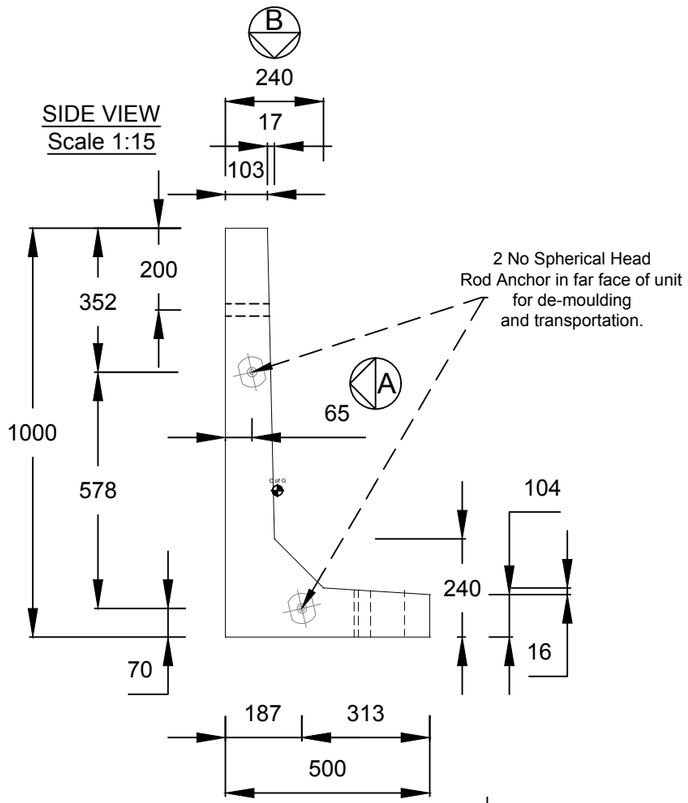

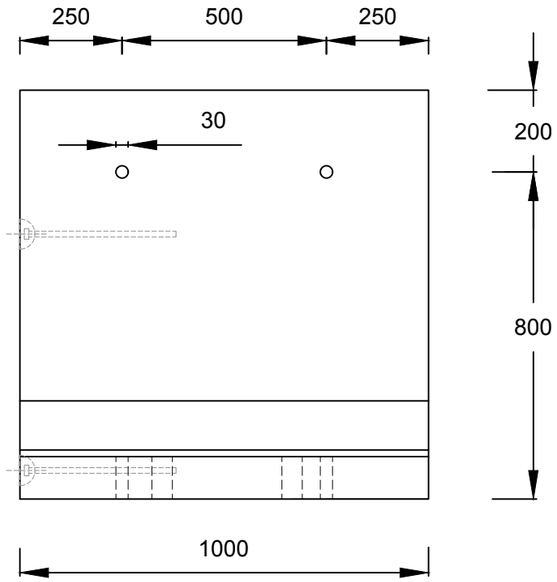

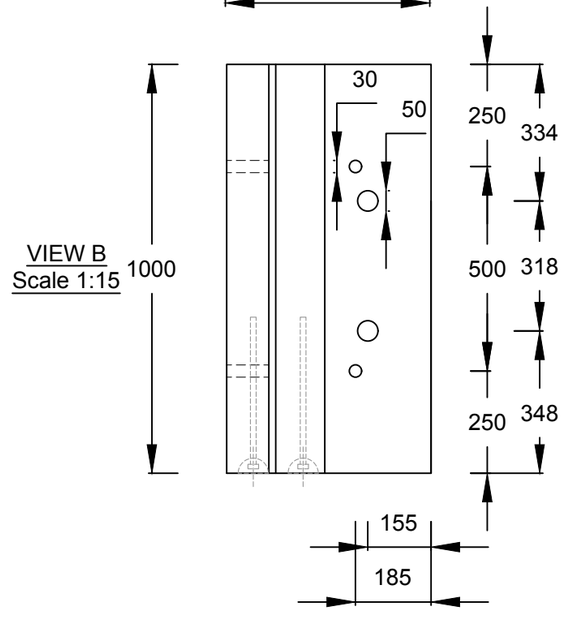

1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3,
Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
1000 Wall Unit	0.16	0.42	0.44

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Tensile Force per Dowel	3.25 kN
Resultant Horizontal Force	6.1 kN/m
Resultant Destabilising Moment	1.4 kNm/m
Vertical Force	13.2 kN/m

**These are maximum values associated with all loading conditions. For more specific values see accompanying calculation.*

First Issue	FM	PS	18/09/2019
Revision/Description	Drawn	Checked	Date

Title, Supplementary title

Bolt Down Retaining Wall
Standard unit 1.0m

Identification number	Created by
FLB10D-1000	FM
Document type	Technical reference
Information use	PS
Document Status	Approved by
Released	TM

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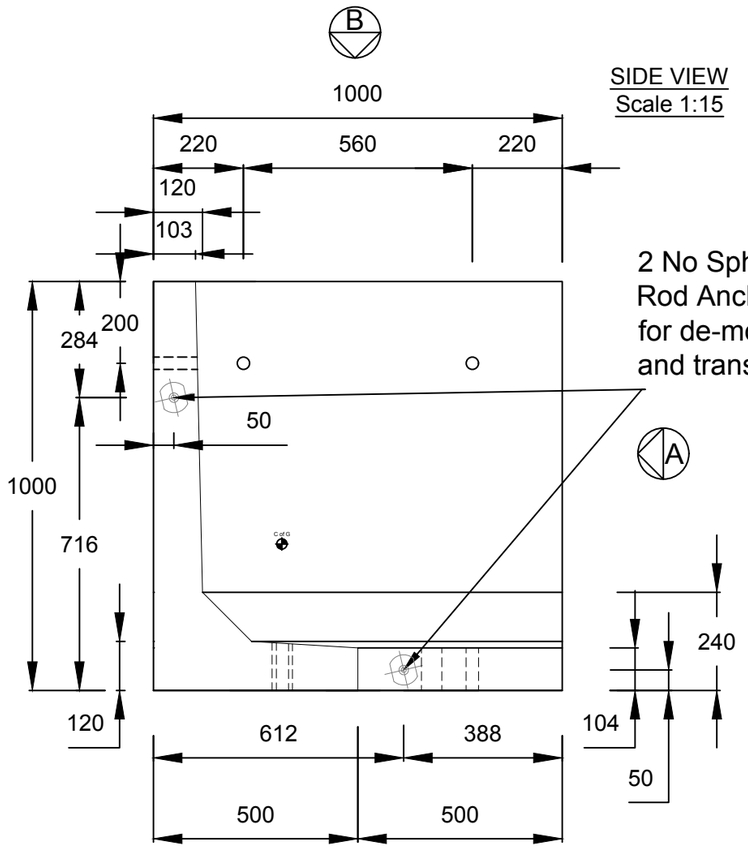
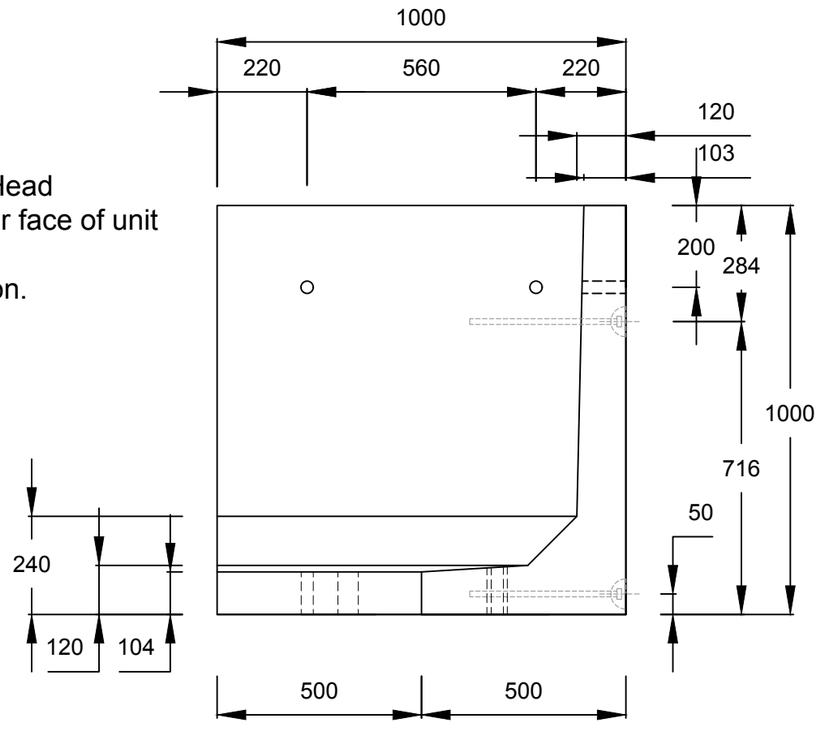
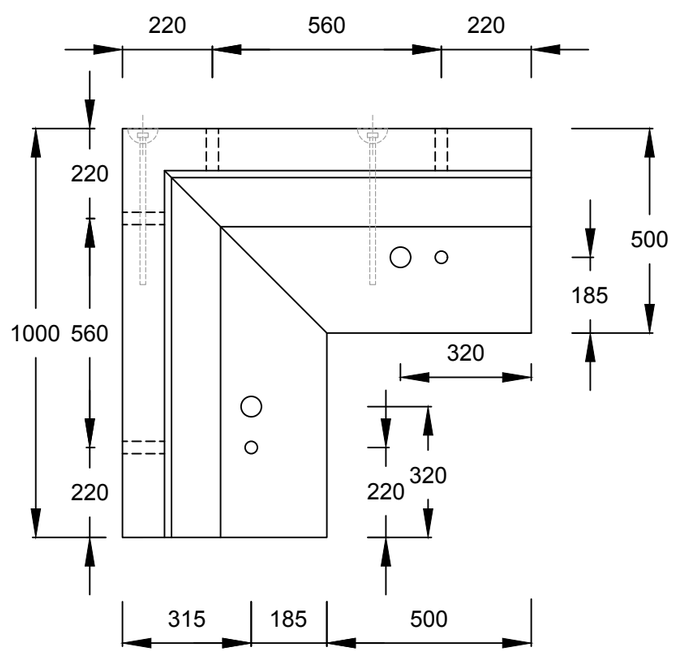
Date of issue	Paper size	Revision	Sheet
18/09/2019	A3	P01	1/14







