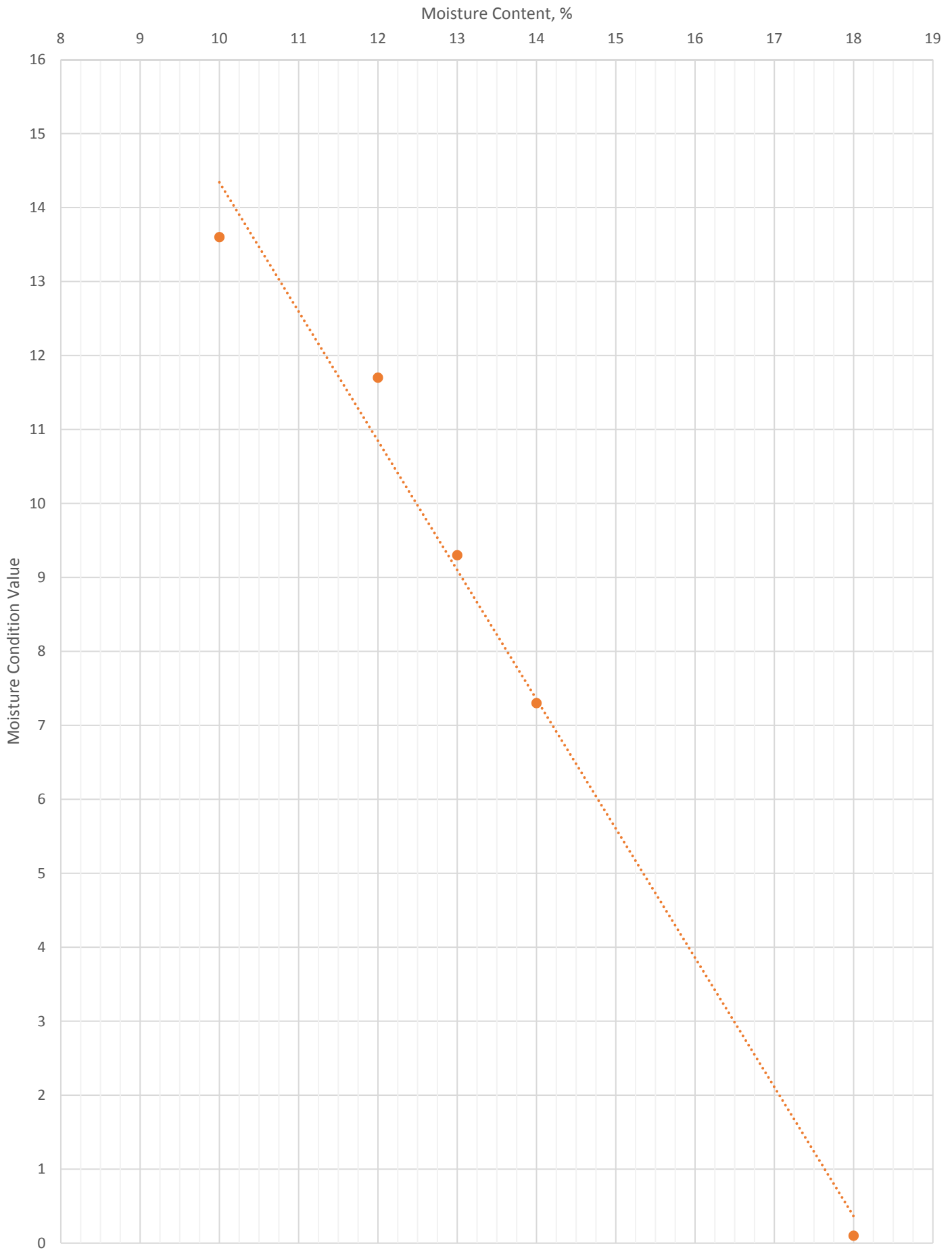
--- EW02, TP3/13, 0.5m

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

**Glacial Till derived from Granite
Particle Size Distribution**

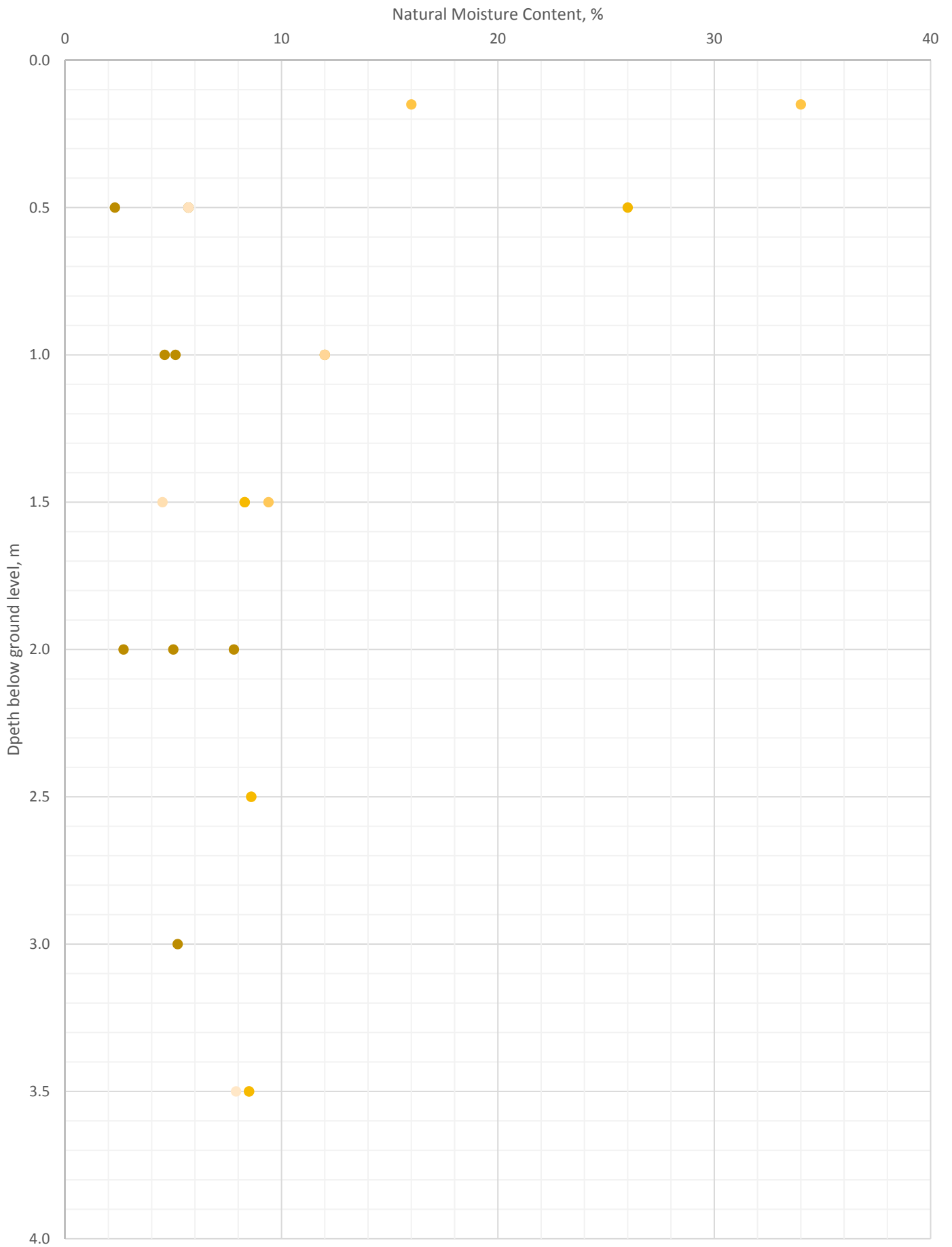
D233985-00

FIGURE 5.10



- EW02, TP3/34, 1m
- Linear (EW02, TP3/34, 1m)

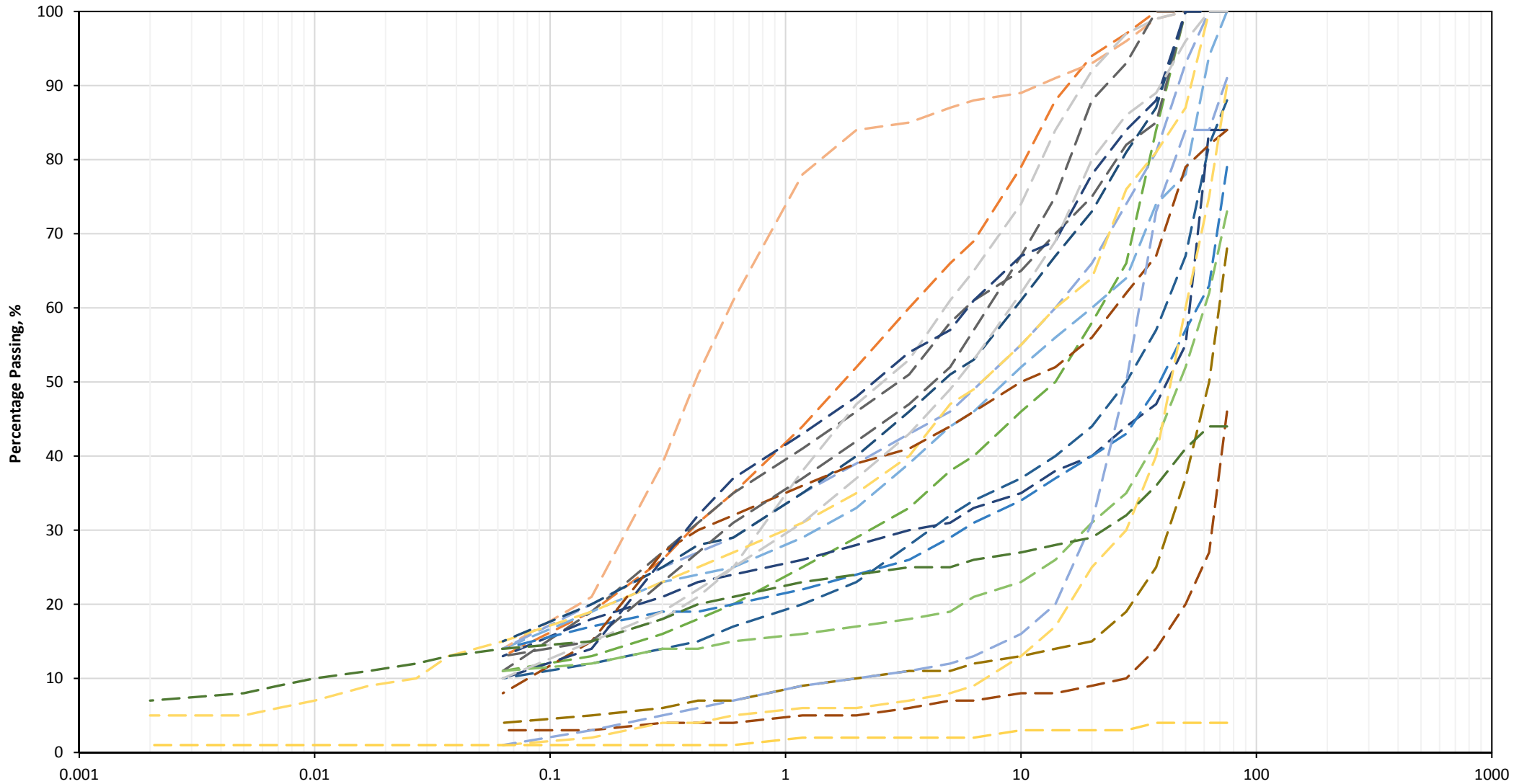
**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**
**Glacial Till derived from Granite
Moisture Content vs Moisture Condition Value**



**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

**Glacial Gravels derived from Limestone
Natural Moisture Content vs Depth**

- EW14 ● EW15 ● EW16 ● EW17 ● EW18
- EW21 ● EW22 ● EW23 ● EW27 ● EW29



CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		

Particle Size, mm

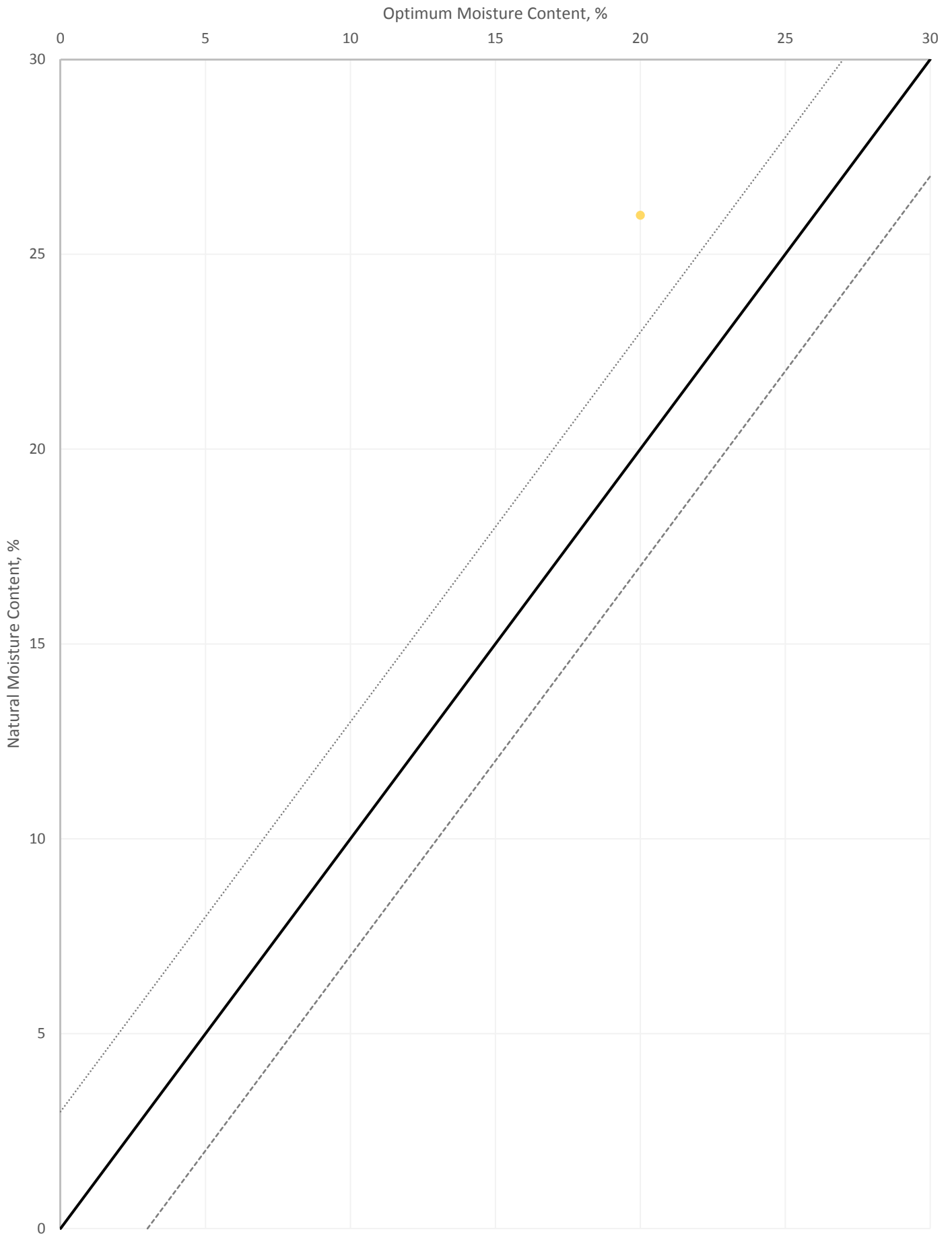
- EW14, SSE TP1, 2m
- EW15, BH3/54, 1m
- EW17, BH3/29, 1.5m
- EW21, TP3/25, 1m
- EW15, TP951, 1m
- EW22, R6136/139745, 0.5m
- EW14, BH3/53, 0.5m
- EW15, BH3/54, 2m
- EW16, TP134, 0.5m
- EW27, SW3/16, 1.5m
- EW14, BH3/53, 1m
- EW15, BH3/54, 3m
- EW18, TP3/42, 3.5m
- EW15, TP121, 1m
- EW22, R6136/139742, 0.5m
- EW15, BH3/54, 0.5m
- EW15, BH3/25, 1m
- EW21, TP3/25, 0.15m
- EW15, TP 1432, 1m
- EW22, R6136/139746, 0.5m
- EW29, TP3/53, 3.5m

