



A great place to live, work & play

Scarborough Borough Council

Condition Survey of Inclinometers and Piezometers – 22/4/2013



Royal HaskoningDHV
Enhancing Society Together

Location

Scarborough – South Cliff

Seaward side of access track down the Holbeck Hall landslide, opposite path from middle of car park. In small clearing in middle of gorse thicket.

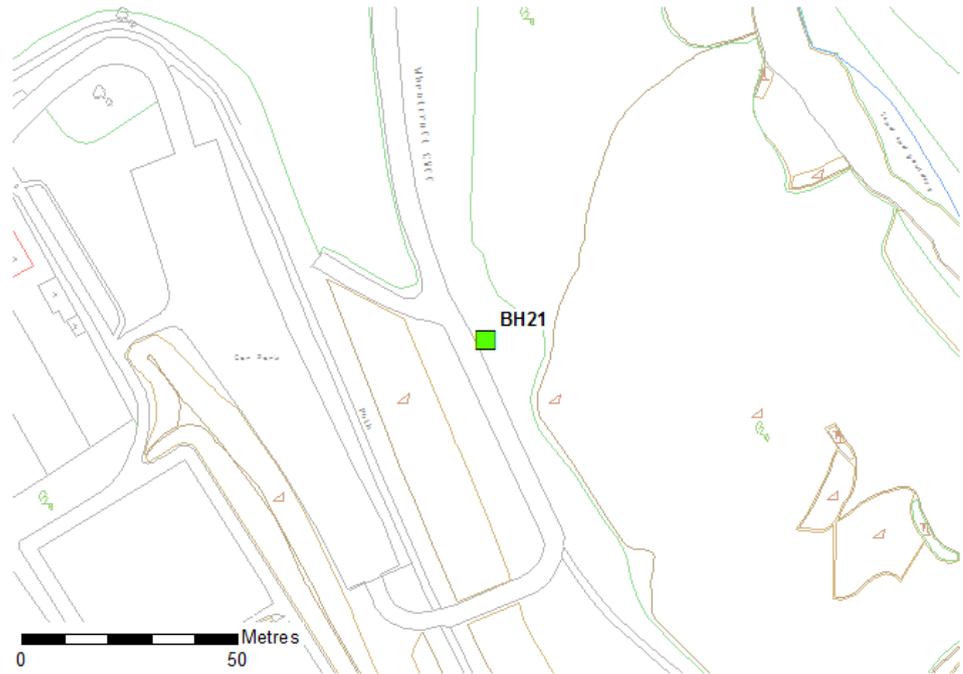
Borehole

BH21

Inclinometer

Map

GPS Reference:
TA 04980 86795



Location Photo

(looking west)



| | | | |
|-------------------------|--|-----------------------|-------|
| Condition Photos |  | | |
| Condition | <ul style="list-style-type: none"> • Cover and hinge ok but locking screw corroded and cover was not locked. • Concrete surround ok. • Vegetation ok, but may be an issue in summer. • No cap to inner tube. | | |
| Known Depth | 31.10m | Recorded Depth | 2.48m |
| Comments | <ul style="list-style-type: none"> • Large discrepancy between recorded and known depth, suggests borehole may have sheared. • No water recorded. • Dummy inclinometer went to 2.43m. | | |



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Location

Scarborough – South Cliff

At the top of the disabled access route down South Cliff Gardens, close to the Clock Tower and access point to Esplanade.

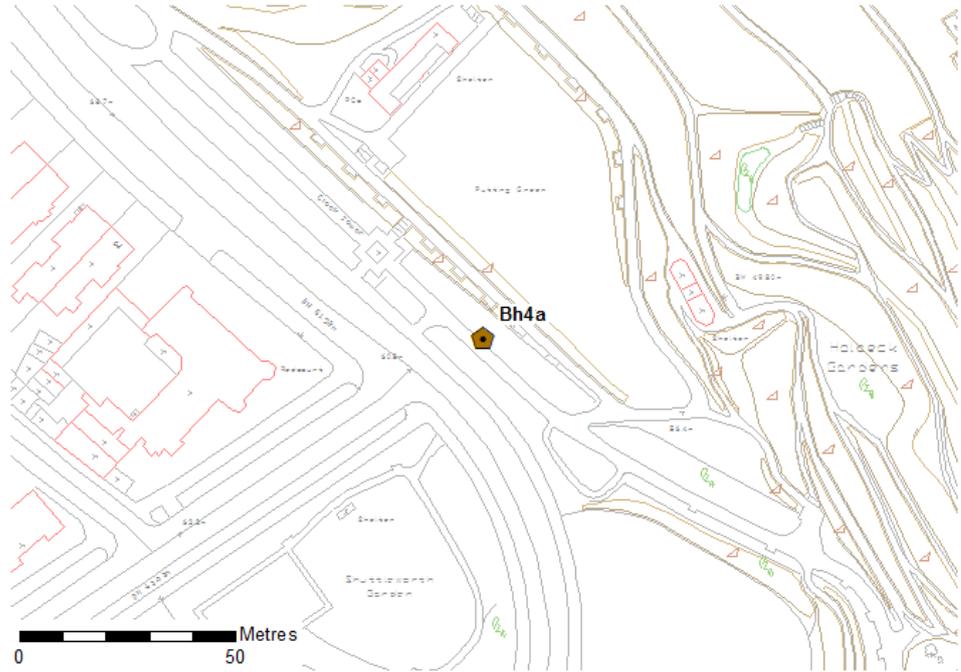
Borehole

BH4

Piezometer - twin

Map

GPS Reference:
TA 04693 87147



Location Photo

(looking north-west)



| | | | | | |
|-------------------------------------|--|----------------------------------|--|--------------------|-------------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok, 4 locking screws. • Concrete surround ok but starting to crack. • Double piezometer with automated loggers present. • Tarmac footpath – no vegetation issues. | | | | |
| Recorded Depth to Instrument | Not available | | Recorded Depth to Water | Not available | |
| Known Depth to Instrument | a) 27.70m b) 33.30m | Last Recorded Water Depth | a) 8.10m b) 8.40m | Record Date | 2009 (Mouchel) |
| Comments | | | | | |



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Location

Scarborough – South Cliff

At south-east corner of putting green, at the junction of the paths where the disabled access route bends round to the north.

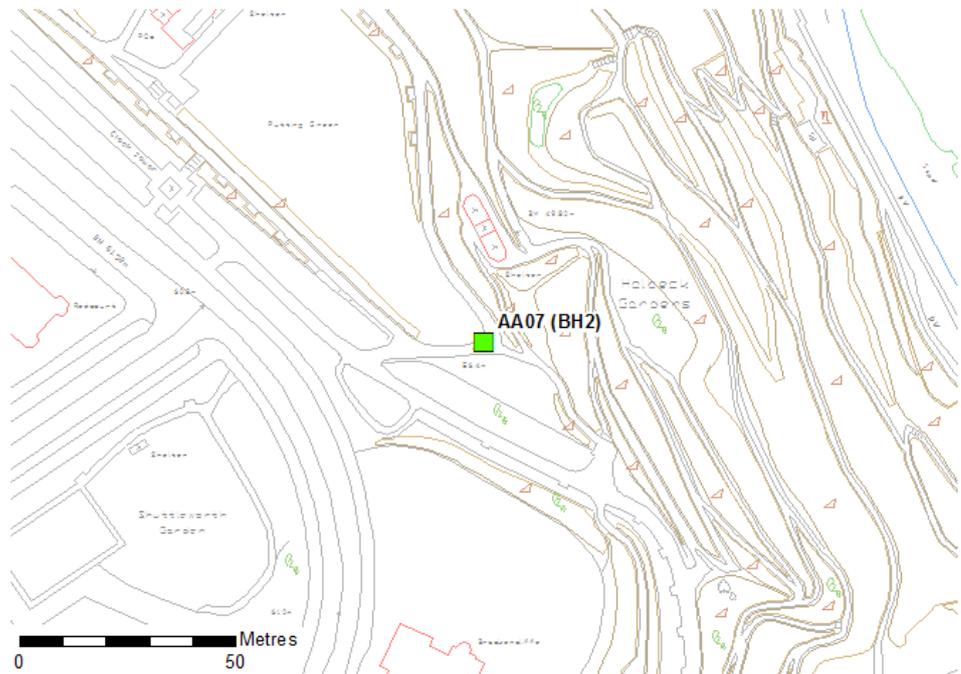
Borehole

BH2

Inclinometer

Map

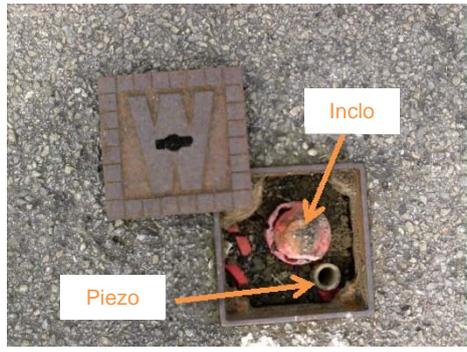
GPS Reference:
TA 04741 87131



Location Photo

(looking north-west)



| | | | | |
|--------------------------------|--|------------------------------|--|--|
| <p>Condition Photos</p> |  | |  | |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover ok, hinged at one corner (pivots). • Cover does not have a locking mechanism. • Inner tube has a cap which is damaged but functional. • Tarmac footpath – no vegetation issues. | | | |
| <p>Known Depth</p> | <p>60.00m</p> | <p>Recorded Depth</p> | <p>61.00m</p> | |
| <p>Comments</p> | <ul style="list-style-type: none"> • Water recorded at 48.1m. • Dummy inclinometer went to 60.95m. • Piezometer tube also present in borehole – depth of 1.35m with water recorded at 0.2m. | | | |



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Location

Scarborough – South Cliff

Footpath around bottom edge of putting green, at north-east corner.

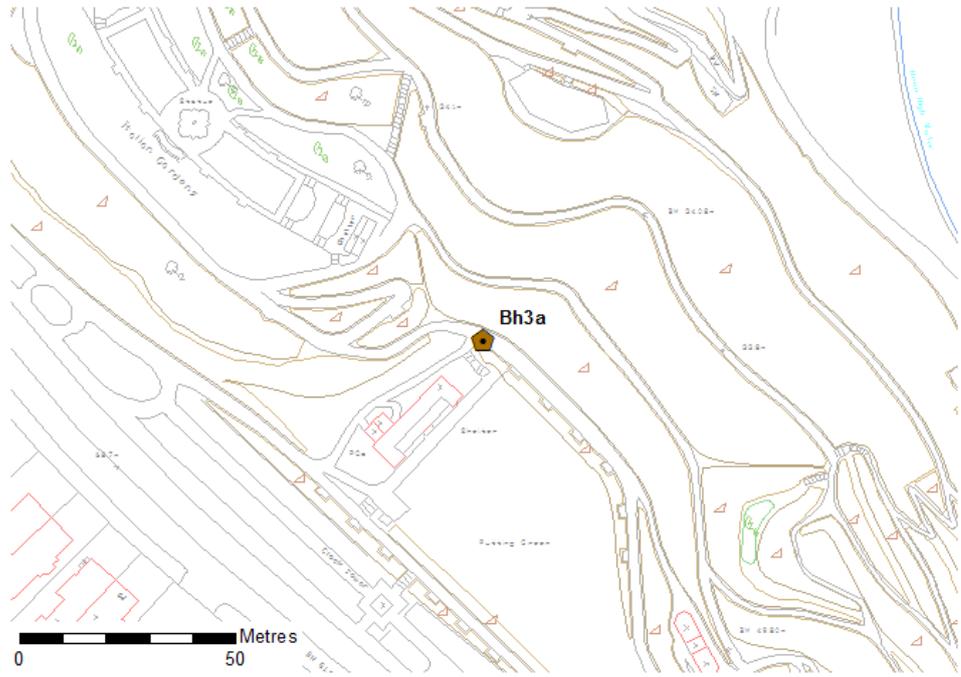
Borehole

BH3

Piezometer - triple

Map

GPS Reference:
TA 04692 87229



Location Photo

(looking north-west)



| | | | | | |
|-------------------------------------|---|----------------------------------|--|--------------------|-------------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok with 4 locking screws. • Concrete surround ok. • 3 piezometer tubes with 2 automated data loggers. • In tarmac footpath – no vegetation issues. | | | | |
| Recorded Depth to Instrument | Not available | | Recorded Depth to Water | Not available | |
| Known Depth to Instrument | a) 12.28m b) 42.40m | Last Recorded Water Depth | a) 9.80m b) 37.49m | Record Date | 2009 (Mouchel) |
| Comments | | | | | |



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Location

Scarborough – South Cliff

Footpath directly above the Italian Gardens, roughly in line with central pond feature.

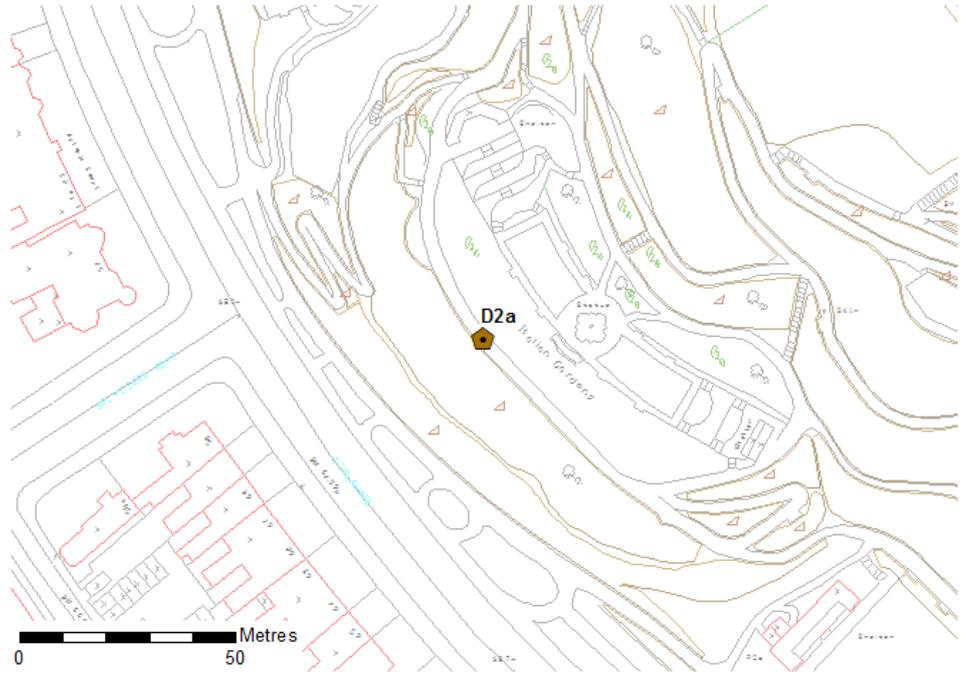
Borehole

D2

Piezometer - twin

Map

GPS Reference:
TA 04600 87277



Location Photo

(looking south-east)



| | | | | | |
|-------------------------------------|--|----------------------------------|--|--------------------|-------------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok with 4 locking screws. • Concrete surround ok. • Double piezometers with automated data loggers. • Tarmac footpath – no vegetation issues. | | | | |
| Recorded Depth to Instrument | Not available | | Recorded Depth to Water | Not available | |
| Known Depth to Instrument | a) 19.40m b) 5.04m | Last Recorded Water Depth | a) 6.11m b) 1.06m | Record Date | 2009 (Mouchel) |
| Comments | | | | | |



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Location

Scarborough – South Cliff

Second parallel footpath below the Italian Gardens, close to bottom of steps and raised round manhole.

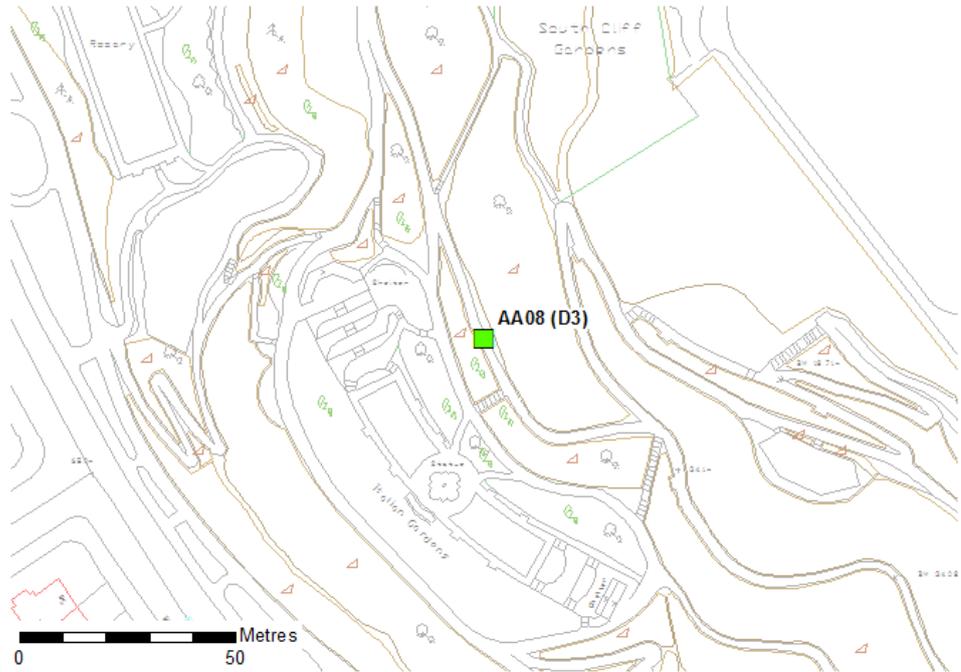
Borehole

D3

Inclinometer

Map

GPS Reference:
TA 04634 87314



Location Photo

(looking south-east)



| | | | |
|--------------------------------|---|------------------------------|--|
| <p>Condition Photos</p> |  | |  |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover and hinge ok, but locking screw is corroded. • Inner tube has bung present. • Tarmac footpath – no vegetation issues. | | |
| <p>Known Depth</p> | <p>24.80m</p> | <p>Recorded Depth</p> | <p>24.90m</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Water recorded at 21.4m. • Dummy inclinometer went to 24.82m. • Measurements to top of outer tube. | | |



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Location

Scarborough – South Cliff

On the disabled access route, below the Rose Garden, next to the grassed plateau area. Close to fork in path and manhole cover.