1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3, Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
1000 Wall Unit	0.29	0.75	0.79

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Revision/Description	Drawn	Checked	Date
First Issue	FM	PS	18/09/2019

Title, Supplementary title

Bolt Down Retaining Wall
Standard Corner unit 1.0m

Identification number	Created by
FCB10D-1000	FM
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Information use	PS
Document Status	**Approved by**
Released	TM

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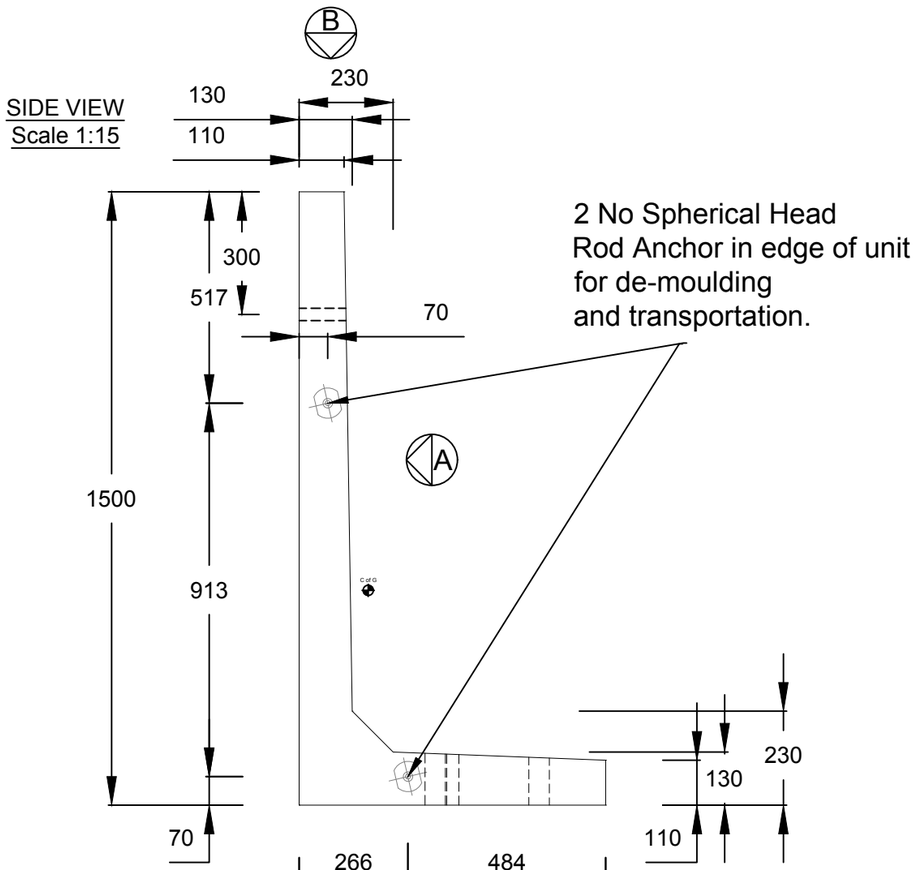
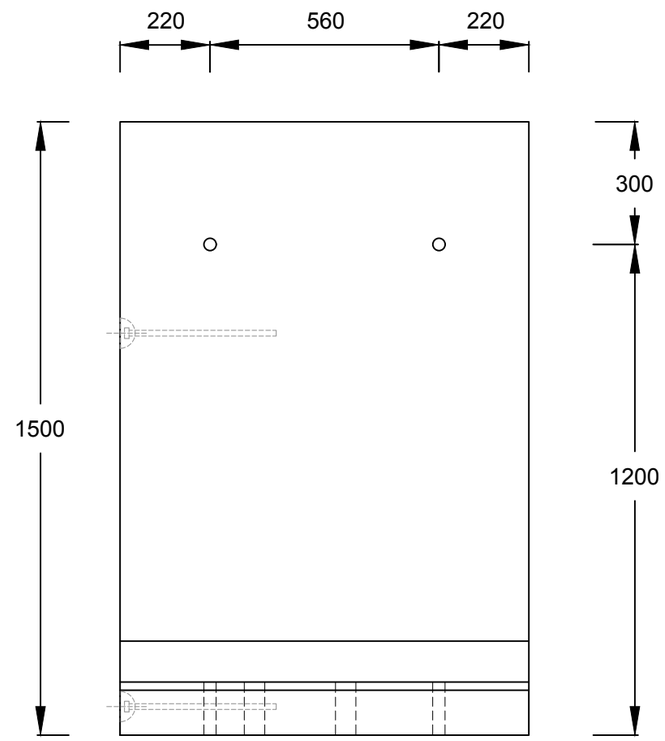
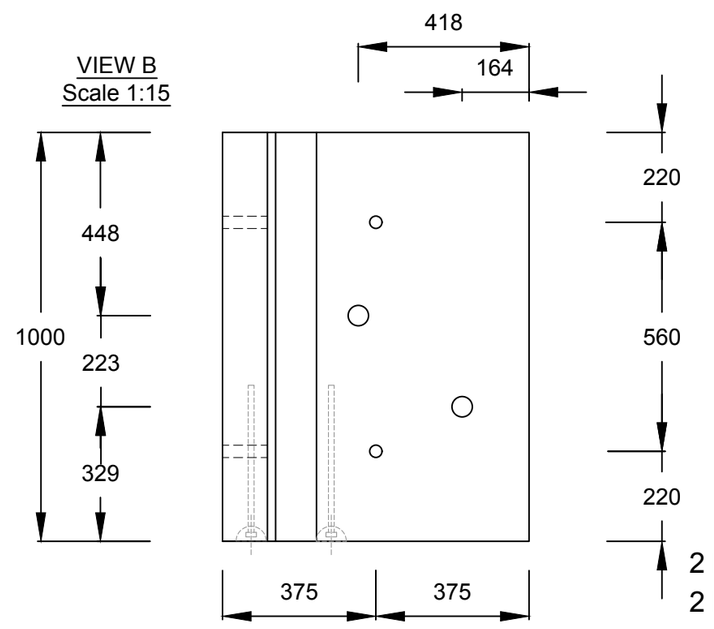
Date of issue	Paper size	Revision	Sheet
18/09/2019	A3	P01	2/14







2 No Ø30mm holes for Anchor Installation
2 No Ø50mm Performed Grout Holes

1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3, Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
1500 Wall Unit	0.26	0.68	0.71

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Tensile Force per Dowel	3.6 kN
Resultant Horizontal Force	14.4 kN/m
Resultant Destabilising Moment	3.2 kNm/m
Vertical Force	29.5 kN/m

**These are maximum values associated with all loading conditions. For more specific values see accompanying calculation.*

Revision/Description	Drawn	Checked	Date
First Issue	FM	PS	18/09/2019

Title, Supplementary title
Bolt Down Retaining Wall
Standard unit 1.5m

Identification number: FLB10D-1500
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Document type: Information use
Technical reference: PS
Document Status: Released
Approved by: TM