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

**Glacial Gravels derived from Limestone
Particle Size Distribution**

D233985-00

FIGURE 5.13

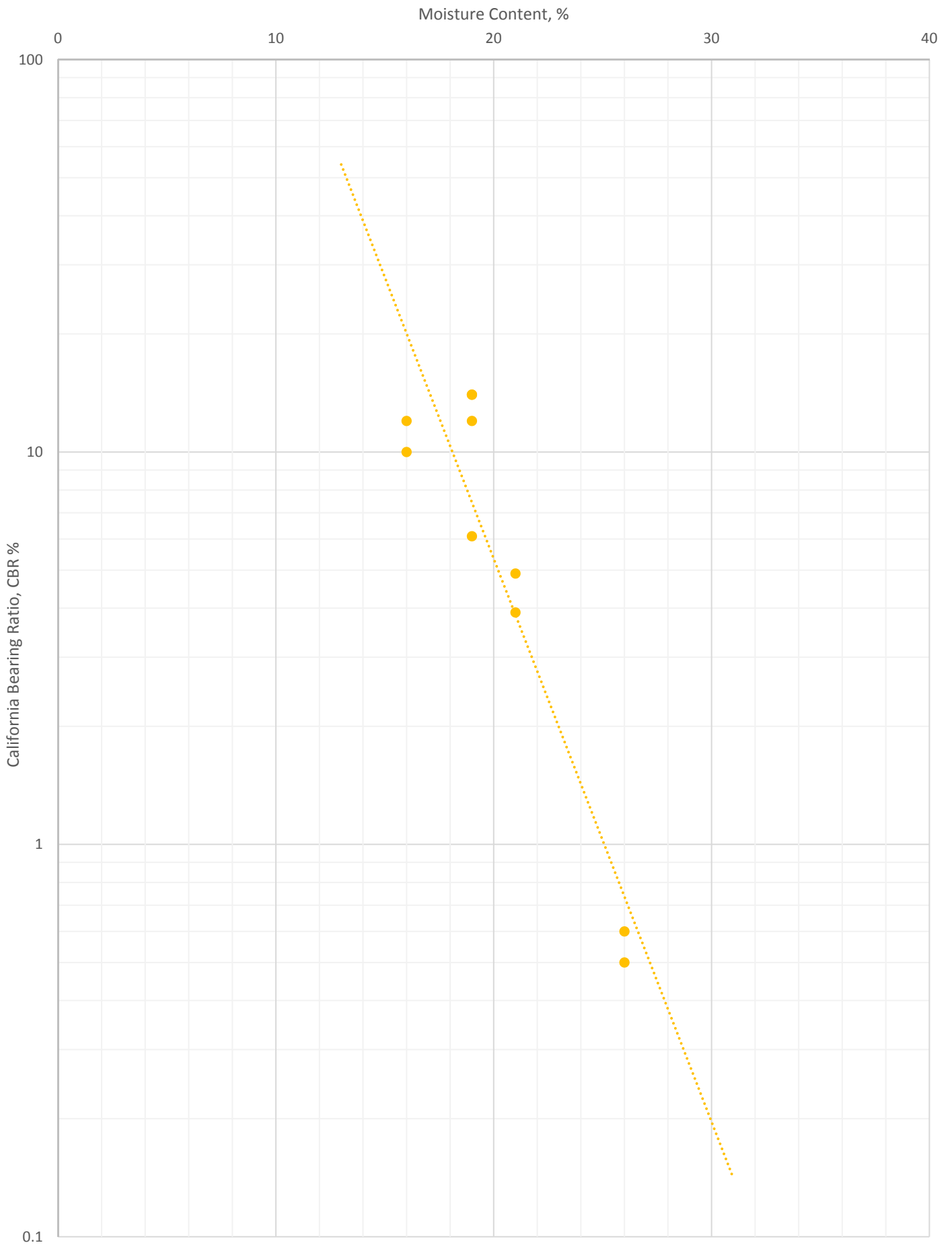


- OMC +3%
- OMC -3%
- OMC
- EW16, TP134, 0.5m

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)
Glacial Gravels derived from Limestone
Optimum vs Natural Moisture Content**

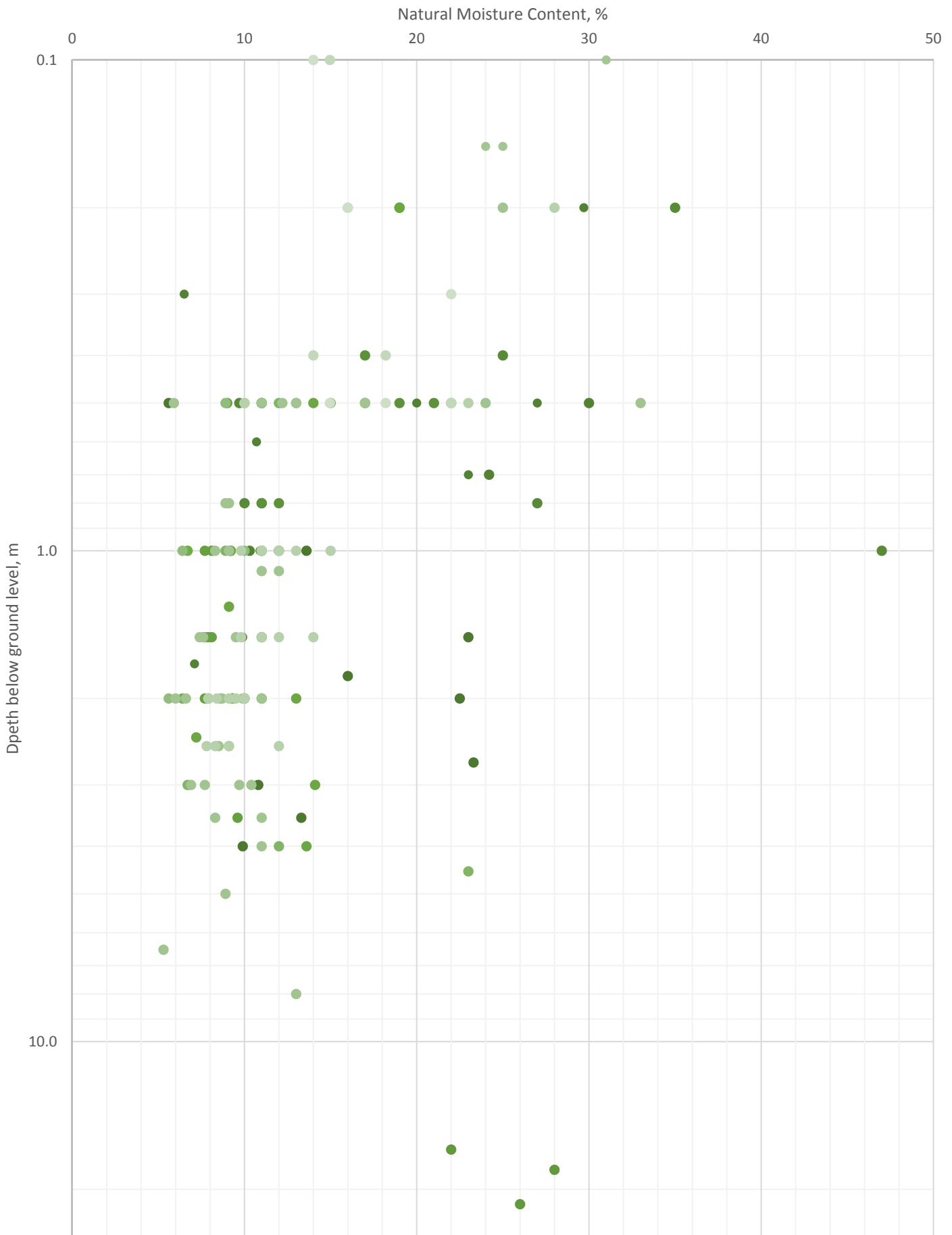
D233985-00

FIGURE 5.14



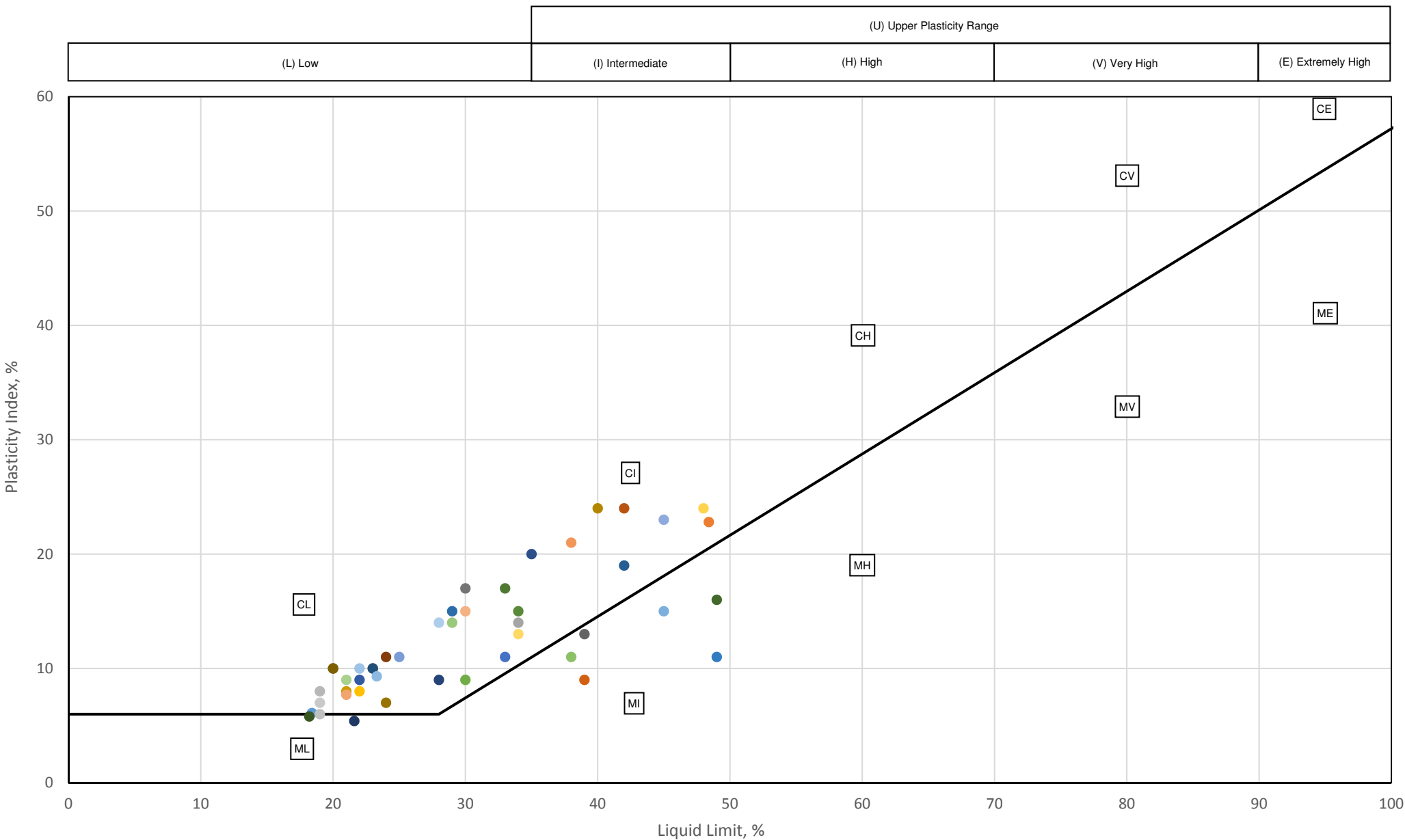
● EW16, TP134, 0.5m

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)
Glacial Gravels derived from Limestone
Moisture Content vs California Bearing Ratio**



- EW14 ● EW15 ● EW16 ● EW17 ● EW18 ● EW19
- EW21 ● EW22 ● EW23 ● EW24 ● EW25 ● EW26
- EW27 ● EW28 ● EW29 ● EW30 ● EW32 ● EW33

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**
**Glacial Till derived from Limestone
Natural Moisture Content vs Depth**



