



Escola Politècnica Superior
d'Edificació de Barcelona

UNIVERSITAT POLITÈCNICA DE CATALUNYA

GRADO EN ARQUITECTURA TÉCNICA Y EDIFICACIÓN

TRABAJO DE FIN DE GRADO

Bachelor Project. Architectural Technology

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Convocatoria: Febrero 2018

RESUMEN

Durante la transición de nuestra carrera se van impartiendo distintas asignaturas, con un pilar en común entre todas ellas, pero sin acabar de juntarlas hasta los últimos cursos.

Este trabajo muestra cómo se estudia la carrera de *Architectural Technology and Construction Management* en la localidad danesa de Horsens, que, como ya sabéis, tiene una educación basada en el autoaprendizaje y la búsqueda de información.

Por lo que, mezclando la educación española y danesa, como un puzzle, se juntan todas esas asignaturas aprendidas al largo de la carrera para desarrollar un proyecto real, des de la propuesta del diseño constructivo y arquitectónico de una reforma/extensión, en mi caso, hasta la entrega final del edificio construido, realizando un paso por los detalles constructivos, plannings, industriales, presupuesto, contratos, etc.

Basándome en éstas distintas fases, podré enseñar algunos de los documentos utilizados en el semestre anterior en Dinamarca.

También me centraré en uno de los industriales de la vivienda, que en mi caso, ya que trabajo en una empresa dedicada al mármol, será la realización de los baños, tanto pavimento como aplacados.

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1. INTRODUCCIÓN

El presente trabajo, se trata de un proyecto final de grado de Arquitectura Técnica, realizando la doble titulación entre Dinamarca y España.

Cursé el 5º Semestre en VIA University College de Horsens, Dinamarca, dónde el semestre se basaba en la reforma de un bloque de viviendas de las cuales podíamos ir a visitar y obtener toda clase de planos e información.

Para el 7º semestre, es decir, el Trabajo Final de Grado, la idea ha sido la misma, dando a conocer a la educación española la forma de aprender, estudiar y trabajar en la universidad de Dinamarca, por lo que he intentado, mezclando técnicas, conocimientos y formas de construcción danesas y españolas, realizar un proyecto real.

Al largo del trabajo iréis viendo una sucesión de documentos en inglés, los cuales son parte del aprendizaje que obtuve en Dinamarca, así como la presentación final, la cual es el documento que se entrega y se evalúa allí.

2. NÚCLEO DE LA MEMORIA

2.1 ANTECEDENTES

Emplazamiento y características del solar

El objeto del proyecto se trata de un centro cultural con el emplazamiento en Antigua casa "Can Marqués" de Llinars del Vallés, código postal 08450, provincia de Barcelona.

La promoción de la obra la efectúa el Ayuntamiento de Llinars del Vallés.

El terreno sobre el cual se proyecta el programa del Edificio anexo de servicios culturales "Can Marqués" comparte solar con el Teatro/Auditorio, construido hace dos años atrás. El conjunto tiene un total de 35.820,58m² de superficie distribuidos de la siguiente forma: 16.392m² como suelo de equipamiento para teatro auditorio y cultural, y 19.428,58m² de parque urbano.

El solar sobre el que construir el programa del Edificio de servicios culturales lo constituye una franja alargada, orientada en sentido norte-sur, de topografía poco accidentada. Limita al norte con la Calle Ronda Sant Antoni, al sur con la calle Bellver, ambas de nueva creación, al este con el parque urbano, bosque de Can Marqués, y al oeste con los cierres de los solares residenciales.

Alrededor del solar se pueden encontrar todo tipo de servicios públicos y privados, tales y como supermercados, aparcamiento, transporte público, etc.



Figura 2.1 Emplazamiento de Can Marqués

2.2 DESCRIPCIÓN DEL PROYECTO

Datos urbanísticos

En cuanto a datos urbanísticos, la construcción se encuentra en suelo urbano según planeamiento vigente del P.P.U. de Can Marqués y el P.G.O.U de Llinars, cualificando el suelo en equipamiento público y zona verde admitiendo el uso de equipamiento público.

Siguiendo la normativa de edificación en zona de equipamientos tenemos las siguientes condiciones:

Plan parcial:

Art. 13.3, 3, 1) "Las edificaciones se ajustarán a las necesidades funcionales de los diferentes equipamientos, al paisaje, al respeto a las condiciones ambientales y a la integración en el sector que el cual están ubicados".

Art. 13.3, 3, 3) "Se permitirán todo tipo de edificaciones siempre que su altura no supere los 10m, (planta baja más dos plantas piso) y su ocupación sea como máximo el 30% del solar total".

Art. 13.3, 3, 4) "La edificabilidad máxima permitida será de 0,4m²/m²"

Art. 13.3, 3, 5) "El Ayuntamiento podrá disponer del suelo de equipamiento público de la manera que estime más oportuna. La separación de la edificación a los límites de la parcela será como mínimo de 10m. a vial y zonas verdes y de 15m. con cualquier otro linde que limite con parcela o suelo privado".

Criterios compositivos del proyecto

Gracias al descubrimiento de valores ambientales y de jardinería en su entorno inmediato se ha querido preservar el edificio existente.

La casa propiamente dicha tiene una extensión de 220m² aproximadamente repartidos en dos plantas. Con la extensión se quiere llegar a obtener una superficie total de 1.184,30m².

Se desconocen las fases de construcción de los cobertizos y espacios anexos a la casa, los cuales actualmente están en ruinas. Su forma de adición mediante patios facilita añadir cuerpos de edificación perfectos para el uso que se le quiere dar a la edificación final. Mantener y aumentar el sistema de patios y cubiertas, ha dado lugar a un encadenado de aulas que comparten espacios exteriores cerrados adecuados para su función educativa. La nueva construcción se basará pues, en un largo pasillo el cual unirá la casa existente con la sala polivalente dónde se harán los espectáculos/conciertos. En ambos lados de este largo pasillo se encuentran las diferentes aulas, así como 3 patios pequeños para obtener luz solar y ventilación natural en la mayor parte del edificio.

A continuación, se muestra un estudio del aprovechamiento de luz solar en distintas épocas del año.

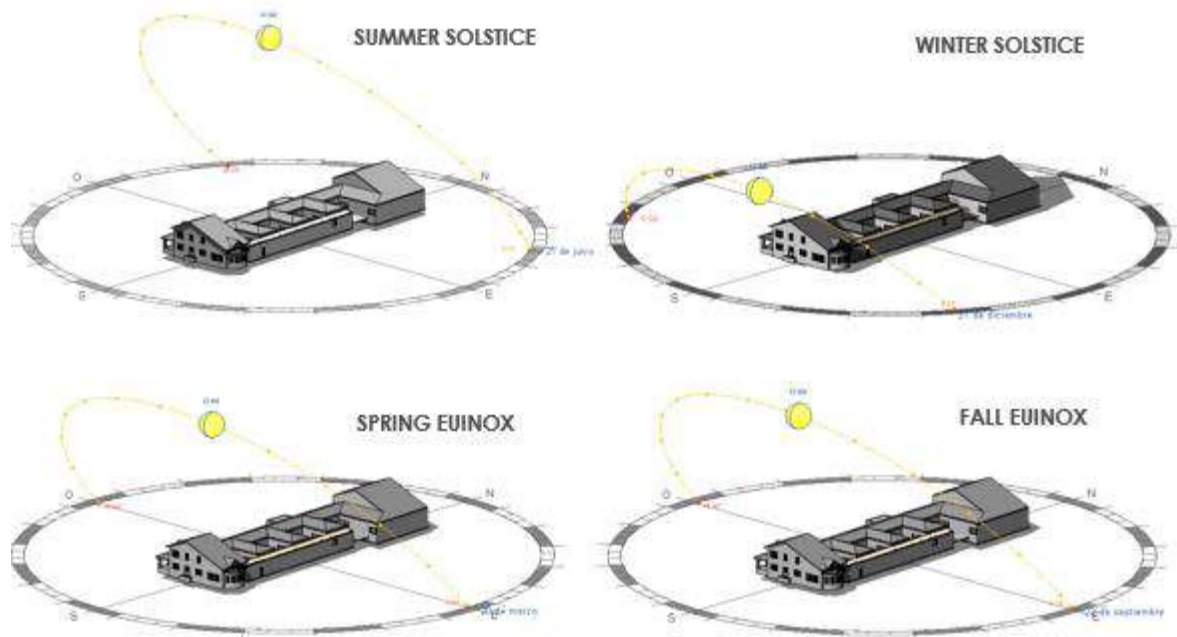


Figura 2.2.1 Estudio de los efectos de la luz solar en el edificio en distintas épocas del año.

La arquitectura de este edificio, resultante de la ampliación de la preexistente casa Can Marqués, consiste en la recuperación de la casa propiamente dicha, ampliando espacios interiores a partir de la eliminación de separaciones interiores como se puede ver en las imágenes que hay a continuación, dónde la parte naranja son los elementos los cuales se tendrán que demoler.