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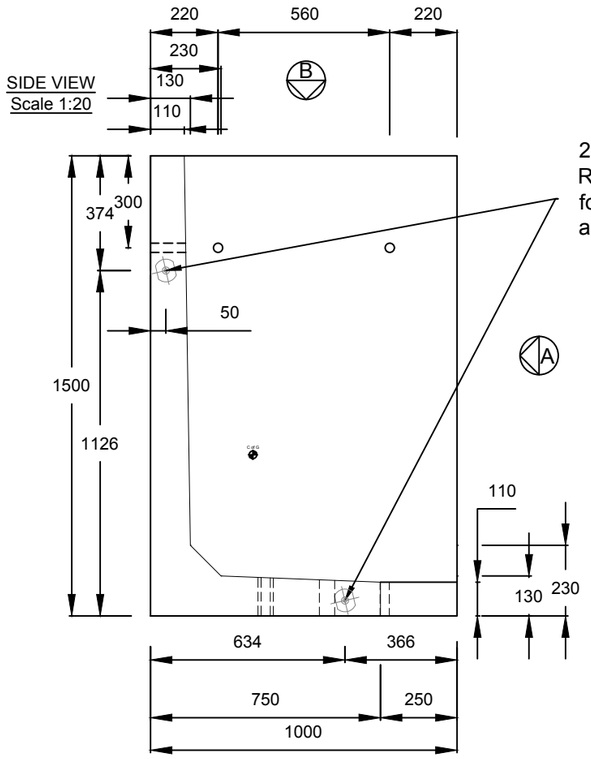
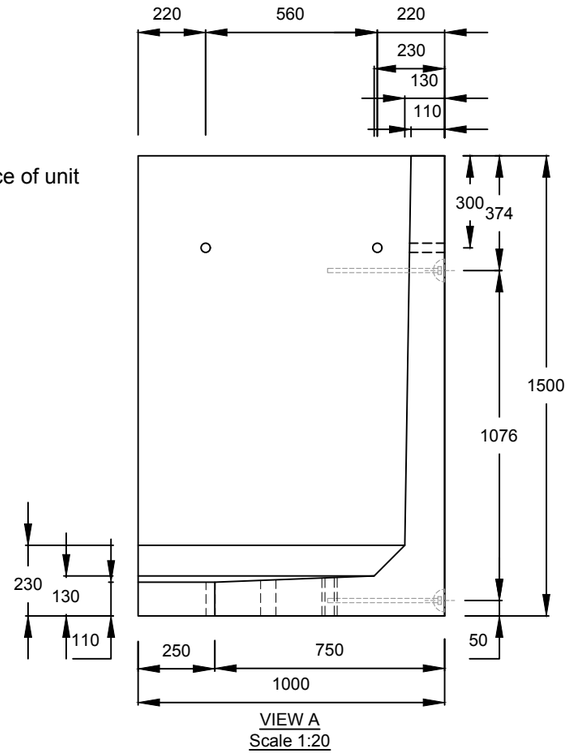
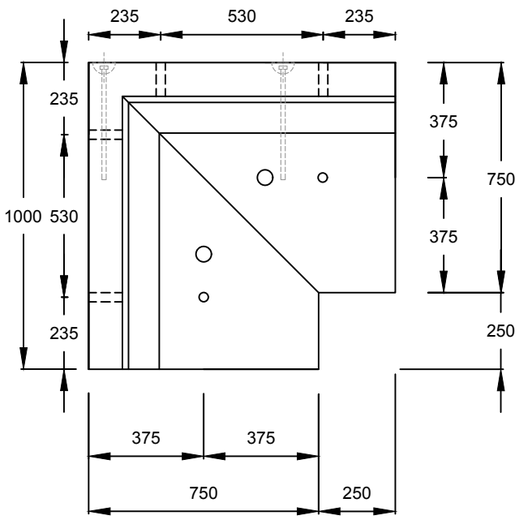
Date of issue	Paper size	Revision	Sheet
18/09/2019	A3	P01	3/14



2 No Spherical Head Rod Anchor in far face of unit for de-moulding and transportation.



VIEW A
Scale 1:20



VIEW B
Scale 1:20

1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3, Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
1500 Wall Unit	0.43	1.12	1.17

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Revision/Description	Drawn	Checked	Date
First Issue	FM	PS	18/09/2019

Title, Supplementary title
Bolt Down Retaining Wall
Standard Corner unit 1.5m

Identification number	Created by
FCB10D-1500	FM
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Document Status	**Approved by**
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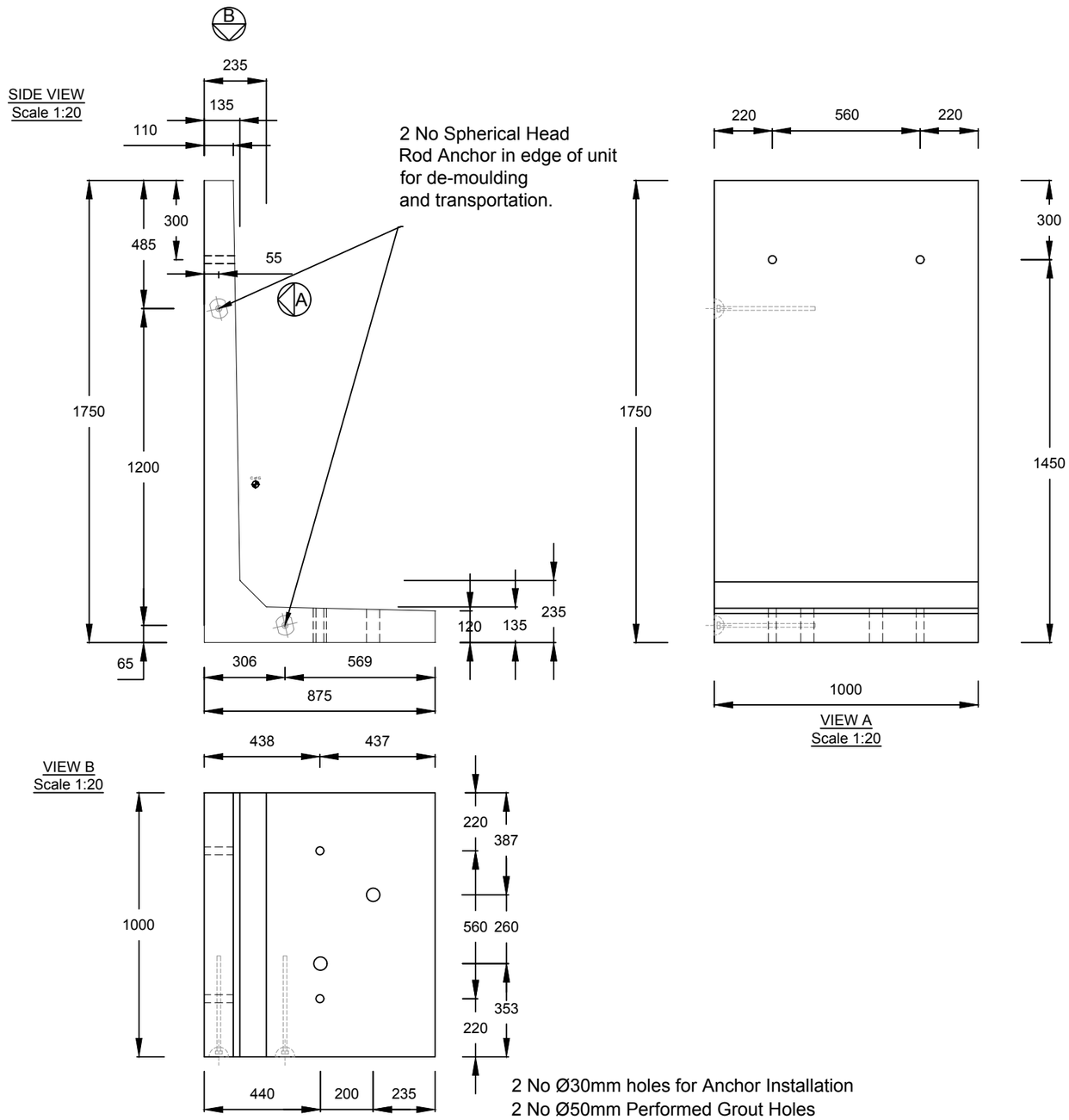
Date of issue	Paper size	Revision	Sheet
18/09/2019	A3	P01	4/14



1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3, Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
1750 Wall Unit	0.32	0.83	0.87

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Tensile Force per Dowel	4.45 kN
Resultant Horizontal Force	20.0 kN/m
Resultant Destabilising Moment	4.6 kNm/m
Vertical Force	40.2 kN/m

**These are maximum values associated with all loading conditions. For more specific values see accompanying calculation.*