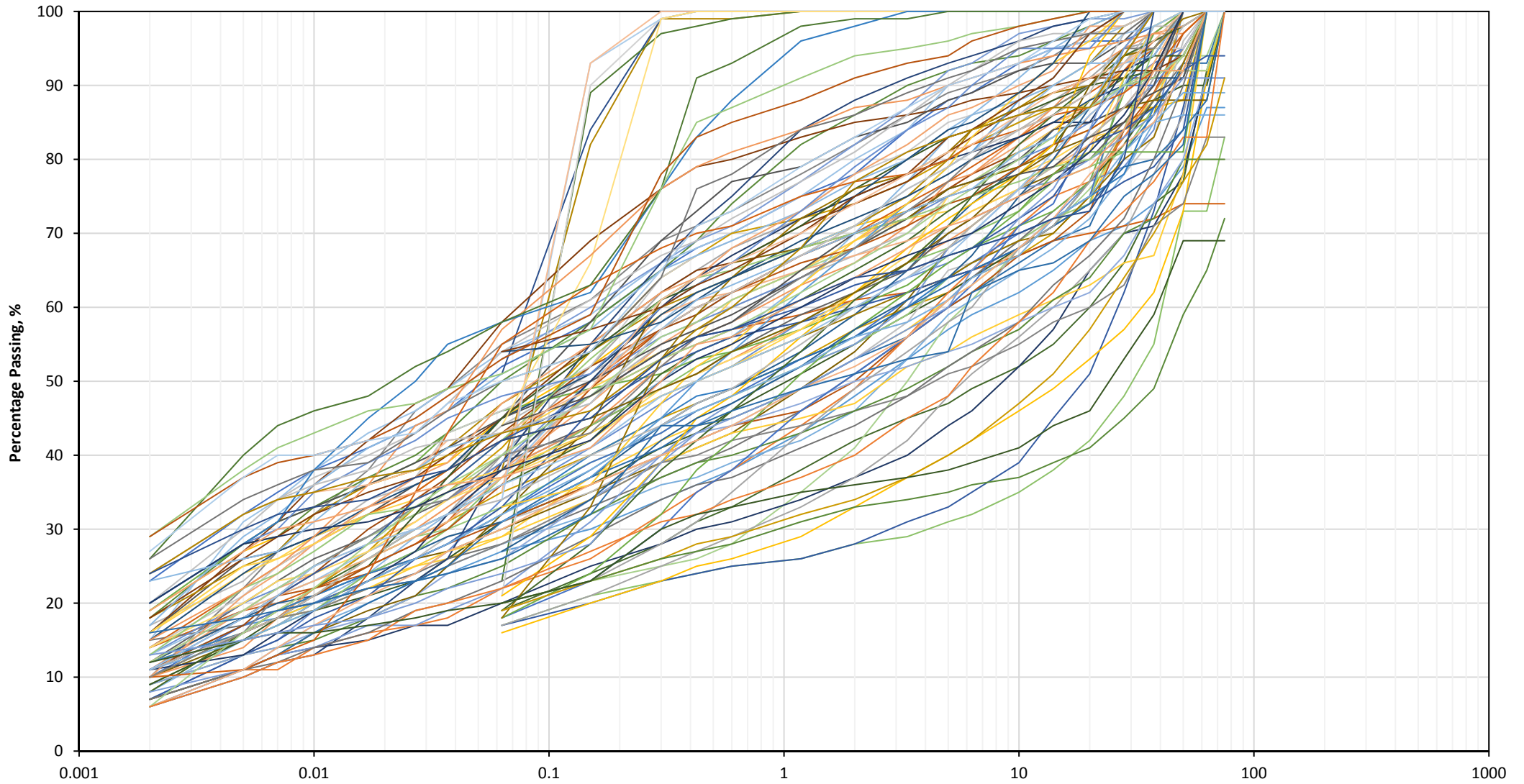
- | | | | | | |
|----------------------------|----------------------------|----------------------------|----------------------------|----------------------|----------------------------|
| ● EW14, SSE BH2, 2m | ● EW14, SSE BH1, 2.7m | ● EW15, TP127B, 0.5m | ● EW15, TP127A, 0.5m | ● EW15, TP128, 0.3m | ● EW15, TP962, 0.6m |
| ● EW16, TP969, 0.7m | ● EW16, TP134A, 0.5m | ● EW16, TP971, 1m | ● EW16, TP136, 0.5m | ● EW17, TP139, 0.2m | ● EW17, TP142, 1m |
| ● EW18, TP3/41, 0.5m | ● EW18, TP3/42, 0.8m | ● EW19, BH06, 16.6m | ● EW19, BH06, 18.25m | ● EW19, BH06, 21.45m | ● EW22, R6136/139754, 1.5m |
| ● EW22, R6136/139745, 3.5m | ● EW22, R6136/139740, 0.5m | ● EW22, R6136/139741, 1.5m | ● EW22, R6136/139739, 1.5m | ● EW23, BH3/31, 1m | ● EW23, BH3/31, 4m |
| ● EW25, BH3/32, 5m | ● EW25, BH3/32, 9m | ● EW27, BH3/35CP, 0.5m | ● EW27, BH3/47, 2m | ● EW27, BH3/47, 3m | ● EW29, TP3/44, 2m |
| ● EW30, TP3/45, 2.5m | ● EW32, R1340/67206, 2m | ● EW33, R1340/67210, 0.5m | ● EW33, R1340/67212, 0.5m | ● EW15, TP1436, 1m | ● EW15, TP1436, 1.5m |
| ● EW27, SW3/17, 0.2m | ● EW27, TP3/50, 0.8m | ● EW27, TP3/50, 2m | ● EW27, TP3/50, 3m | ● EW27, SW3/16, 0.5m | ● EW29, TP3/52, 0.5m |
| ● EW29, TP3/52, 0.5m | ● EW29, TP3/53, 1m | ● EW29, TP3/53, 2m | ● EW29, TP3/53, 3.5m | | |

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

**Glacial Till derived from Limestone
Casagrande Plasticity Chart**

D233985-00

FIGURE 5.17

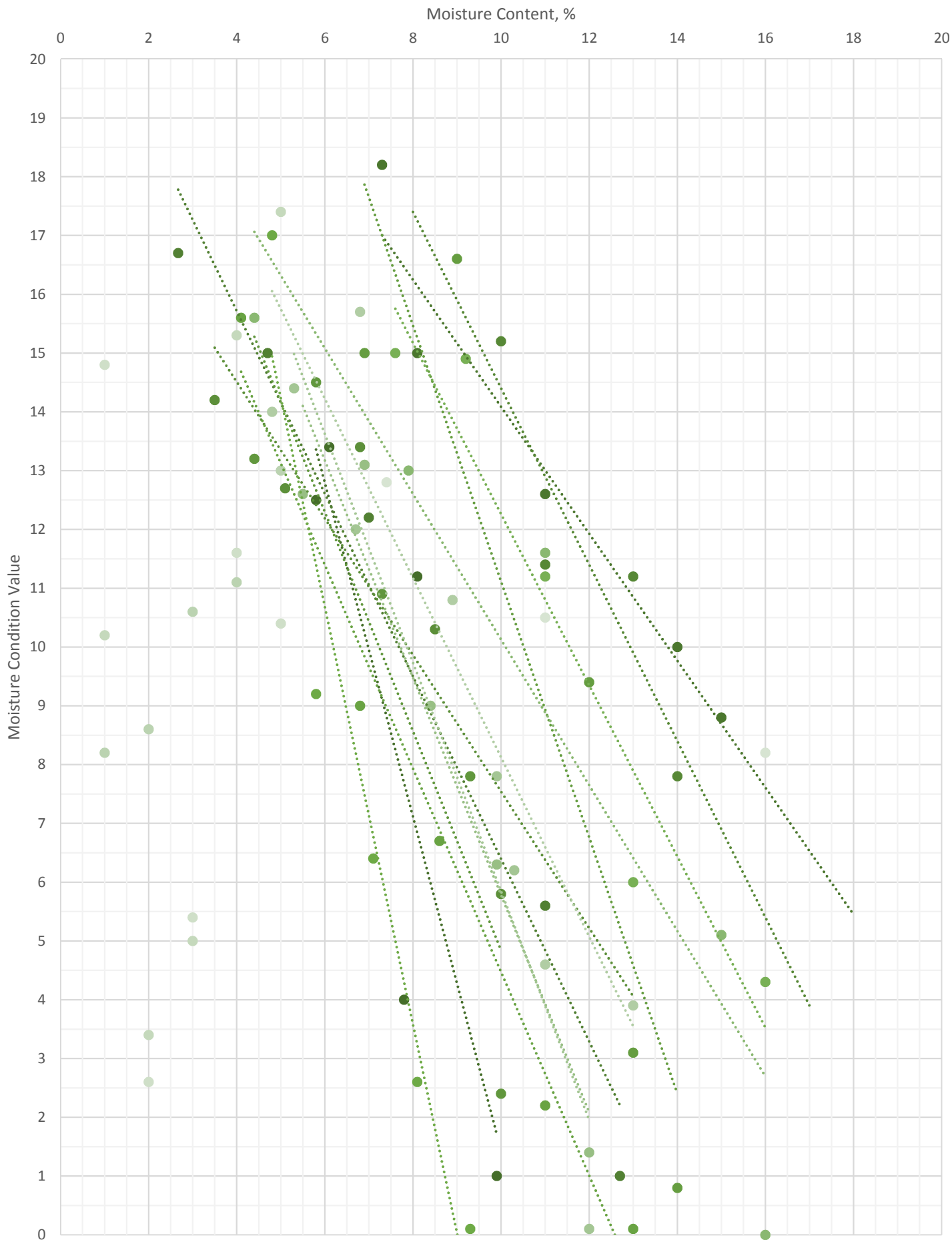


CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		

- Particle Size, mm**
- | | | | | | | |
|-----------------------|-------------------------|-------------------------|-------------------------|---------------------|---------------------|--------------------------|
| EW14, BH3/52, 0.5m | EW14, BH3/52, 1m | EW14, BH3/52, 2m | EW14, BH3/52, 3m | EW15, BH3/25, 0.5m | EW15, BH3/25, 2m | EW15, BH3/27, 0.5m |
| EW15, BH3/27, 1m | EW16, BH3/28, 0.2m | EW17, BH3/29, 1m | EW17, BH3/29, 2.5m | EW17, TP3/36, 0.4m | EW17, TP3/36, 0.8m | EW17, TP3/24, 0.5m |
| EW18, TP3/41, 0.5m | EW18, TP3/42, 0.8m | EW18, BH03, 14.9m | EW18, BH03, 19m | EW18, BH03, 25.5m | EW21, TP3/25, 2m | EW23, BH3/31, 0.3m |
| EW23, BH3/31, 0.5m | EW23, BH3/31, 0.6m | EW23, BH3/31, 1m | EW23, BH3/31, 2m | EW23, BH3/31, 3m | EW23, BH3/31, 4m | EW24, TP3/27, 0.5m |
| EW24, TP3/27, 1m | EW24, TP3/27, 2m | EW26, BH3/32, 0.5m | EW26, BH3/32, 1m | EW26, BH3/32, 2m | EW26, BH3/32, 3m | EW26, BH3/32, 4m |
| EW26, BH3/33, 0.5m | EW26, BH3/33, 1m | EW26, BH3/33, 2m | EW26, BH3/34, 0.5m | EW26, BH3/34, 1m | EW26, BH3/34, 2m | EW27, TP3/31, 0.5m |
| EW27, TP3/31, 2.5m | EW27, TP3/31, 3.5m | EW27, SW3/02, 0.5m | EW27, SW3/02, 1m | EW27, TP3/28, 0.5m | EW27, TP3/28, 1m | EW27, TP3/28, 2m |
| EW27, TP3/28, 3m | EW27, BH3/35, 0.5m | EW27, BH3/35CP, 0.5m | EW27, BH3/35, 1m | EW27, BH3/35CP, 1m | EW27, BH3/35, 2m | EW27, BH3/35, 3m |
| EW27, BH3/35, 4m | EW27, BH3/35, 5m | EW27, BH3/35, 6.5m | EW27, BH3/35, 8m | EW28, TP3/23, 0.5m | EW28, TP3/23, 1m | EW28, TP3/23, 2m |
| EW28, BH3/47, 0.5m | EW28, BH3/47, 1m | EW28, BH3/47, 2m | EW28, BH3/47, 3m | EW28, BH3/36, 0.1m | EW28, TP3/22, 0.15m | EW29, TP3/44, 1m |
| EW29, TP3/44, 2m | EW30, TP3/45, 1.5m | EW30, TP3/45, 2.5m | EW32, BH3/40, 0.15m | EW32, BH3/40, 0.5m | EW32, BH3/48, 0.1m | EW33, BH3/43, 0.2m |
| EW33, BH3/43, 0.3m | EW33, TP3/30, 0.1m | EW18, BH03, 25.8m | EW18, BH03, 26.7m | EW18, BH03, 26.7m | EW18, BH03, 27.55m | EW14, SSE BH2, 1m |
| EW14, SSE TP2, 2m | EW14, SSE BH1, 3.5m | EW14, SSE BH1, 4m | EW15, SSE TP3, 1.8m | EW15, SSE TP3, 1.8m | EW15, TP123, 1.5m | EW15, TP125, 1.5m |
| EW15, TP127B, 0.5m | EW15, TP127A, 0.5m | EW15, TP128, 0.2m | EW15, TP1436, 0.96m | EW15, TP1436, 0.96m | EW16, TP134A, 0.5m | EW16, TP134A, 0.5m |
| EW16, TP971, 1m | EW16, TP136, 0.5m | EW17, TP139, 0.2m | EW17, TP149, 0.1m | EW17, TP151, 0.1m | EW16, TP969, 0.7m | EW22, R6136/139754, 3.5m |
| EW32, R1340/67206, 2m | EW32, R1340/67207, 1.5m | EW33, R1340/67210, 0.5m | EW33, R1340/67212, 0.5m | EW23, SW3/19, 0.2m | EW27, SW3/17, 0.2m | EW27, TP3/50, 0.8m |
| EW27, TP3/50, 1.5m | EW27, TP3/50, 2m | EW27, TP3/50, 3m | EW27, SW3/12, 1m | EW27, SW3/12, 2m | EW27, SW3/16, 3m | EW29, TP3/52, 0.2m |
| EW29, TP3/52, 0.5m | EW29, TP3/53, 1m | EW29, TP3/53, 2m | EW29, TP3/53, 2m | EW29, TP3/53, 2.5m | EW29, SW3/13, 1.5m | |

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)
Glacial Till derived from Limestone
Particle Size Distribution**