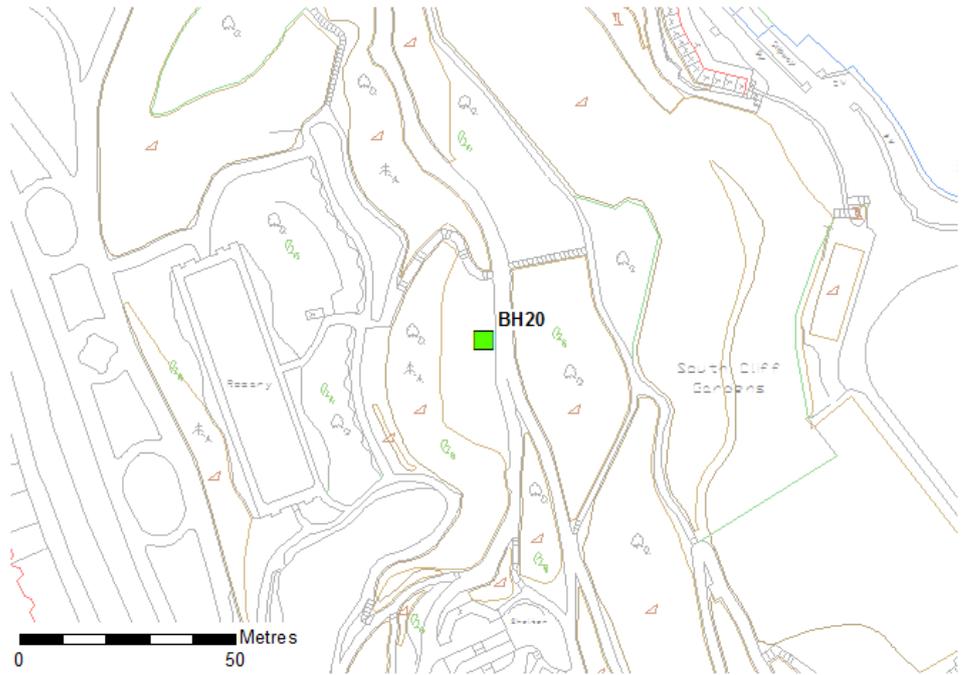
Borehole

BH20

Inclinometer

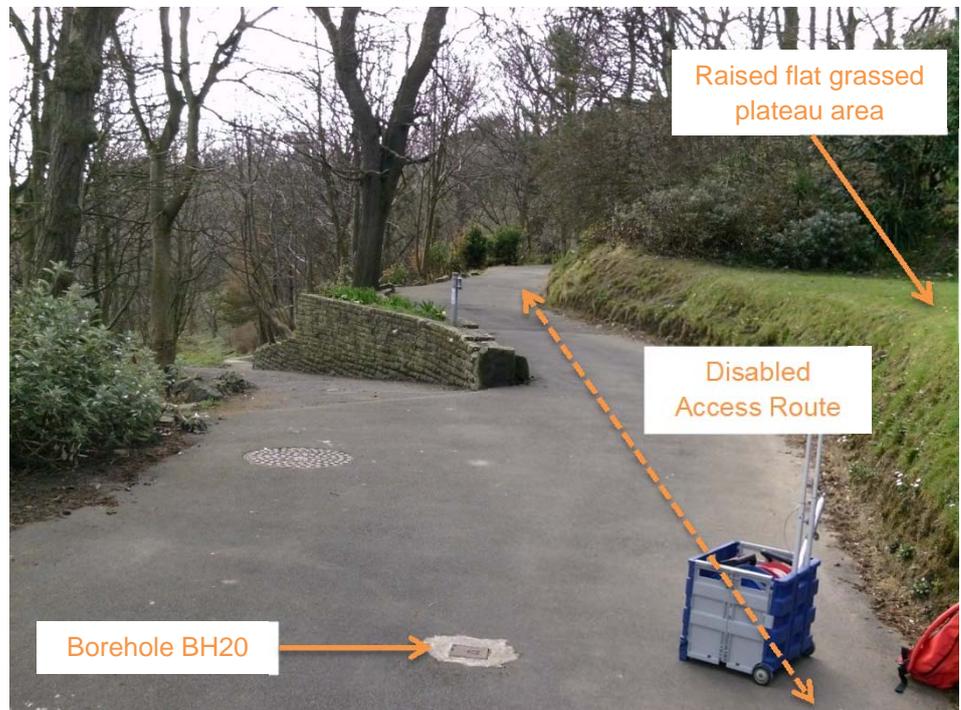
Map

GPS Reference:
TA 04602 87393



Location Photo

(looking south)



| | | | |
|-------------------------|---|-----------------------|-----|
| Condition Photos |  | | |
| Condition | <ul style="list-style-type: none"> • Cover and hinge ok, but locking mechanism is broken. • Concrete surround ok. • Cap to inner tube present. • Tarmac footpath – no vegetation issues. | | |
| Known Depth | 46.50m | Recorded Depth | 31m |
| Comments | <ul style="list-style-type: none"> • Water recorded at 0.1m and rose to ground level during measuring. • Dummy inclinometer went to 31.08m. • Discrepancy between known depth and recorded depth suggests that borehole may be sheared at depth. | | |



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Location

Scarborough – South Cliff

On disabled access route, close to sharp bend and raised bench.

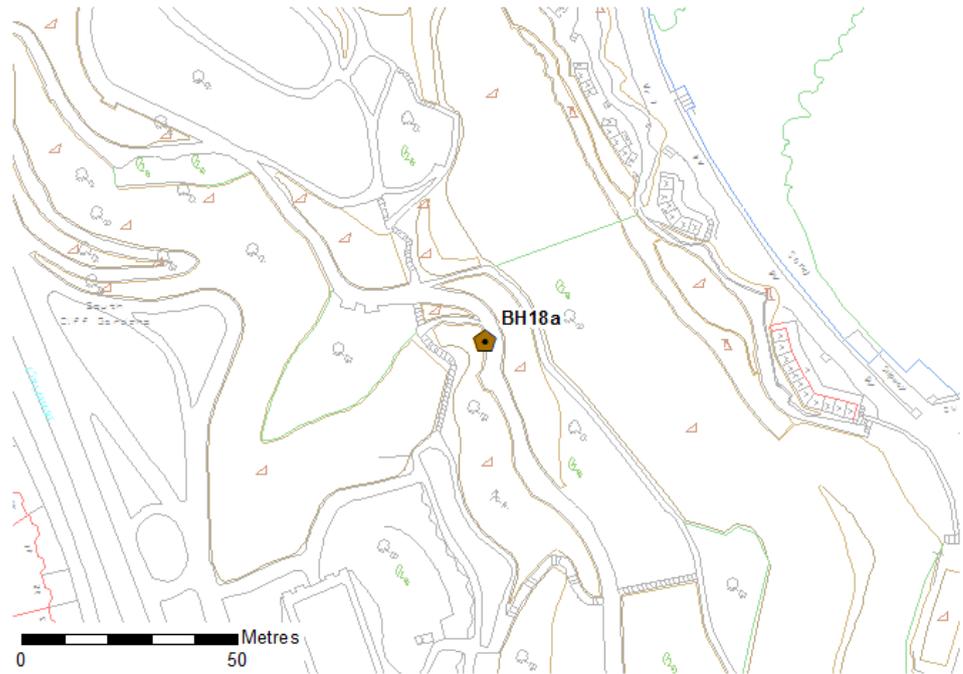
Borehole

BH18

Piezometer - twin

Map

GPS Reference:
TA 04577 87469



Location Photo

(looking south)



| | | | | | |
|-------------------------------------|--|----------------------------------|--|--------------------|---------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok with 4 locking screws. • Concrete surround ok. • Double piezometers with automated data loggers. • Tarmac footpath – no vegetation issues. | | | | |
| Recorded Depth to Instrument | Not available | | Recorded Depth to Water | Not available | |
| Known Depth to Instrument | a) 16.00m b) 19.00m | Last Recorded Water Depth | Not available | Record Date | Not available |
| Comments | <ul style="list-style-type: none"> • Further north along same footpath as BH20 (disabled access route). • Another double piezometer borehole is close by, which is not automated but has a diver (small square metal cover, inner tubes both have caps). | | | | |



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Location

Scarborough – South Cliff

On the disabled access route above the oval grassed area which is above the Clock Café. Between the sets of steps which go up to the highways structure and down to the grassed oval.

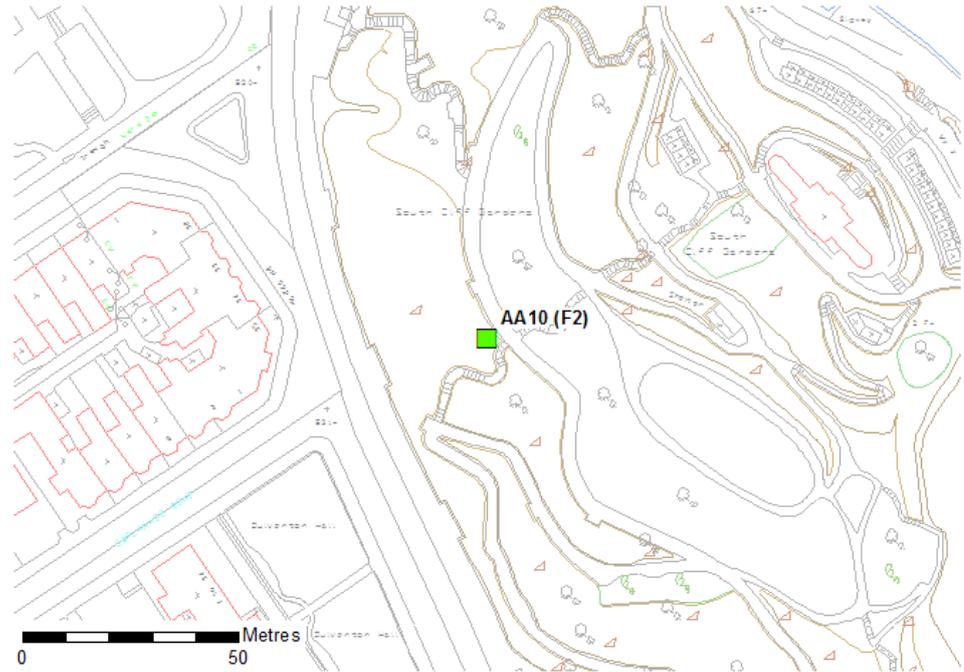
Borehole

F2

Inclinometer

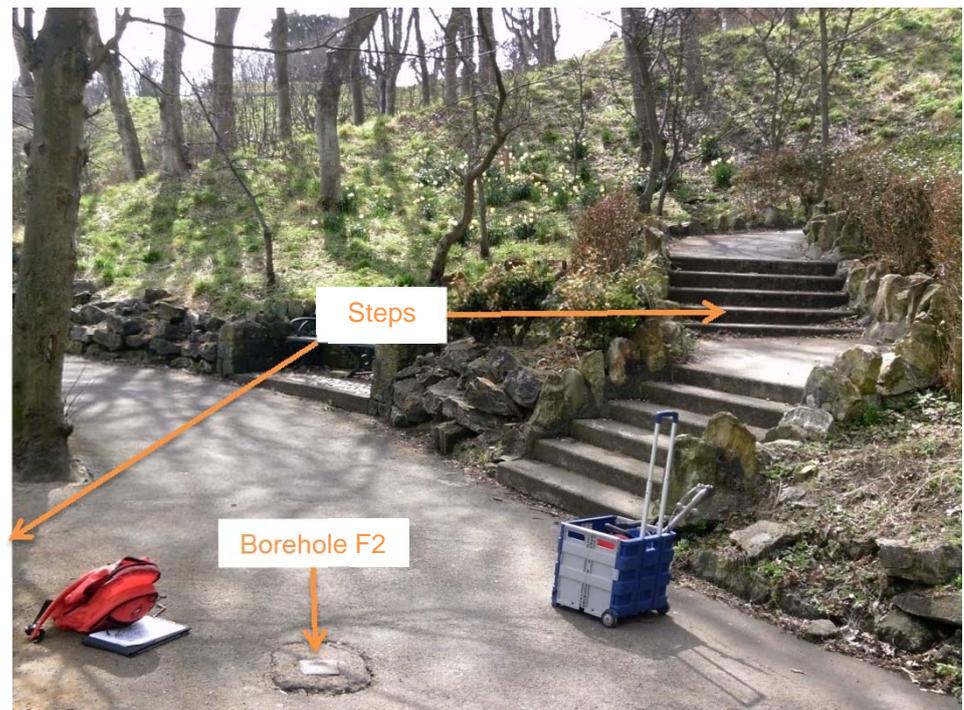
Map

GPS Reference:
TA 04465 87567



Location Photo

(looking south)



| | | | |
|-------------------------|---|-----------------------|--------|
| Condition Photos |  | | |
| Condition | <ul style="list-style-type: none"> • Cover and hinge ok, but no locking mechanism. • Footpath has sunken slightly around the tarmac surround. • Bung to inner tube present. • Tarmac footpath – no vegetation issues. | | |
| Known Depth | 30.50m | Recorded Depth | 30.15m |
| Comments | <ul style="list-style-type: none"> • Water recorded at 13.6m. • Dummy inclinometer went to 30.35m, but on first attempt only went 9.96m. • Measurements to top of metal lid (edge of inner tube too uneven to measure to). | | |



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Location

Scarborough – South Cliff

Footpath behind the Clock Café at the northern end, between flights of steps.

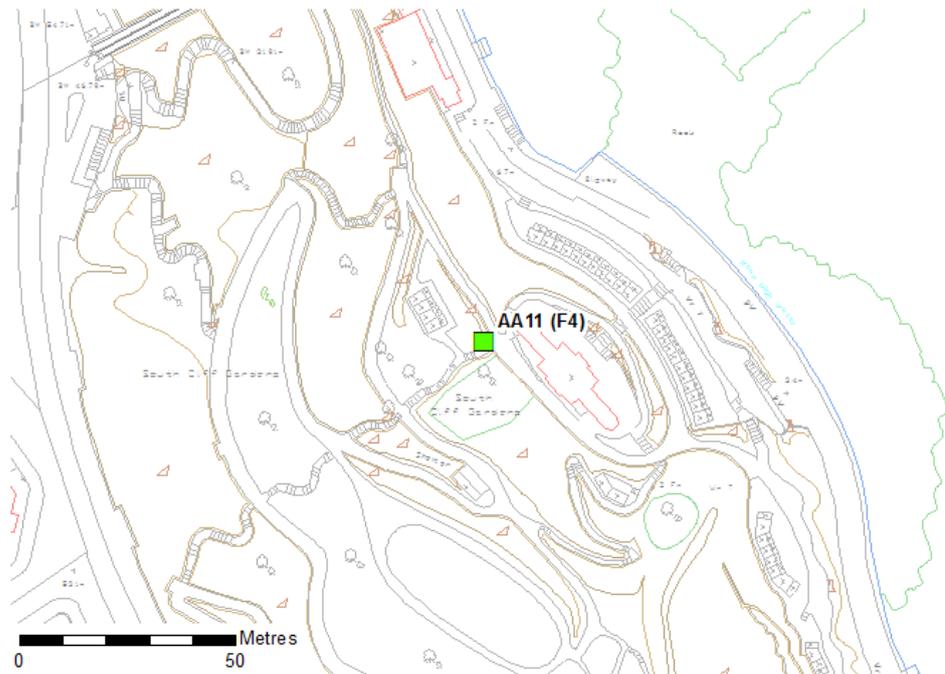
Borehole

F4

Inclinometer

Map

GPS Reference:
TA 04523 87604



Location Photo

(looking east)



| | | | |
|-------------------------|--|-----------------------|--------|
| Condition Photos |  | | |
| Condition | <ul style="list-style-type: none"> • Cover and hinge ok, but lock corroded and inoperable. • Concrete surround ok. • No cap to inner tube. • Tarmac footpath – no vegetation issues. | | |
| Known Depth | 20.17m | Recorded Depth | 20.00m |
| Comments | <ul style="list-style-type: none"> • Water recorded at 14.4m. • Dummy inclinometer went to 20.05m. • Measurements to top of inner tube. | | |



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Location

Scarborough – South Cliff

In gardens of Dulverton Hall, on north-west boundary line adjacent to fence (on Esplanade Road side).

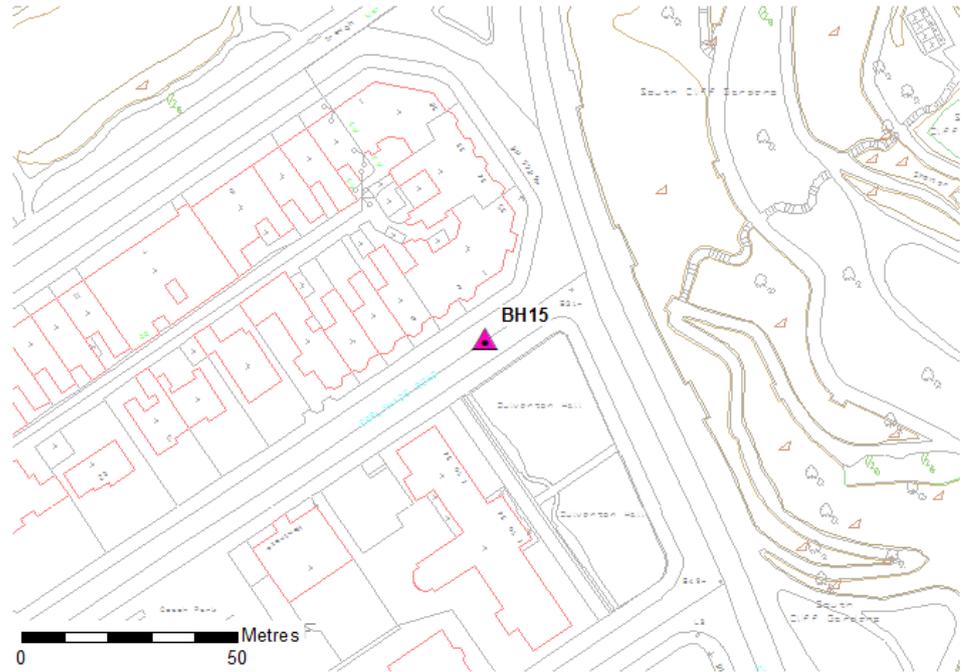
Borehole

BH15

Piezometer

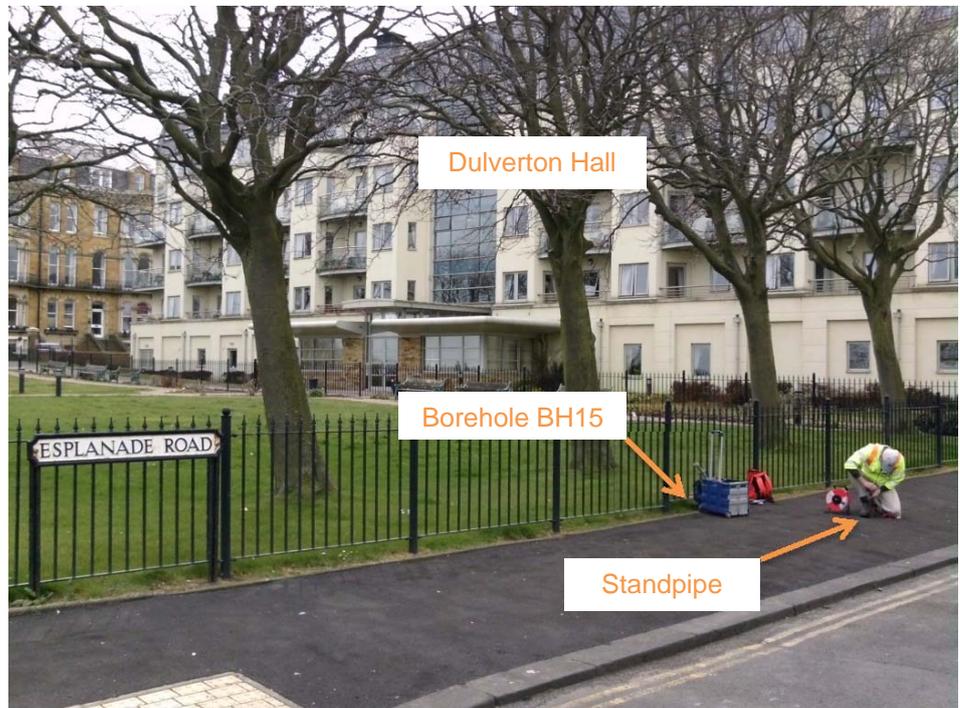
Map

GPS Reference:
TA 04408 87539



Location Photo

(looking south)



| | | | | | |
|-------------------------------------|---|----------------------------------|--|--------------------|---------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover and hinge ok, but no locking mechanism. • Concrete surround ok. • No internal cap. • Vegetation ok – short mown grass, well maintained. | | | | |
| Recorded Depth to Instrument | 55.2m | Recorded Depth to Water | 41.2m | | |
| Known Depth to Instrument | 57.00m | Last Recorded Water Depth | Not available | Record Date | Not available |
| Comments | <ul style="list-style-type: none"> • There is also a standpipe in the footpath on Esplanade Road (outside of gardens) directly in line with Borehole BH15. • Standpipe – cover and hinge ok, but locking screw is corroded and sticking up (should be removed or cut off to prevent trip hazard for pedestrians), internal cap, no vegetation issues (in tarmac footpath). • Standpipe – depth of 17.58m with no water recorded. | | | | |



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Location

Scarborough – South Cliff

Opposite no. 42 Esplanade. In footpath behind the floral beds, close to the Rose Garden entrance to South Cliff Gardens.