Revision/Description	Drawn	Checked	Date
First Issue	FM	PS	18/09/2019

Title, Supplementary title

Bolt Down Retaining Wall
Standard unit 1.750m

Identification number	Created by
FLB10D-1750	FM
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Information use	PS
Document Status	**Approved by**
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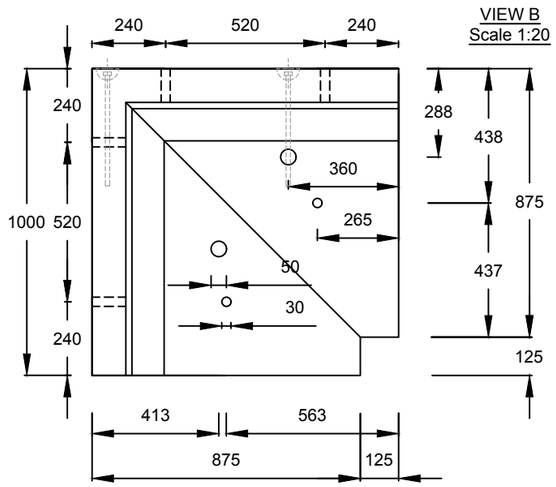
Date of issue	Paper size	Revision	Sheet
18/09/2019	A3	P01	5/14



2 No Ø30mm holes for Anchor Installation

2 No Ø50mm Performed Grout Holes

1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3,
Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
1750 Wall Unit	0.51	1.33	1.39

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

First Issue	FM	PS	18/09/2019
Revision/Description	Drawn	Checked	Date

Title, Supplementary title

Bolt Down Retaining Wall
Standard Corner unit 1.750m

Identification number	Created by
FCB10D-1750	FM
Document type	Technical reference
Information use	PS
Document Status	Approved by
Released	TM

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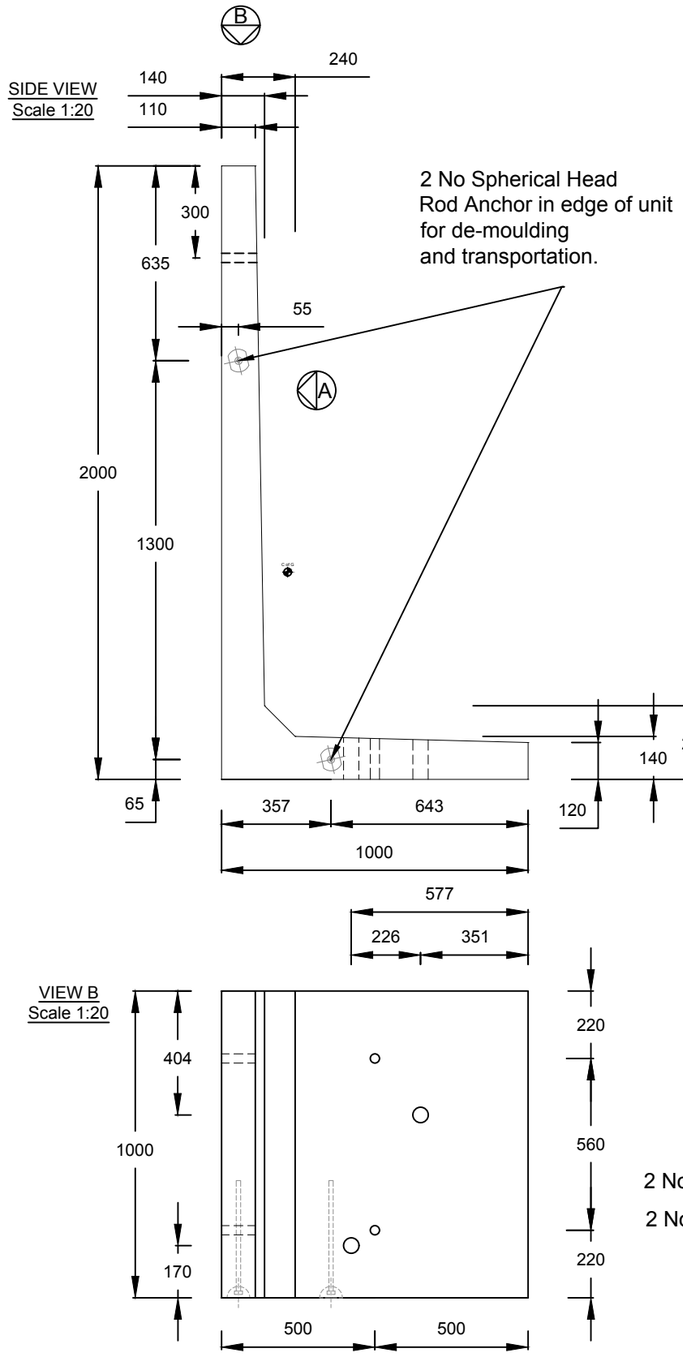
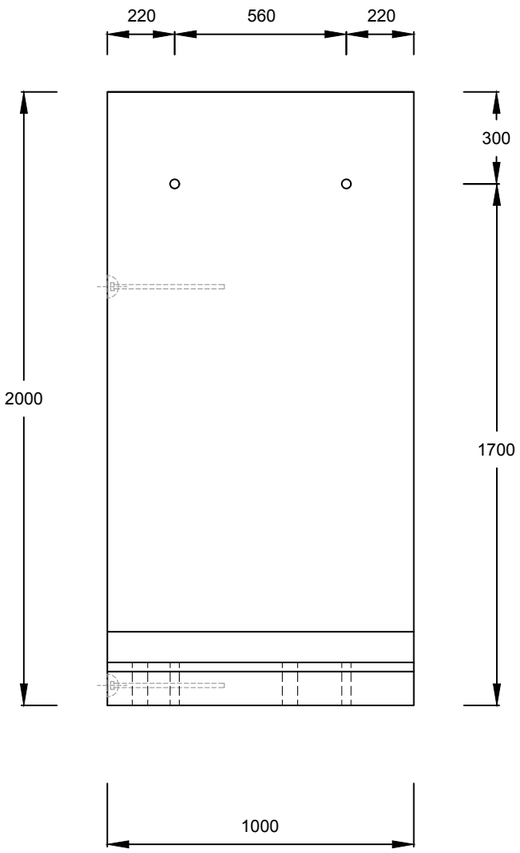
Date of issue	Paper size	Revision	Sheet
18/09/2019	A3	P01	6/14





VIEW A
Scale 1:20

2 No Ø30mm holes for Anchor Installation

2 No Ø50mm Performed Grout Holes

1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3,
Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
2000 Wall Unit	0.37	0.96	1.01

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Tensile Force per Dowel	5.6 kN
Resultant Horizontal Force	26.6 kN/m
Resultant Destabilising Moment	6.8 kNm/m
Vertical Force	52.5 kN/m

**These are maximum values associated with all loading conditions.*
For more specific values see accompanying calculation.

Revision/Description	Drawn	Checked	Date
First Issue	FM	PS	18/09/2019

Title, Supplementary title

Bolt Down Retaining Wall
Standard unit 2.0m

Identification number	Created by
FLB10D-2000	FM
Document type	Technical reference
Information use	PS
Document Status	Approved by
Released	TM