D233985-00 FIGURE 5.18

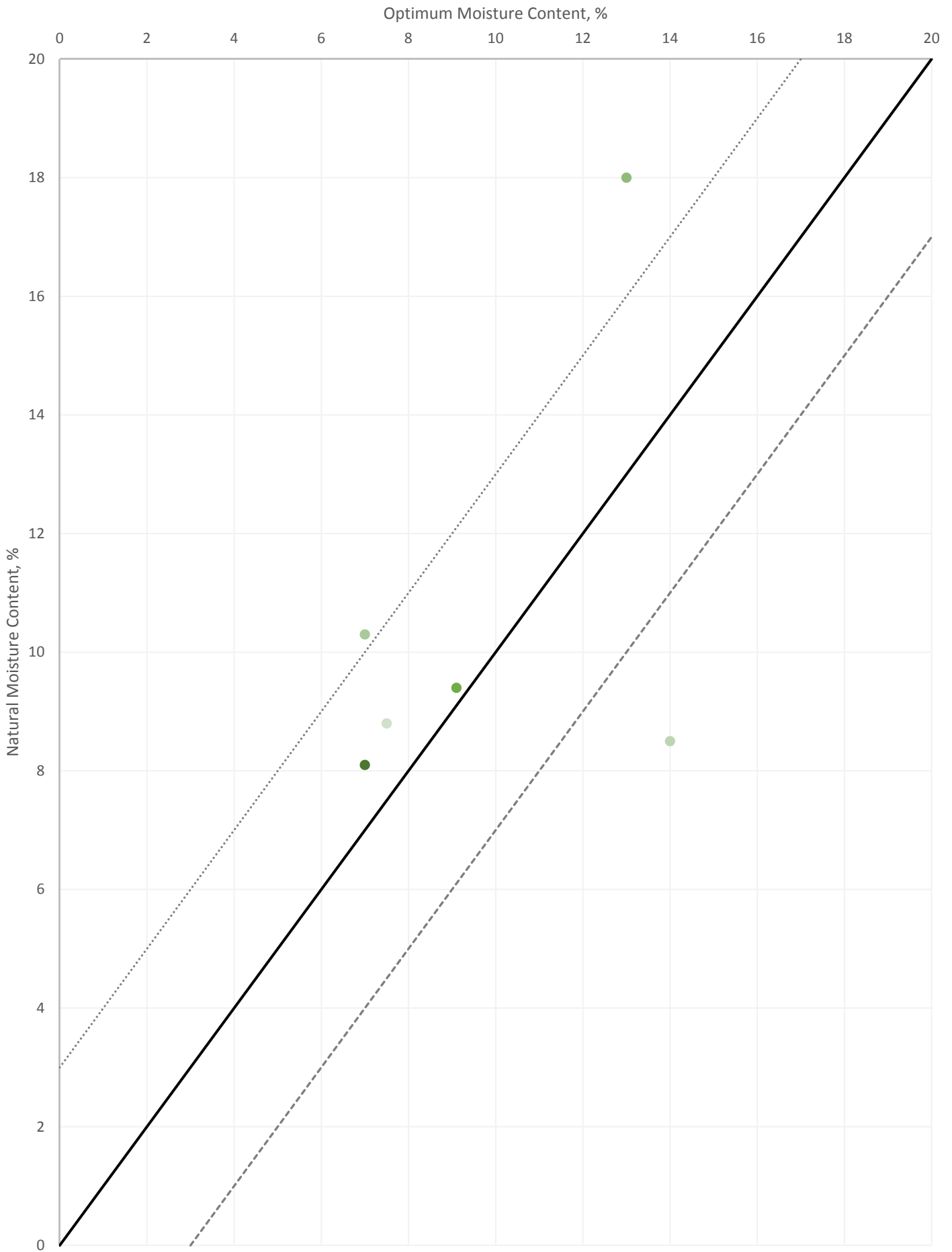


- EW15, TP125, 1.7m
- EW16, TP971, 1m
- EW18, TP3/42, 0.8m
- EW25, BH3/32, 3m
- EW26, BH3/33, 2m
- EW26, BH3/34, 2m
- EW27, TP3/23, 2m
- EW28, BH3/36, 0.1m
- EW30, TP3/45, 1.5m
- EW15, TP128, 0.3m
- EW17, TP142, 1m
- EW24, TP3/27, 1m
- EW26, BH3/33, 1m
- EW26, BH3/34, 1m
- EW27, TP3/23, 1.1m
- EW27, BH3/47, 2m
- EW29, TP3/44, 2m
- EW33, BH3/43, 0.2m

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**
Glacial Till derived from Limestone
Moisture Content vs Moisture Condition Value