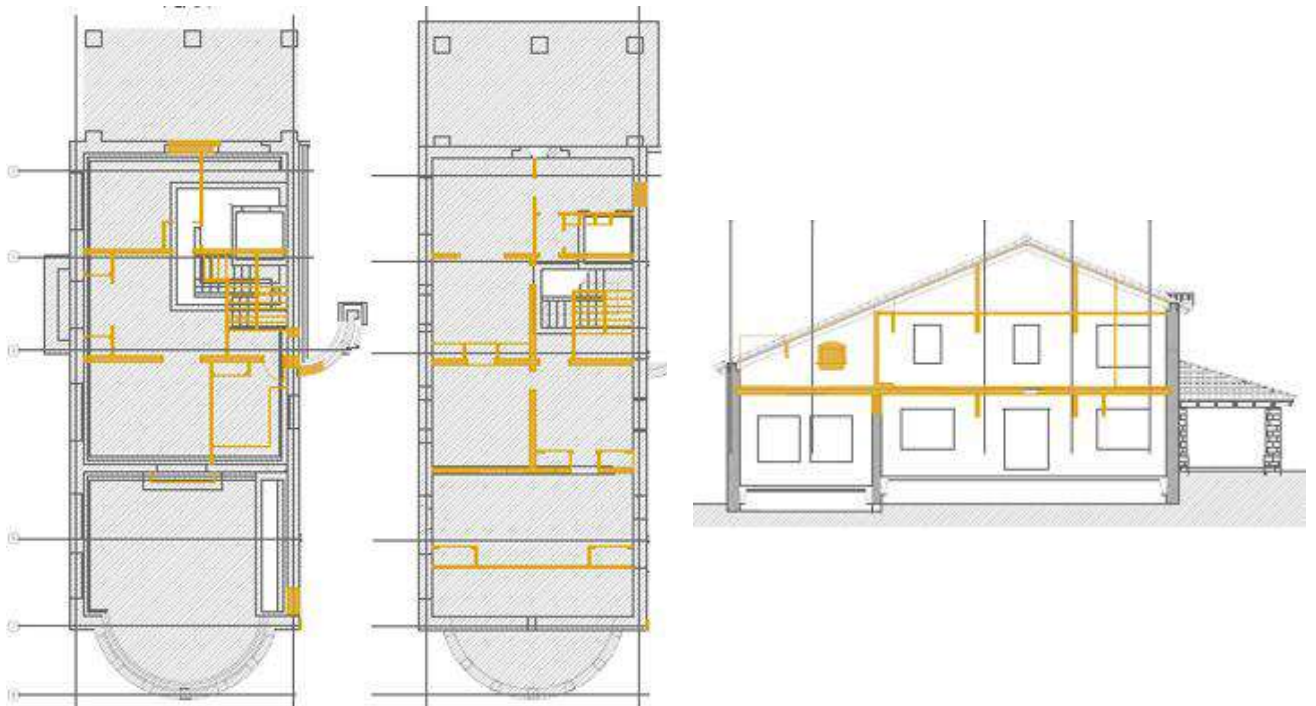


Figura 2.2.2 En esta imagen se aprecia la futura demolición en color marrón de la casa Can Marqués.

El proyecto mantiene la volumetría de la casa original y la de sus propios materiales y ofrece, para su identificación como obra nueva, las cubiertas de cinc y la fachada en hormigón visto para el nuevo volumen a construir.

Cuadro de superficies

Espacios	Sup. Útil (m²)
Local técnico	83.689
Entrada	85.883
Habitación social	51.315
Sala 1	17.581
Baño 1	14.793
Baño 2	11.423
Clase 1	18.513
Clase 2	19.665
Almacén 1	18.913
Almacén 2	7.575
Baño 3	12.635
Baño minusválido	4.676
Baño 4	12.937
Local técnico	18.998
Almacén 3	50.393
Sala polivalente	188.721
Vestidor 1	23.871
Vestidor 2	23.773
Clase 3	54.073
Oficina 1	9.592
Oficina 2	9.574
Clase 4	59.080
Clase 5	60.209
Oficina 3	20.280
Pasillo	212.642
Hall 2	48.264
Aula de profesorado	76.849
Habitación	44.441
TOTAL	1.184,30m²

Tabla. 2.2.1

También se ha querido tratar un tema muy importante actualmente, y en Dinamarca des de hace tiempo: la sostenibilidad. Se ha realizado un esquema de los principales métodos sostenibles que quiero aplicar en esta vivienda, y más adelante se verá el decreto de eco eficiencia de la normativa española que cumple.

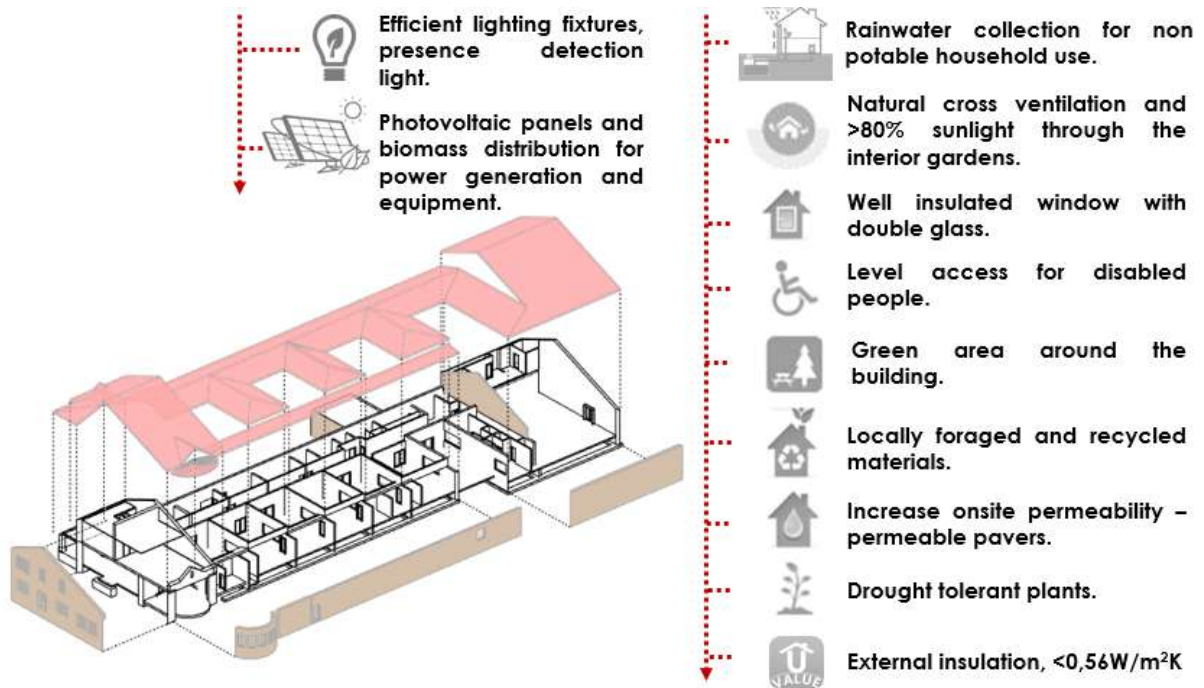


Figura 2.2.3 Esquema de sostenibilidad para el edificio a construir

2.3 Memoria constructiva

- Sistema estructural

La estructura del edificio está compuesta por dos volúmenes que se conectan: uno ya existente y el otro de nueva construcción.

Esta nueva construcción se basa en una estructura de hormigón armado justificada por sus óptimas características de aislamiento acústico; el tipo de elementos verticales propuestos conducen a que, en una determinada pared, exista únicamente un material, con la ventaja que supone para la no aparición de comportamientos diferenciados entre materiales; las transmisiones de ruidos por impacto serán fácilmente tratadas hablando de un mismo material envolvente.

Del punto de vista estructural del bloque ya existente, se ha pretendido mantener las paredes de la periferia y algunas interiores que serán aprovechadas para garantizar un buen comportamiento del edificio, algunos elementos serán demolidos debido a su mal estado.

Para garantizar un buen comportamiento de la estructura del edificio existente, se realizará una losa de cimentación de 15cm de espesor conectada a los muros existentes a través de armaduras galvanizadas.

En cuanto al nuevo volumen, se ha pretendido conseguir una distribución lineal de los muros, realizando losas in situ y cubiertas con 20cm. Las paredes exteriores tienen 20cm de espesor.

Para la cimentación, al largo de las paredes maestras, se ha realizado una zapata continua de unos 35cm de espesor.

CARACTERÍSTICAS DE LOS MATERIALES:

- Hormigón armado: HA-25/B/25/IIa
- Acero en barras: B-400-S
- Acero en mallazo: B-500-T

- Fachada

Como se ha dicho anteriormente, la estructura es a base de paredes maestras y cubiertas inclinadas en losas de hormigón armado, por lo que la fachada de la nueva edificación está realizada con hormigón visto.

Esta decisión ha sido tomada por varias razones: evidentemente si nos referimos a temas económicos, toda la estructura de hormigón encarece mucho el presupuesto versus a la típica construcción a base de pilares, pero al relacionar este proyecto con lo estudiado en Dinamarca se ha decidido estudiar otro tipo de material no tan desarrollado en los países nórdicos.

Por otro lado, se ha querido jugar con la arquitectura y el diseño combinando los acabados de la masía, típicos de la época en que se construyó, con lo avanzado que está el mundo del hormigón, realizando un acabado a la fachada realizado con hormigón visto abujardado.

Por último, la utilización de hormigón como fachada exterior nos suma la problemática de la posibilidad de tener puentes térmicos en el interior de la edificación. Al tratarse de un proyecto no real, simplemente un trabajo, es una buena opción para poder describir con detalles constructivos los puntos críticos donde podría haber puentes térmicos, dando solución a éstos.

Por lo que, la fachada está constituida (de exterior a interior):

Hormigón visto abujardado.

Cámara de aire para evitar de alguna forma la posible humedad que pueda entrar en el edificio.

A continuación, un panel aislante de lana de roca para disminuir la transferencia de temperatura entre el interior y el exterior.