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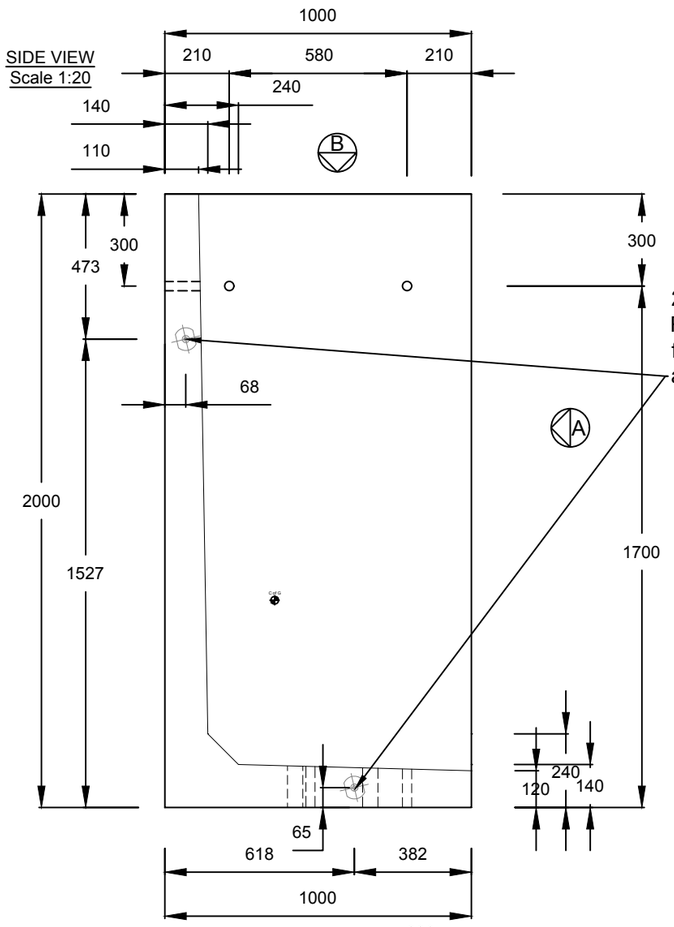
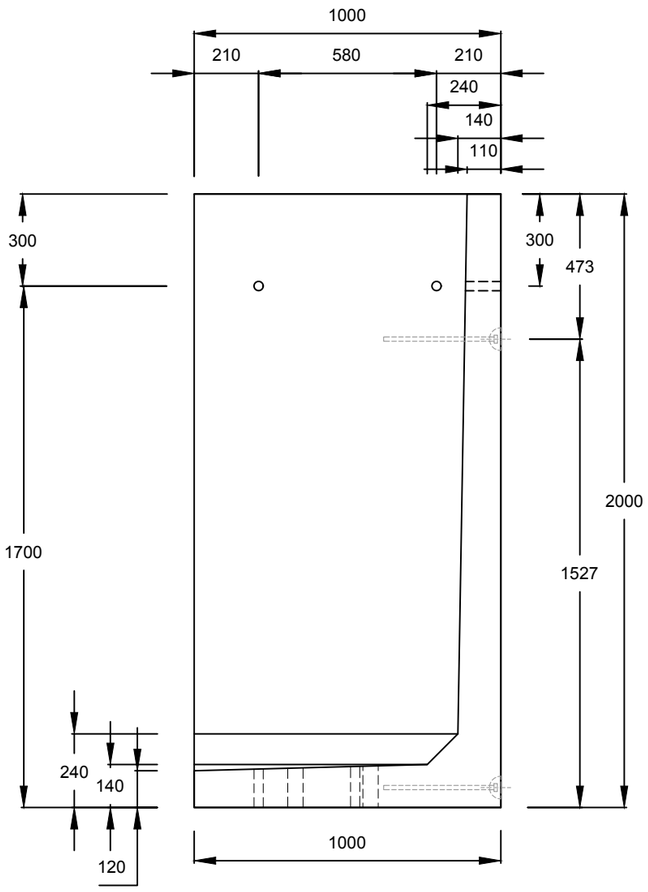
Date of issue	Paper size	Revision	Sheet
18/09/2019	A3	P01	7/14

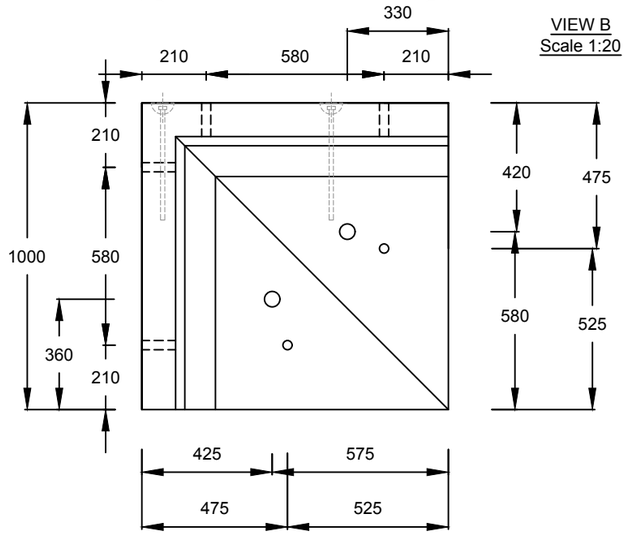
SIDE VIEW
Scale 1:20



VIEW A
Scale 1:20



VIEW B
Scale 1:20



1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3,
Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
2000 Wall Unit	0.58	1.51	1.58

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Revision/Description	Drawn	Checked	Date
First Issue	FM	PS	18/09/2019

Title, Supplementary title

Bolt Down Retaining Wall
Standard Corner unit 2.0m

Identification number	Created by
FCB10D-2000	FM
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Released	TM

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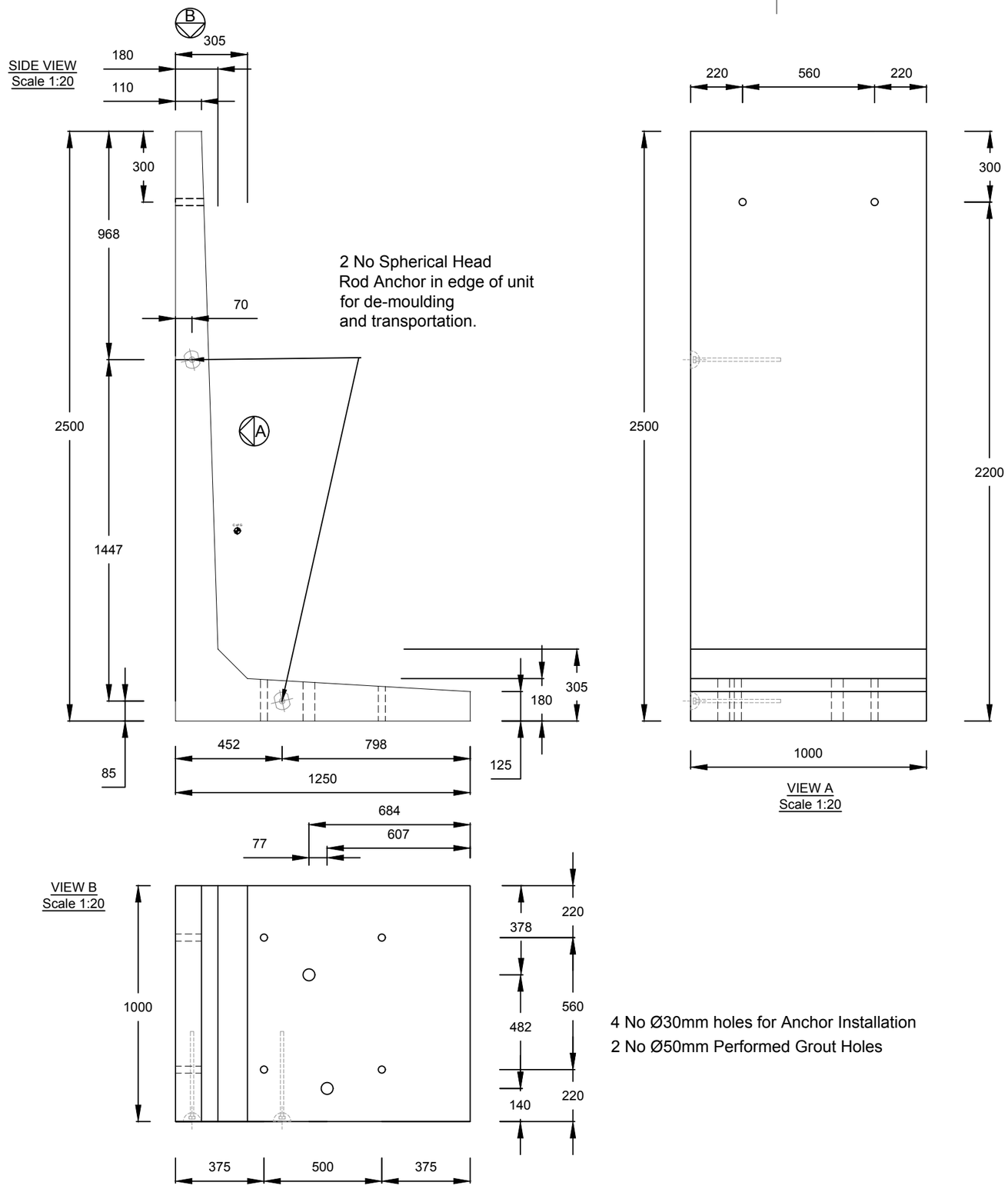
Date of issue	Paper size	Revision	Sheet
18/09/2019	A3	P01	8/14



1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3,
Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
2500 Wall Unit	0.55	1.43	1.50

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Tensile Force per Dowel	5.7 kN
Resultant Horizontal Force	42.7 kN/m
Resultant Destabilising Moment	14.2 kNm/m
Vertical Force	82.4 kN/m

**These are maximum values associated with all loading conditions. For more specific values see accompanying calculation.*

Revision/Description	Drawn	Checked	Date
First Issue	FM	PS	18/09/2019

Title, Supplementary title

Bolt Down Retaining Wall
Standard unit 2.5m

Identification number	Created by
FLB10D-2500	FM
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Information use	PS
Document Status	Approved by
Released	TM