D233985-00

FIGURE 5.19



..... OMC +3%

———— OMC

● EW15, TP125, 1.7m

● EW17, TP142, 1m

● EW22, R6136/139741, 1.5m

----- OMC -3%

● EW15, TP128, 0.3m

● EW16, TP971, 1m

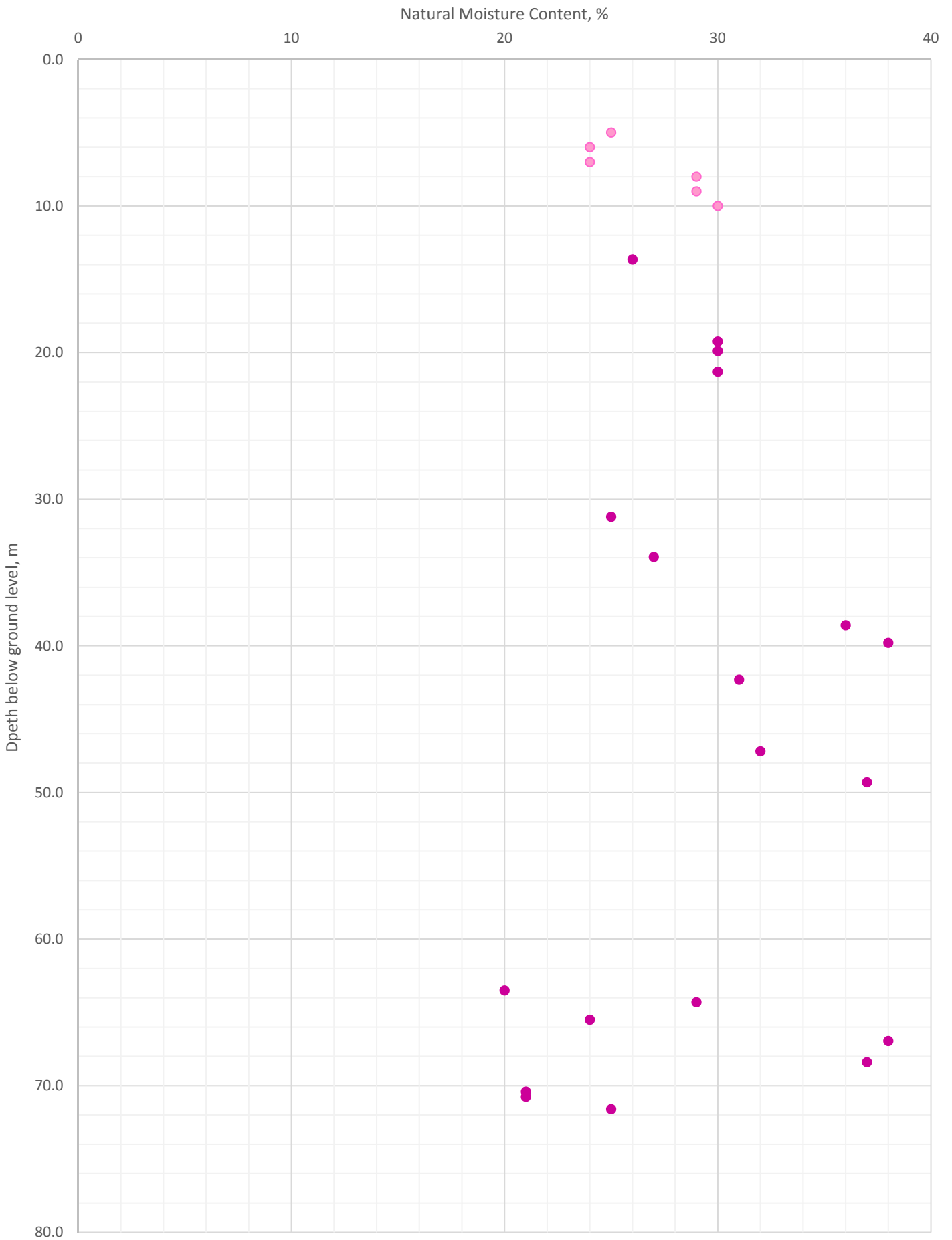
● EW21, TP3/25, 1m

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

**Glacial Till derived from Limestone
Optimum vs Natural Moisture Content**

D233985-00

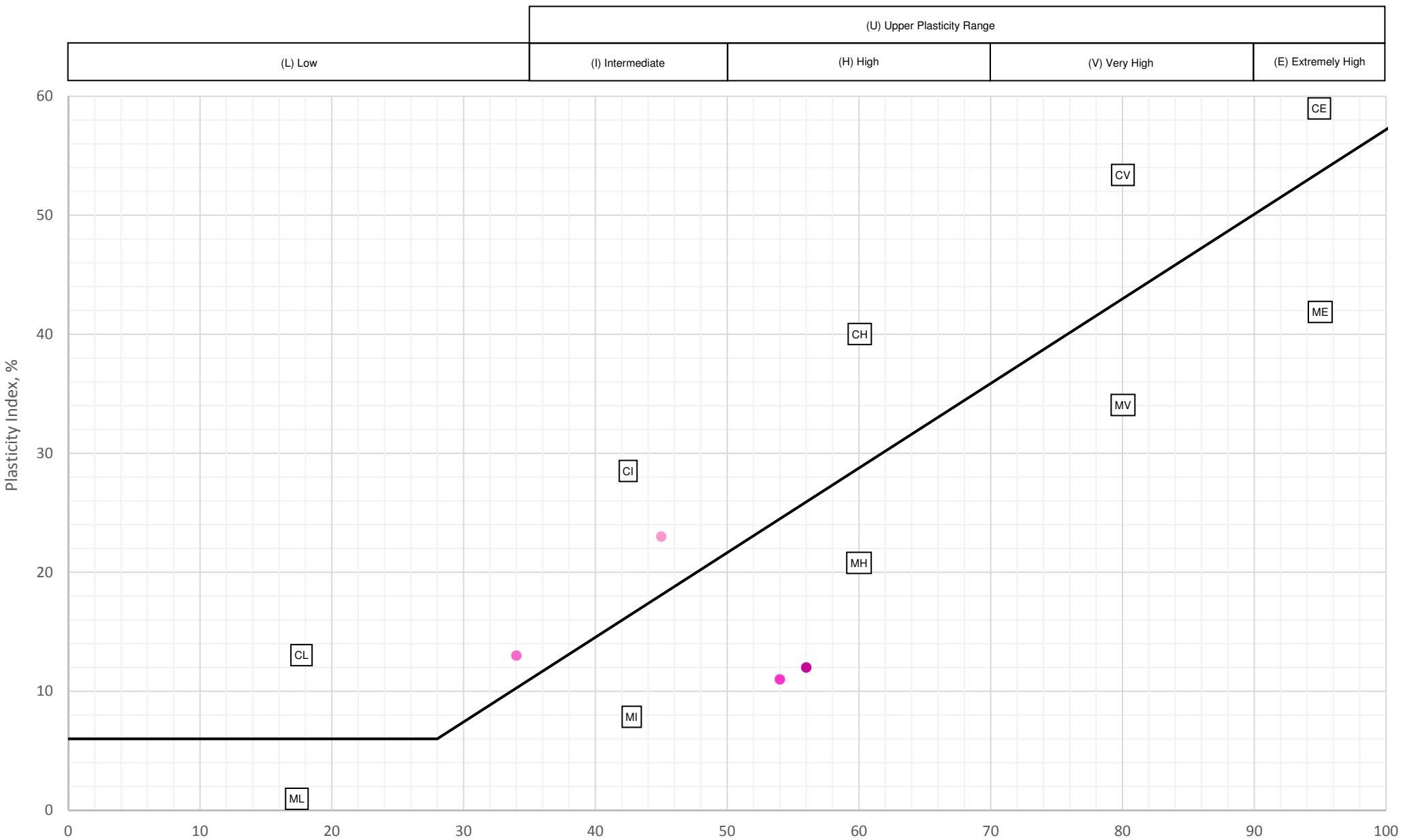
FIGURE 5.20



**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

**Palaeokarst Fill
Natural Moisture Content vs Depth**

● EW18 ● EW25



● EW18, BH03, 39.8m

● EW18, BH03, 49.3m

● EW25, BH3/32, 5m

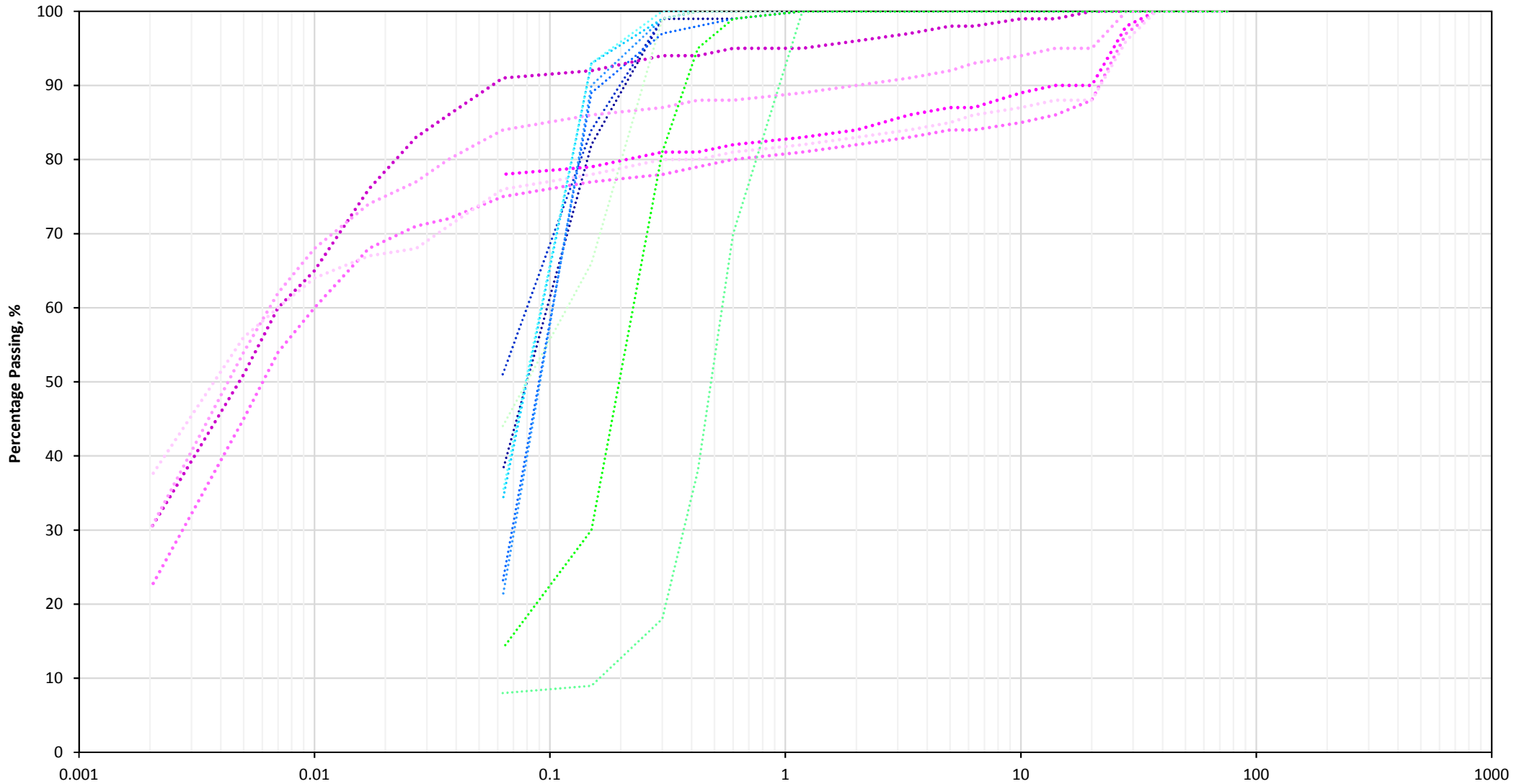
● EW25, BH3/32, 9m

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

**Palaeokarst Fill
Casagrande Plasticity Chart**

D233985-00

FIGURE 5.22



CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		

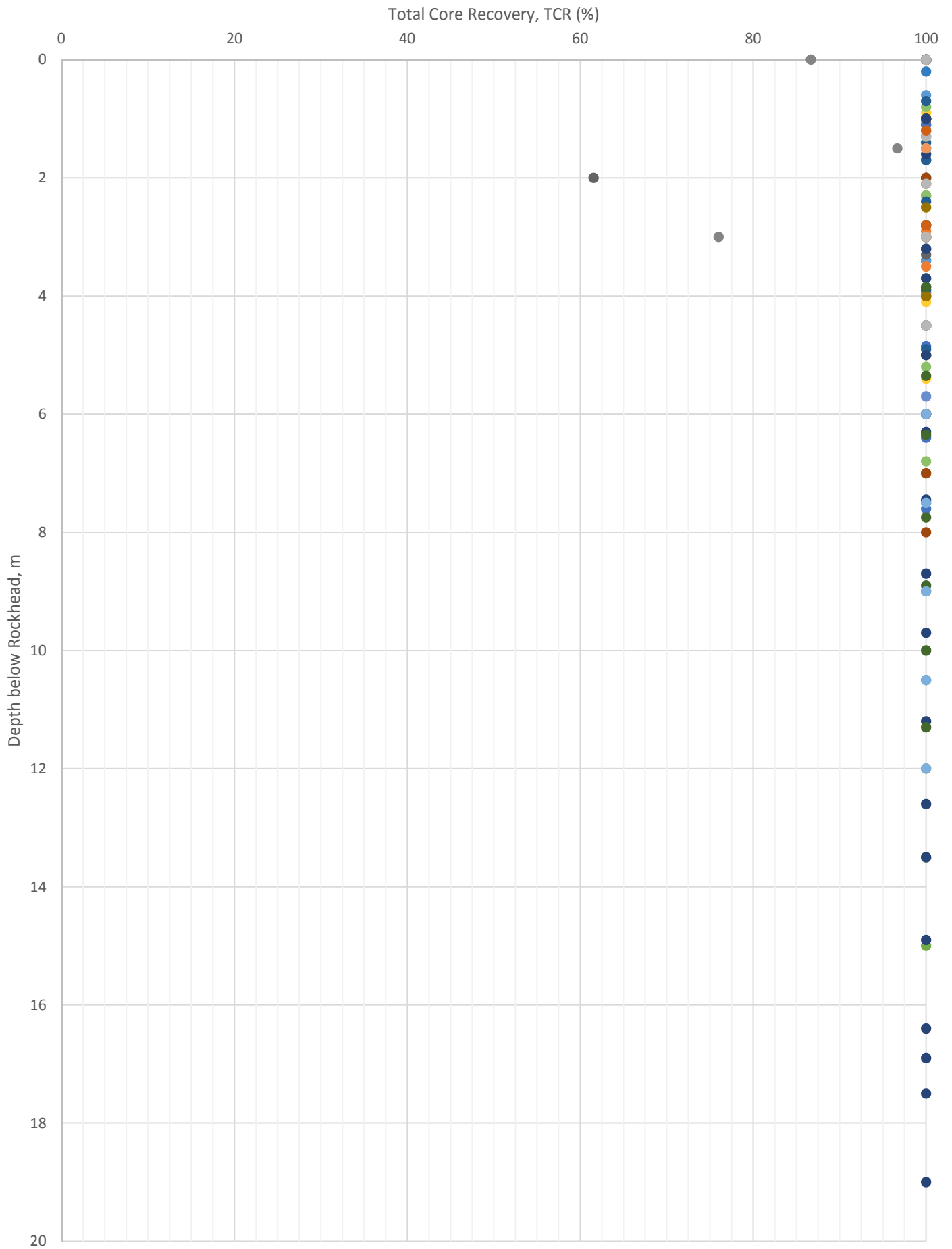
- EW18, BH03, 14.9m EW18, BH03, 19m EW18, BH03, 25.5m EW26, BH3/32, 5m EW26, BH3/32, 6m
- EW26, BH3/32, 7m EW26, BH3/32, 8m EW26, BH3/32, 9m EW18, BH03, 25.8m EW18, BH03, 26.5m
- EW18, BH03, 26.7m EW18, BH03, 27.55m EW18, BH03, 30.25m EW18, BH03, 36.7m

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

**Palaeokarst Fill
Particle Size Distribution**

D233985-00

FIGURE 5.23



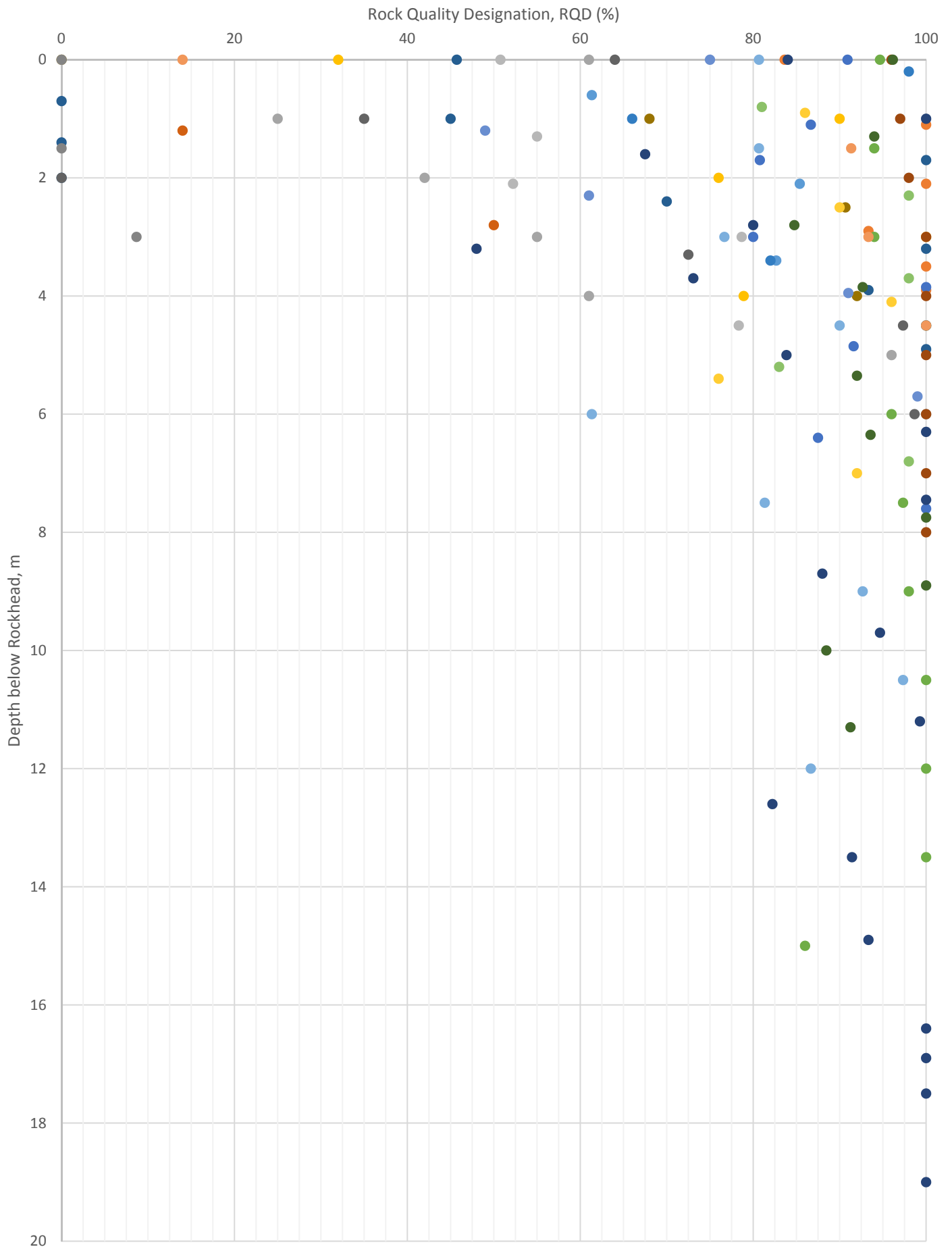
- EW01, RC 507 ● EW01, RC 508 ● EW01, RC 510 ● EW01, RC 511
- EW03, BH3/03R ● EW04, BH3/04R ● EW05, BH3/06R ● EW06, BH3/07R
- EW06, BH3/08R ● EW07, BH3/10R ● EW08, BH3/11R ● EW08, BH3/13R
- EW09, BH3/16R ● EW10, BH3/17R ● EW11, BH3/18R ● EW11, BH3/19R
- EW12, BH3/22R ● EW13, BH3/23R ● EW13, BH3/24R ● EW05, RC 715
- EW05, RC422

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

Granite - Total Core Recovery

D233985-00

FIGURE 5.24



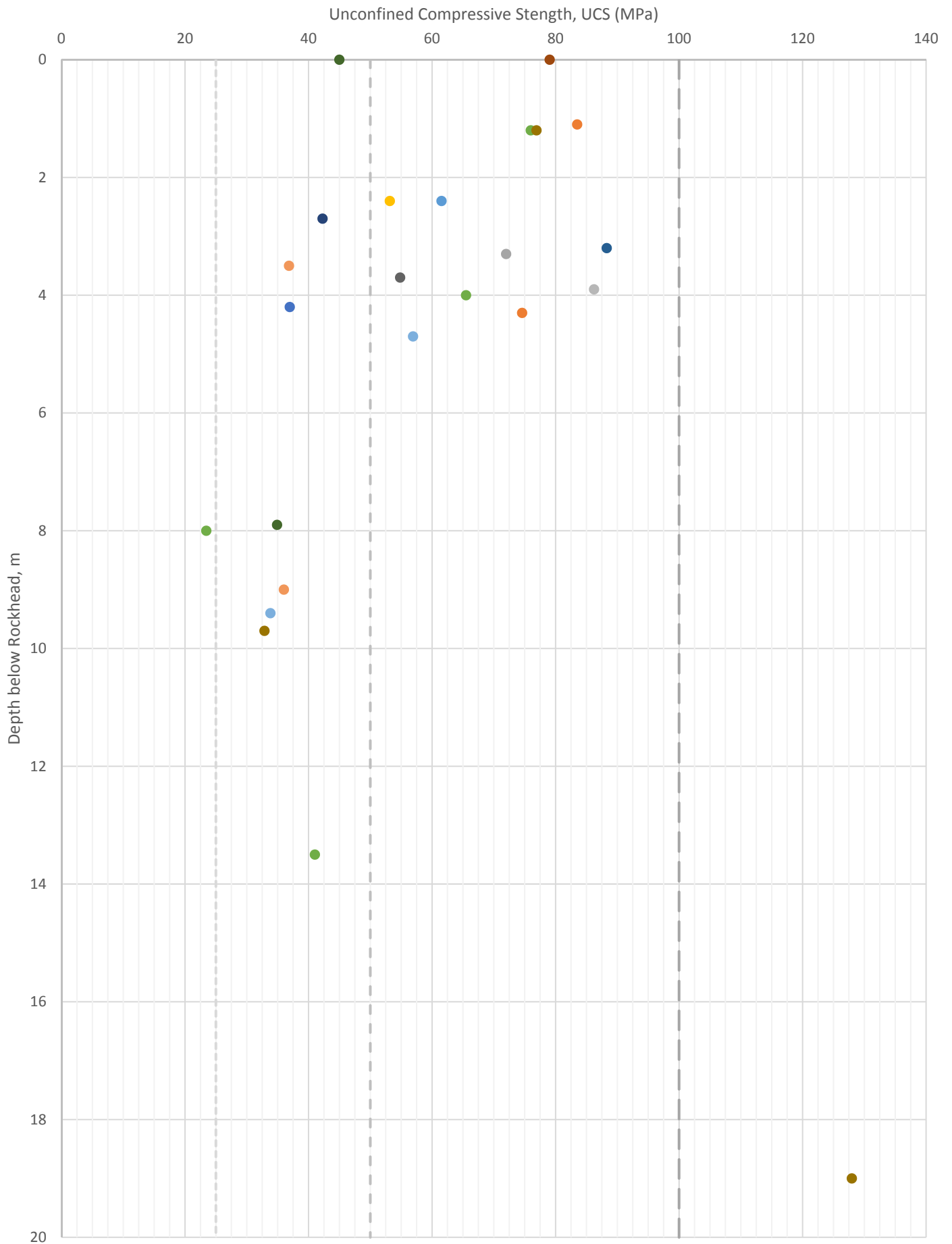
- EW03, BH3/03R ● EW04, BH3/04R ● EW05, BH3/06R ● EW06, BH3/07R
- EW06, BH3/08R ● EW07, BH3/10R ● EW08, BH3/11R ● EW08, BH3/13R
- EW09, BH3/16R ● EW10, BH3/17R ● EW11, BH3/18R ● EW11, BH3/19R
- EW12, BH3/22R ● EW13, BH3/23R ● EW13, BH3/24R ● EW01, RC 507
- EW01, RC 508 ● EW01, RC 510 ● EW01, RC 511 ● EW05, RC 715
- EW05, RC422