Borehole

BH17

Inclinometer

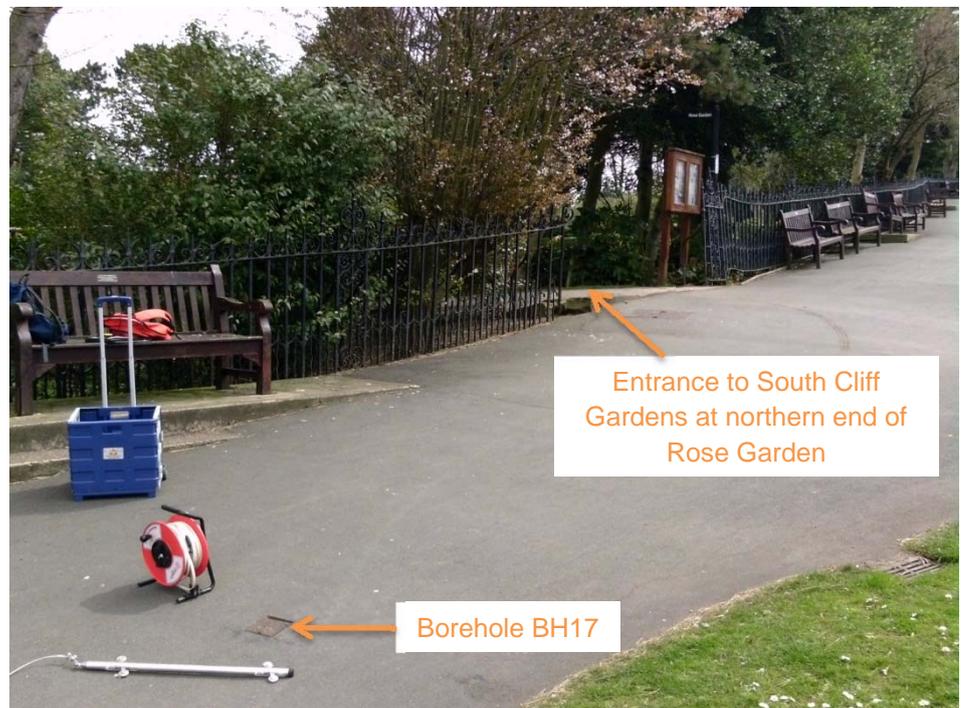
Map

GPS Reference:
TA 04499 87420



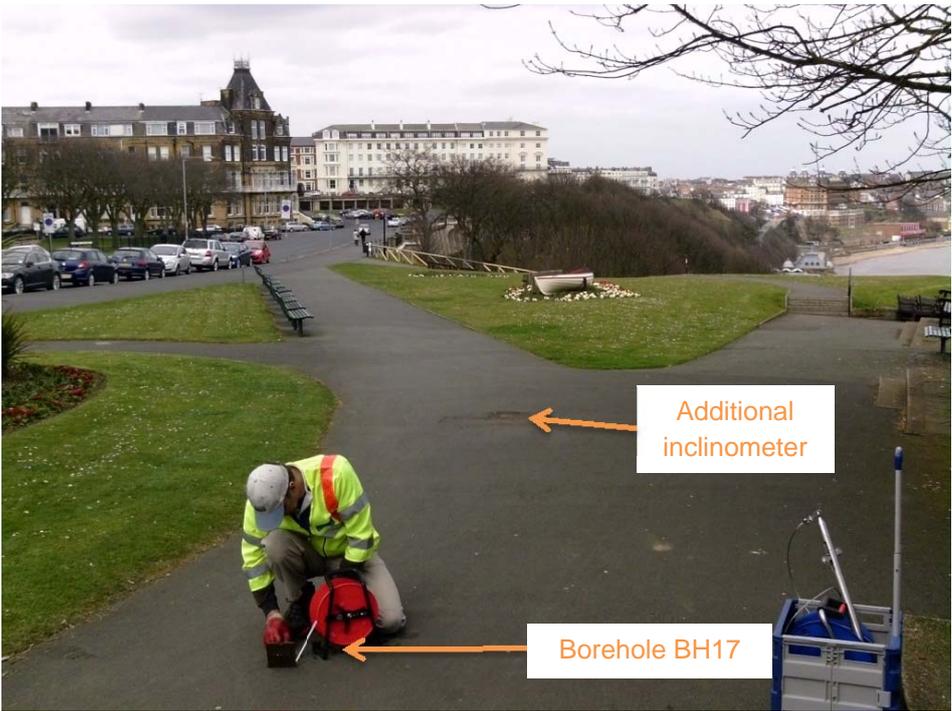
Location Photo

(looking south-east)



Entrance to South Cliff Gardens at northern end of Rose Garden

Borehole BH17

| | | | |
|--------------------------------|--|------------------------------|---------------|
| <p>Condition Photos</p> |  | | |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover has slight damage – back right corner is fractured across from the locking screw hole to hinge, but cover still functions as a whole. • Hinge ok. • Locking screw missing. • No internal cap to tube. • Tarmac footpath – no vegetation issues. | | |
| <p>Known Depth</p> | <p>50.00m</p> | <p>Recorded Depth</p> | <p>48.30m</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Water recorded at 38.1m • Dummy inclinometer went to 48.05m • There is another inclinometer borehole (not measured) approximately 5m to the north of BH17 (between the oval floral bed and boat floral bed). See photo (looking north).  | | |



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Location

Scarborough – South Cliff

Access from entrance into South Cliff Gardens (opposite 44 Esplanade), borehole is in the gully/valley area to left of footpath opposite entrance to Rose Gardens.

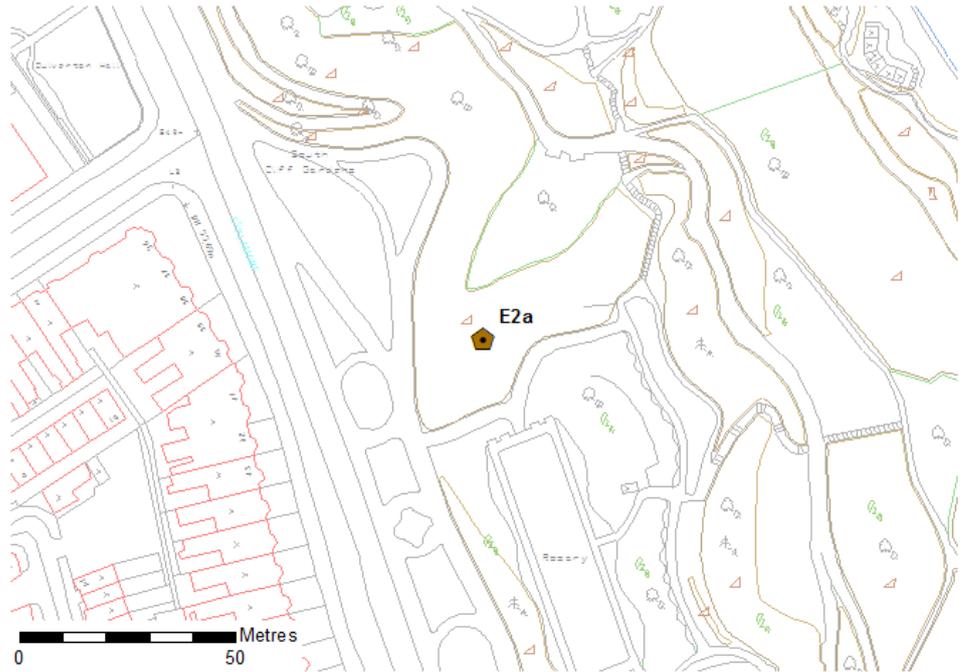
Borehole

E2

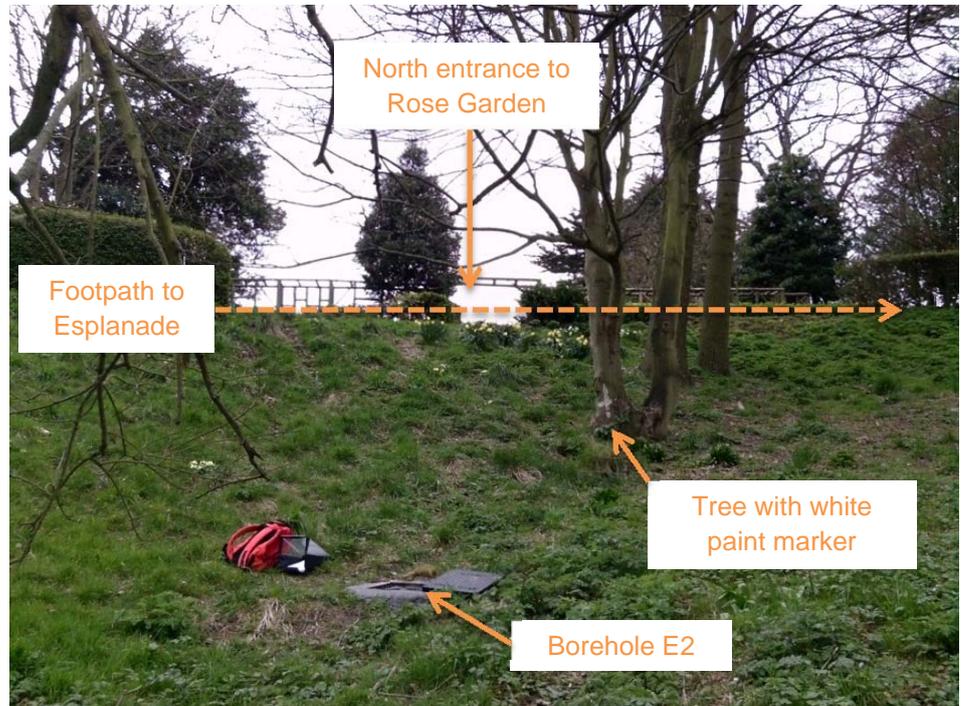
Piezometer - twin

Map

GPS Reference:
TA 04529 87434



Location Photos



Looking south out from 'valley' bottom.

| | | | | | |
|-------------------------------------|--|----------------------------------|---|--------------------|----------------|
| |  <p data-bbox="496 770 746 853">Tree with white paint marking</p> <p data-bbox="1082 770 1310 819">Borehole E2</p> <p data-bbox="759 875 1145 898">Looking north in to 'valley' from footpath.</p> | | | | |
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok with 4 locking screws. • Concrete surround ok. • Vegetation could be a problem in summer, likely to completely hide the borehole. • Double piezometer with automated data loggers. | | | | |
| Recorded Depth to Instrument | Not available | | Recorded Depth to Water | Not available | |
| Known Depth to Instrument | a) 16.85m b) 8.20m | Last Recorded Water Depth | a) 3.60m b) 1.24m | Record Date | 2009 (Mouchel) |
| Comments | <ul style="list-style-type: none"> • Close to double-trunk tree which has a white cross painted on it. | | | | |



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Location

Scarborough – South Cliff

In footpath behind floral beds, opposite no. 50 Esplanade.

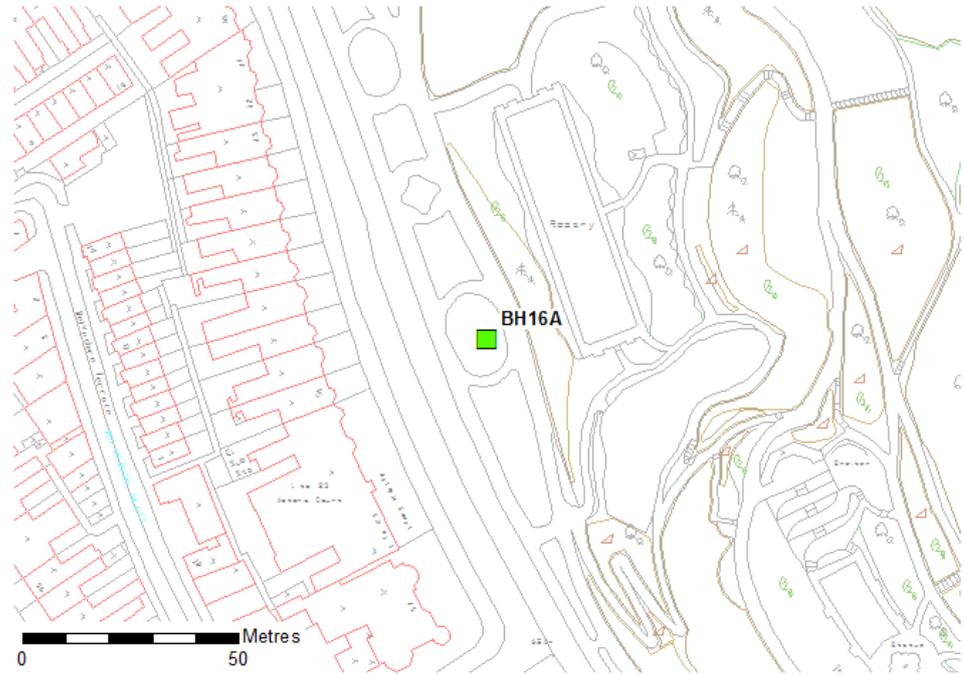
Borehole

BH16A

Inclinometer

Map

GPS Reference:
TA 04528 87356



Location Photo

(looking north)



| | | | |
|-------------------------|--|-----------------------|--|
| Condition Photos |  | |  |
| Condition | <ul style="list-style-type: none"> • Cover and hinge ok, not locked. • Concrete surround is ok. • No cap to inner tube. • Tarmac footpath – no vegetation issues. | | |
| Known Depth | 51.50m | Recorded Depth | 52.8m |
| Comments | <ul style="list-style-type: none"> • Water recorded at 38.85m. • Dummy inclinometer went to 52.45m. • Series of three inclinometer in close proximity, based on markings on footpath these are assumed to be: <ul style="list-style-type: none"> ○ Northern = BH16A ○ Middle = BH16 ○ Southern = AA05 | | |



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Location

Scarborough – South Cliff

Opposite no. 60 Esplanade. In path between 4th and 5th floral beds/grassed verge from clock tower.

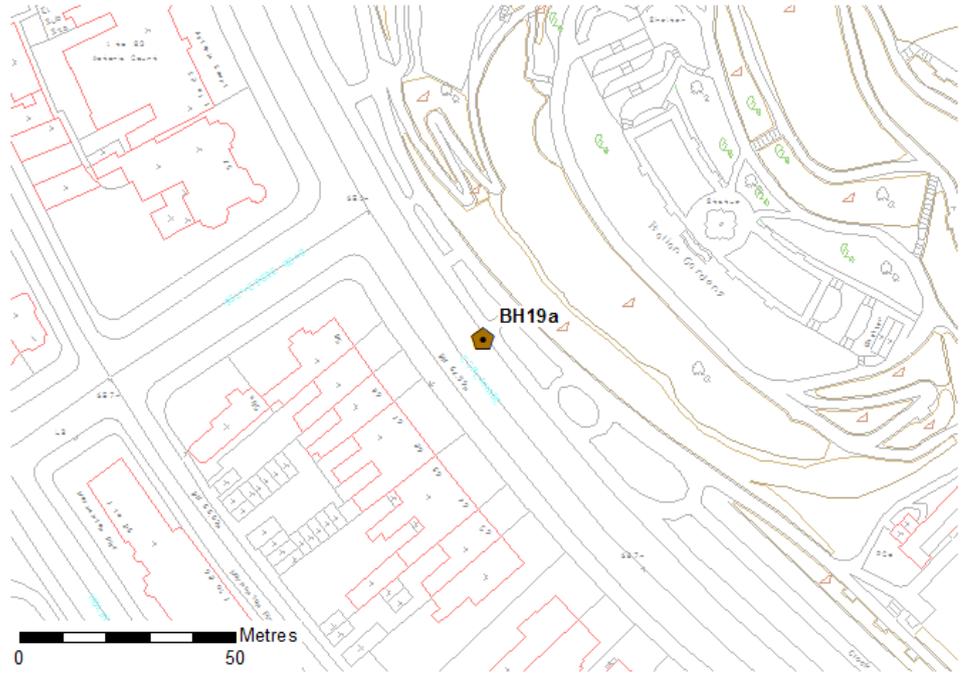
Borehole

BH19

Piezometer - twin

Map

GPS Reference:
TA 04570 87253



Location Photo

(looking south-east)



| | | | | | |
|-------------------------------------|---|----------------------------------|--|--------------------|---------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok with 4 locking screws. • Concrete surround ok. • Tarmac footpath – no vegetation issues. • Double piezometer with automated data loggers. | | | | |
| Recorded Depth to Instrument | Not available | | Recorded Depth to Water | Not available | |
| Known Depth to Instrument | a) 11.00m b) 16.50m | Last Recorded Water Depth | Not available | Record Date | Not available |
| Comments | | | | | |



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Location

Scarborough – South Cliff

Corner of Prince of Wales Terrace, in the parking bays at the kerb line, close to the stepped entrance to prince of Wales gardens

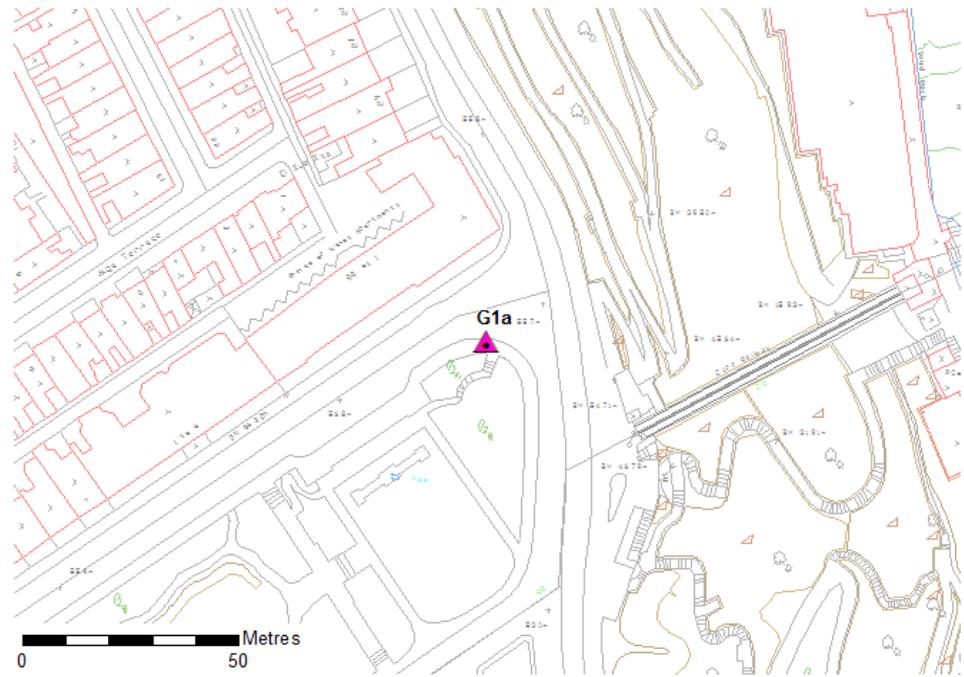
Borehole

G1

Piezometer - twin

Map

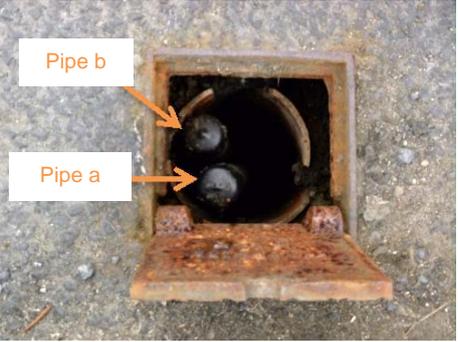
GPS Reference:
TA 04398 87693



Location Photo

(looking south)



| | | | | | |
|--|--|---|--|---------------------------|---------------------------|
| <p>Condition Photos</p> |  | |  | | |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover and hinge ok, no locking mechanism. • Caps to inner tubes. • Double piezometer. • In tarmac road – no vegetation issues. | | | | |
| <p>Recorded Depth to Instrument</p> | <p>a) 36.40m b) 2.0m</p> | <p>Recorded Depth to Water</p> | <p>a) dry b) dry</p> | | |
| <p>Known Depth to Instrument</p> | <p>a) 36.40m b) 2.10m</p> | <p>Last Recorded Water Depth</p> | <p>a) 36.31m b) 2.10m</p> | <p>Record Date</p> | <p>2009 (Mouchel)</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Pipe a is closest to the kerb line, and pipe b is closest to the road. • Both inner tubes were dry apart from damp/wet sediment at the bottom of the tubes. | | | | |



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Location

Scarborough – South Cliff

At the footpath junction at the end of the 3rd 'zig-zag' down the path at side of Cliff Lift. Close to lamppost 38.