Para finalizar la fachada, se realizará doble capa de cartón-yeso.

- Cubierta

Formada por:

- o Revestimiento de Zinc natural de 0.650/0.80mm de espesor, incluyendo todos los cortes, remates, fijaciones y accesorios de aplicación y puesta en obra;
- o Lámina de absorción/dilatación de PVC actuando como barrera térmica y de absorción acústica para ruidos de impacto;
- o Barrera de vapor;
- o 22mm de panel de contrachapado;
- o 30mm de cámara de aire para obtener una buena ventilación de la cubierta;
- o Barrera de aire;
- o 120mm de lana mineral con una conductividad térmica de 0.034W/mK;
- o Todo ello sujeto con listones de 120x40mm y 30x40mm.

- Revestimientos

Los revestimientos exteriores para la edificación existente se realizarán con piedra natural calcárea de tipo San Vicenç, con acabado abujardado, con una altura de máximo 800mm desde el suelo.

En el interior, tanto en arrimaderos como zócalos, se empleará mármol tipo "Crema Marfil" de 20mm de espesor con acabado mate y tratamiento hidrófugo de superficie.

- Sistema de compartimentación

La compartimentación interior está formada por tabiques de ladrillo y acabado de yeso de 12.5mm de espesor.

- Pavimentos:

- o Tarima flotante de madera formada por lamas de madera maciza de 2400mm de longitud, 120mm de ancho y 22mm de espesor, adherido con 3mm de adhesivo para madera a una capa de mortero de regularización de 50mm; 50mm de poliestireno con conductividad térmica de 0.037W/mK dónde irá apoyado el suelo radiante; seguido de 10mm de polietileno con conductividad térmica de 0.028W/mK.
- o Suelo de mármol formado por 20mm de mármol Crema Marfil con acabado abujardado, a contra junta adherido con 5mm de cemento cola a 65mm de mortero y 50mm de poliestireno con conductividad térmica de 0.037W/mK y, a continuación, 10mm de polietileno con conductividad térmica de 0.028W/mK.

- Aislamientos:

Aislamiento térmico constituido por lana mineral de espesor variable según situación (ver planos y detalles constructivos), con una conductividad térmica de 0.037W/mK.

2.4 Prestaciones del Edificio

Las prestaciones del edificio siguen las exigencias básicas del CTE. El cumplimiento del CTE se puede garantizar a través de los Documentos Básicos correspondientes, explicados a continuación.

Requisitos básicos de Seguridad (CTE)

SE Seguridad estructural

Los elementos constructivos del edificio cumplen con los requisitos establecidos en este apartado.

SI Seguridad en caso de incendio

Exigencia básica SI 1 - Propagación interior

Según la tabla 1.1 Condiciones de compartimentación en sectores de incendio:

<i>Docente</i>	- Si el edificio tiene más de una planta, la superficie construida de cada <i>sector de incendio</i> no debe exceder de 4.000 m ² . Cuando tenga una única planta, no es preciso que esté compartimentada en <i>sectores de incendio</i> .
<i>Hospitalario</i>	- Las plantas con zonas de hospitalización o con unidades especiales (quirófanos).

No es necesario tener una compartimentación en sectores de incendio ya que nuestra construcción no supera los 4000m2. Pero, sí será necesario compartimentar el local técnico y ascensor por tener un riesgo especial.

Para ello, tenemos la tabla 1.2. Resistencia al fuego de las paredes, techos y puertas que delimitan sectores de incendio dónde nos delimita la resistencia de cada elemento:

Tabla 1.2 Resistencia al fuego de las paredes, techos y puertas que delimitan sectores de incendio ⁽¹⁾⁽²⁾

Elemento	Resistencia al fuego			
	Plantas bajo rasante	Plantas sobre rasante en edificio con altura de evacuación:		
		h ≤ 15 m	15 < h ≤ 28 m	h > 28 m
Paredes y techos ⁽³⁾ que separan al sector considerado del resto del edificio, siendo su uso previsto: ⁽⁴⁾				
- Sector de riesgo mínimo en edificio de cualquier uso	(no se admite)	EI 120	EI 120	EI 120
- Residencial Vivienda, Residencial Público, Docente, Administrativo	EI 120	EI 60	EI 90	EI 120
- Comercial, Pública Concurrencia, Hospitalario	EI 120 ⁽⁵⁾	EI 90	EI 120	EI 180
- Aparcamiento ⁽⁶⁾	EI 120 ⁽⁷⁾	EI 120	EI 120	EI 120
Puertas de paso entre sectores de incendio	EI ₂ t-C5 siendo t la mitad del tiempo de resistencia al fuego requerido a la pared en la que se encuentre, o bien la cuarta parte cuando el paso se realice a través de un vestíbulo de independencia y de dos puertas.			

El ascensor dispondrá en cada acceso, o bien de puertas E 30 o bien de un vestíbulo de independencia con una puerta EI2 30-C5.

Para todos aquellos elementos que sean portantes, se le añadirá R.

En cuanto al local técnico, al tratarse como una compartimentación aislada por tener un riesgo especial nos regimos por la tabla 2.1 Clasificación de los locales y zonas de riesgo especial integrados en edificios dónde el uso previsto para este local será de riesgo bajo obteniendo las siguientes características de sus elementos:

Tabla 2.2 Condiciones de las zonas de riesgo especial integradas en edificios ⁽¹⁾

Característica	Riesgo bajo	Riesgo medio	Riesgo alto
Resistencia al fuego de la estructura portante ⁽²⁾	R 90	R 120	R 180
Resistencia al fuego de las paredes y techos ⁽³⁾ que separan la zona del resto del edificio ⁽²⁾⁽⁴⁾	EI 90	EI 120	EI 180
Vestíbulo de independencia en cada comunicación de la zona con el resto del edificio	-	Sí	Sí
Puertas de comunicación con el resto del edificio	EI ₂ 45-C5	2 x EI ₂ 30 -C5	2 x EI ₂ 45-C5
Máximo recorrido hasta alguna salida del local ⁽⁵⁾	≤ 25 m ⁽⁶⁾	≤ 25 m ⁽⁶⁾	≤ 25 m ⁽⁶⁾

Exigencia básica SI 2 - Propagación exterior

- Medianerías y Fachadas: Los elementos verticales separadores de otro edificio deben ser al menos EI 120.
- Cubiertas: Con el fin de limitar el riesgo de propagación exterior del incendio por la cubierta esta tendrá una resistencia al fuego REI 60, como mínimo.

Exigencia básica SI 3 – Evacuación de ocupantes

En la Tabla 3.1. Número de salidas de planta y longitud de los recorridos de evacuación:

	dentado.
Plantas o recintos que disponen de más de una salida de planta o salida de recinto respectivamente ⁽³⁾	La longitud de los recorridos de evacuación hasta alguna salida de planta no excede de 50 m, excepto en los casos que se indican a continuación: <ul style="list-style-type: none"> - 35 m en zonas en las que se prevea la presencia de ocupantes que duermen, o en plantas de hospitalización o de tratamiento intensivo en uso Hospitalario y en plantas de escuela infantil o de enseñanza primaria - 75 m en espacios al aire libre en los que el riesgo de declaración de un incendio sea

Exigencia básica SI 4 Instalaciones de protección contra incendios

Los edificios deben disponer de los equipos e instalaciones de protección contra incendios que se indican a continuación:

- Extintores portátiles de eficacia 21A-113B, a 15m de recorrido en cada planta, como máximo, desde todo origen de evacuación y en las zonas de riesgo especial.
- Al menos un hidrante hasta 10.000m² de superficie construida.
- Bocas de incendio equipadas.
- Sistema de alarma apto para emitir mensajes por megafonía.
- Sistema de detección de incendio.

SUA Seguridad de utilización y accesibilidad

Exigencia básica SU 1 Seguridad frente al riesgo de caídas.

Las discontinuidades y la resistencia al deslizamiento de los pavimentos, los desniveles, las escaleras y la limpieza de los cristales cumplen el DB SU.

Exigencia básica SU 2 Seguridad frente al riesgo de impacto o de atrapamiento.

Se limita el riesgo de que los usuarios puedan impactar o quedar enganchados en elementos fijos o practicables del edificio, de acuerdo con el DB SU 2.

Exigencia básica SU 3 Seguridad frente al riesgo de aprisionamiento.

Se limita el riesgo de que los usuarios puedan quedar accidentalmente cerrados dentro de un recinto.

Exigencia básica SU 4 Seguridad frente al riesgo causado por una iluminación inadecuada.

Se cumple con una iluminación mínima de 20 lux en zonas exteriores y de 100 lux en zonas interiores, así como, de un alumbrado de emergencia que, en caso de fallo del alumbrado normal, suministre la iluminación necesaria para facilitar la visibilidad a los usuarios de manera que puedan abandonar el edificio, evite las situaciones de pánico y permita la visión de las señales indicativas de las salidas y la situación de los equipos y medios de protección existentes.

Exigencia básica SU 5 Seguridad frente del riesgo causado por situaciones con alta ocupación.

Esta exigencia básica no es aplicable a este edificio al estar muy por debajo de la ocupación de los 3000 espectadores de pie que mantiene la norma.

HE Ahorro de energía

Exigencia básica HE 1 Limitación de la demanda energética.

La categoría climática correspondiente a este municipio es la C2. La altitud sobre el nivel del mar es <250m. La clase de clima que afecta al edificio es 2.