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

Granite - Rock Quality Designation

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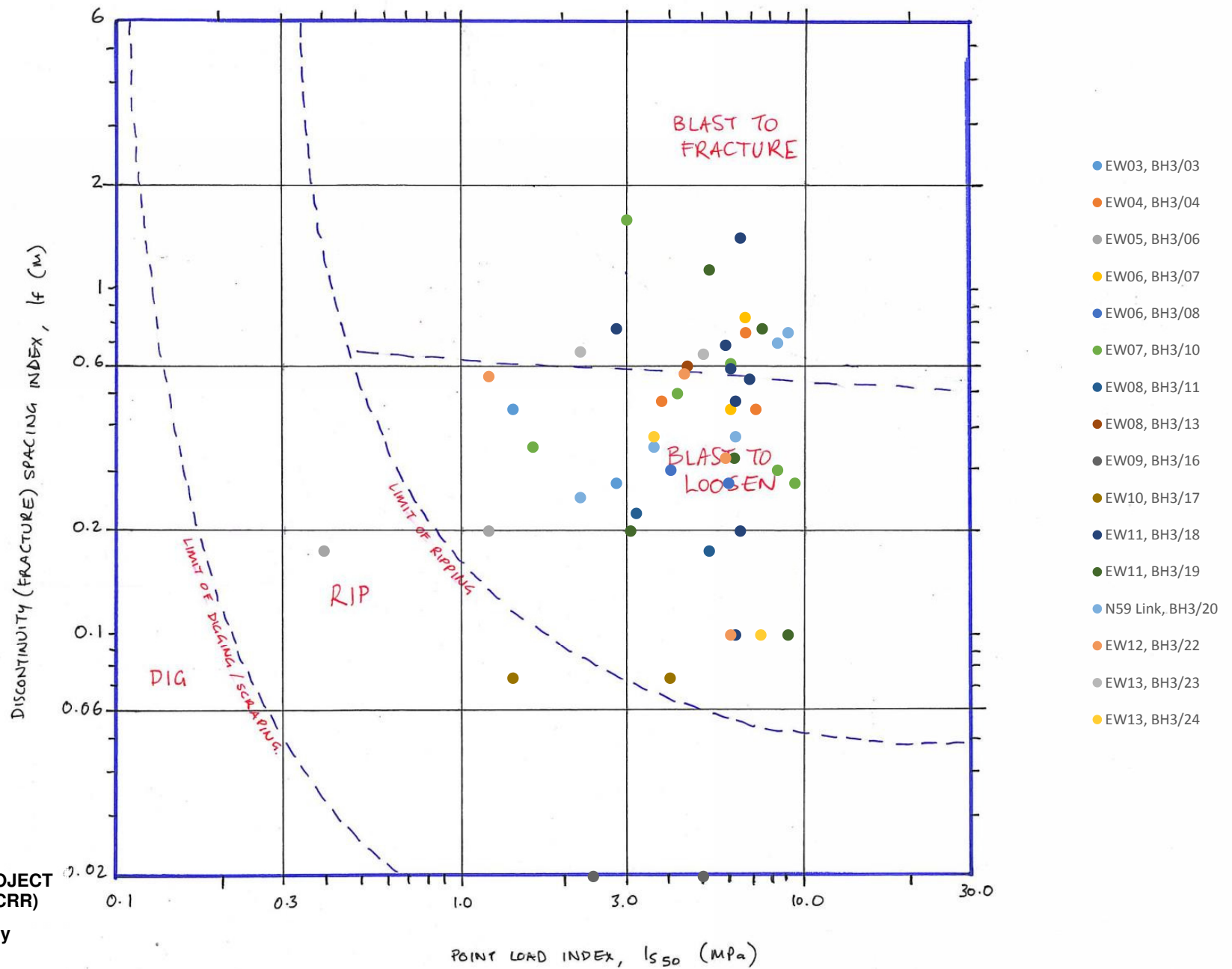
FIGURE 5.25



- EW03, BH3/03
 - EW06, BH3/07
 - EW08, BH3/11
 - EW10, BH3/17
 - N59 Link, BH3/20
 - EW04, BH3/04
 - EW06, BH3/08
 - EW08, BH3/13
 - EW11, BH3/18
 - EW12, BH3/22
 - EW05, BH3/06
 - EW07, BH3/10
 - EW09, BH3/16
 - EW11, BH3/19
 - EW13, BH3/24
- Strong - - - Medium Strong - - - - - Weak

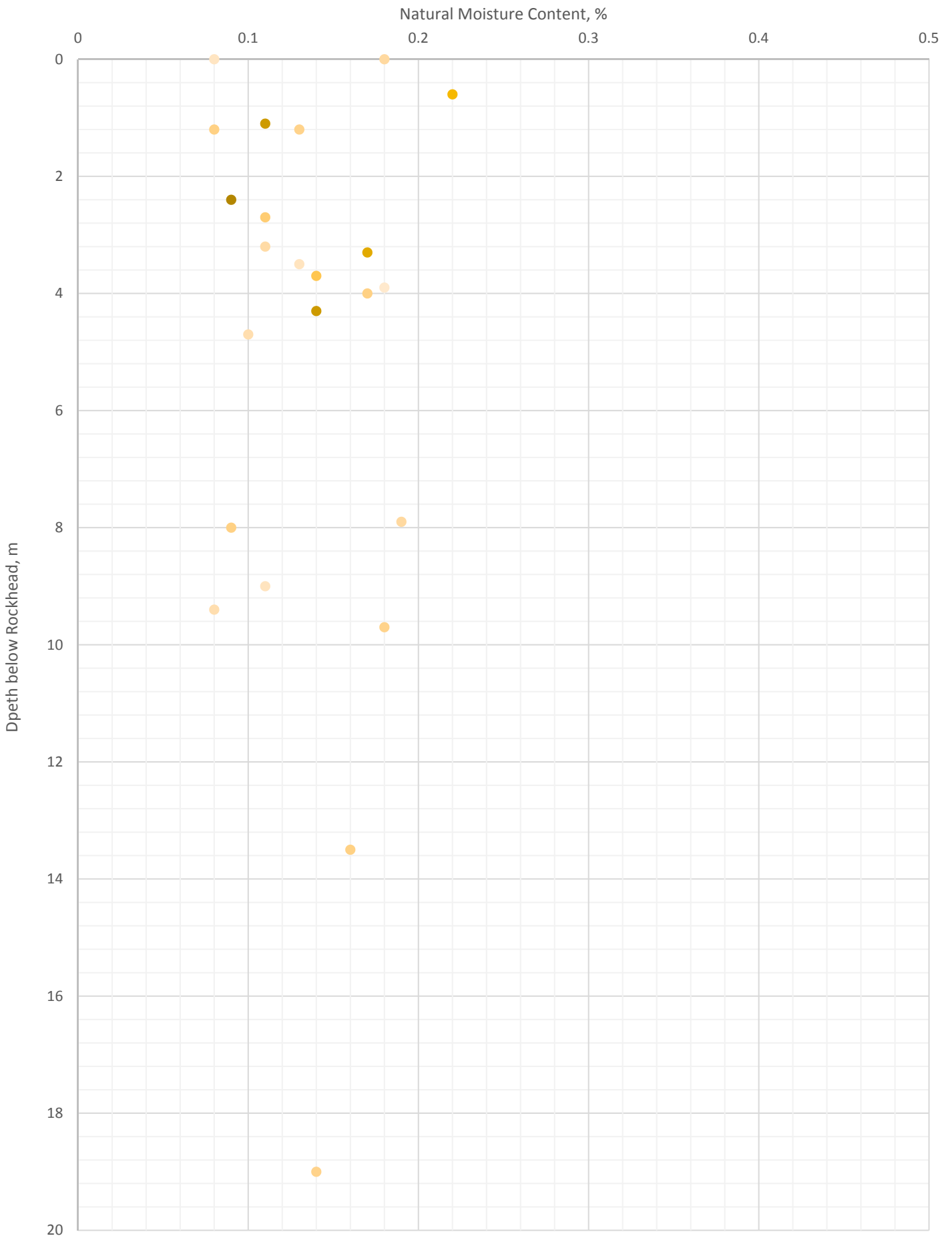
**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**
**Granite - Unconfined Compressive Strength
vs Depth below Rockhead**

EXCAVABILITY CLASSIFICATION AFTER FRANKLIN ET AL (1971)



GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)

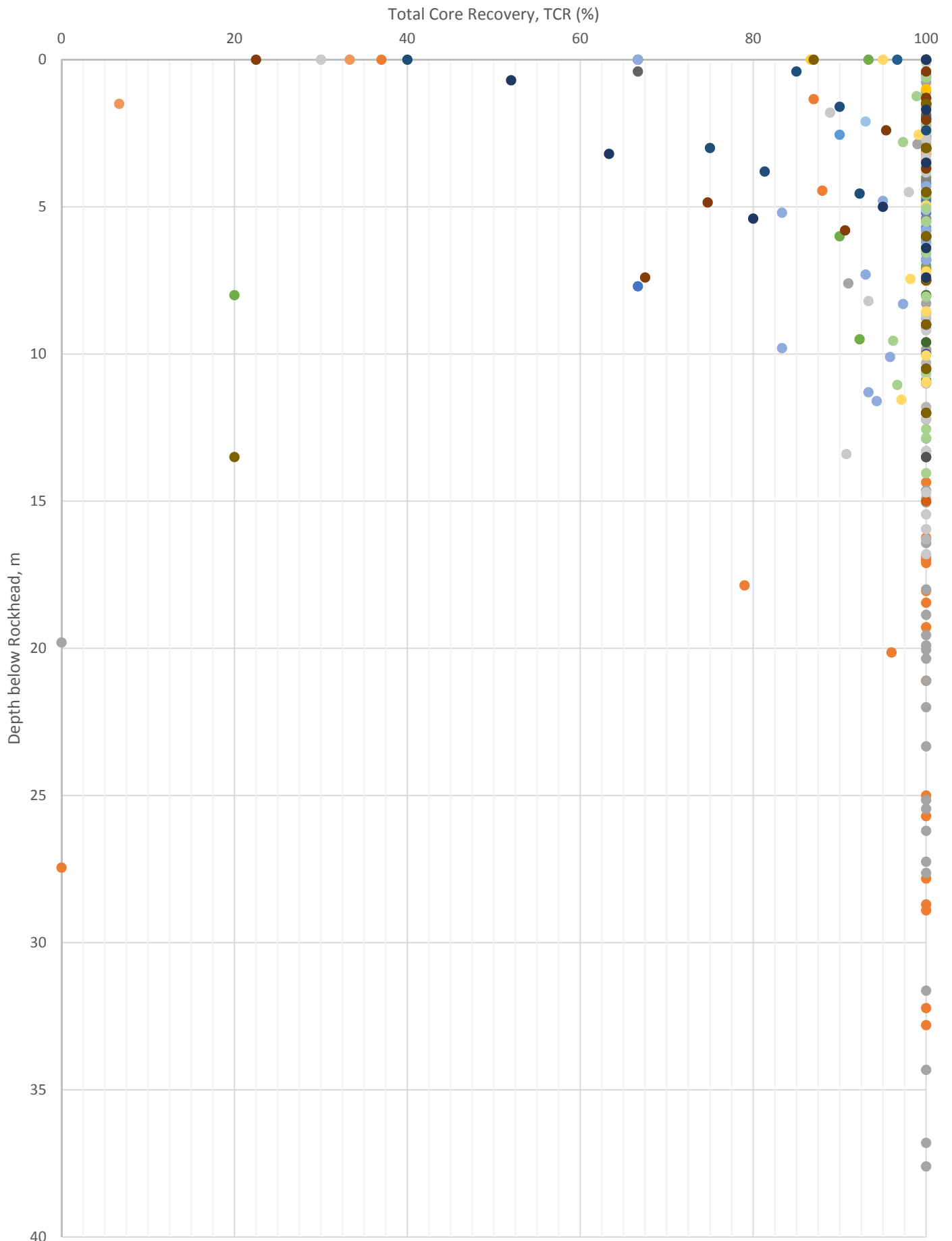
Granite - Rock Excavability
Franklin et al (1971)



- EW03, BH3/03 ● EW04, BH3/04 ● EW05, BH3/06
- EW06, BH3/07 ● EW06, BH3/08 ● EW07, BH3/10
- EW08, BH3/11 ● EW08, BH3/13 ● EW09, BH3/16
- EW10, BH3/17 ● EW11, BH3/18 ● EW11, BH3/19
- N59 Link, BH3/20 ● EW12, BH3/22 ● EW13, BH3/24