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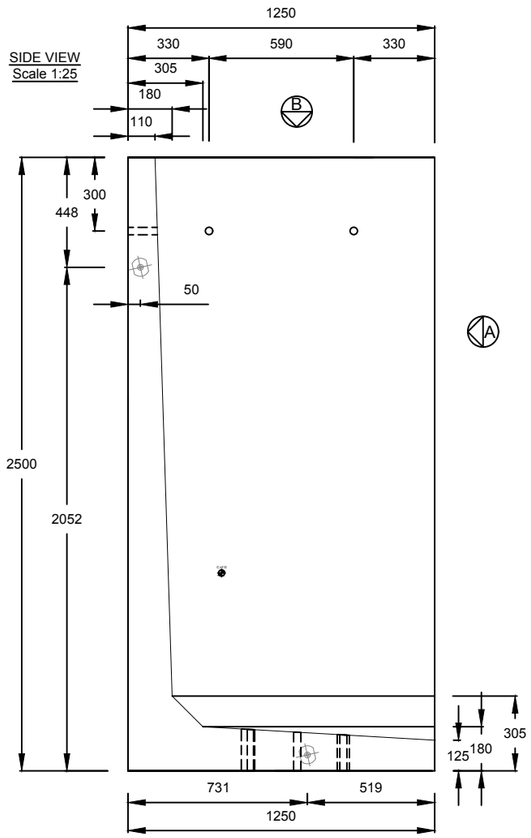
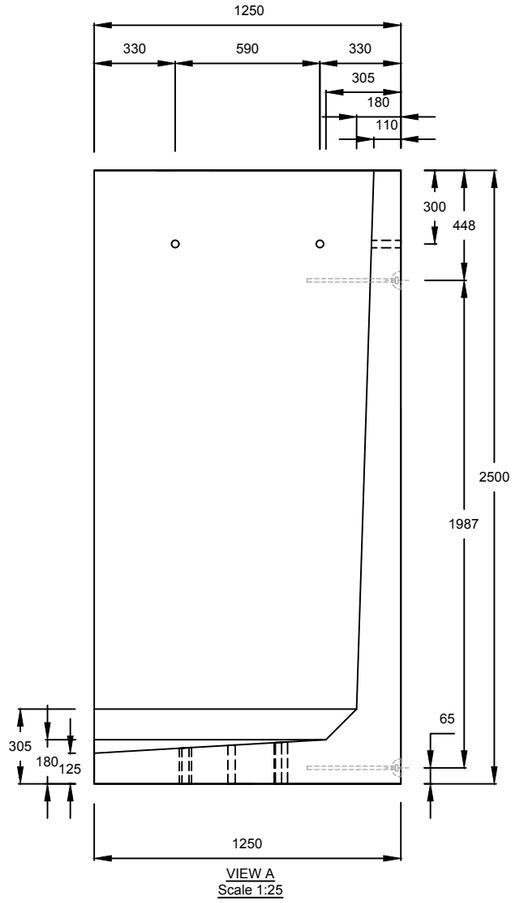
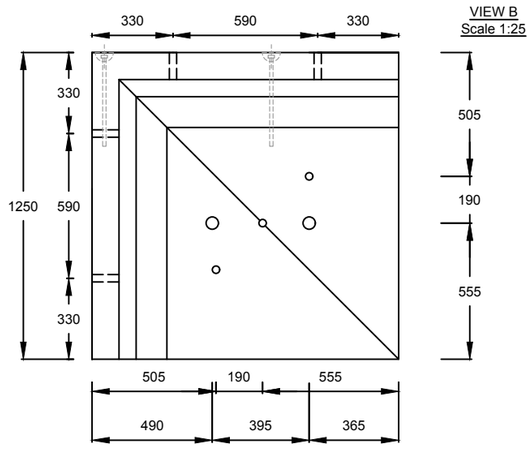
Date of issue	Paper size	Revision	Sheet
18/09/2019	A3	P01	9/14







1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3, Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
2500 Wall Unit	1.08	2.81	2.95

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Revision/Description	Drawn	Checked	Date
First Issue	FM	PS	18/09/2019

Title, Supplementary title

Bolt Down Retaining Wall Standard Corner unit 2.0m

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Document Status	**Approved by**
Released	TM

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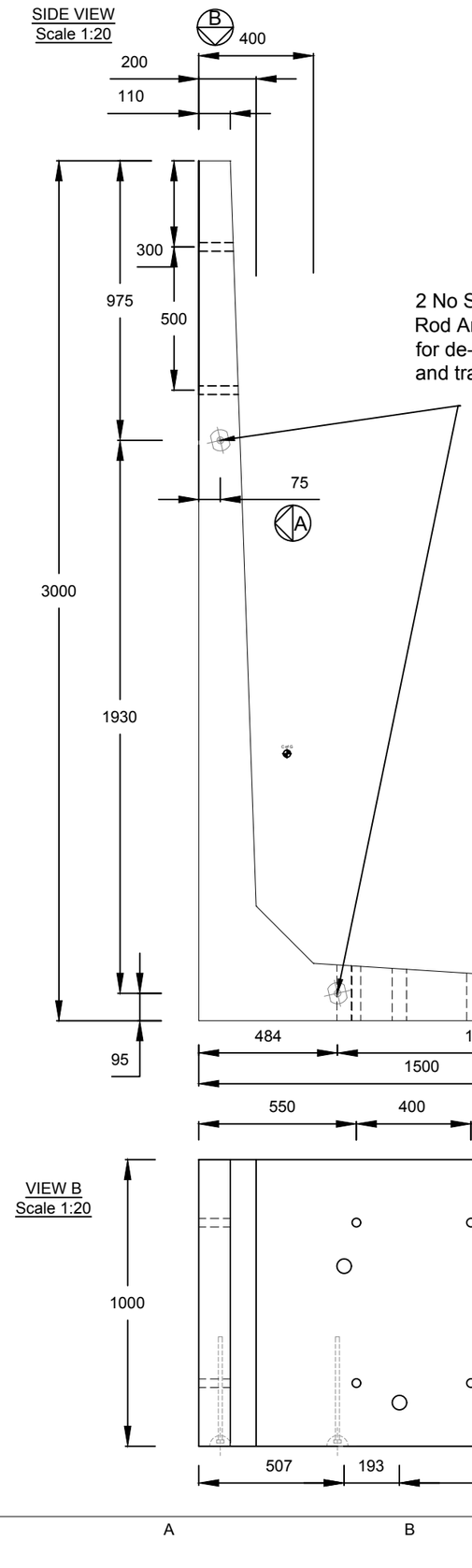
Date of issue	Paper size	Revision	Sheet
18/09/2019	A3	P01	10/14

SIDE VIEW
Scale 1:20

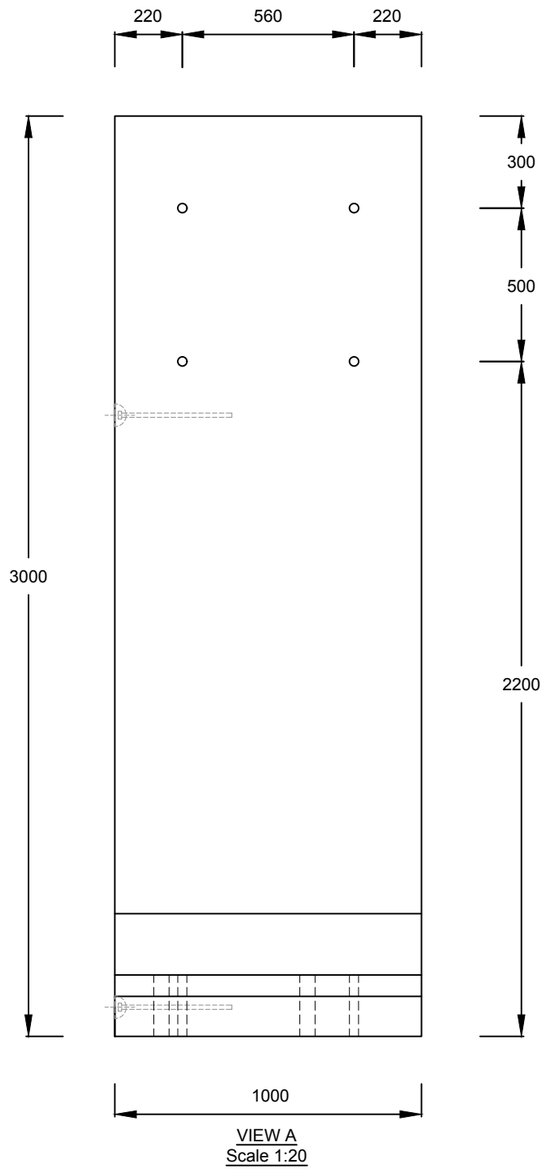


2 No Spherical Head Rod Anchor in edge of unit for de-moulding and transportation.

VIEW B
Scale 1:20

4 No Ø30mm holes for Anchor Installation

2 No Ø50mm Performed Grout Holes



VIEW A
Scale 1:20

1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3, Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
3000 Wall Unit	0.72	1.87	1.96