Referente a la conductividad térmica tenemos los siguientes valores:

Tabla 2.3 Transmitancia térmica máxima y permeabilidad al aire de los elementos de la envolvente térmica

Parámetro	Zona climática de invierno					
	α	A	B	C	D	E
Transmitancia térmica de muros y elementos en contacto con el terreno ⁽¹⁾ [W/m ² ·K]	1,35	1,25	1,00	0,75	0,60	0,55
Transmitancia térmica de cubiertas y suelos en contacto con el aire [W/m ² ·K]	1,20	0,80	0,65	0,50	0,40	0,35
Transmitancia térmica de huecos ⁽²⁾ [W/m ² ·K]	5,70	5,70	4,20	3,10	2,70	2,50
Permeabilidad al aire de huecos ⁽³⁾ [m ³ /h·m ²]	≤ 50	≤ 50	≤ 50	≤ 27	≤ 27	≤ 27

Tabla 2.5 Transmitancia térmica límite de particiones interiores, cuando delimiten unidades del mismo uso, U en W/m²·K

Tipo de elemento	Zona climática de invierno					
	α	A	B	C	D	E
Particiones horizontales	1,90	1,80	1,55	1,35	1,20	1,00
Particiones verticales	1,40	1,40	1,20	1,20	1,20	1,00

D.2.10 ZONA CLIMÁTICA C2

Transmitancia límite de muros de fachada y cerramientos en contacto con el terreno	U_{Mlim}: 0,73 W/m² K
Transmitancia límite de suelos	U_{Slim}: 0,50 W/m² K
Transmitancia límite de cubiertas	U_{Clim}: 0,41 W/m² K
Factor solar modificado límite de lucernarios	F_{Llim}: 0,32

% de huecos	Transmitancia límite de huecos U _{Hlim} W/m ² K				Factor solar modificado límite de huecos F _{Hlim}					
	N/NE/NO	E/O	S	SE/SO	Baja carga interna			Media, alta o muy alta carga interna		
					E/O	S	SE/SO	E/O	S	SE/SO
de 0 a 10	4,4	4,4	4,4	4,4	-	-	-	-	-	-
de 11 a 20	3,4	3,9	4,4	4,4	-	-	-	-	-	-
de 21 a 30	2,9	3,3	4,3	4,3	-	-	-	0,60	-	-
de 31 a 40	2,6	3,0	3,9	3,9	-	-	-	0,47	-	0,51
de 41 a 50	2,4	2,8	3,6	3,6	0,59	-	-	0,40	0,58	0,43
de 51 a 60	2,2	2,7	3,5	3,5	0,51	-	0,55	0,35	0,52	0,38

HR Protección frente al ruido (recinto protegido)

Aislamiento acústico a ruido aéreo:

- El índice global de reducción acústica, ponderado A, RA, de la tabiquería no será menor que **33 dBA**.
- El aislamiento acústico a ruido aéreo, DnT,A, entre un recinto protegido y un recinto de instalaciones, colindante vertical u horizontalmente con él, no será menor que **55 dBA**.
- El aislamiento acústico a ruido aéreo, D2m,nT,Atr, entre un recinto protegido y el exterior no será menor que **30dB**.

Aislamiento acústico a ruido de impactos:

- El nivel global de presión de ruido de impactos, L'nT,w, en un recinto protegido colindante vertical, horizontalmente o que tenga una arista horizontal común con un recinto de actividad o con un recinto de instalaciones no será mayor que **60 dB**.
- El nivel global de presión de ruido de impactos, L'nT,w, en un recinto protegido colindante vertical, horizontalmente o que tenga una arista horizontal común con cualquier otro recinto habitable o protegido del edificio, no perteneciente a la misma unidad de uso y que no sea recinto de instalaciones o de actividad, no será mayor que **65 dB**.

Valores límite de reverberación:

En conjunto los elementos constructivos, acabados superficiales y revestimientos que delimitan un aula o una sala de conferencias tendrán la absorción acústica suficiente de tal manera que:

- El tiempo de reverberación no será mayor que **0,7 s**.

HS Salubridad (Higiene, salud y medio ambiente)

Exigencias básicas HS 1 Protección frente a la Humedad.

El riesgo previsible de presencia inadecuada de agua o humedad en el interior de los edificios y en todos sus cerramientos se limitará de acuerdo con lo que establece el DB HS 1.

Exigencias básicas HS 2 Recogida y evacuación de residuos.

El edificio dispone de espacios individuales para la recogida y evacuación de los residuos generados.

Exigencias básicas HS 3 Calidad del aire interior.

El edificio dispone de ventilación natural para que todos sus recintos puedan ser ventilados adecuadamente.

Exigencias básicas HS 4 Subministro de agua.

El edificio dispone de medios adecuados para suministrar agua para el consumo de forma sostenible al equipamiento higiénico previsto gracias a las placas solares, así como a la calefacción la cual se obtendrá mediante la combinación de las placas solares y una caldera de biomasa situada en el local técnico.

El diámetro mínimo de las derivaciones a los aparatos cumple con la exigencia del HS 4 Subministro de agua:

Tabla 4.2 Diámetros mínimos de derivaciones a los aparatos

Aparato o punto de consumo	Diámetro nominal del ramal de enlace	
	Tubo de acero	Tubo de cobre o plástico (mm)
Lavamanos	½	12
Lavabo, bidé	½	12
Ducha	½	12
Bañera <1,40 m	¾	20
Bañera >1,40 m	¾	20
Inodoro con cisterna	½	12
Inodoro con fluxor	1- 1 ½	25-40
Urinario con grifo temporizado	½	12
Urinario con cisterna	½	12
Fregadero doméstico	½	12
Fregadero industrial	¾	20
Lavavajillas doméstico	½ (rosca a ¾)	12
Lavavajillas industrial	¾	20

Exigencias básicas HS 5 Evacuación de aguas.

De acuerdo con el DB HS 5, los diámetros de los conductos de aguas residuales son los apropiados para transportar las unidades de evacuación siguientes:

Tabla 4.1 UDs correspondientes a los distintos aparatos sanitarios

Tipo de aparato sanitario	Unidades de desagüe UD		Diámetro mínimo sifón y derivación individual (mm)	
	Uso privado	Uso público	Uso privado	Uso público
Lavabo	1	2	32	40
Bidé	2	3	32	40
Ducha	2	3	40	50
Bañera (con o sin ducha)	3	4	40	50
Inodoro	Con cisterna	4	5	100
	Con fluxómetro	8	10	100
Urinario	Pedestal	-	4	-
	Suspendido	-	2	-
	En batería	-	3.5	-
Fregadero	De cocina	3	6	40
	De laboratorio, restaurante, etc.	-	2	-
Lavadero	3	-	40	-
Vertedero	-	8	-	100
Fuente para beber	-	0.5	-	25
Sumidero sifónico	1	3	40	50
Lavavajillas	3	6	40	50
Lavadora	3	6	40	50
Cuarto de baño (lavabo, inodoro, bañera y bidé)	Inodoro con cisterna	7	-	100
	Inodoro con fluxómetro	8	-	100
Cuarto de aseo (lavabo, inodoro y ducha)	Inodoro con cisterna	6	-	100
	Inodoro con fluxómetro	8	-	100

Decreto de eco eficiencia

Se cumplirán los parámetros obligatorios que señala el Decreto 21/2006 de eco eficiencia en los edificios. Para obtener un mínimo de 10 puntos, se utilizarán las soluciones constructivas siguientes:

- Asoleamiento directo >80%: 5 puntos
- Ventilación natural cruzada: 6 puntos
- Iluminación comunitaria con detectores de presencia: 3 puntos
- Construcción de una cubierta ventilada: 5 puntos
- Utilización de energías renovables para obtener la climatización (calefacción y/o refrigeración) del edificio: 7 puntos
- **TOTAL: 53 puntos.**

2.5 Presupuesto aproximado

FASE DE EJECUCIÓN		IMPORTE
1.0	Trabajos previos y movimiento de tierras	22.750,20€
1.1	Estructura	340.353,75€
1.2	Impermeabilización y aislamientos	115.535€
1.3	Paletaería	6.723,05€
1.4	Cubiertas	115.352,27€
1.5	Revestimientos	156.875,33€
1.6	Pavimentos y arrambadores	127.589,55€
1.7	Mobiliario	6.219,16€
1.8	Carpintería	57.941,02€
1.9	Elementos y accesorios de baño	8.846,59€
1.10	Instalaciones	342.118,75€
1.11	Reforma de la masía	81.548,47€
1.12	Seguridad y salud	8.321,98€
TOTAL		1.390.175,12€

Tabla 2.5.1

2.6 Planning

El tiempo estimado para la demolición parcial de la vivienda actual y la nueva extensión del edificio estudiado es de un total de 10 meses repartidos de la siguiente forma:

	MONTH 1				MONTH 2				MONTH 3				MONTH 4				MONTH 5				MONTH 6				MONTH 7				MONTH 8				MONTH 9				MONTH 10							
	January				February				March				April				May				June				July				August				September				October							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Demolition work																																												
Construction work																																												

CONCRETE AND DEMOLITION

1. Internal demolition
2. Opening for a new elevator and stair
3. Excavation and foundations
4. New staircase
5. New building construction (walls, roof and basement)

MASONRY

1. Internal walls
2. Insulation for internal and external walls
3. Roof cladding and insulation
4. Bathroom floor and tiles
5. Stone work
6. Suspended ceiling

CARPENTRY

1. Internal demolition
2. Gutters
3. Windows
4. Doors
5. Finishes
6. Down pipe

OTHERS

1. Elevator
2. Electric installations
3. Ground drainage
4. Plumbing
5. Ventilation unit
6. Water installation
7. Sewer installation
8. Painting
9. Bathroom furniture