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

**Granite - Natural Moisture Content vs
Depth below Rockhead**



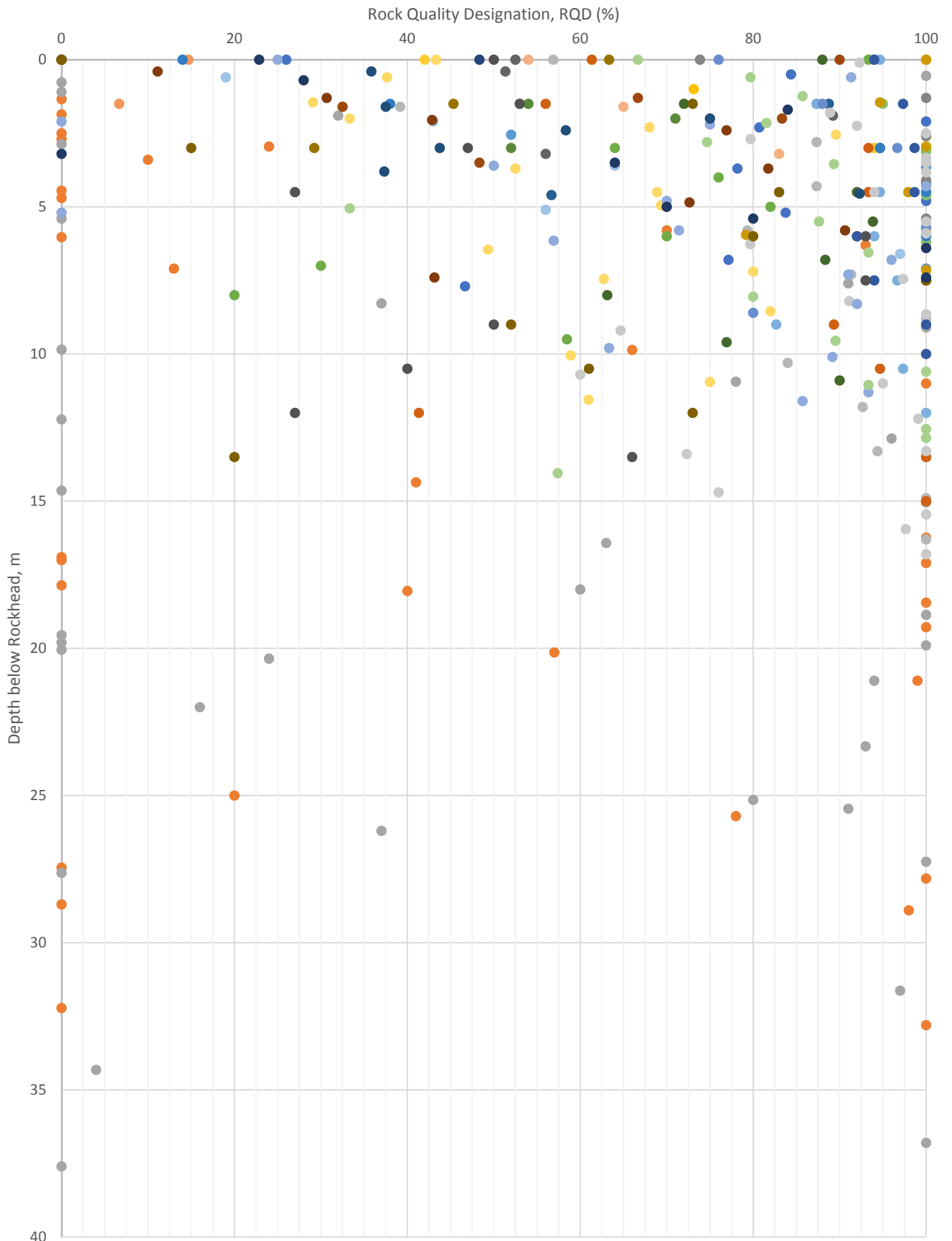
- EW18, BH03
- EW15, BH3/26R
- EW22, BH3/30R
- EW26, BH3/34R
- EW32, BH3/39R
- EW14, BH3/52R
- EW16, RC 970
- RC02/03
- EW29, RC3/60
- EW19, BH04
- EW15, BH3/27R
- EW23, BH3/31R
- EW27, BH3/35R
- EW32, BH3/40R
- EW14, BH3/53R
- EW17, RC 977
- EW30, RC02/04
- EW29, RC3/61
- EW19, BH05
- EW16, BH3/28R
- EW26, BH3/32R
- EW28, BH3/36R
- EW33, BH3/41R
- EW15, BH3/54R
- EW28, RC02/01
- EW15, RC126
- EW17, RC138
- EW15, BH3/25R
- EW17, BH3/29R
- EW26, BH3/33R
- EW32, BH3/38R
- EW24, BH3/46R
- EW16, RC 968
- EW29, RC02/02
- EW16, RC135

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

Limestone - Total Core Recovery

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FIGURE 5.29



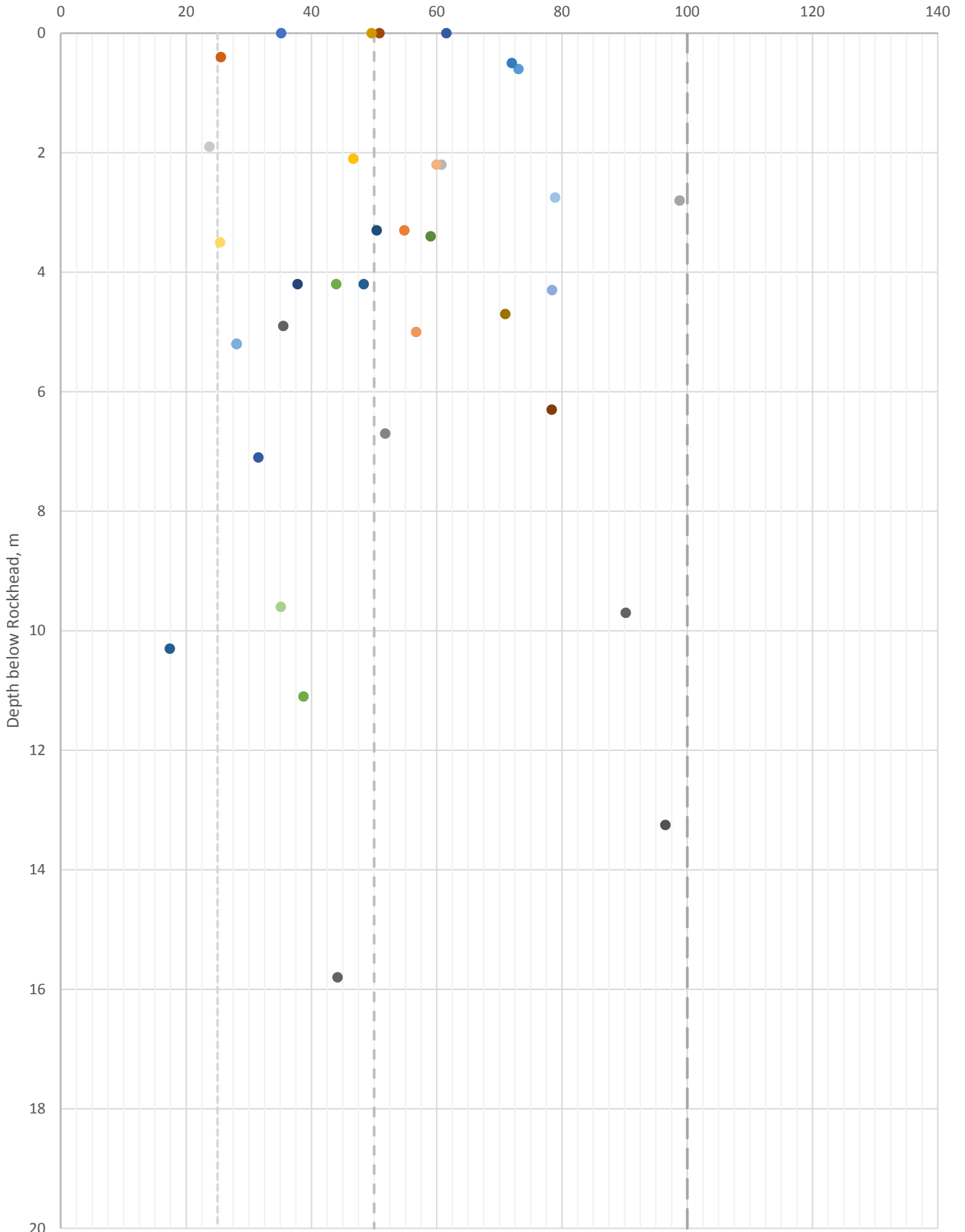
- | | | | |
|-----------------|-----------------|-----------------|-----------------|
| ● EW18, BH03 | ● EW19, BH04 | ● EW19, BH05 | ● EW15, BH3/25R |
| ● EW15, BH3/26R | ● EW15, BH3/27R | ● EW16, BH3/28R | ● EW17, BH3/29R |
| ● EW22, BH3/30R | ● EW23, BH3/31R | ● EW26, BH3/32R | ● EW26, BH3/33R |
| ● EW26, BH3/34R | ● EW27, BH3/35R | ● EW28, BH3/36R | ● EW32, BH3/38R |
| ● EW32, BH3/39R | ● EW32, BH3/40R | ● EW33, BH3/41R | ● EW24, BH3/46R |
| ● EW14, BH3/52R | ● EW14, BH3/53R | ● EW15, BH3/54R | ● EW16, RC 968 |
| ● EW16, RC 970 | ● EW17, RC 977 | ● EW28, RC02/01 | ● EW29, RC02/02 |
| ● EW29, RC02/03 | ● EW30, RC02/04 | ● EW15, RC126 | ● EW16, RC135 |
| ● EW29, RC3/60 | ● EW29, RC3/61 | ● EW17, RC138 | |

**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)
Limestone - Rock Quality Designation**

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FIGURE 5.30

Unconfined Compressive Strength, UCS (MPa)



- | | | | |
|----------------|-----------------|----------------|----------------|
| — Strong | — Medium Strong | — Weak | ● EW15, BH3/25 |
| ● EW15, BH3/26 | ● EW15, BH3/27 | ● EW16, BH3/28 | ● EW26, BH3/32 |
| ● EW26, BH3/33 | ● EW26, BH3/34 | ● EW27, BH3/35 | ● EW28, BH3/36 |
| ● EW32, BH3/38 | ● EW32, BH3/39 | ● EW32, BH3/40 | ● EW32, BH3/40 |
| ● EW32, BH3/41 | ● EW33, BH3/42 | ● EW33, BH3/43 | ● EW27, BH3/47 |
| ● EW32, BH3/48 | ● EW14, BH3/52 | ● EW14, BH3/53 | ● EW14, BH3/54 |
| ● EW14, RC135 | ● EW14, RC968 | ● EW14, RC970 | ● EW29, RC3/60 |
| ● EW29, RC3/60 | ● EW29, RC3/60 | ● EW29, RC3/61 | ● EW29, RC3/61 |
| ● EW29, RC3/61 | | | |

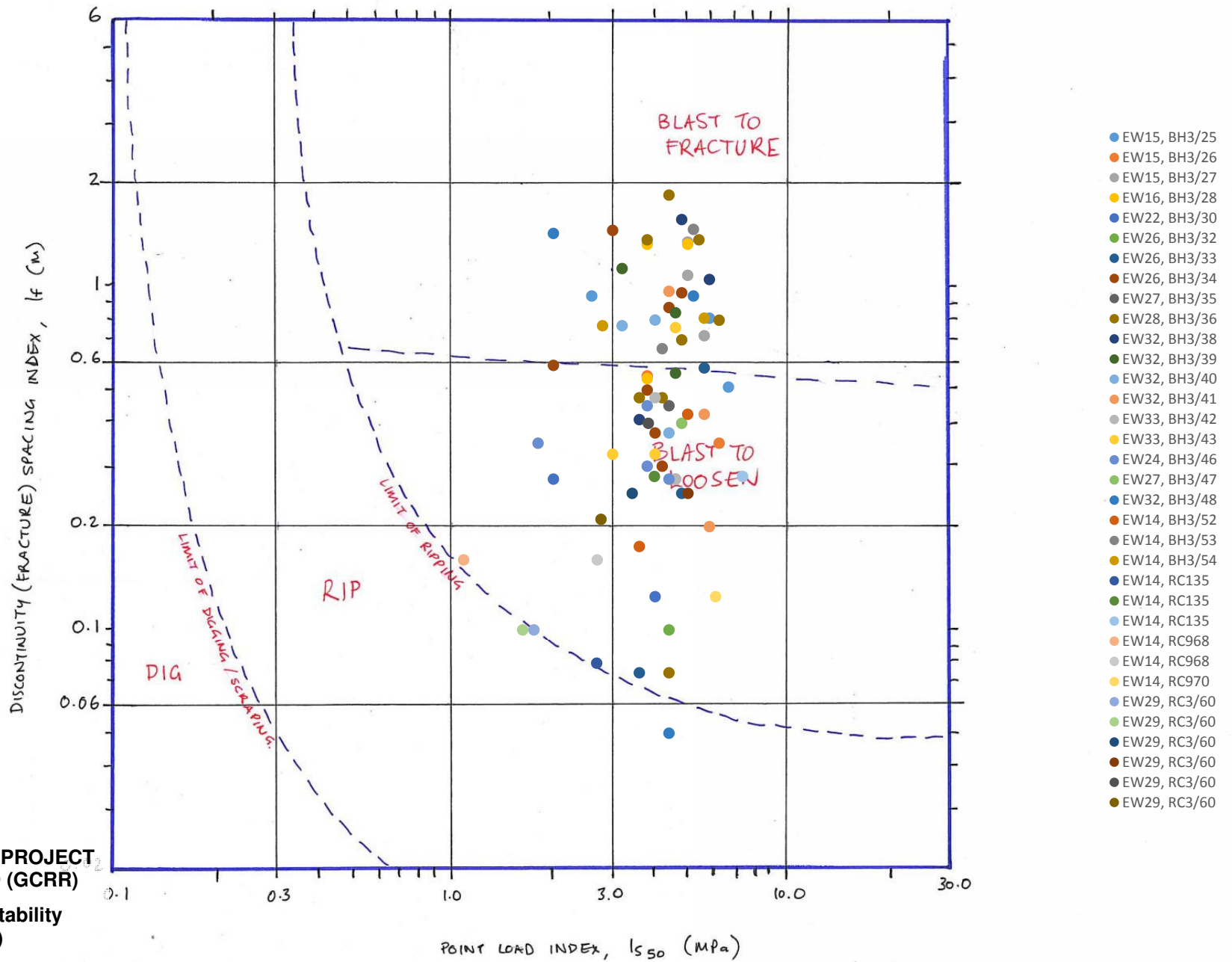
**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**