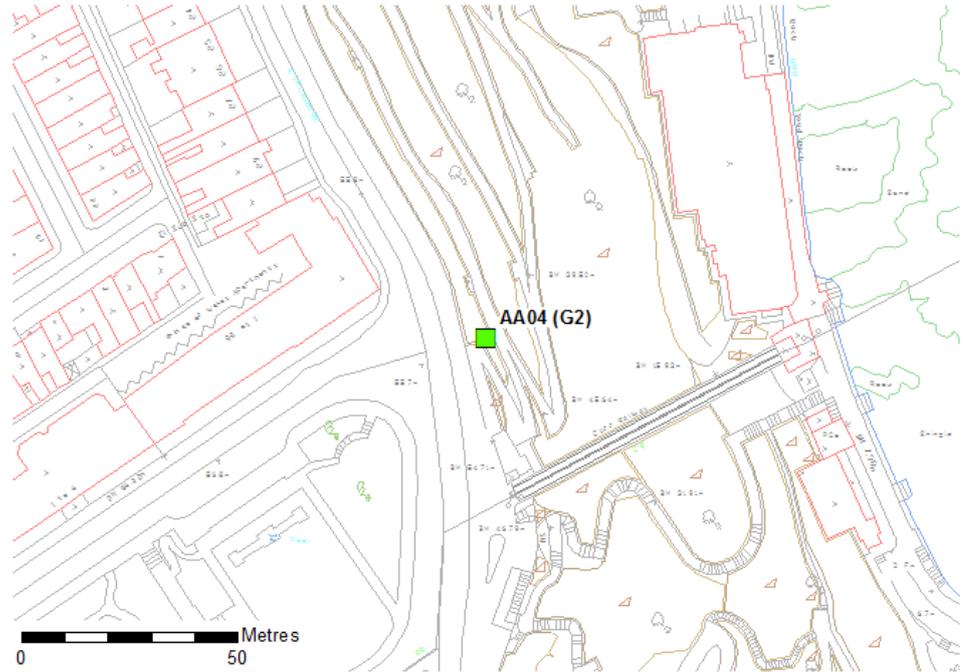
Borehole

G2

Inclinometer

Map

GPS Reference:
TA 04426 87708



Location Photo

(looking south)



| | | | |
|-------------------------|---|-----------------------|--|
| Condition Photos |  | |  |
| Condition | <ul style="list-style-type: none"> • Cover and hinge ok though quite stiff. Not locked, mechanism corroded. • Concrete surround ok. • No cap to inner tube. • Tarmac footpath – no vegetation issues. | | |
| Known Depth | 40.60m | Recorded Depth | 40.40m |
| Comments | <ul style="list-style-type: none"> • Water recorded at 40.0m. • Dummy inclinometer went to 40.90m • Measurements to top of inner (red) tube. | | |



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Location

Scarborough – South Cliff

Between 1st and 2nd shelters on first parallel footpath beneath Esplanade (heading from Cliff Lift). Close to Borehole G2. North of lamppost 23.

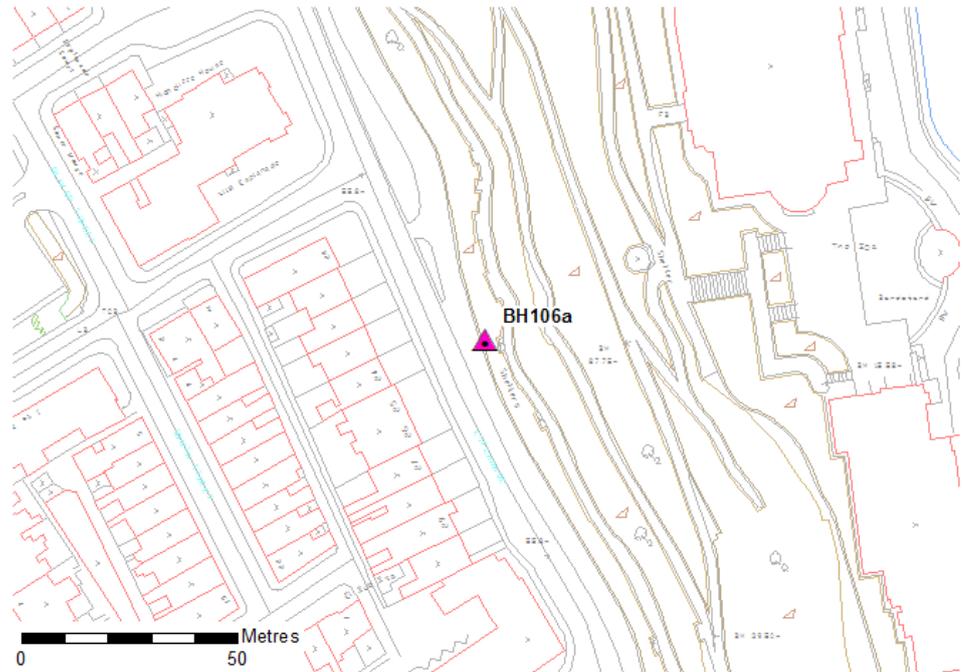
Borehole

BH106

Piezometer - twin

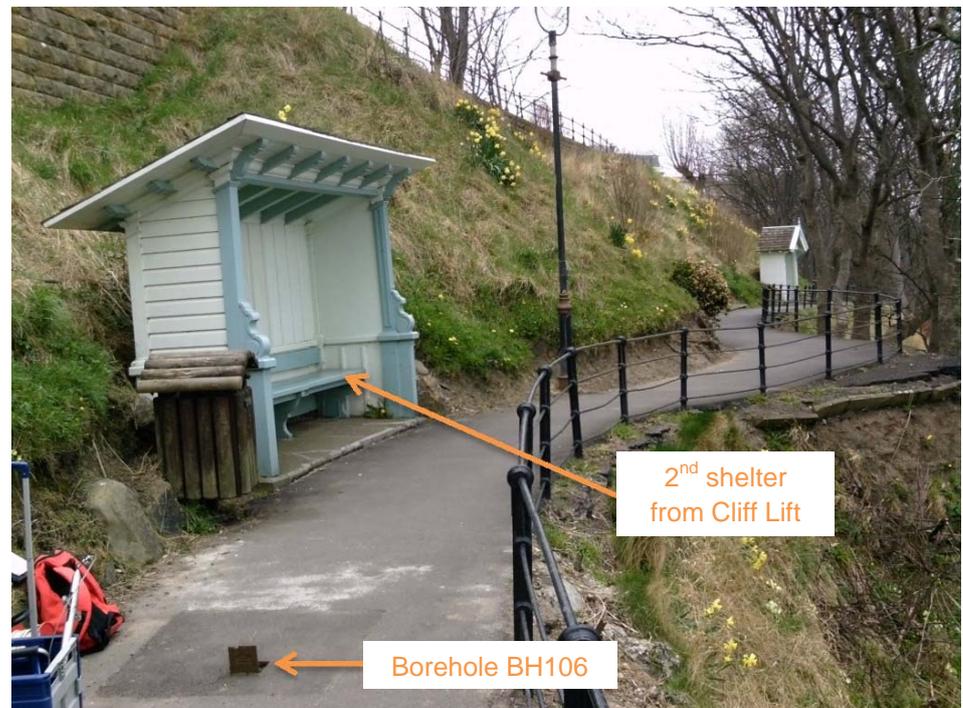
Map

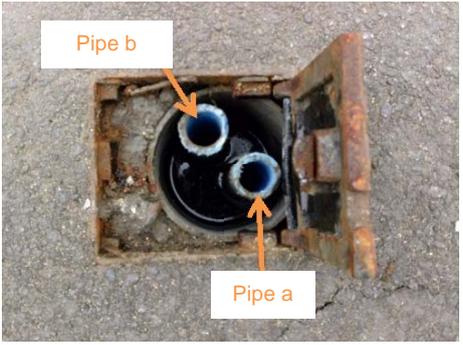
GPS Reference:
TA 04383 87792



Location Photo

(looking north)



| | | | | | |
|-------------------------------------|---|----------------------------------|--|--------------------|---------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover and hinge ok, lock broken. • Tarmac footpath – no vegetation issues. • Double piezometer (no caps). | | | | |
| Recorded Depth to Instrument | a) 41.10m b) 32.30m | Recorded Depth to Water | a) dry b) dry | | |
| Known Depth to Instrument | a) unknown b) unknown | Last Recorded Water Depth | Not available | Record Date | Not available |
| Comments | <ul style="list-style-type: none"> • Pipe a is closest to the hinge, and pipe b is closest to opening edge. | | | | |



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Condition Survey of Inclinometers and Piezometers – 23/4/2013



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Location

Scarborough – South Cliff

Opposite no. 24 Esplanade (St. Annes) in the footpath.

Borehole

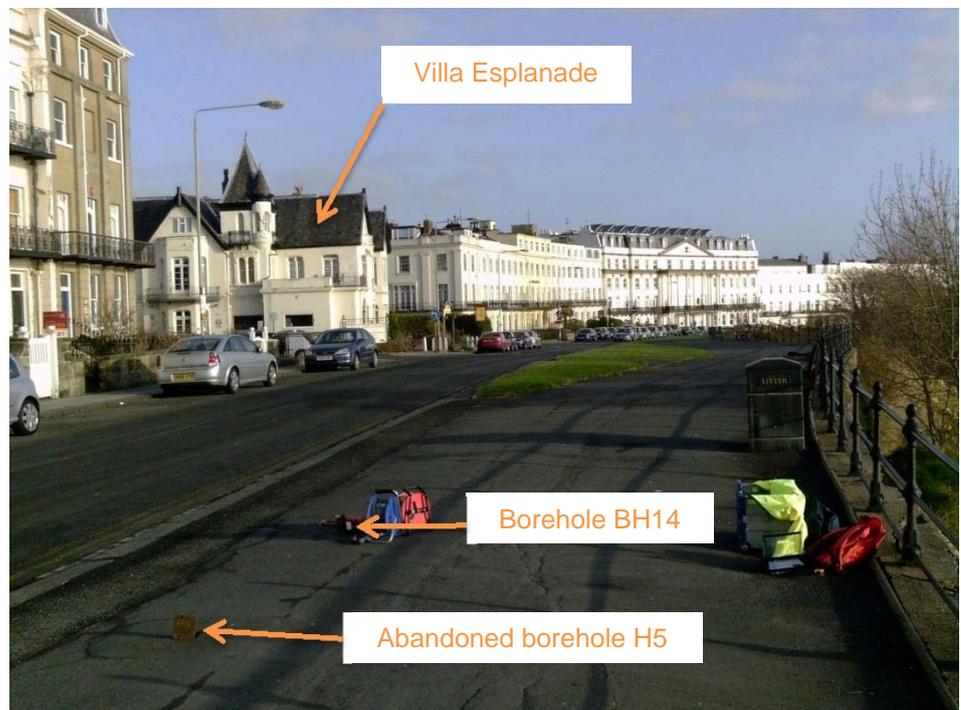
BH14

Inclinometer**Map**

GPS Reference:
TA 04374 87789

**Location Photo**

(looking north-east)



| | | | |
|-------------------------|---|-----------------------|--------|
| Condition Photos |  | | |
| Condition | <ul style="list-style-type: none"> • Cover and hinge ok, locking screw corroded and sticking up (should be removed or trimmed to prevent pedestrian trip hazard). • Cap present on inner tube. • Tarmac footpath – no vegetation issues. | | |
| Known Depth | 56.00m | Recorded Depth | 56.67m |
| Comments | <ul style="list-style-type: none"> • Water recorded at 40.00m. • Dummy inclinometer went to 56.60m. • Two boreholes in close proximity, BH14 is the most northerly. | | |



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Location

Scarborough – South Cliff

Opposite the end of St. Martin's Avenue, in the grass verge.

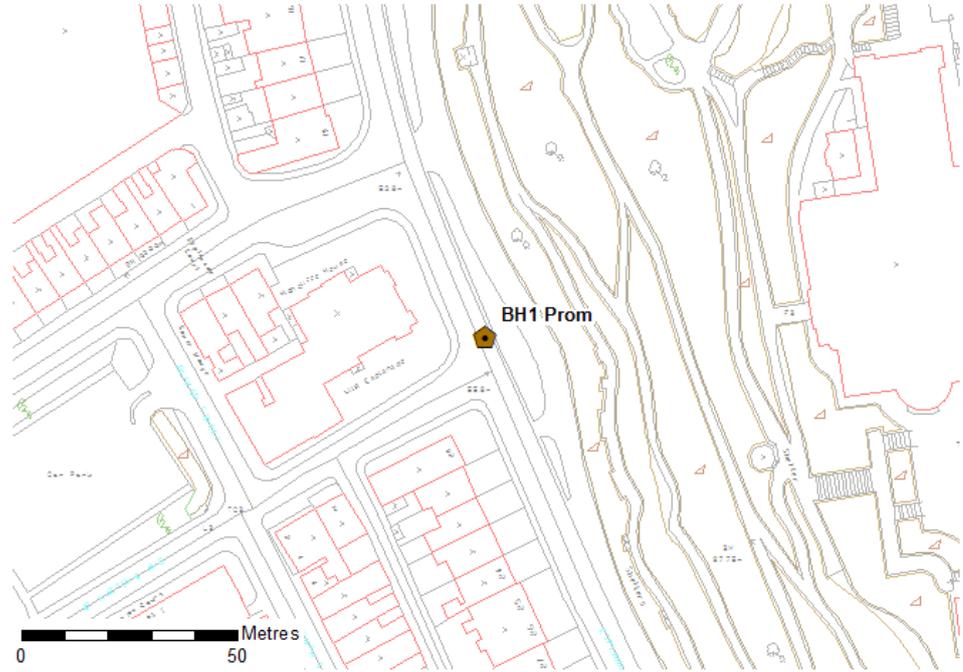
Borehole

BH1 (prom)

Piezometer

Map

GPS Reference:
TA 04354 87839



Location Photo

(looking north-east)



| | | | | | |
|-------------------------------------|---|----------------------------------|--|--------------------|---------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok with 4 locking screws. • Concrete surround ok. • Vegetation ok – short mown grass, well maintained. • Single piezometer with automated data logger. | | | | |
| Recorded Depth to Instrument | Not available | | Recorded Depth to Water | Not available | |
| Known Depth to Instrument | 13.60m | Last Recorded Water Depth | Not available | Record Date | Not available |
| Comments | <ul style="list-style-type: none"> • Black foam tube for packing next to piezometer tube. • Lots of water present inside the outer tube. | | | | |



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Location

Scarborough – South Cliff

Opposite the end of Albion Road, in footpath at end of grass verge.

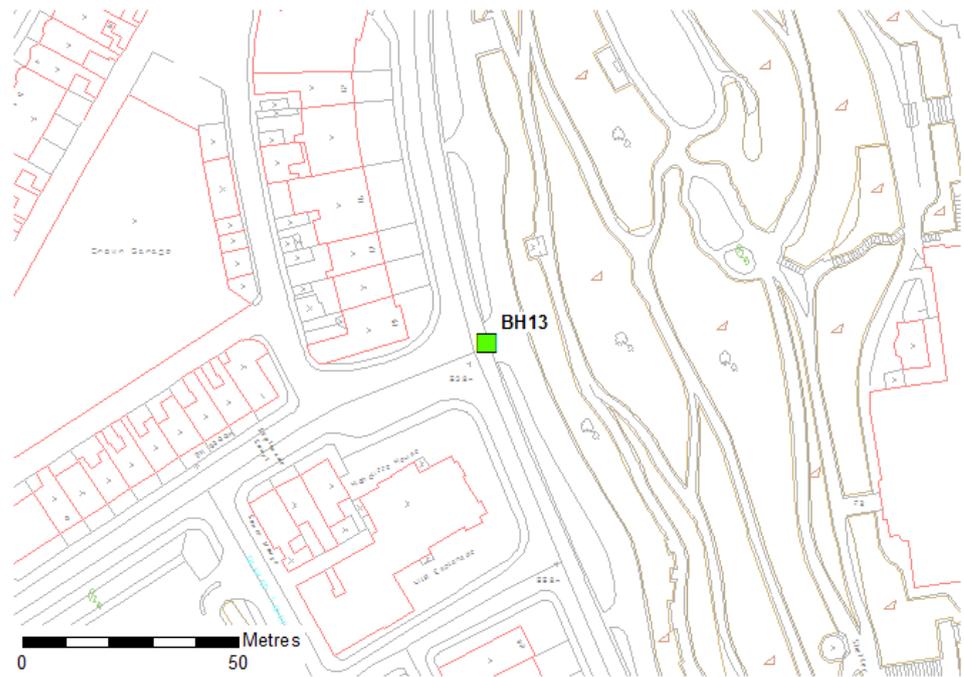
Borehole

BH13

Inclinometer

Map

GPS Reference:
TA 04338 87882



Location Photo

(looking north-east)



| | | | |
|--------------------------------|---|------------------------------|--|
| <p>Condition Photos</p> |  | |  |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover and hinge ok, but locking screw corroded and sticking up (should be removed or cut off to prevent pedestrian trip hazard). • Tarmac surround ok. • In tarmac footpath – no vegetation issues. • Cap present to inner tube. | | |
| <p>Known Depth</p> | <p>61.40m</p> | <p>Recorded Depth</p> | <p>61.80m</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Water recorded at 11.0m (inconclusive). • Dummy inclinometer went to 61.75m. • Two inclinometers in close proximity, BH13 assumed to be most southerly. | | |



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Location

Scarborough – South Cliff

At junction of paths at bottom of first slope down from ornamental gates opposite Crown Spa Hotel. Near lamppost 18.