	MONTH 1				MONTH 2				MONTH 3				MONTH 4				MONTH 5				MONTH 6				MONTH 7				MONTH 8				MONTH 9				MONTH 10								
	January				February				March				April				May				June				July				August				September				October								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	
Concrete and demolition	Internal demolition																																												
	Opening for a new elevator																																												
	Opening for a new staircase																																												
	New staircase																																												
	Excavation and foundations																																												
Masonry	New basement																																												
	New external walls construction																																												
	New roof construction																																												
Masonry	Internal walls																																												
	Insulation int/ext walls																																												
	Roof cladding and insulation																																												
	Bathroom floor and tiles																																												
	Stone work																																												
	Suspended ceiling																																												
Carpentry	Internal demolition																																												
	Gutters																																												
	Windows																																												
	Doors																																												
	Finishes																																												
	Down pipe																																												
Other	Electric installation																																												
	Elevator																																												
	Ground drainage																																												
	Plumbing																																												
	Ventilation unit																																												
	Water/Heating installation																																												
	Sewer installation																																												
	Painting																																												
	Bathroom furniture																																												

4. CONCLUSIONES / RECOMENDACIONES

Cómo estudiante de una doble titulación mi experiencia estando allí ha sido muy buena. Al principio estaba muy perdida ya que la forma de enseñar allí no tiene nada que ver con la que impartimos en España, por lo que, hasta que no llevé un tiempo no me acabé de adaptar al no tener asignaturas y aprender a base de preguntar y buscar por mi misma.

Al finalizar mi estancia en Dinamarca y ver todo el proyecto realizado con mis compañeros (grupo de 4 arquitectos y 4 ingenieros) me di cuenta de lo bien que va realizar un proyecto des de 0 pasando por las fases de proyecto básico y proyecto ejecutivo con un proyecto real, en vez de realizarse con asignaturas sueltas sin ver un caso práctico al conjunto.

Por lo que, al realizar este proyecto final de grado con un proyecto real, me ha servido para que me surgieran dudas, sobre todo en detalles constructivos, que no son los básicos que se pueden llegar a estudiar, así como resolverlos siguiendo la normativa española.

Por otro lado, Dinamarca es uno de los países más sostenibles de Europa, por lo que te hace pensar en los materiales a utilizar o reutilizables, las medidas sostenibles posibles, etc. para que la vivienda sea lo más sostenible posible.

Como recomendación, animaría a toda la gente posible a realizar la doble titulación entre España y Dinamarca, ya que dan una visión muy distinta al aprendizaje y al estudio de nuestra carrera, es una oportunidad estupenda para aprender y practicar el idioma inglés, apoyan y facilitan mucho el intercambio y la comunicación entre estudiantes, lo que ayuda a conocer a gente de todas partes del mundo que pueden aportar técnicas constructivas muy distintas a las vistas habitualmente y, por supuesto, obtienes una doble titulación que seguro en un futuro será de utilidad.

5. BIBLIOGRAFÍA

<http://ptop.gencat.net/rpucportal/AppJava/cercaExpedient.do?reqCode=veureDocument&codintExp=221684&fromPage=load>

- Ordenación urbanística de Llinars del Vallés

<https://www.codigotecnico.org/>

- Código técnico

http://economia.gencat.cat/web/.content/documents/arxius/doc_12104557_1.pdf

- Decreto de ecoeficiencia

<https://studienet.via.dk/CookieAuth.dll?GetLogon?curl=Z2FsitesZ2FenZ2Fdefault.aspx&reason=0&formdir=14>

- Toda la documentación relacionada con documentos daneses.

www.u-wert.net

- Página web la cual permite calcular la conductividad térmica de los materiales o elementos a construir.

<https://itec.es/nouBedec.e/>

- Página web para la obtención de precios de elementos para poder realizar el presupuesto.

6. AGRADECIMIENTOS

- Manuel Borbón Sanllorente: ha sido mi tutor durante los 6 meses del trabajo final de grado, por lo que le agradezco el seguimiento y apoyo durante el mismo.
- Roger Howard: ha sido mi tutor danés durante los 6 meses del trabajo final de grado, por lo que le agradezco el seguimiento y apoyo durante el mismo.
- Ferran Reja Iglesias: es el director de la empresa donde trabajo. Ha hecho lo posible para solucionar mis dudas y realizar visitas de obra para poder ver el proceso constructivo del edificio estudiado.

7. ANEXO

A continuación, se detallarán los documentos referentes a derecho de nuestro edificio.

7.1 DOCUMENTO 1 – **CONSULTATION AGREEMENT**

Este documento hace referencia al contrato que se realiza entre el Arquitecto y cliente.

Consultation agreement

Consultation Agreement

The following is a standard form for consultant services recommended by PAR¹ and based upon ABR 89².

1. Parties involved

1.1 The undersigned:

Antiga casa Can Marqués, Llinars del Vallés, 08450

1.2 In the following defined as the client and co-undersigned:

Total consultant:

Horsens architect, Kollegievandet 30, 8700 Horsens. Sandra Martín

In the following defined as the consultant have entered into formal agreement based on the following conditions:

2. Scope of consultancy

2.1 The Agreement comprises consulting services concerning:

Horsens architect: Architect work

2.2 Other consultants involved in the project:

Geotech service: Geotechnical report of the building site.

Llinars del Vallès Geotech: ground condition work.

Engineer consultancy: Civil engineering

2.3: As design/project manager is appointed:

Roger Howard Taylor, Horsens architect, Kollegievandet 30, 8700 Horsens.

Manuel Borbón, Barcelona architect, UPC

3. Basis for the agreement

¹ Association of Danish Architects

² General Conditions of Consultant Services

BPM

Consultation agreement

3.1 Consultant material applicable:

Booklet with descriptions of the main idea for the project. Registration of the building.

3.2 Client material applicable:

*Existing drawings of the building.
Overall design strategy.*

3.3 Other conditions:

All the material from outline phase has been given to the client and the contract will apply from Outline to the building have been handed over to the client.

4. Consultant services

0. outline proposal: new floor plans, elevations, sustainability, time schedule, 3D views, building improvement, installation system, vertical analysis, sound and fire analysis... all the necessary to show to the client what we want to build.

1. Detail 1: Location / site plan, building site plan, plans - cellar, ground floor, roof plan, sewer plan, elevations, sections, structural details (load carrying details), list of documents, application for building permit, energy framework, building services, building services drawings, (plans, 3D and principal sketches), static documentation, structural plans, elevations and details for prefabricated concrete elements, structural plans for renovated building.

2. Detail 2: Provide a detailed basis for the Contractors calculation of the price, securing that the received prices in the tender bids come as close to the realistic market price as possible, and the work can be executed as planned. It is fundamental that the quality of the project material, worked out by the consultant, is detailed and complete. An unclear Detail Design II project will give the contractors the possibility for demanding extra claims during the execution phase, and the economical overview will be lost. Secondly the constructions may be carried out in inappropriate ways...

3. Execution (Demolition and execution of work.): consultate the workers in case of missing drawings and details. And, consultate if there are unforeseen problems.

For more details about the services see ABR 89 2.3.1

5. Client's services

According to ABR 89

BPM

Consultation agreement

6. Time limits

Outline proposal 25.09.17 – 08.10.17

Detail 1 09.10.17 – 05.11.17

Detail 2 06.11.17 – 03.12.17

Tender 26.11.17 – 31.12.17

Execution (Demolition and execution of work.) 01.01.18 – 21.10.18

Penalties (day fine) can just be given if the final day 21.10.18 and handing over 31.10.18 is delayed. The day fine is 1 ‰ (excluding VAT) of the total amount of the fee, each day.

7. Financial basis for the project

The project must be built and constructed within the budget of 1.390.175,12€.- excluded mva.

This maximum amount includes:

Yield, administration cost, site costs, construction cost, consultant cost of the work that is agreed

on.

The consultants have a right to re-design if the total price extend whit 10 % of the total price. The

consultants will also get a time extension. The extension will be as many weeks that has been used for designing and construct the building.

8. Fee

Total fee: 1.390.175,12€

Distribution of fee:

Outline 25%

Detail 1 25%

Detail 2 35%

Execution 15%

Annex 1. For calculations.

9. Expenditures

According to ABR 89

10. Payment

Payment of the fee is gone be divided like this:

Outline 25%

BPM

Consultation agreement

Detail 1 25%

Detail 2 35%

Execution 15%

Payment will be done after each month according to the fee plan (Annex 1)

11. Liabilities

According to ABR 89.

The consultant group will make a project insures that will insure up to the total amount of the fee.

12. Insurance

The consulting group will creat an insurance for this specific project. This will cover the consultants professional liability.

13. Disputes

ABR 89 Cap. 9

14. Special conditions

- The consultant need to inform the client about the project development. The client need also to be present during all construction meetings.*
- The consultant group have the copyright for all the drawings after handing over.*

7.2 DOCUMENTO 2 – **CASE SPECIFICATION**

Este documento hace referencia a la normativa y condiciones a seguir en obra cualquiera de los industriales involucrados en la obra.