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Tensile Force per Dowel	8.45 kN
Resultant Horizontal Force	62.5 kN/m
Resultant Destabilising Moment	25.8 kNm/m
Vertical Force	118.8 kN/m

**These are maximum values associated with all loading conditions. For more specific values see accompanying calculation.*

Revision/Description	Drawn	Checked	Date
First Issue	FM	PS	18/09/2019

Title, Supplementary title

Bolt Down Retaining Wall
Standard unit 3.0m

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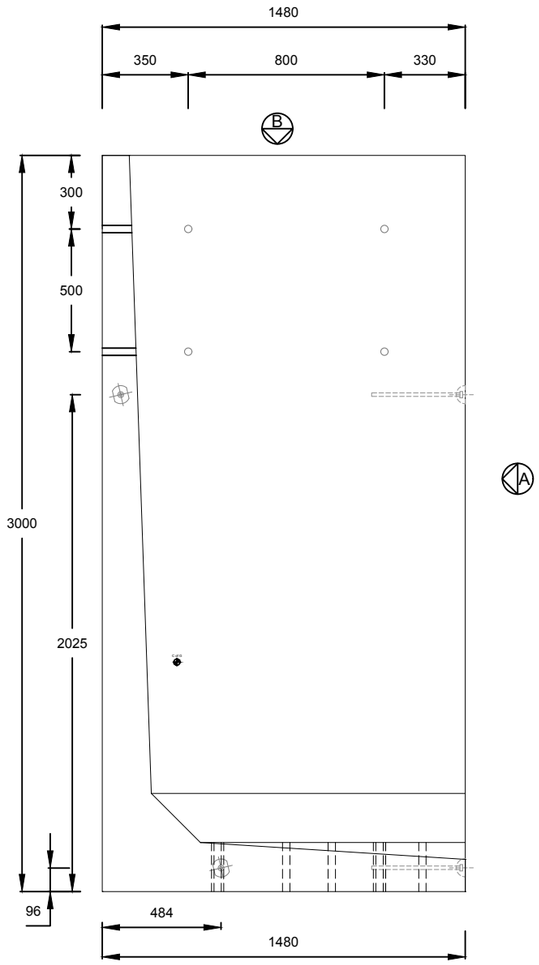
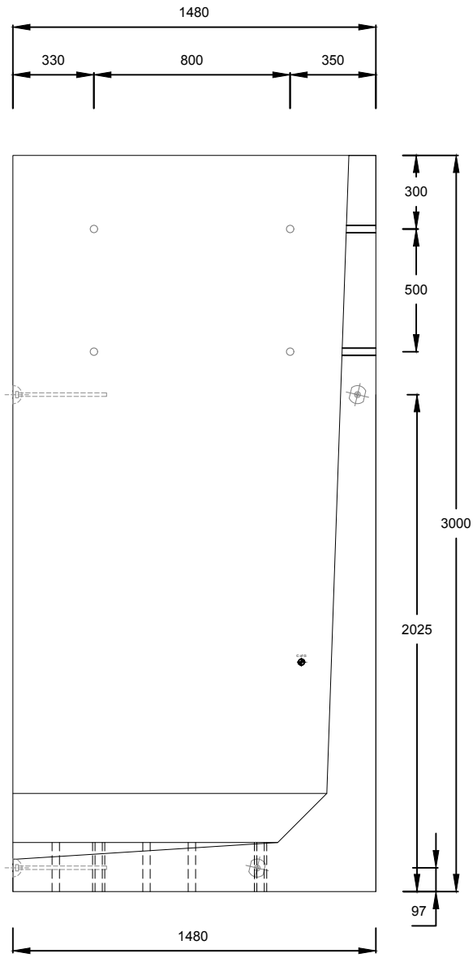
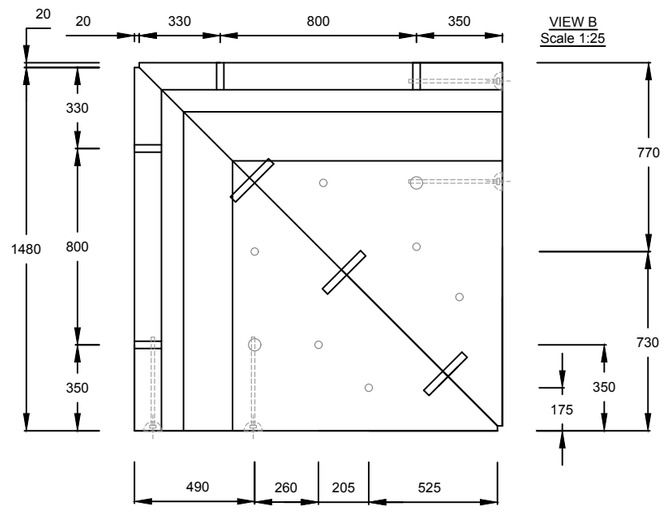
Date of issue	Paper size	Revision	Sheet
18/09/2019	A3	P01	11/14





VIEW A
Scale 1:25



VIEW B
Scale 1:25

1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3, Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
3000 Wall Unit	0.86	2.23	2.35

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Revision/Description	Drawn	Checked	Date
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Title, Supplementary title

Bolt Down Retaining Wall
Standard Corner unit 3.0m

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Date of issue	Paper size	Revision	Sheet
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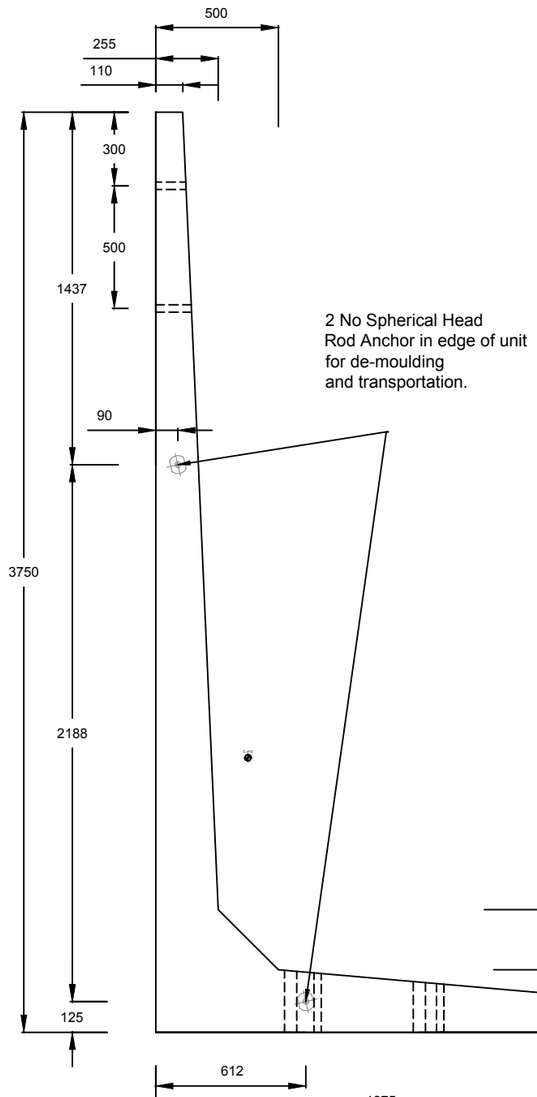
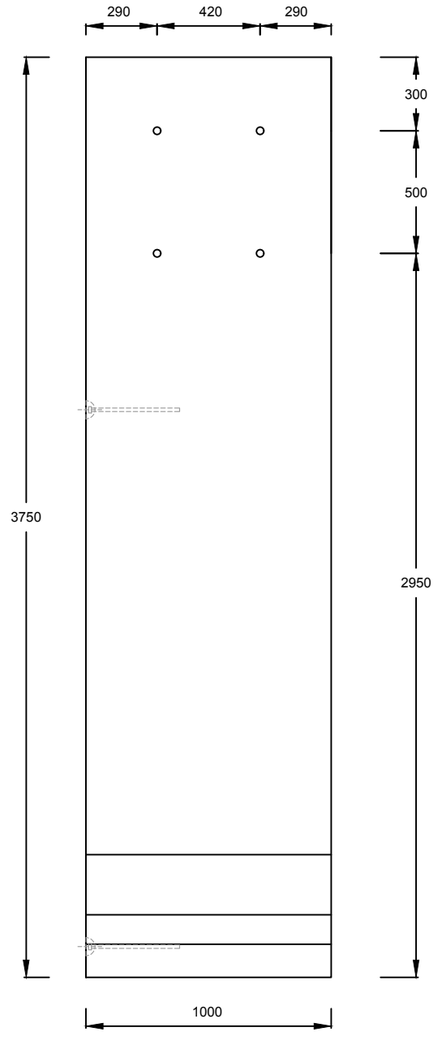
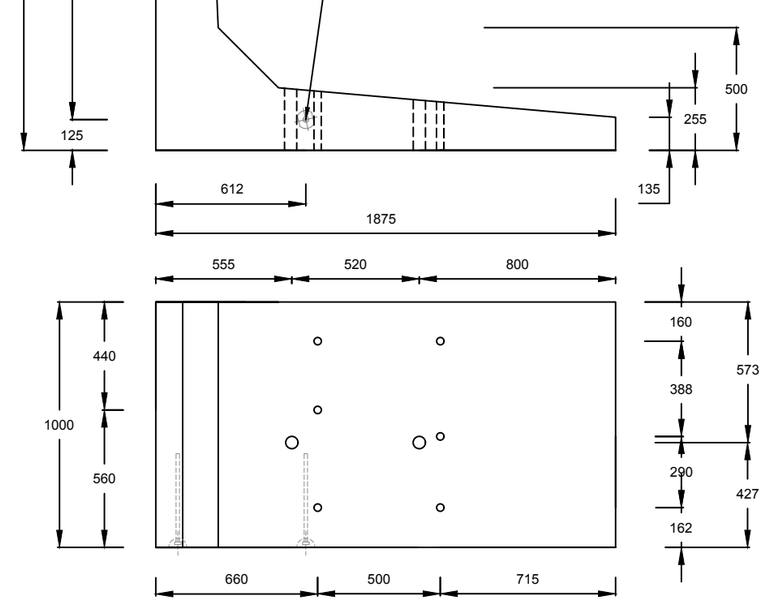