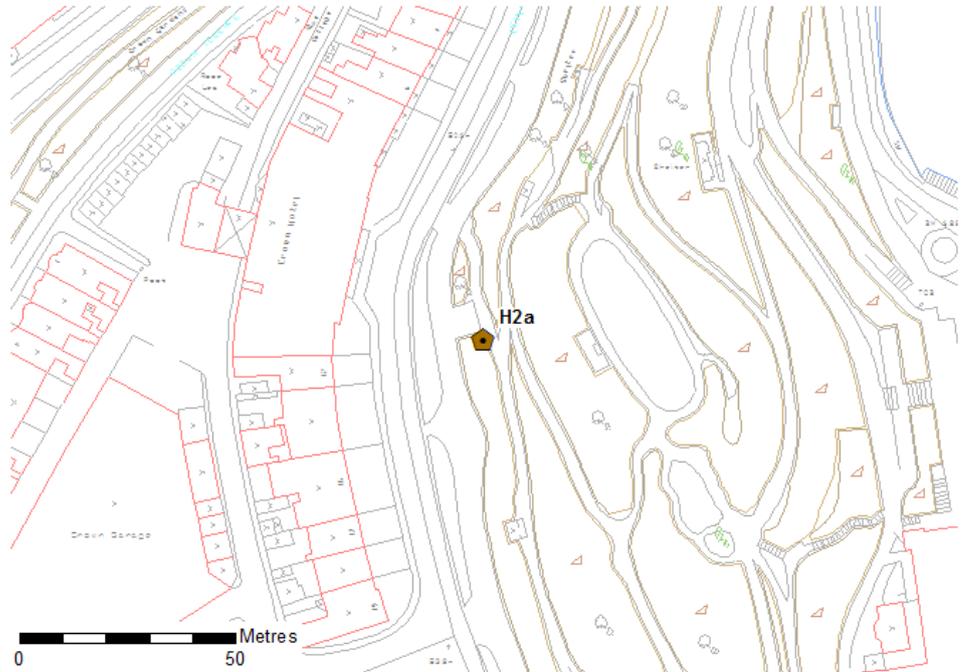
Borehole

H2

Piezometer - twin

Map

GPS Reference:
TA 04342 87949



Location Photo

(looking north)



| | | | | | |
|-------------------------------------|---|----------------------------------|--|--------------------|-------------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok with 4 locking screws. • Concrete surround ok. • Tarmac footpath – no vegetation issues. • Double piezometer with automated data loggers. | | | | |
| Recorded Depth to Instrument | Not available | | Recorded Depth to Water | Not available | |
| Known Depth to Instrument | a) 29.10m b) 34.37m | Last Recorded Water Depth | a) 29.10m b) 34.37m | Record Date | 2009 (Mouchel) |
| Comments | <ul style="list-style-type: none"> • | | | | |



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Location

Scarborough – South Cliff

Opposite corner of Wessex Court at end of the Esplanade, at the start of the path/steps down to the Cliff Bridge.

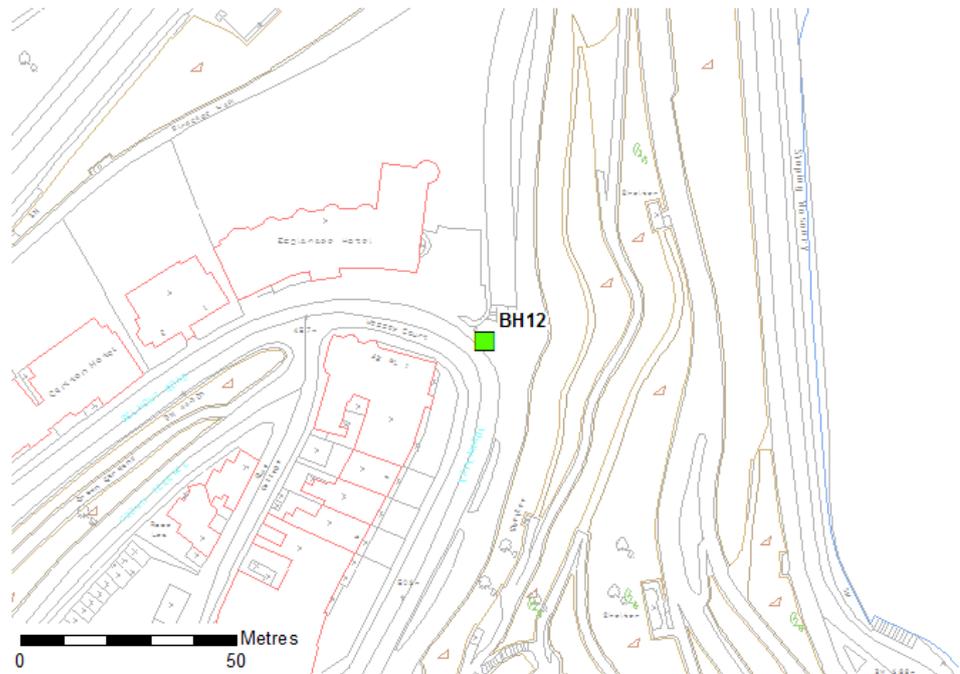
Borehole

BH12

Inclinometer

Map

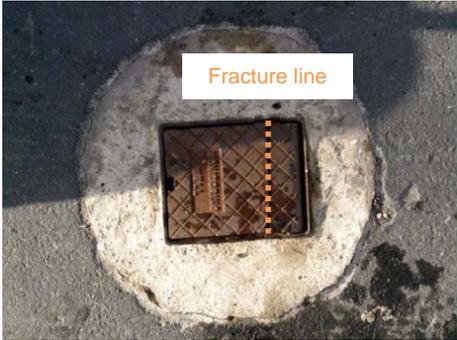
GPS Reference:
TA 04354 88053



Location Photo

(looking west)



| | | | | |
|-------------------------|---|-----------------------|--|--|
| Condition Photos |  | |  | |
| Condition | <ul style="list-style-type: none"> • Cover broken, fractured right across close to hinge (through locking screw hole). • Cap to inner tube present. • Concrete surround ok. • Tarmac footpath – no vegetation issues. | | | |
| Known Depth | 65.00m | Recorded Depth | 66.80m | |
| Comments | <ul style="list-style-type: none"> • Water recorded at 44.62m. • Dummy inclinometer went to 66.19m. • Two adjacent inclinometers, BH12 assumed to be most southerly (with white concrete surround). | | | |



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Location

Scarborough – South Bay

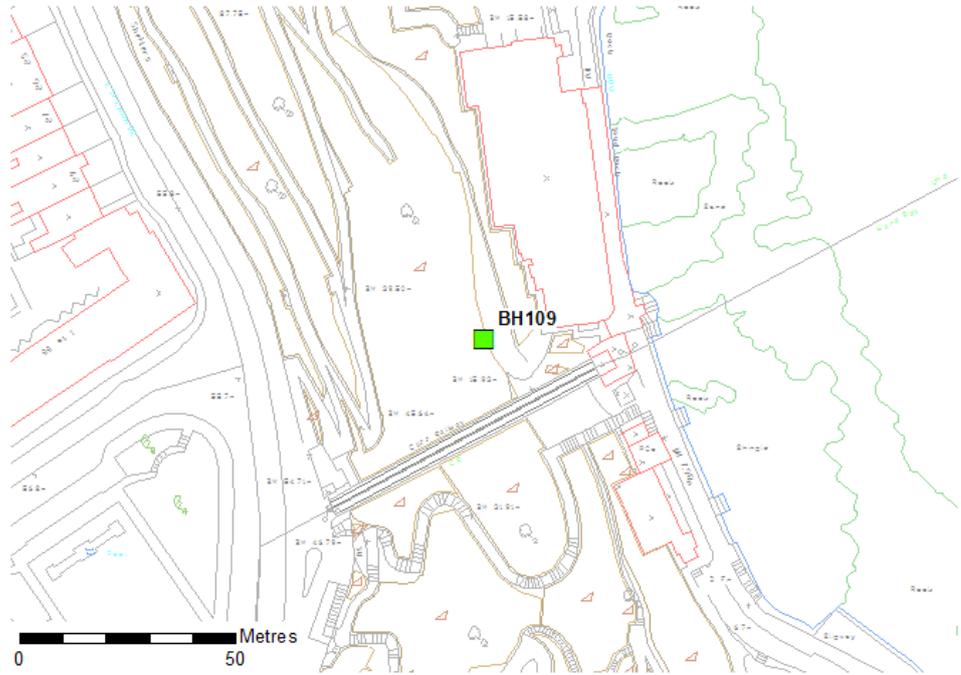
In the grass bank at the top of the steps up the side of the kiosk at the bottom of the Cliff Lift.

Borehole

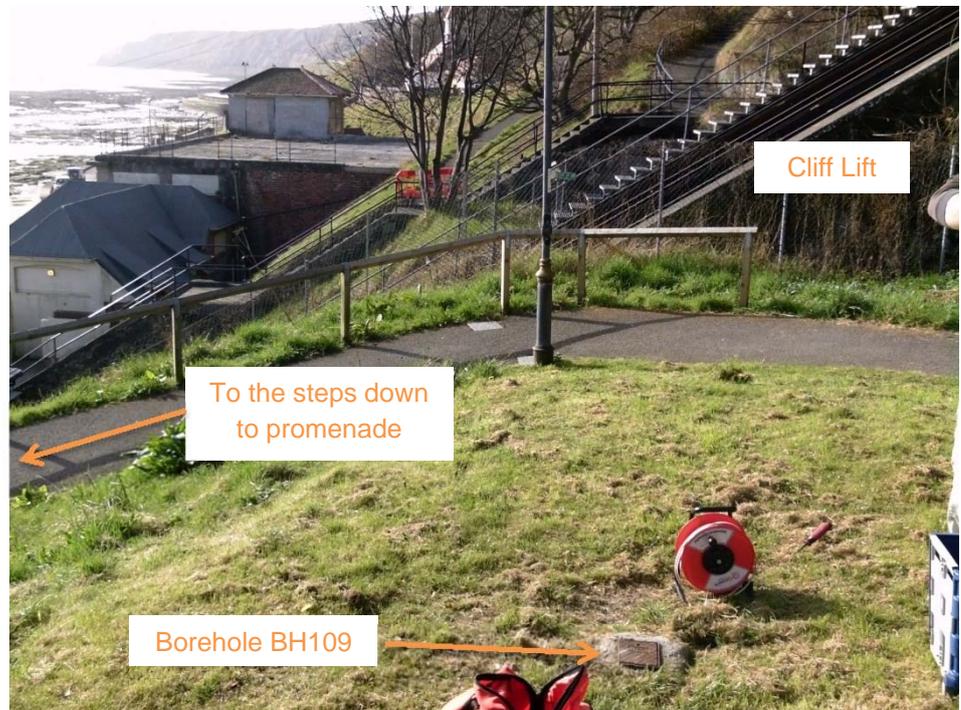
BH109

Inclinometer**Map**

GPS Reference:
TA 04468 87711

**Location Photo**

(looking south-east)



| | | | |
|--------------------------------|---|------------------------------|--|
| <p>Condition Photos</p> |  | |  |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover and hinge ok, but lock corroded. • Concrete surround ok but it is raised above surrounding ground level, could be damaged by mowing equipment. • Vegetation ok, appears to be mown grass but could be a problem if not well maintained. | | |
| <p>Known Depth</p> | <p>Unknown</p> | <p>Recorded Depth</p> | <p>15.00m</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Water recorded at 13.90m. • Dummy inclinometer went to 15.15m. | | |



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Location

Scarborough – South Cliff

Opposite lamppost 2, near junction of footpath behind Ocean Ballroom with access steps to building.

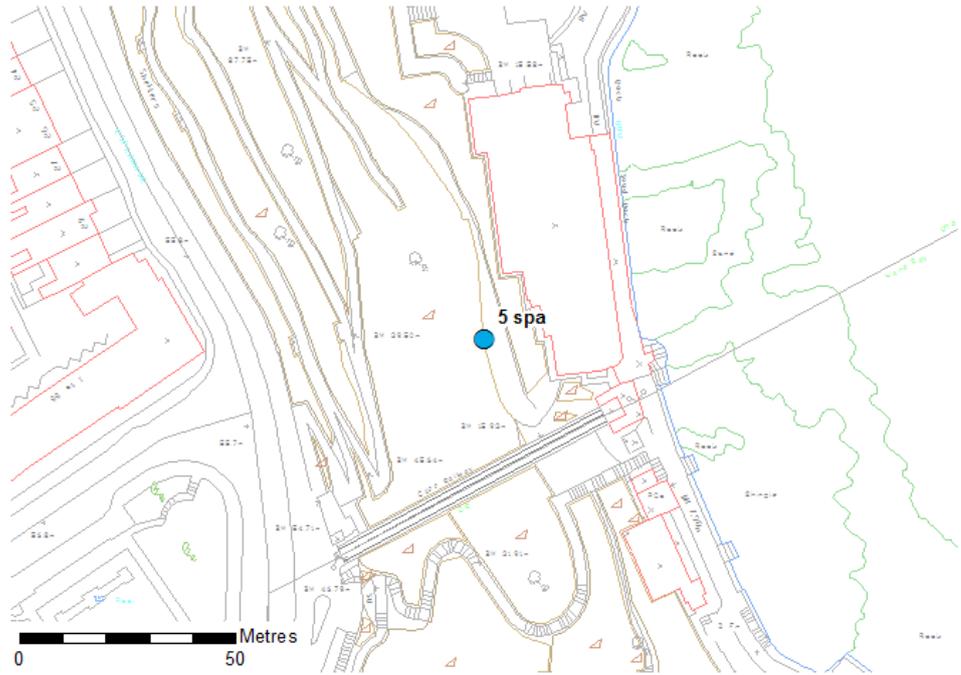
Borehole

Spa 5

Monitoring Drainage Well

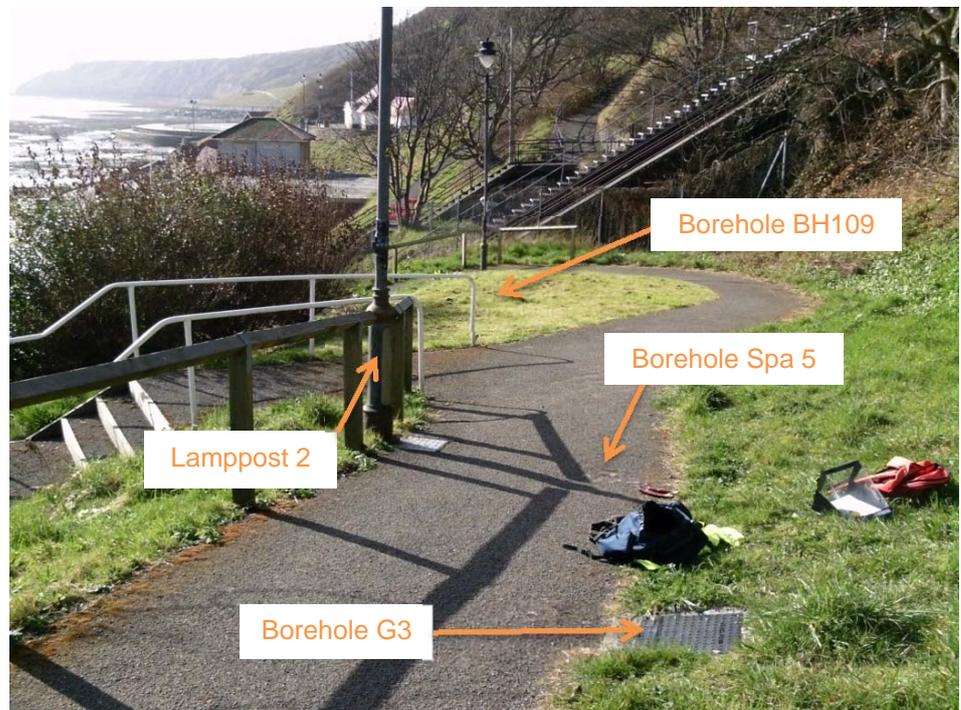
Map

GPS Reference:
TA 04466 87722



Location Photo

(looking south-east)



| | | | | | |
|-------------------------|---|----------------------------------|--|--------------------|----------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok, but hinge broken, not attached. • No locking mechanism. • Tarmac footpath – no vegetation issues. | | | | |
| Recorded Depth | 8.63m | Recorded Depth to Water | Dry (damp sediment at bottom) | | |
| Known Depth | 8.80m | Last Recorded Water Depth | Dry | Record Date | 2009 (Mouchel) |
| Comments | <ul style="list-style-type: none"> • Close to piezometer Borehole G3. | | | | |



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Location

Scarborough – South Cliff

At edge of footpath near lamppost 2 on footpath around back of Ocean Ballroom from the steps up the side of the kiosk at the bottom of the Cliff Lift.

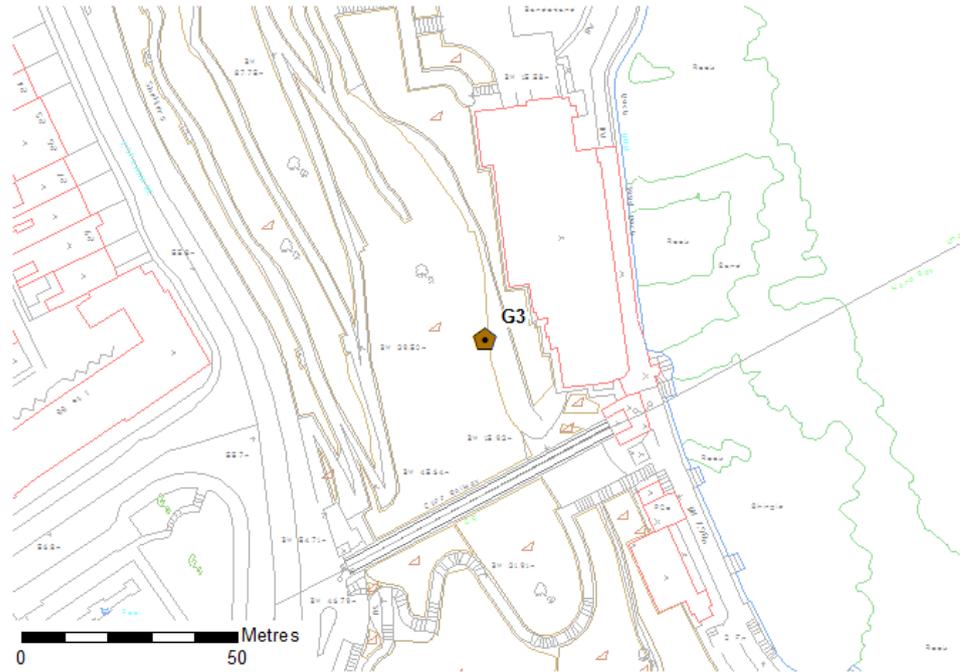
Borehole

G3

Piezometer

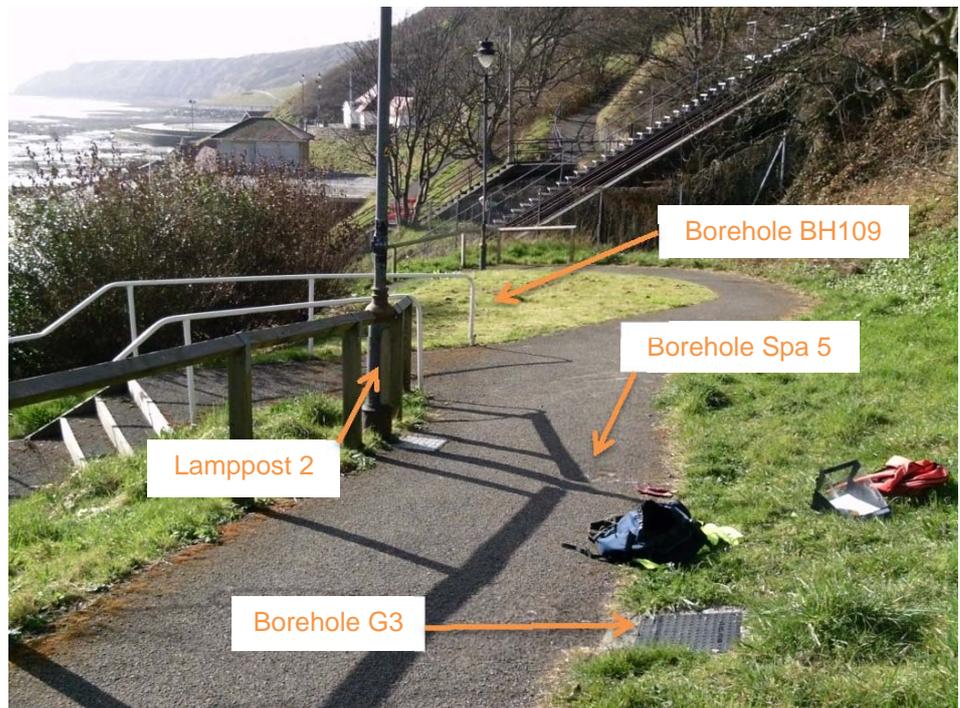
Map

GPS Reference:
TA 04465 87725



Location Photo

(looking south-east)



| | | | | | |
|--|---|---|--|---------------------------|-----------------------|
| <p>Condition Photos</p> |  | |  | | |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover ok with 4 locking screws. • Concrete surround ok. • Single piezometer with automated data logger. • In edge of grassed area, may become slightly overgrown in summer but should still be easily found. | | | | |
| <p>Recorded Depth to Instrument</p> | <p>Not available</p> | | <p>Recorded Depth to Water</p> | <p>Not available</p> | |
| <p>Known Depth to Instrument</p> | <p>6.17m</p> | <p>Last Recorded Water Depth</p> | <p>4.81m</p> | <p>Record Date</p> | <p>2009 (Mouchel)</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Close to Borehole Spa 5 (monitoring drainage well). | | | | |



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Location

Scarborough – South Cliff

In footpath near next lamppost up from lamppost 2 on footpath around back of Ocean Ballroom from the steps up the side of the kiosk at the bottom of the Cliff Lift.