Case Specifications

Renovation of Can Marqués

08450 Llinars del Vallés, Barcelona

Sandra Martín / AH73-A17

February 2018

1. Table of contents

1. Table of Contents (continued)

Project Specific Specifications

Table of Contents

2. Orientation

- 2.1. General
- 2.2. The Project Background
- 2.3. Summary of Contracts/Works
- 2.4. Project Documents
- 2.5. Project Organisation

3. GC 92 (General Conditions of Contract)

- A. Contractual basis
- B. Performance bond and insurance
- C. Performance of the contract
- D. The employer's obligation to pay
- E. Extension of time limits and delay
- F. Handing-over of the work
- G. Defects
- H. 1-and 5-year inspections
- I. Special provisions on determination
- J. Disputes'

4. The building site

- 4.1. General
- 4.2. Stipulations
 - 4.2.1 Directions from local authorities
 - 4.2.2 Permits and reports to authorities
 - 4.2.3 Other stipulations
- 4.3. Handover of building
- 4.4. Existing conditions
- 4.5. The Client's setting-out of the building
- 4.6. Establishment of the building site
 - 4.6.1 Site plan
 - 4.6.2 Demarcation of the building site
 - 4.6.3 Fencing in the building site
 - 4.6.4 Closing off
 - 4.6.5 Security
 - 4.6.6 Security against theft
 - 4.6.7 Signposting
 - 4.6.8 Screening off/blocking off against 3rd person.
- 4.7 The Site's infrastructure
 - 4.7.1 Parking

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- 4.7.2 External road and path system
- 4.7.3 Traffic system within the building
- 4.7.4 Sealing off of rebates and holes in traffic areas.
- 4.7.5 Establishing barriers in traffic areas
- 4.7.6 Lighting up traffic areas
- 4.7.7 Provisions for shielding against inclement weather in traffic areas.
- 4.7.8 Clearing and cleaning traffic areas.
- 4.8 Portable site cabins and storage areas
 - 4.8.1 Conditions for Cabins
 - 4.8.2 Storage space
 - 4.8.3 Tent workshops
 - 4.8.4 Skips and refuse
 - 4.8.5 Lighting of cabin area and storage space
 - 4.8.6 Provisions for inclement weather in Cabin/storage area.
 - 4.8.7 Clearing and cleaning of cabin and storage area
 - 4.8.9 First aid post
 - 4.8.9 Fire extinguishing materials
- 4.9 Work areas
 - 4.9.1 Closing off rebates and holes in work areas
 - 4.9.2 Establishing barriers in work areas
 - 4.9.3 Lighting work areas
 - 4.9.4 Provisions against inclement weather in work areas
 - 4.9.5 Clearing and cleaning work areas
- 4.10 Technical installations
 - 4.10.1 Cranes and building material lifts
 - 4.10.2 Personnel elevators
 - 4.10.3 Scaffolding
- 4.11 Site utilities
 - 4.11.1 Water, sewer and drainage
 - 4.11.2 Electricity
 - 4.11.3 Telephone
- 4.12 Special provisions for buildings in use
 - 4.12.1 General work conditions
 - 4.12.2 Information to tenants

5. Health and Safety

- 5.1 General
 - 5.1.1 Organisation
 - 5.1.2 Safety meetings
- 5.2 Health and Safety Plan
- 5.3 The work environment
 - 5.1.3 Safety meetings
 - 5.1.4 Limiting noise
 - 5.1.5 Limiting damage and adverse effects of vibration
 - 5.1.6 Limiting the adverse effects of dust
 - 5.1.7 Limiting adverse ergonomic effects

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7.2 Project management

7.2.1 Site meetings

7.2.2 Kick off meetings

7.3 Quality Plan

7.4 Contractor's quality control and documentation

7.4.1 General

7.4.2 Quality control documentation

7.4.3 Operational & Maintenance documentation

7.4.5 Filing QA-documents

7.5 Handing over procedure (project preview)

7.6 Local authority inspections

7.7 Guarantee/warranty documents

7.8 Handing over

7.9 Quality assurance after handing over

8. Scheduling

8.1 General

8.2 Time Schedules

8.3 Inclement weather days

3. GC 92 (General Conditions of Contract)

Basis Specification (right page)

2. Orientation

2.1 General

The directions in the Works Specification have priority over the stipulations in the Case Specifications.

In the case of the Work Specification, the Building Component Specifications (Chapter 4) and drawings have priority over the Work Specifications' Chapter 3.

2.2 The Project Background

2.3 Summary of Contracts/Works

2.4 Project Documents

The project documents are structured in accordance with *BPS Structure for Specifications, edition 2001-08-06*

2.5 Project Organisation

Project Specific Specification

2. Orientation

2.1 General

BPS Basis Specifications – The Building Case, publication B201, edition 2001-08-06 is, together with this project specific specification, valid for this particular project. The project specific stipulations have priority over the Basis Specifications.

2.2 The Project Background

The project consists of the rehabilitation of Can Marqués. Which includes updating the existing building (accessibility, over all look, structure...) and build an extension. The new gross floor area is 1.184,30m².

2. 3 Summary of Contracts/Works

2.4 Project Documents

2.5 Project Organisation

-Client: Llinars del Vallés Council
-Site adress: Can Marqués, 08450 Llinars del Vallés, Barcelona, España.
-Client's consultant or project administrator: Sandra Martín Solà.
-Designer with field of responsibility: Sandra Martin Solà..

3. GC 92 (General Conditions of Contract)

GC 92

Project Specific Specification

3. GC 92

A. Contractual basis

A. Contractual basis

General conditions

General conditions

§1. The present general conditions shall apply to contracts for the provision of works and supplies within building and engineering.

§1.

Subs. 2. In relation to supplies the term ‘employer’ shall be defined as the buyer and ‘contractor’ as the vendor. In relation to sub-contracts the term ‘employer’ shall be defined as the main contractor and ‘contractor’ as the sub-contractor.

Subs. 3. Deviations from the general conditions shall be valid only when it is clearly and explicitly stated in which respects such deviations are to be made.

Subs. 4. Unless otherwise provided the amounts stated shall not include value-added tax (VAT).

Subs. 5. Unless otherwise provided the term ‘workday’ shall be defined as all such weekdays from Monday through to Friday as are not official public holidays.

Subs. 6. All documents shall be drafted in Danish and all indications of currency, measures and weight shall be Danish indications. Negotiations, including site meetings, shall be conducted in Danish. If documents are also drafted in another language and in the event that discrepancies appear between the foreign-language version and the Danish text, the Danish text shall prevail.

Subs. 6. All Documents shall be drafted in English or Spanish. Negotiations, including site meetings, shall be conducted in Spanish. If documents are also drafted in another language and in the event that discrepancies appear between the foreign-language version and the English text, the English text shall prevail.

Subs. 7. The legal relationship between the parties shall in all respects be treated in accordance with Danish Law.

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The employer's invitation to tender

§2. 'Tender' Shall be defined as the employer's invitation for bids.

Subs. 2. Bids shall be made on the basis of the information contained in the tender documents. The contents of these documents must be unambiguous and presented so as to make quite clear the extent and nature of the services to be provided.

Subs. 3. The tender documents must stipulate a time schedule

Subs. 4. The tender documents must inform of the existence on the site of any ancient monuments, cf. § 16.

Subs. 5. If a fee is charged for the tender documents to ensure their return, this must appear from the invitation to tender. The fee shall be refunded immediately upon the return within a reasonable time of a complete and undamaged set of tender documents, irrespective of whether the person returning the documents has submitted a bid or not.

The employer's invitation to tender

§2.

Subs. 2. Bids must be submitted in accordance with the following documents that form the foundation for submission of bids, as well as transfer and execution of works. The client reserves the right to take possible alternative bids.

- Letter of invitation to tender
- These common conditions
- Work specifications
- Building component specifications
- Drawings
- Tender time schedule

Bidders must verify that the delivered tender documents are complete, taking responsibility for the eventuality that a possible low bid, which resulted due to lack of documents, drawings, etc., is the sole responsibility of the bidders themselves.

The price is fixed throughout the construction period, in accordance with the tender time schedule. Adjustments in contract sum for price changes after this date will be based on Spanish Regulation.

3. GC 92 (General Conditions of Contract)

Subs. 6. With a view to the evaluation of the bids received, the employer may in the tender documents set conditions for the form in which bids are to be submitted, including one which requires bids to be drafted with a reasonable specification of the bid price on tender lists made available for that purpose.

Subs. 7. If the bid or parts thereof, is to be made in the form of unit prices, the employer must stipulate the weight given to the individual unit prices in the evaluation of the total bid.

The contractor's bid

§3. Where a bid is submitted by several tenders in unison, they shall all be jointly and severally bound by it.

Subs. 2. If, in an invitation for tenders, tenders are requested to stipulate a price not only for the work as a whole, but also for parts of the work, the prices quoted for the individual parts may be considered as distinct bids only when this has been explicitly stated in the tender documents or in connection with the submission of the bid.

Subs. 3. If, in addition to an overall bid price, a bid is to contain unit prices, both types of prices shall be binding upon the tenderer. Unit prices shall be applied in case of adjustments of payment occasioned by services being of different extent than stated by the employer in the tender documents. The internal sequence of bids shall be determined on the basis of the total bids only.

Subs. 4. The bid shall cover only those services which are indicated as belonging under the contract on drawings given to the contractor to use as a basis for the bid or which are mentioned in those sections of the work description which apply to the contract in question.

Subs. 5. Bids shall be open for acceptance for a

The contractor's bid

§3. Bidders must acquaint themselves with the working conditions on site and also carry out further investigations, which are considered necessary for bidding.

Subs. 5. Bidders are bound by their bids and

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period of 20 workdays from the closing date.
Other bids in writing shall be open for acceptance for a period of 20 workdays from the date of the bid.

other written offers for a period of 40 working days.

Subs. 6. Bidders whose bids are not accepted may demand that their own bid, drawings, calculations and descriptions be returned to them.

Subs. 7. The employer must promptly notify unsuccessful bidders of the result of the tender.