**Limestone - Unconfined Compressive
Strength vs Depth below Rockhead**

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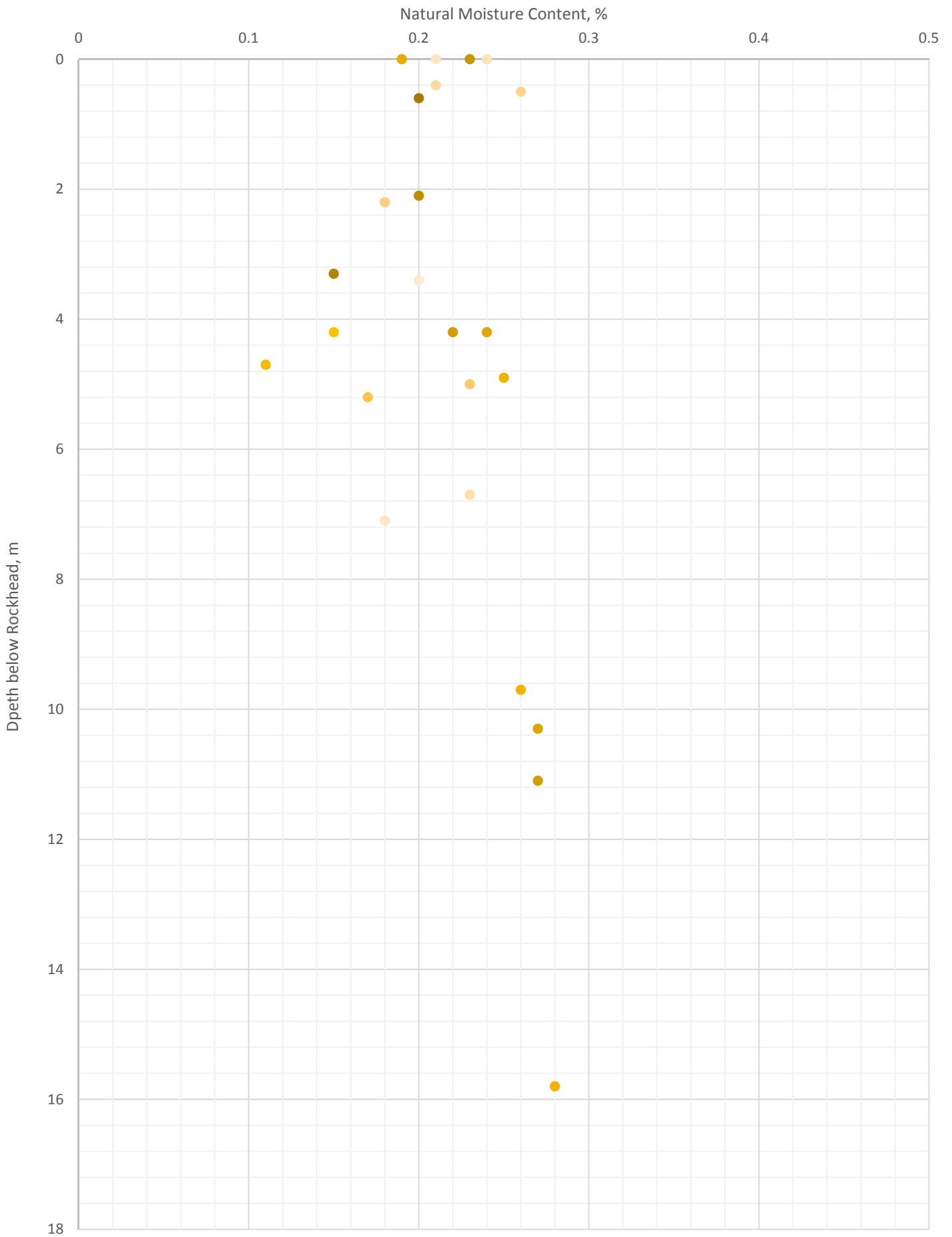
FIGURE 5.31

EXCAVABILITY CLASSIFICATION AFTER FRANKLIN ET AL (1971)

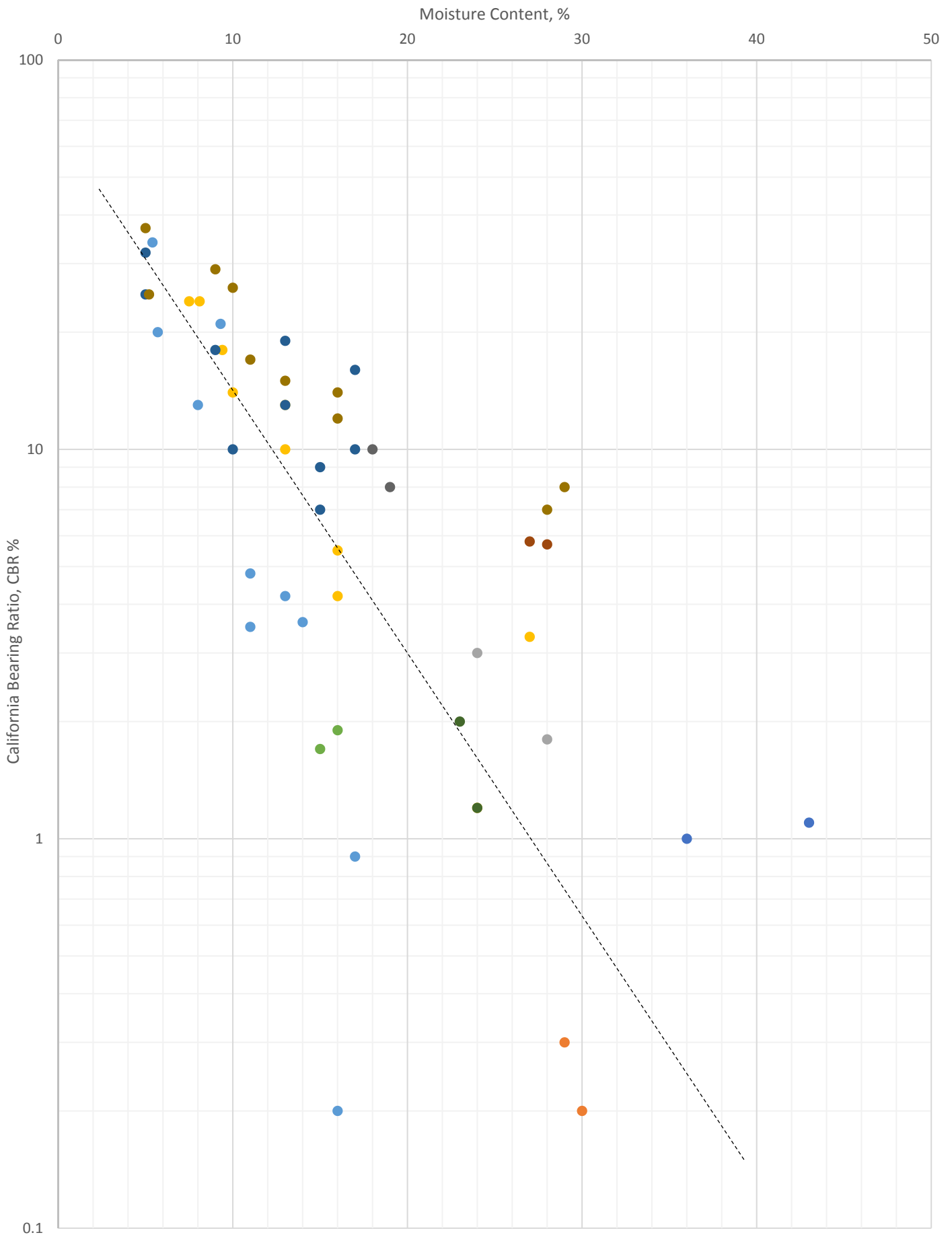


GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)

Limestone - Rock Excavability
Franklin et al (1971)



**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**
**Limestone - Natural Moisture Content vs
Depth below Rockhead**

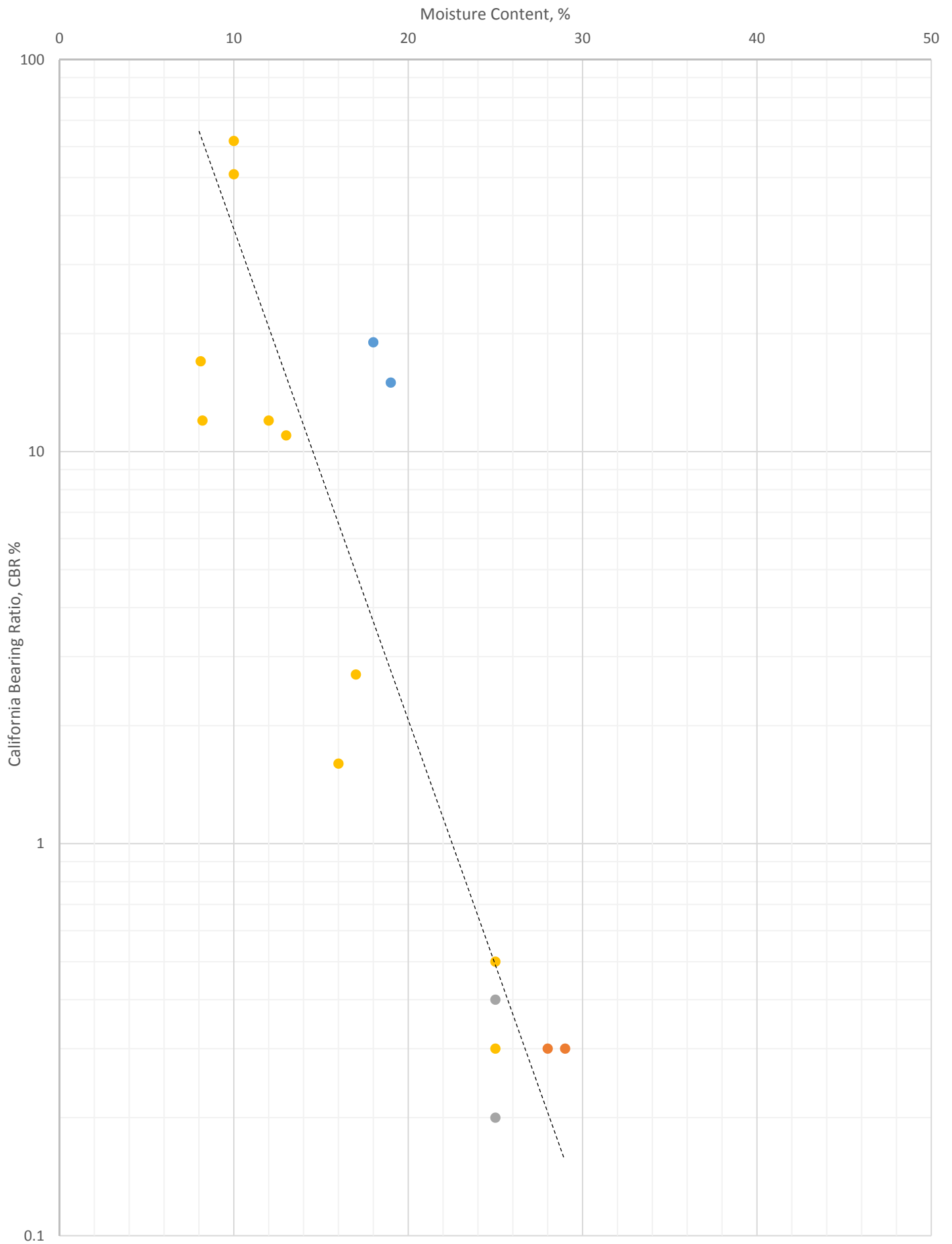


- EW01, TP3/01, 1m
- EW02, TP3/06, 1.1m
- EW08, TP3/21, 0.15m
- N59 Link, BH3/20, 0.5m
- EW08, BH3/15, 0.4m
- EW05, TP3/43, 0.5m
- EW01, TP3/03, 1.6m
- EW06, TP3/17, 0.5m
- N59 Link, TP3/08, 1.2m
- EW08, BH3/14, 0.1m
- EW11, BH3/18, 0.5m

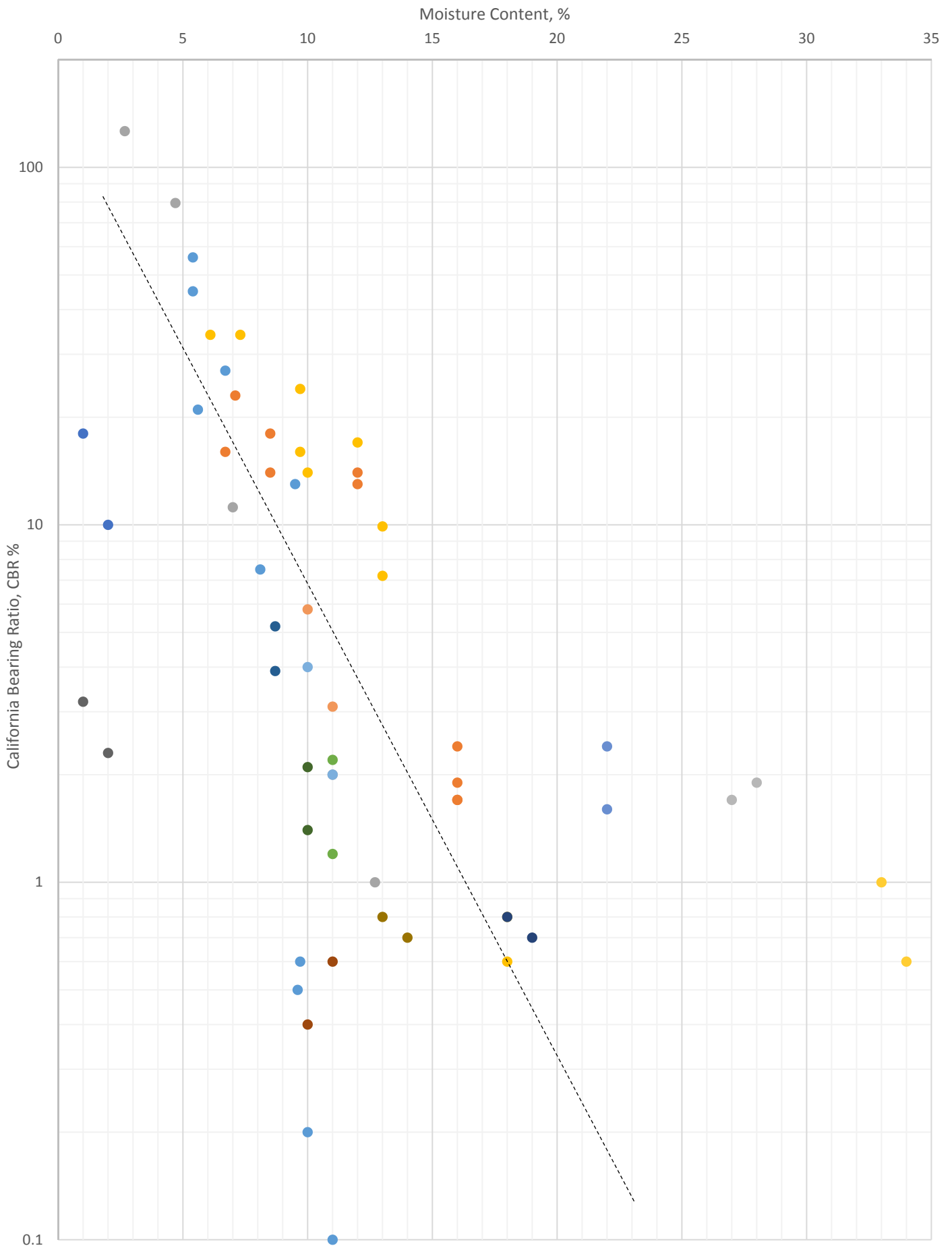
**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**
**Glacial Gravels derived from Granite -
Moisture Content vs California Bearing Ratio**

D233985-00

FIGURE 5.34



**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**
Glacial Till derived from Granite
Moisture Content vs California Bearing Ratio



**GALWAY CITY TRANSPORT PROJECT
GALWAY CITY RING ROAD (GCRR)**
Glacial Till derived from Limestone
Moisture Content vs California Bearing Ratio

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FIGURE 5.36