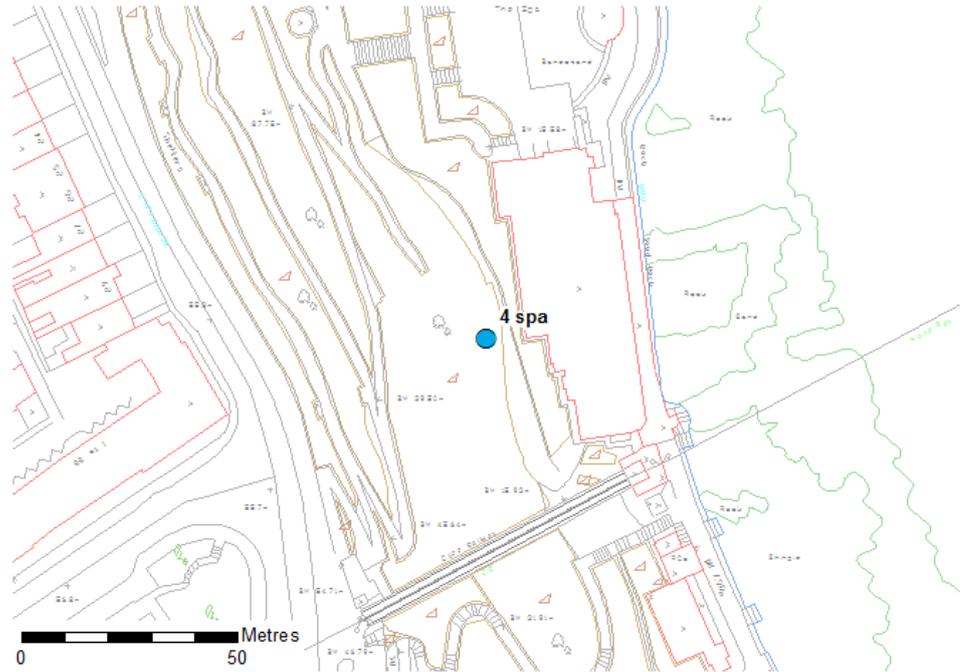
Borehole

Spa 4

Monitoring Drainage Well

Map

GPS Reference:
TA 04461 87737



Location Photo

(looking south)



| | | | | | |
|-------------------------|--|----------------------------------|--|--------------------|----------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok, hinge ok but stiff. • Locking mechanism corroded. • Concrete surround ok. • Tarmac footpath – no vegetation issues. | | | | |
| Recorded Depth | 7.00m | Recorded Depth to Water | 6.02m | | |
| Known Depth | 7.27m | Last Recorded Water Depth | 6.37m | Record Date | 2009 (Mouchel) |
| Comments | | | | | |



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Location

Scarborough – South Cliff

Edge of footpath between next two lampposts up from lamppost 2 on footpath around back of Ocean Ballroom from the steps up the side of the kiosk at the bottom of the Cliff Lift.

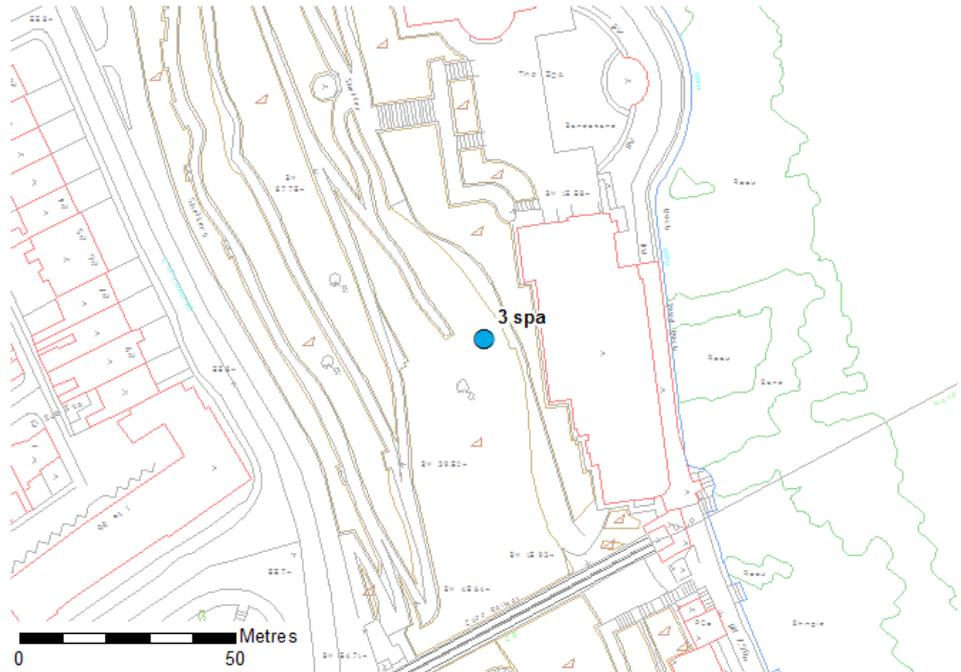
Borehole

Spa 3

Monitoring Drainage Well

Map

GPS Reference:
TA 04455 87752



Location Photo

(looking north)



| | | | | | |
|-------------------------|---|----------------------------------|--|--------------------|----------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok but broken off at hinge. • No locking mechanism. • Tarmac footpath – no vegetation issues. | | | | |
| Recorded Depth | 11.15m | Recorded Depth to Water | 6.43m | | |
| Known Depth | 11.48m | Last Recorded Water Depth | 6.63m | Record Date | 2009 (Mouchel) |
| Comments | <ul style="list-style-type: none"> • | | | | |



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Condition Survey of Inclinometers and Piezometers – 23/4/2013



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Location

Scarborough – South Cliff

Opposite lamppost in grassed seating area overlooking the terrace/Sun Court/Vita Dome.

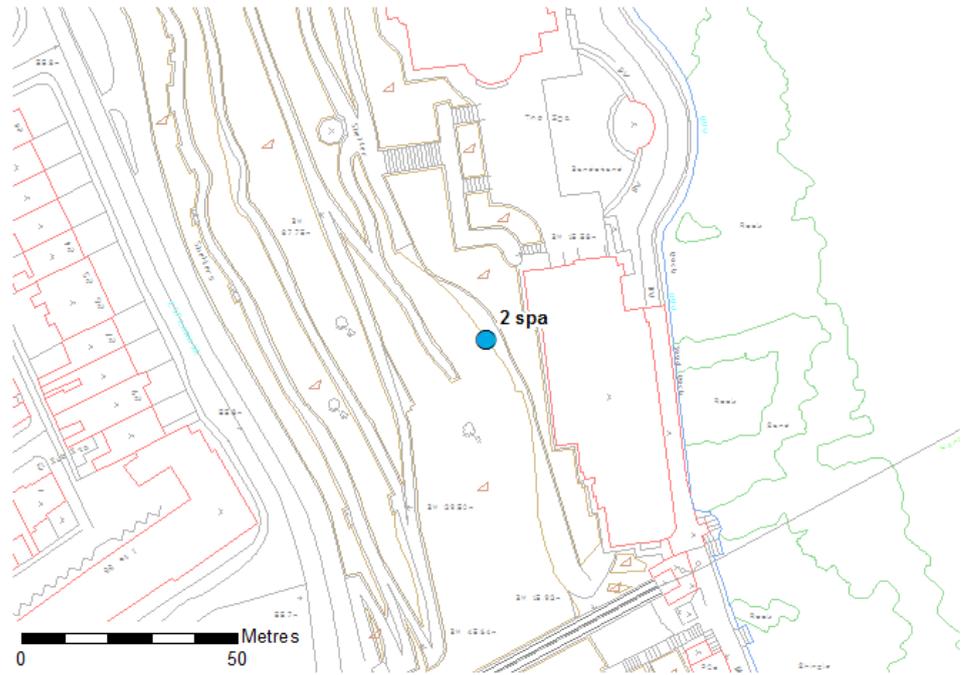
Borehole

Spa 2

Monitoring Drainage Well

Map

GPS Reference:
TA 04454 87762



Location Photo

(looking north)



| | | | | | |
|-------------------------|---|----------------------------------|--|--------------------|----------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok, hinge ok but stiff, no locking mechanism. • Vegetation ok – in short mown grass area, likely to be well maintained for the seating area. | | | | |
| Recorded Depth | 11.88m | Recorded Depth to Water | 9.00m | | |
| Known Depth | 12.80m | Last Recorded Water Depth | 9.03m | Record Date | 2009 (Mouchel) |
| Comments | <ul style="list-style-type: none"> • Adjacent to BH107 – Spa 2 is more southerly borehole. | | | | |



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Location

Scarborough – South Cliff

At southern end of benches in grassed seating area overlooking the terrace/Sun Court/Vita Dome.

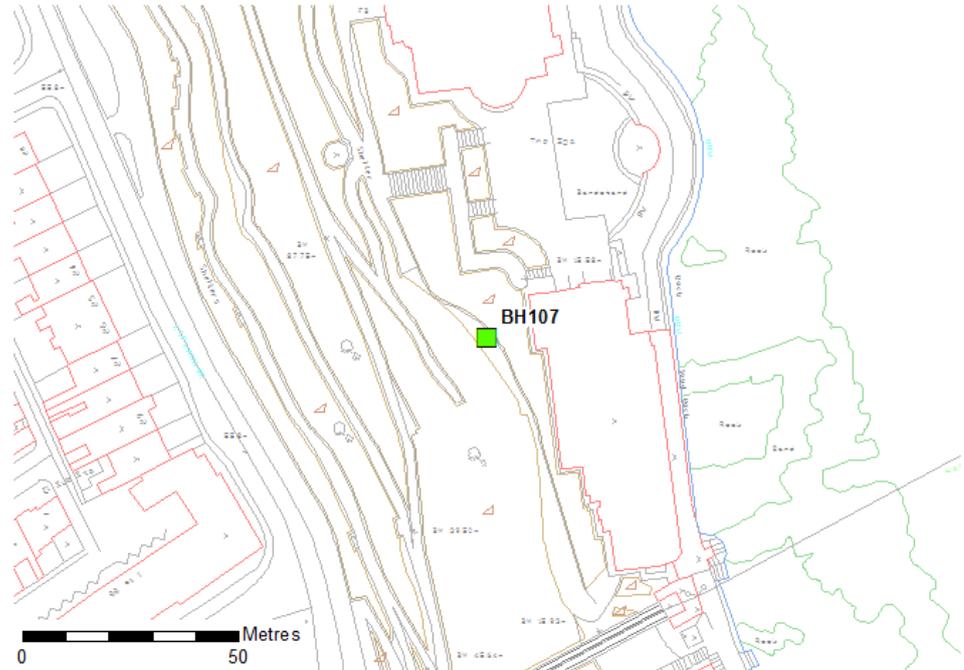
Borehole

BH107

Inclinometer

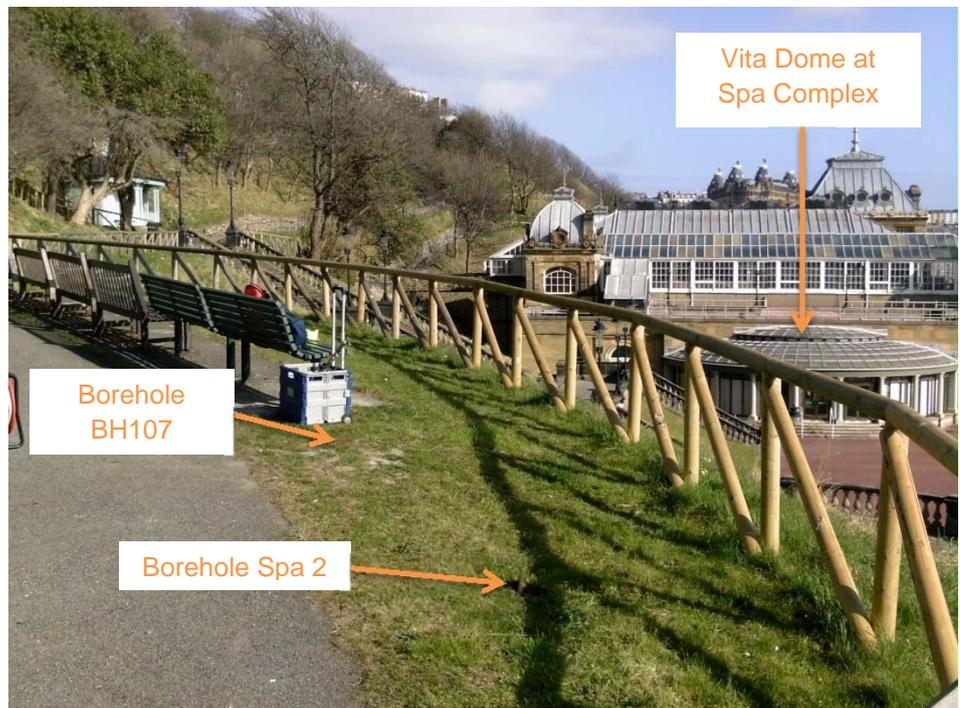
Map

GPS Reference:
TA 04453 87763



Location Photo

(looking north)



| | | | |
|-------------------------|--|-----------------------|--------|
| Condition Photos |  | | |
| Condition | <ul style="list-style-type: none"> • Cover and hinge ok, but locking mechanism corroded and bent. • No cap to inner tube. • No vegetation issues – mown grass, likely to be well maintained for the seating area. | | |
| Known Depth | Unknown | Recorded Depth | 18.05m |
| Comments | <ul style="list-style-type: none"> • Water recorded at 15.95m. • Dummy inclinometer went to 17.99m. • Adjacent to Borehole Spa 2 – BH107 is closer to the benches. | | |



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Location

Scarborough – South Cliff

In front of benches in grassed seating area overlooking the terrace/Sun Court/Vita Dome (4th bench up from southern end).

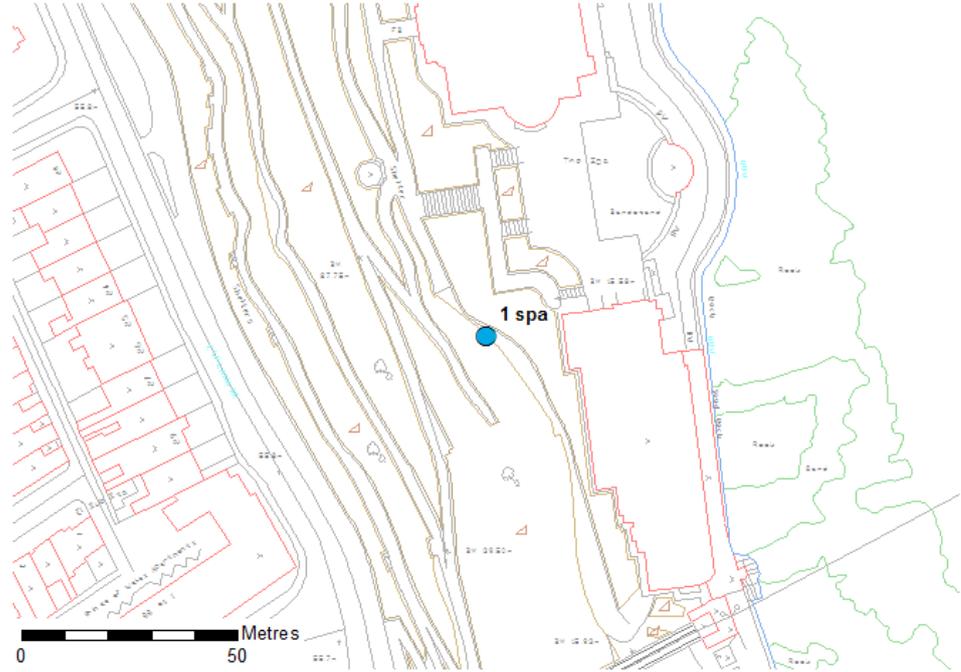
Borehole

Spa 1

Monitoring Drainage Well

Map

GPS Reference:
TA 04445 87773



Location Photo

(looking south-east)



| | | | | | |
|--------------------------------|--|---|--|---------------------------|-----------------------|
| <p>Condition Photos</p> |  | |  | | |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover and hinge ok, locking mechanism corroded. • Slightly overgrown but in short mown grass area, likely to be well maintained for the seating area. | | | | |
| <p>Recorded Depth</p> | <p>12.85m</p> | <p>Recorded Depth to Water</p> | <p>12.38m</p> | | |
| <p>Known Depth</p> | <p>13.90m</p> | <p>Last Recorded Water Depth</p> | <p>12.97m</p> | <p>Record Date</p> | <p>2009 (Mouchel)</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Close to Boreholes Spa 2 and BH107 (in same grassed seating area). | | | | |



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Location

Scarborough – South Cliff

Middle of footpath up the left of the shelter at the top of the Italian Staircase from the terrace above the Sun Court.