The contract

§4. An agreement for the performance of work or the provision of supplies shall be made by acceptance in writing of the bid submitted or by a special document. Reference may be made to the documents upon which the contract is based.
Subs. 2. Any stamp duty must be paid by the employer.

The contract

§4.

Assignment of rights and obligations, etc.

§5. The parties may assign their rights under the contract.

Assignment of rights and obligations, etc.

§5. Transport on the contract sum can only be given as a main transport (irreversible distribution transport) to the bank or savings bank, and must then apply to the entire contract sum or residual contract sum.

Subs. 2. If the contractor assigns claims under the agreements which are not due for payment, those assigned claims, which relate to the performance of the work, shall have priority over other assigned claims.

Subs. 3. Neither party may transfer his obligations to a third party without prior consent from the other party.

Subs. 4. The contractor may sub-let unto others the performance of the work to the extent that it is customary or natural for such work to be performed under a sub-contractor.

Subs. 5. Where it has been proved that a claim

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against the contractor concerning defects cannot, or can only with the greatest difficulty be successful, the employer shall be entitled to put forward the claim directly against the contractor's sub-contractors and suppliers, cf. 10, *Subs.*4.

B. Performance bond and insurance The provision by the contractor of a performance bond

§6. Unless otherwise provided in the tender documents, the contractor must within a period of 8 workdays of the conclusion of the contract provide security for the due performance of his obligations towards the employer. The bond may be in the form of an adequate guarantee from a bank or a savings bank, an insurance guarantee or other adequate types of security.

Subs. 2. Until the handing-over of the work, the bond provided must correspond to 15% of the contract sum. After handing-over the bond must correspond to 10% of the contract sum.

Subs. 3. The bond provided for supplies delivered completely finished in instalments must correspond to 10% of the contract sum.

Subs. 4. One year after handing-over the bond must be reduced, however cf. §36, subs.3.(1) , to 2% of the contract sum, unless prior claim for the rectification of defects has been put forward in writing by the employer, in which case the bond shall be reduced when such rectification has been effected.

Subs. 5. The bond shall cease 5 years after handing –over, however cf. §36.(1), unless a prior claim for rectification has been put forward in writing by the employer, in which case the bond shall cease when such rectification has been effected.

Subs. 6. Proportional release of the bond shall be made in case of sectional completion, cf. § 28, subs.4, last full stop.

B. Performance bond and insurance The provision by the contractor of a performance bond

§6.

3. GC 92 (General Conditions of Contract)

Subs. 7. If the employer requests payment under the bond provided, such request must be made in writing and notified simultaneously to the contractor and the guarantor, with an exact indication of the nature and extent of the alleged breach as well as the magnitude of the amount claimed. The amount shall be payable to the employer within 10 workdays of receipt of the above notification, unless the contractor has filed a prior request with the Court of Arbitration asking for an order on the specific question whether the payment claim of the employer is justified, in which case the provisions of § 46 shall apply.

Subs. 8. The purpose of the bond shall be to satisfy all claims which the employer may have under the contract, including such claims as relate to any extra work and the recovery of too large payments already made under the contract.

The provision by the employer of a performance bond

§7. If the contractor so requires, the employer under a private contract shall provide a performance bond for the due performance of his pecuniary obligations towards the contractor within 8 days of a demand therefor. The bond shall be provided in the form of an adequate guarantee from a bank, an insurance-guarantee or other adequate types of security.

Subs. 2. The bond shall correspond to the average payment for a three-month period, however with a minimum of 10% of the contract cum, so calculated that the contract sum is divided evenly on the number of months stipulated in the contract for the performance of the work. Where the contract is extended to include extra work under §14, the contractor may claim the bond to be increased if the payment for the totality of such extras – to the exclusion of extra work for which payment has already been effected – exceeds half of the average payment for one month under the original contract.

Subs. 3. If the contractor requests payment under

The provision by the employer of a performance bond

§7. The client provides no security bond.

3. GC 92 (General Conditions of Contract)

the bond provided, such request must be made in writing and notified simultaneously to the employer and guarantor, with an exact indication of the magnitude of the amount claimed. The amount shall be payable to the contractor within 10 workdays of receipt of the above notification, unless the employer has failed a prior request with the

Court of Arbitration asking for an order on the specific question whether the payment claim of the contractor is justified, in which case the provisions of § 46 shall apply.

Subs. 4. The purpose of the bond shall be to satisfy all claims which the contractor may have under the contract, including such claims as relate to any extra work.

Insurance

§8. The employer shall take out and pay for the usual fire and storm and tempest insurance from the commencement of the work and until any defects established in connection with the handing-over have been rectified. At the request of the contractor, the contractor and any sub-contractor shall be included as insured under the insurance policy. The insurance must provide cover for the work of all contractors on the building or engineering work under the contract. For building alterations or additions the insurance must provide cover for damage to the work and the building or engineering work on which alterations or additions are being made.

Subs. 2. Public-sector employers may claim acceptance as self-insurers.

Subs. 3. The contractor and any sub-contractors must be covered by the usual liability insurance in relation to injury or damage for which they may incur liability under the general provisions of Danish legislation. Upon request the contractor must furnish documentation of such insurance being in force.

Insurance

§8.

3. GC 92 (General Conditions of Contract)

C. Performance of the contract

Working schedule and measurements

§9. The contractor must as soon as possible, and in cooperation with the employer, prepare a working schedule.

Subs. 2. The setting out of the main grid lines and heights (levels) shall be the responsibility of the employer, with all other setting out being undertaken by the contractor.

Services provided by the contractor

§10. The work must be performed in accordance with the provisions of the contract, with due professional care and skill or in accordance with any instructions given by the employer under §15. To the extent that no special descriptions are made of the materials, they must be of general good quality.

Subs. 2. The contractor shall supply all materials and perform all secondary services required for the completion of the work.

Subs. 3. Materials and other supplies intended for incorporation in the work must be supplied by the contractor without any right of lien. Once the specific objects have been delivered at the site they become the property of the employer.

Subs. 4. Materials and other supplies for the work must be supplied with a 5-year suppliers' liability for defects, however cf. § 36, subs. 3(2). The liability period shall commence upon the handling-over of the work and shall be limited to a maximum of 6 years from delivery to stock or for resale. Moreover, the supplier must have accepted partly that claims of defects under the circumstances mentioned in § 5, *Subs. 5*, can be made directly against the supplier, partly that disputes concerning defective supplies can be brought before the Building and Construction Arbitration Court.

C. Performance of the contract

Working schedule and measurements

§9.

Services provided by the contractor

§10.

3. GC 92 (General Conditions of Contract)

Subs. 5. The contractor may refrain from complying with the provisions of subs. 4 above if such compliance will cause him considerable additional expense or substantially delay the work or if, in the case of small supplies, control of compliance with that provision will be too burdensome. In the case of large supplies, the employer must be informed of such omission.

Project conferences, documentation and tests

§11. In the tender documents, the employer may provide that the contractor is to participate in project conferences. Provisions may also be made for the nature and extent of samplings and the kind of documentation to be furnished by the contractor in relation to the performance of the work, constructions made, the origin and properties of the materials used and the samplings made. Such provisions may be contained in a tender control plan. Participation in project conferences and the furnishing of documentation and tests form part of the service to be provided by the contractor.

Subs. 2. During the performance of the work and upon handing-over, the employer may demand that further tests be made. In this case too, the contractor must make available the necessary staff for tests and test analyses. If such further tests show that the services provided are up to contract, the employer must be charged with the cost thereof as for extra work. Otherwise the contractor shall pay for the costs incurred by the employer.

Subs. 3. The contractor shall allow access for the employer and his supervisors to the building and production sites where the work is being carried out. Moreover, the employer may claim that such information be furnished as is necessary to evaluate the service.

Subs. 4. During the performance of the work, the employer and his supervisors may reject work or materials that are not up to contract. Such rejection must be made at the earliest possible

Project conferences, documentation and tests

§11.

Subs. 3. The contractor is obliged to inform the client before production starts and before material supplies are ordered.

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time.

Subs. 5. The contractor must arrange for regular tidying-up and clearing-away and for the immediate removal of rejected materials from the building site.

Deterioration of the work etc. Maintenance

§12. If the work, or part thereof, is deteriorated, destroyed or lost before handing-over, the contractors shall arrange for and defray all expenses arising out of the provision of a service which is up to contract, unless the occurrence was caused by the employer.

If the employer delivers materials to the work done by the contractor, the same rule shall apply to these materials in the time from the receipt by the contractor thereof and until the handing-over of the work.

Subs. 2. The employer shall not be liable for damage caused by contractors to the work, materials and equipment of other contractors.

Subs. 3. The contractor shall maintain the work performed until handing-over.

Subs. 4. If works or parts thereof are put to use prior to handing-over, the provisions of subs. 1-3 above shall apply in the period until such works are put to use.

Relations to public authorities

§13. The employer shall arrange for the necessary planning permission for the project and shall defray all expenses thereby incurred.

Subs. 2. The contractor shall arrange for notifications, applications for licences, requests for inspections and such certificates as relate to the execution of the work itself and shall defray all expenses thereby incurred.

Deterioration of the work etc. Maintenance

§12.

Relations to public authorities

§13.

3. GC 92 (General Conditions of Contract)

Alterations in the work

§14. The employer may demand that alterations be made in the nature and extent of the work where such alterations are naturally linked to the services agreed upon. The contractor shall be entitled to undertake such alterations, unless the employer points out special conditions which justify that the performance of the work be undertaken by others.