2 No Spherical Head
Rod Anchor in edge of unit
for de-moulding
and transportation.





6 No Ø30mm holes for Anchor Installation

2 No Ø50mm Performed Grout Holes

1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3, Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
3750 Wall Unit	1.08	2.87	2.95

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Tensile Force per Dowel	9.43 kN
Resultant Horizontal Force	99.7 kN/m
Resultant Destabilising Moment	52.6 kNm/m
Vertical Force	186.5 kN/m

**These are maximum values associated with all loading conditions. For more specific values see accompanying calculation.*

Revision/Description	Drawn	Checked	Date
First Issue	FM	PS	18/09/2019

Title, Supplementary title

Bolt Down Retaining Wall
Standard unit 3.750m

Identification number	Created by
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Date of issue	Paper size	Revision	Sheet
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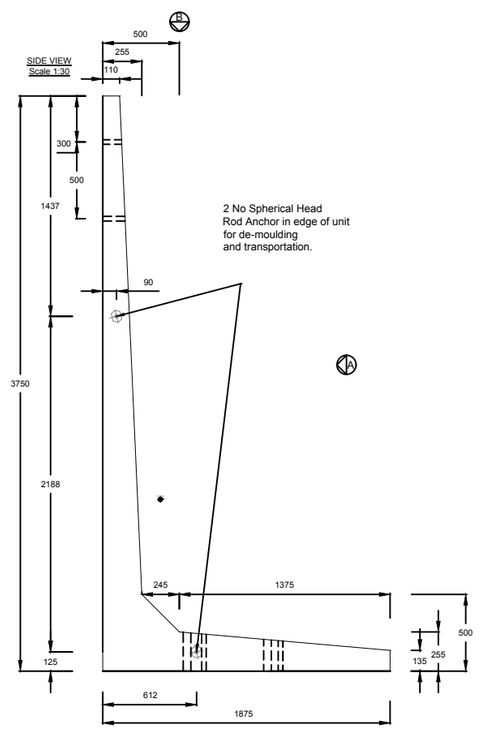

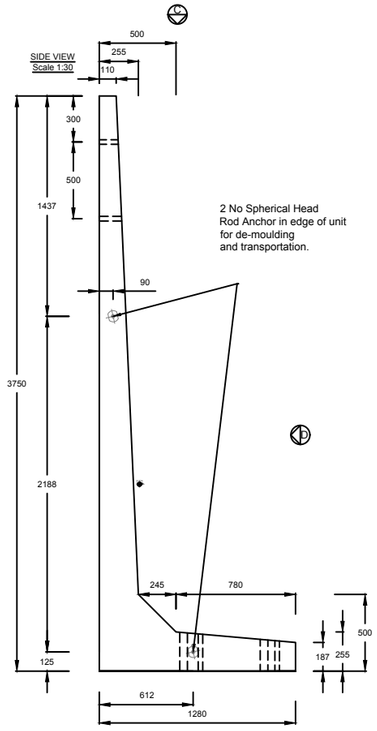

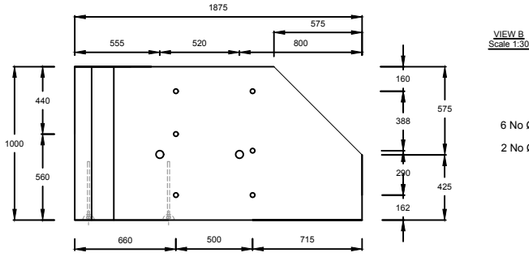

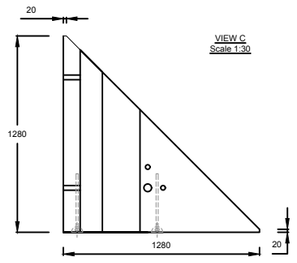

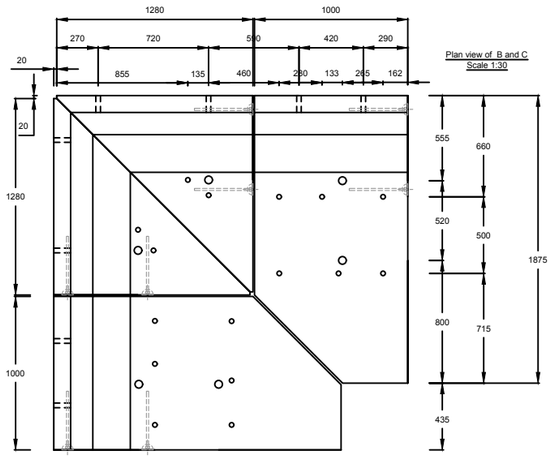

1. Design

a) Concrete design to BS EN 1992-1-1:2004.
b) Loading as per design calculation - 10kN/m2 surcharge with level fill retained to front / rear or 30.0° sloped fill retained to front / rear.
c) Assumed soil parameters:
Characteristic effective shearing resistance φ = 32.5°, Unit weight of fill = 18kN/m3, Backfill assumed to be composed of a free draining granular material.
d) JP Concrete have designed the concrete units only, the stability of the support conditions should be checked by overall scheme designer.

2. Concrete

a) Lifting strength based on 2 cubes = 15 N/mm².
b) Characteristic 28 day cube strength = 55 N/mm².
c) Concrete provides Design Chemical Class 2 (DC2) to Special Digest 1, Table D2.

3. Reinforcement

a) Reinforcement (500B or C) to BS4449.
b) Scheduling, dimensioning, bending and cutting to BS8666.
c) Cage to be tack welded and/or tied with 17 gauge annealed tying wire.

4. Durability

a) Design Life: >50 years to BS8500.
b) Cover to Reinforcement & Exposure:

Min Cover	Cover Block Size (mm)	Min Cover (mm)	Max Cover (mm)
All Faces	45	40	50

Exposure			
All Faces	XC3/4	XD3	XF4

5. Handling

a) Unit Volume / Weight

Unit Ref	Volume (m³)	Weight (T)	Weight + 5% (T)
3750 Wall Unit	1.02	2.65	2.78

Weight is based on 2.6 T/m³.
+5% is recommended for sizing lifting equipment.
***Note:** Please refer to JP Concrete Handling and Installation Guide for more information.*

6. Manufacture

a) Manufactured to BS EN 13369:2013.
b) Tolerances based on BS EN 13369:2013 & BS EN 13670:2009.
c) Finishes: *As below unless indicated otherwise on drawing*

	Cast Edge	All Other Faces
Class	Steel Float	A

7. Foundation

a) Concrete base to be designed and installed (by others) to accommodate the tensile force in the dowels and to resist the horizontal force and overturning moment, as specified below, so that stability in maintained.
b) To ensure good bond and satisfy cover requirements in the anchors the slab should have minimum strength of C20 / C25 and a minimum depth of 200mm.

Revision/Description	Drawn	Checked	Date
First Issue	FM	PS	18/09/2019

Title, Supplementary title

Bolt Down Retaining Wall
Standard Corner unit 3.750m

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