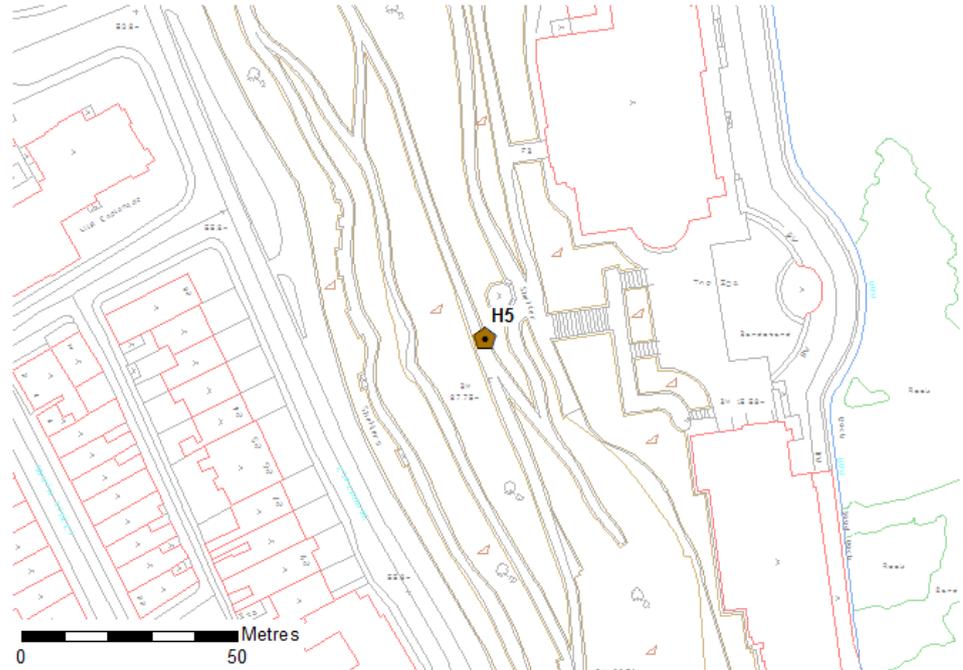
Borehole

H5

Piezometer

Map

GPS Reference:
TA 04415 87801



Location Photo

(looking north)



| | | | | | |
|-------------------------------------|--|----------------------------------|--|--------------------|----------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok with 4 locking screws. • Concrete surround ok. • Tarmac footpath – no vegetation issues. • Single piezometer with automated data logger. | | | | |
| Recorded Depth to Instrument | Not available | | Recorded Depth to Water | Not available | |
| Known Depth to Instrument | 6.91m | Last Recorded Water Depth | 0.74m | Record Date | 2009 (Mouchel) |
| Comments | <ul style="list-style-type: none"> • | | | | |



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Location

Scarborough – South Cliff

Middle of footpath behind the main Spa building, just north of the access bridge to the back of the buildings.

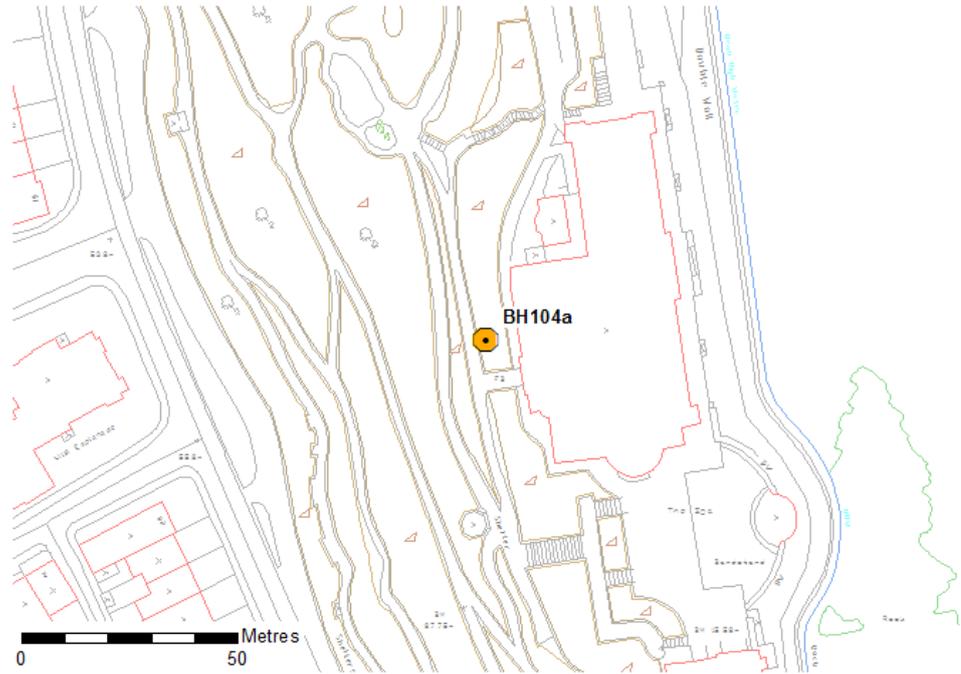
Borehole

BH104

Piezometer - twin

Map

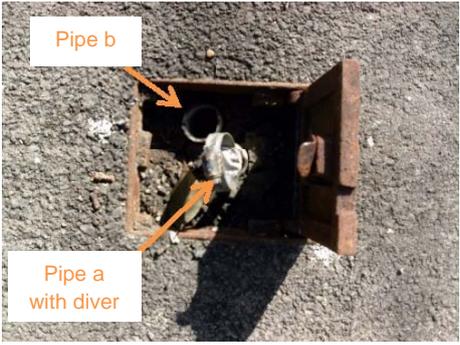
GPS Reference:
TA 04421 87854



Location Photo

(looking south)



| | | | | | |
|--|--|---|--|---------------------------|----------------------|
| <p>Condition Photos</p> |  | |  | | |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover and hinge ok, but does not close flush due to diver (potential pedestrian trip hazard). • Lock mechanism corroded and broken. • Tarmac surround ok. • Tarmac footpath – no vegetation issues. • Double piezometer with diver in central piezometer tube. | | | | |
| <p>Recorded Depth to Instrument</p> | <p>a) 15.90m b) 12.21m</p> | <p>Recorded Depth to Water</p> | <p>a) 13.00m b) 9.27m</p> | | |
| <p>Known Depth to Instrument</p> | <p>a) unknown b) unknown</p> | <p>Last Recorded Water Depth</p> | <p>Not available</p> | <p>Record Date</p> | <p>Not available</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Pipe a is the central one which contains the diver, pipe b is the one on the left when looking towards the hinge. • Diver length of 15.00m. | | | | |



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Location

Scarborough – South Cliff

Between lampposts 35 and 34 on the 3rd 'zig-zag' of path up to the left of the shelter at the top of the Italian Staircase.

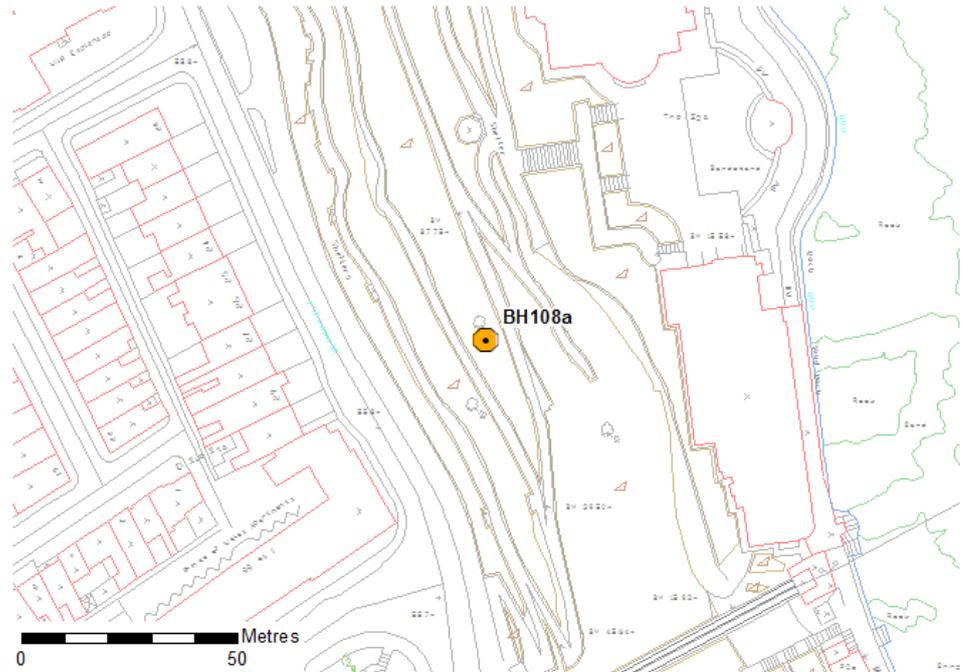
Borehole

BH108

Piezometer - triple

Map

GPS Reference:
TA 04422 87762



Location Photo

(looking north-west)



| | | | | | |
|--|---|---|--|---------------------------|----------------------|
| <p>Condition Photos</p> |  | |  | | |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover and hinge ok, but locking mechanism broken. • Concrete surround ok. • Tarmac footpath – no vegetation issues. • Triple piezometer, with diver in most uphill pipe. | | | | |
| <p>Recorded Depth to Instrument</p> | <p>a) 24.12m b) 6.02m c) 0.5m</p> | <p>Recorded Depth to Water</p> | <p>a) 16.67m b) dry (damp sediment) c) dry (damp sediment)</p> | | |
| <p>Known Depth to Instrument</p> | <p>a) unknown b) unknown c) unknown</p> | <p>Last Recorded Water Depth</p> | <p>Not available</p> | <p>Record Date</p> | <p>Not available</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Measurements to top of outer tube. • Triple piezometer – a) most uphill, b) bottom right, and c) bottom left (when looking uphill away from the hinge). • Diver in pipe a, length of 22.04m | | | | |



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Location

Scarborough – South Cliff

Opposite lamppost 6 on footpath between Cliff Bridge and Spa Complex, just north of major split in path (to gardens and to Spa).

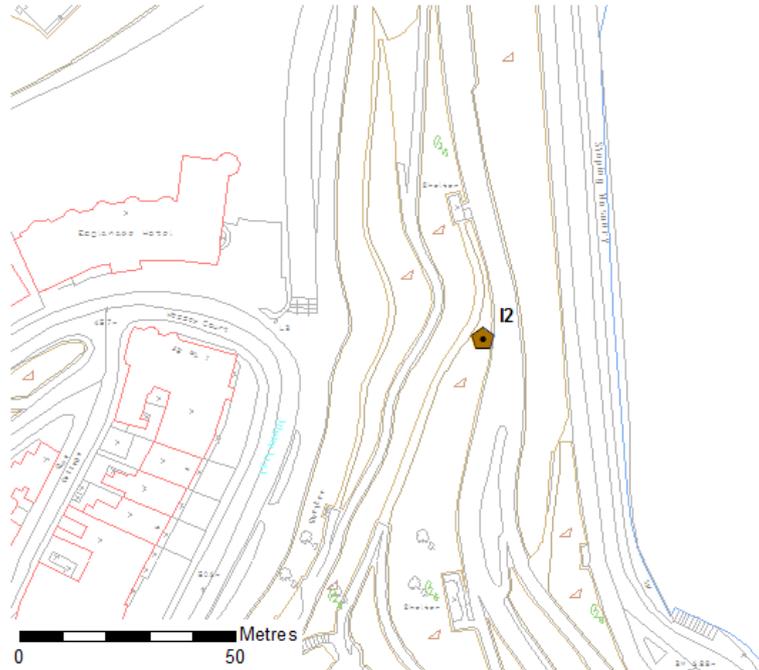
Borehole

I2

Piezometer

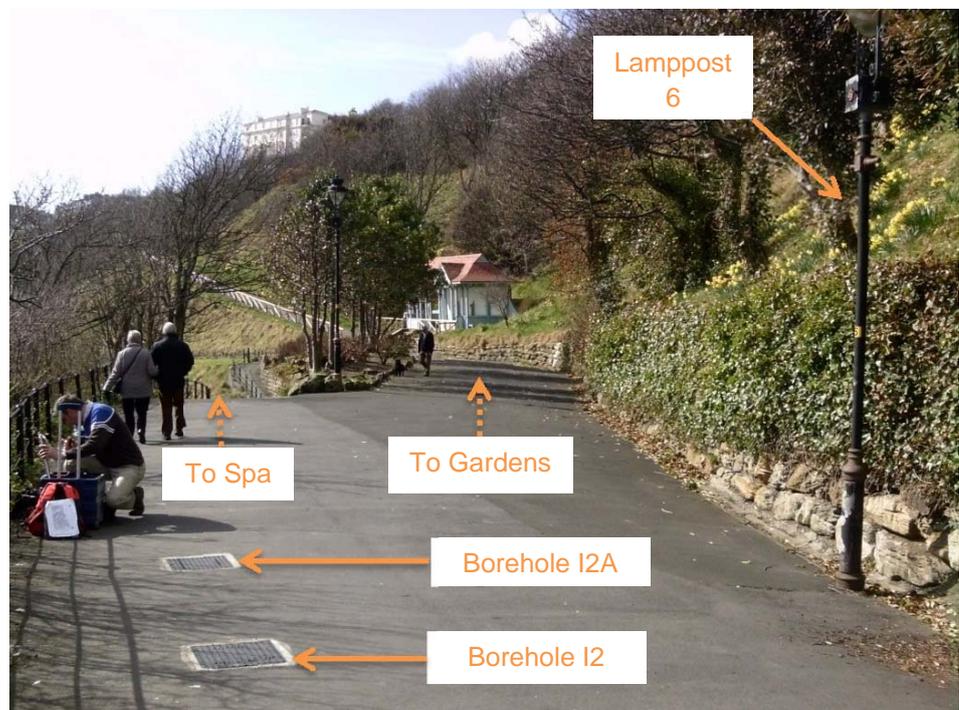
Map

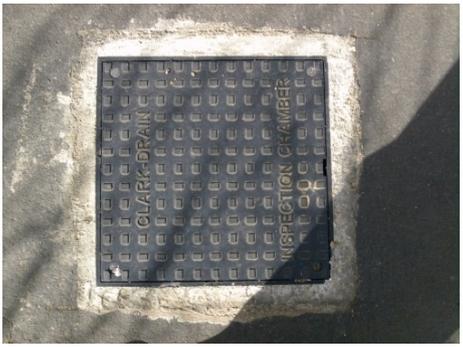
GPS Reference:
TA 04400 88052



Location Photo

(looking south)



| | | | | | |
|-------------------------------------|--|----------------------------------|--|--------------------|----------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok with 4 locking screws. • Concrete surround ok. • Tarmac footpath – no vegetation issues. • Single piezometer with automated data logger. | | | | |
| Recorded Depth to Instrument | Not available | | Recorded Depth to Water | | |
| Known Depth to Instrument | 31.00m | Last Recorded Water Depth | 21.34m | Record Date | 2009 (Mouchel) |
| Comments | <ul style="list-style-type: none"> • Outer tube was full of water. • Adjacent to Borehole I2A. I2 is the most northerly borehole. | | | | |



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Condition Survey of Inclinometers and Piezometers – 23/4/2013



Location

Scarborough – South Cliff

Opposite lamppost 6 on footpath between Cliff Bridge and Spa Complex, just north of major split in path (to gardens and to Spa).

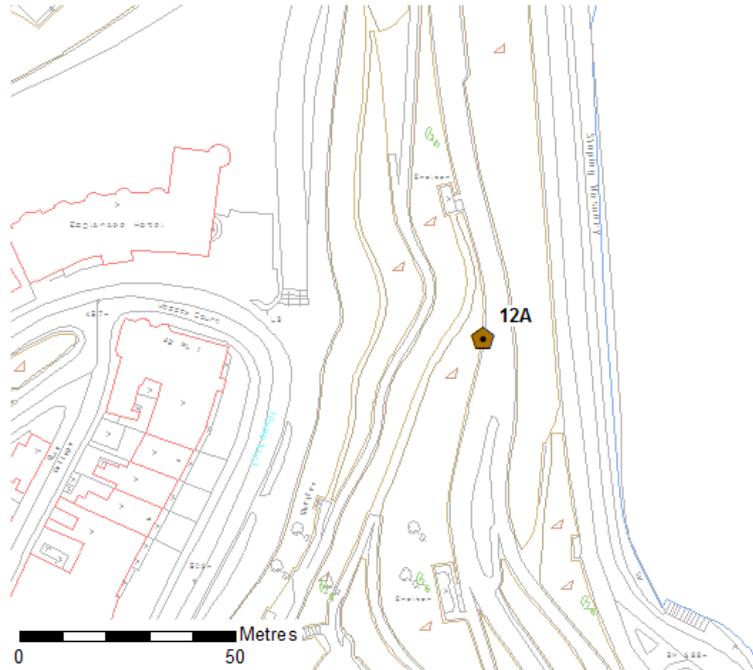
Borehole

I2A

Piezometer

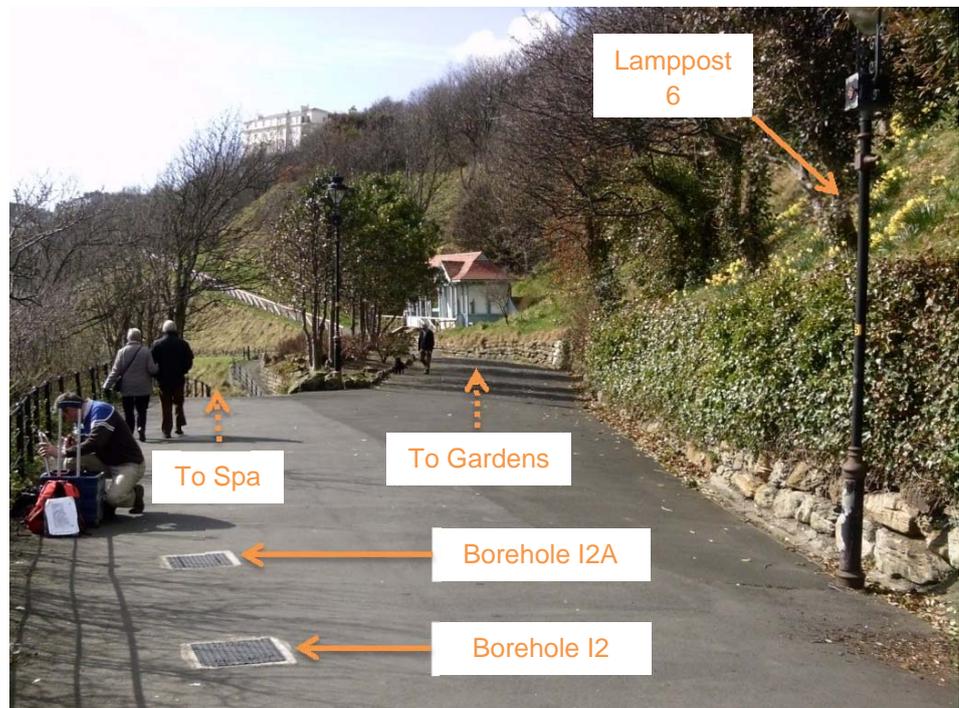
Map

GPS Reference:
TA 04402 88050



Location Photo

(looking south)



| | | | | | |
|-------------------------------------|--|----------------------------------|--|--------------------|----------------|
| Condition Photos |  | |  | | |
| Condition | <ul style="list-style-type: none"> • Cover ok with 4 locking screws. • Concrete surround ok. • Tarmac footpath – no vegetation issues. • Single piezometer with automated data logger. | | | | |
| Recorded Depth to Instrument | Not available | | Recorded Depth to Water | Not available | |
| Known Depth to Instrument | 31.00m | Last Recorded Water Depth | 18.96m | Record Date | 2009 (Mouchel) |
| Comments | <ul style="list-style-type: none"> • Adjacent to Borehole I2. I2A is the most southerly borehole. | | | | |



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Condition Survey of Inclinometers and Piezometers – 23/4/2013



Royal HaskoningDHV
Enhancing Society Together

Location

Scarborough – South Cliff

In front of southern most bench on raised seated area above terrace at northern end of main Spa building.

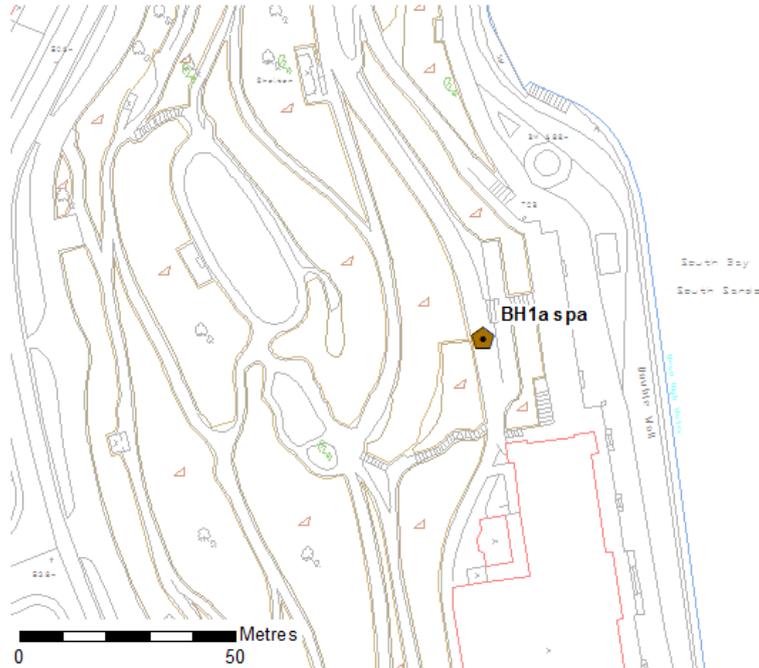
Borehole

BH1 (Spa)

Piezometer - twin

Map

GPS Reference:
TA 04434 87929



Location Photo

(looking north)



| | | | | | |
|--|--|---|--|---------------------------|---------------------------|
| <p>Condition Photos</p> |  | |  | | |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover ok with 4 locking screws. • Concrete surround ok. • In tarmac footpath – no vegetation issues. • Double piezometer with automated data loggers. | | | | |
| <p>Recorded Depth to Instrument</p> | <p>Not available</p> | | <p>Recorded Depth to Water</p> | <p>Not available</p> | |
| <p>Known Depth to Instrument</p> | <p>a) 13.00m b) 4.00m</p> | <p>Last Recorded Water Depth</p> | <p>a) 30.10m b) 12.29m</p> | <p>Record Date</p> | <p>2009 (Mouchel)</p> |
| <p>Comments</p> | | | | | |



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Condition Survey of Inclinometers and Piezometers – 30/4/2013



Royal HaskoningDHV
Enhancing Society Together

Location

Scarborough – South Cliff

In northern end of road in front of Spa Complex, between seawall and raised gravel area (near bus turning circle).

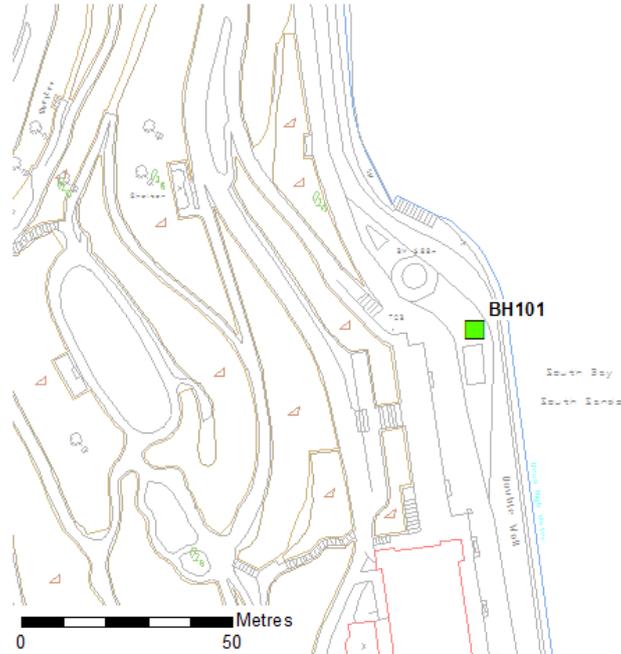
Borehole

BH101

Inclinometer

Map

GPS Reference:
TA 04463 87957



Location Photo

(looking west)



| | | | |
|--------------------------------|--|------------------------------|---------------|
| <p>Condition Photos</p> |  | | |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover ok with 2 bolts (3rd screw hole not used), need 10mm diameter socket to open. • Concrete surround ok. • No cap to inner tube. • Outer tube full of water. • Tarmac road – no vegetation issues. | | |
| <p>Known Depth</p> | <p>26.50m</p> | <p>Recorded Depth</p> | <p>26.63m</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Water recorded at 5.84m. • Dummy inclinometer went to 26.71m. • Measurements to top of metal rim of borehole. | | |



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Condition Survey of Inclinometers and Piezometers – 30/4/2013



Location

Scarborough – South Cliff

In road in front of Spa Complex, between 2nd and 3rd disabled parking bays on the seawall side of car park. Opposite the northern end of the main Spa building.

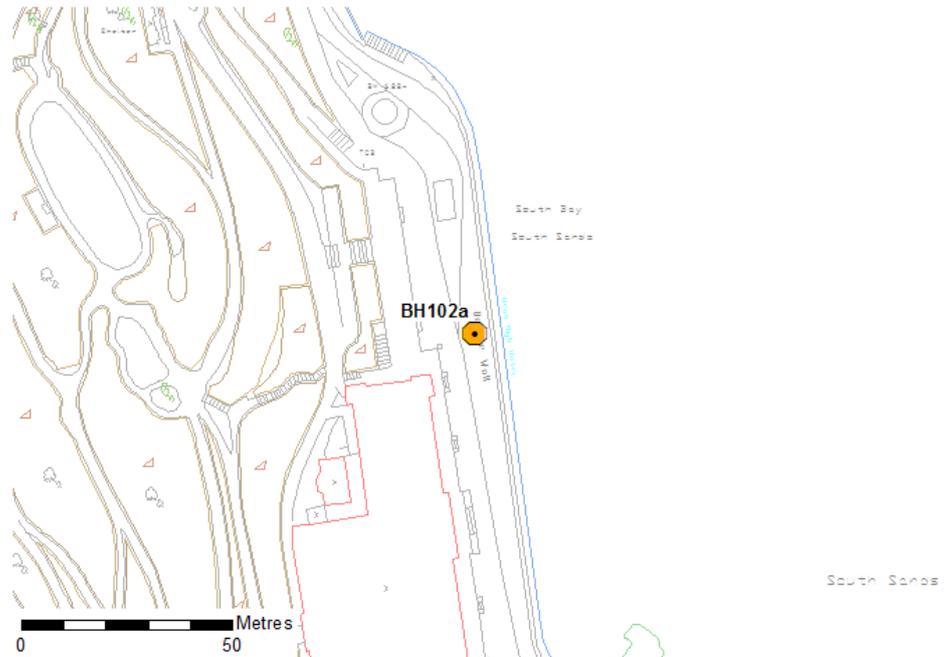
Borehole

BH102

Piezometer - twin

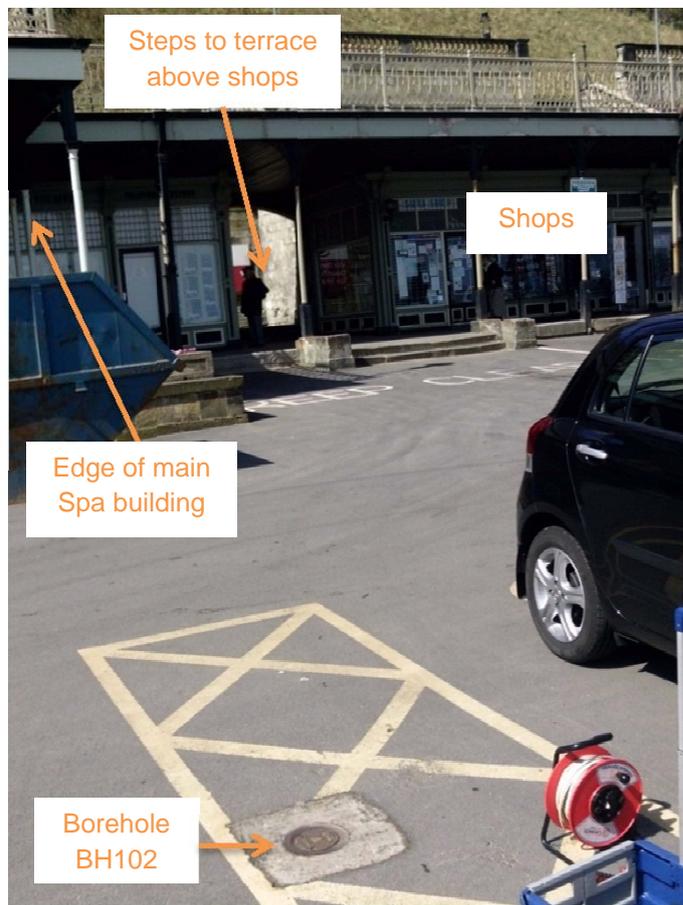
Map

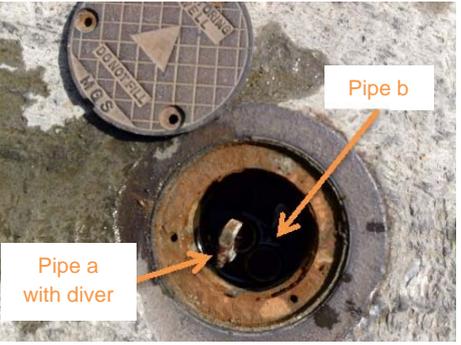
GPS Reference:
TA 04470 87917



Location Photo

(looking north-west)



| | | | | | |
|--|--|---|--|---------------------------|----------------------|
| <p>Condition Photos</p> |  | |  | | |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover ok with 2 bolts (3rd bolt hole not used), needs 10mm diameter socket to open. • Concrete surround ok. • Double piezometer with diver in central piezometer pipe (pipe a). • Tarmac parking bay – no vegetation issues. • Outer tube full of water. | | | | |
| <p>Recorded Depth to Instrument</p> | <p>a) 17.85m b) 15.49m</p> | <p>Recorded Depth to Water</p> | <p>a) 5.15m b) 5.00m</p> | | |
| <p>Known Depth to Instrument</p> | <p>a) unknown b) unknown</p> | <p>Last Recorded Water Depth</p> | <p>Not available</p> | <p>Record Date</p> | <p>Not available</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Pipe a contains a diver and is the most central black piezometer pipe. Pipe b is closer to the edge of the outer tube and is also black. • There is also a smaller blue pipe (for drainage) in the borehole, approximate depth 0.65m. • Diver length of 15.00m. • Measurements to the top of the individual black piezometer pipes. | | | | |



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Condition Survey of Inclinerometers and Piezometers – 30/4/2013



Location

Scarborough – South Bay

In road in front of Spa Complex, opposite the main entrance (reception), in second parallel parking bay to seawall.

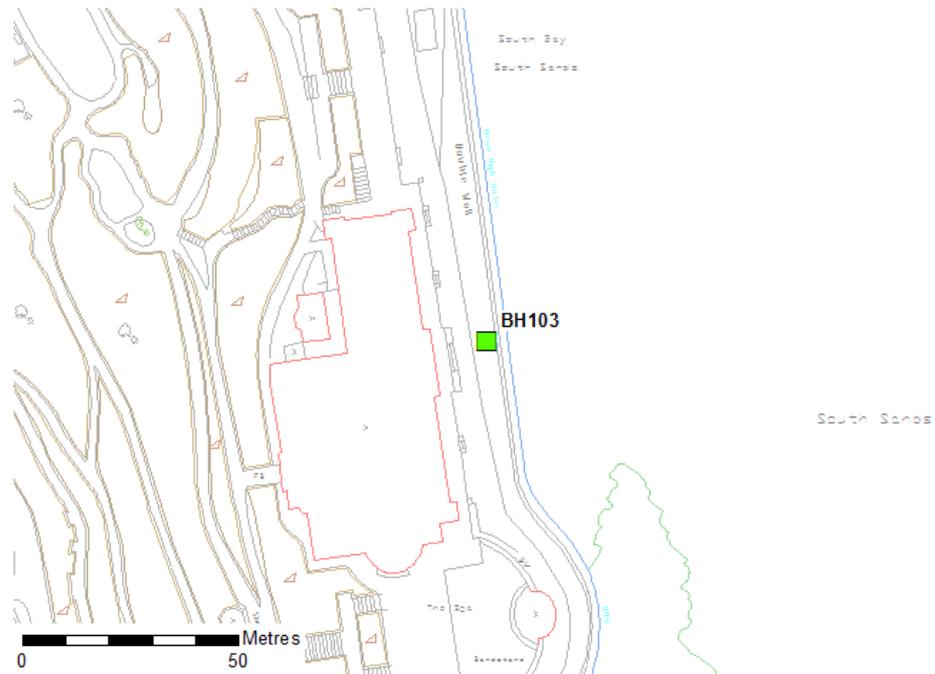
Borehole

BH103

Inclinometer

Map

GPS Reference:
TA 04477 87876



Location Photo

(looking south-west)



| | | | |
|--------------------------------|--|------------------------------|--------------|
| <p>Condition Photos</p> |  | | |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover ok with 3 bolts, 10mm diameter socket required to open. • Concrete surround ok. • No cap to inner tube. • Tarmac parking bay – no vegetation issues. • Outer tube full of water. | | |
| <p>Known Depth</p> | <p>10.42m</p> | <p>Recorded Depth</p> | <p>9.93m</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Water recorded at 5.60m. • Dummy inclinometer went to 10.03m. • Measurements to top of inclinometer inner tube. | | |



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Condition Survey of Inclinerometers and Piezometers – 30/4/2013



Location

Scarborough – South Cliff

At bottom of 1st 'zig-zag' down from the top footpath with the wooden shelters. At the start of abandoned footpath, behind the metal railings.

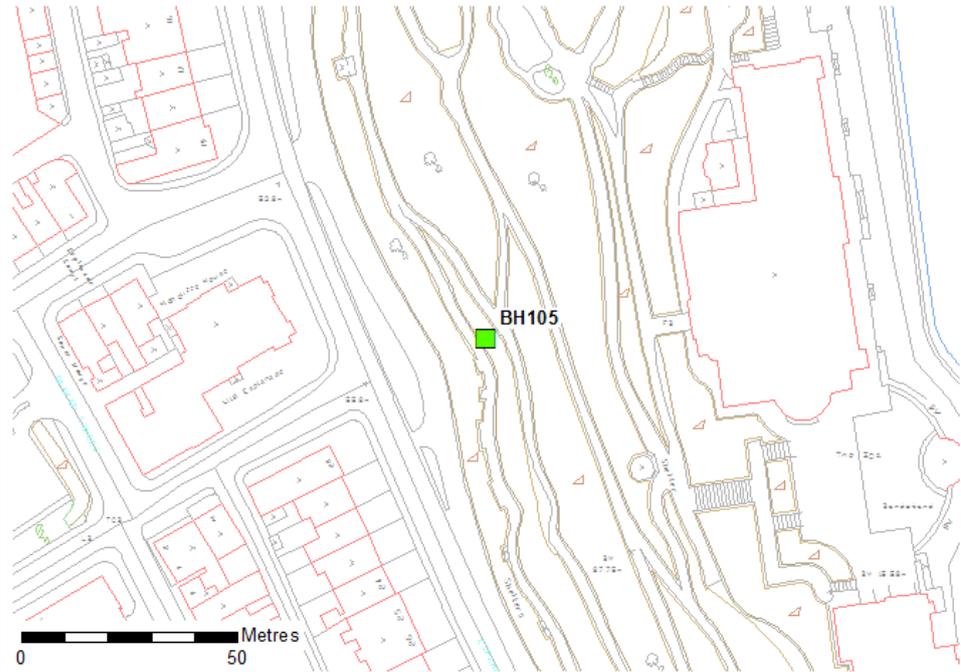
Borehole

BH105 & BH105a

Inclinerometer

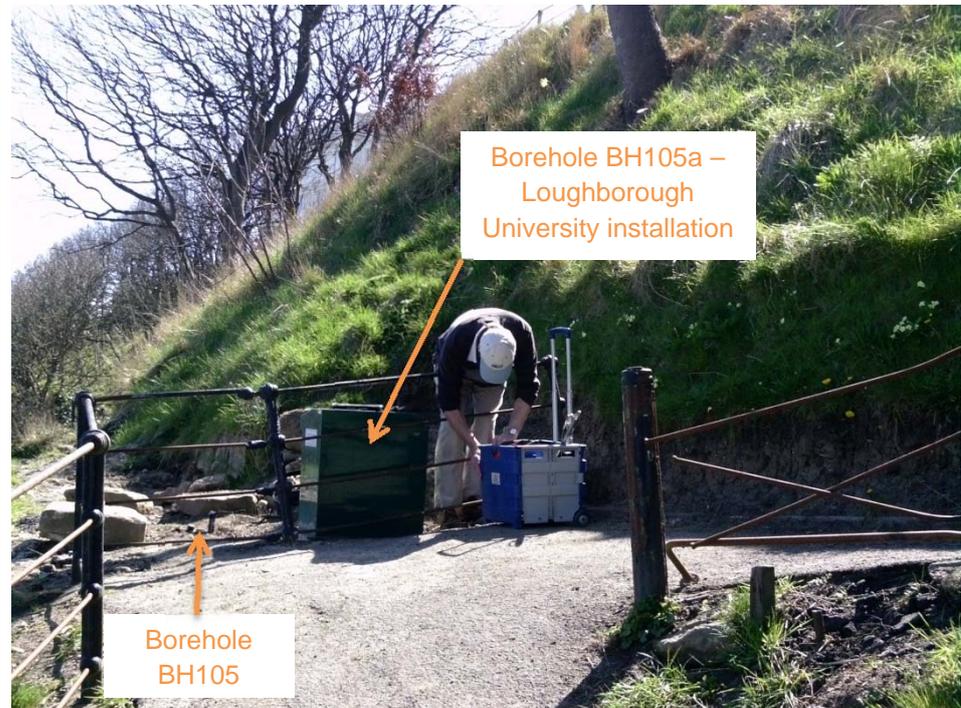
Map

GPS Reference:
TA 04382 87841



Location Photo

(looking south)



| | | | |
|--------------------------------|--|------------------------------|---------------|
| <p>Condition Photos</p> |  | | |
| <p>Condition</p> | <ul style="list-style-type: none"> • Cover and hinge ok, lock broken. • Cap for inner tube. • Inner tube is smaller diameter than usual inclinometer tubes due to being re-lined to repair defects after drilling. • No vegetation but bare earth, could become overgrown with time as in abandoned footpath. • BH105a is the green box unit which houses the Loughborough University acoustic inclinometer device. | | |
| <p>Known Depth</p> | <p>Unknown</p> | <p>Recorded Depth</p> | <p>44.00m</p> |
| <p>Comments</p> | <ul style="list-style-type: none"> • Water recorded at 1.42m, this rose to ground level during dummy inclinometer testing. • Dummy inclinometer went to 44.00m. • Measurements to top of blue inclinometer tube. | | |