Subs. 2. The employer's demands for alterations shall be made in writing. The same shall apply to any demands by the parties for alterations in the contract in respect of price, time and performance bond because of such alteration. An additional contract for the alteration shall be made as soon as possible, and negotiations thereon must not lead to a delay in the performance of the work under the contract.

Subs. 3. Where such alterations relate to work for which unit prices apply, the agreed contract sum shall be adjusted accordingly, unless the parties agree otherwise, cf. subs. 2. However, adjustments in accordance with unit prices may be made only within +/- 15% of the contract sum and within +/- 100% of the individual items in the tender list.

Subs. 4. Payment for alterations other than those provided for in subs. 3 shall be by account rendered unless otherwise agreed by the parties.

Subs. 5. In case of reductions in the extent of the work, the contractor shall give the employer the benefit for any costs for which savings are, or ought to have been obtained. However, where the reduction concerns work for which unit prices apply, cf. subs. 3, this may be done only to the extent that the reduction in work leads to a reduction of the contract sum of more than 15%.

Lack of clarity, obstructions or similar matters

§15. The contractor shall consult with the employer if the contract and its basis do not

Alterations in the work

§14.

Subs. 2. No extra work must be initiated before first being issued on an approved agreement leaflet belonging to the client.

Subs. 3. The contractor will only get paid for extra work if he has got a written request from the client.

Lack of clarity, obstructions or similar matters

§15.

3. GC 92 (General Conditions of Contract)

provide sufficient guidance for the performance of the work.

Subs. 2. Where the contractor finds that the work cannot be performed in accordance with the contract entered into, he shall immediately inform the employer thereof and follow the latter's instructions.

Subs. 3. The contractor shall immediately inform the employer of the occurrence of any events which obstruct work or render work difficult or due to which the employer is likely to suffer inconvenience or loss, including cases in which the employer will incur liability towards third parties. If there is no time to receive instructions from the employer, the contractor must take the best possible measures for the purpose of avoiding losses being suffered by the employer in return for being granted the necessary extension of time limit and against payment.

Subs. 4. The tender documents must contain information on any analyses made of groundwater and soil conditions, contamination or other obstructions. To the extent that the tender documents do not contain exhaustive information on such obstructions, measures aimed at eliminating them and the resulting inconvenience shall be paid as extras.

Subs. 5. If, despite the undertaking of such preliminary analyses as are reasonable or usual considering the character, location and prior use of the site, unforeseen matters arise which lead to orders or bans being imposed by public authorities which prevent continuation of the work or render them unreasonably burdensome for the employer, the latter may annul the contract against payment of compensation to the contractor. Such compensation shall not cover the loss of profit suffered by the contractor by not completing the work but only such other losses as the contractor may suffer.

Ancient monuments

Ancient monuments

3. GC 92 (General Conditions of Contract)

§16. The contractor shall see to it that no in situ ancient monuments are damaged, altered or moved. **§16.**

Subs. 2. The contractor shall immediately notify the discovery of ancient monuments to the Keeper of National Antiquities and the employer, and work must be suspended to the extent that it affects the ancient monument.

Subs.3. The contractor shall see to it that all objects found in the course of work are handed over to the employer.

Subs. 4. The provisions of subs. 1-3 above shall also apply to wrecks and in situ ancient monuments found on the sea bed.

The employer's supervisors

§17. The employer's supervisors shall be defined as his superintending officers, professional supervisors or other supervisors especially appointed by him.

Subs. 2. The employer or his supervisors must be present at the site or be on call.

Subs. 3. The employer's supervisors represent the employer towards the contractor in relation to the organisation and performance of the work. The supervisors may deliver and receive information concerning the work, approve or reject materials or work and issue instructions for the organisation of the work performed by the different contractors with a view to their interrelations.

Subs. 4. Supervision by the employer does not relieve the contractor of undertaking a control of his own.

Work management by the contractor

§18. The contractor shall manage the work either in person or through an agent who acts as his representative towards the employer and the

The employer's supervisors

§17.

Work management by the contractor

§18.

3. GC 92 (General Conditions of Contract)

supervisors in relation to the organisation and performance of the work.

Subs. 2. The contractor or his agent shall be present at the site or be on call.

Site meetings

§19. Site meetings shall be convened by the employer or his supervisors who shall also prepare minutes from the meetings to be sent as soon as possible to the contractors with whom the employer has concluded contracts.

Subs. 2 The contractor himself or his agent shall attend all site meetings.

Subs. 3. At all site meetings statements shall be made of the number of workdays – days lost – on which work has been wholly or partially at a standstill, with indication of the reasons.

Collaboration with other contractors

§20. The contractor shall collaborate with other contractors at the site and shall negotiate with the supervisors in due time for errors and delays caused by insufficient inter-contractor collaboration to be avoided.

Calling-in of employer and contractor Parties residing abroad

§21. The employer and the contractor shall each provide the other with an address and telephone number to which communications are to be made and from where the employer and his supervisors, respectively the contractor or his agent, can be called in.

Subs. 2. If either contractual party resides abroad or takes up residence abroad after the conclusion of the contract, said party shall appoint a person with an address or domicile in this country who is authorised to enter into financially binding

Site meetings

§19. Objections to the minutes of site meetings must be made at latest by the first site meeting after the issue of the minutes. Otherwise, the minutes will be considered as been approved.

Collaboration with other contractors

§20.

Calling-in of employer and contractor Parties residing abroad

§21.

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commitments on his behalf, against whom legal action can be taken on behalf of said party and with whom all negotiations on behalf of said party can be pursued with binding effect.

D. The employer's obligation to pay

Payment

§22. Upon written request to the employer, the contractor shall be entitled to receive payment once a month for work performed, etc. Within 15 days of receipt of such request, cf. Subs. 11, the employer shall effect payment of the amount for which works and materials in accordance with the contract have been provided on the site.

Subs. 2. Subject to the same rules as under subs. 1, the contractor may also demand payment for any off-site materials, etc., purchased by him and not yet delivered. If the employer so demands, the contractor shall provide a performance bond for delivery in accordance with the contract, cf. § 6. The size of such bond shall correspond to the payment demanded for non-delivered materials, inclusive of VAT.

Subs. 3. Requests for payment for materials, etc., made more than 20 workdays prior to the application thereof on the site shall be conditional upon provisions to the effect in the bid.

Subs. 4. Instead of payment under subs. 1, the parties may agree on payment being effected in accordance with a payment schedule that follows the time schedule and stipulates at which times the contract sum or parts thereof are to be paid. Alternatively, the payment schedule may stipulate the stages at which specified amounts, be they in the contract sum or parts thereof, have to be paid. Payment must be made at the agreed times, etc., conditional upon the completed performance of the work to which the payment is related.

Subs. 5. If, in the case of extra work, no agreements have been made on the time of payment thereof, payment may be demanded as

D. The employer's obligation to pay

Payment

§22. Client's payment deadline for the interim payment is 30 working days.

Subs. 2. If interim payment is drawn on not yet delivered goods to the worksite, the contractor must provide security.

Subs. 4. Not part of the agreement.

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provided by subs.1.

Subs. 6. If the contract provides for adjustment of the contract sum in cases of changes of index, wages under collective wage agreements, prices of material, etc., shall be adjusted in connection with the payment for such parts of the work as are affected by the change. Adjustment is to be based on a documented statement provided by the contractor.

Subs. 7. Upon handing over, the contractor shall submit a final and exhaustive account, including one indicating amounts due for all extras. Once the employer has received such account, the contractor may advance no further claims, to the exception of such claims for which reservations have been specifically made in the final account.

Subs. 8. For building works, including site development works, the final account must be submitted to the employer within 25 workdays of the handing over, however, for main contracts within 35 workdays thereof. For engineering works, apart from those mentioned in § 36, subs.1, the time limit for submission of the final account shall be 60 workdays.

Subs. 9. If the employer is not in receipt of the final account at the expiry of the period provided in subs.8, he may submit a written demand requiring the account to be forwarded within 10 workdays. If the contractor fails to submit the account to the employer within this period, he shall forfeit his claim for payment for extra work performed on an account-rendered basis as well as for reimbursement for wage and price increases.

Subs.10. Payment of the amount stated in the contractor's final account shall be affected within 15 days of receipt thereof.

Subs.10. Client's payment deadline for the final and complete interim certificate is 40 working days. Interest is payable on the sum from that point on.

Subs. 11. Amounts due to the contractor shall carry an interest from the due date as provided by the Danish Interest Rate Act. The time limit provided in *Subs.1* is days of grace.

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Subs. 12. Where the contractor finds the amount for which payment has been claimed has not been paid he shall immediately notify the employer thereof in writing.

Subs. 13. In case of dispute between the parties concerning an account, the employer shall effect payment of all undisputed amounts due.

Subs. 14. If the parties disagree on the employer's right to hold back payments or effect set-offs against the claim of the contractor, the provisions of §46 shall apply at the request of either party.

Subs. 15. Whenever necessary in order to prevent work standstills, the employer may at the expense of the contractor effect payment of wages due to the employees of the contractor.

The right of the contractor to stop work

§23. If the employer fails to effect payment within the above time limits of amounts due, the contractor may stop work with a written notice of 5 workdays.

Subs. 2. Moreover, the contractor may stop work immediately upon the employer's bankruptcy or suspension of payments, or if negotiations are initiated on enforced composition, or if the general financial situation of the employer proves to be such that it must be assumed that he is unable to fulfil his obligations under the contract. However, the above shall not apply where the employer has provided, or does so at the request of the contractor, adequate security for the performance of his obligations under the remaining part of the contract.

E. Extension of time limits and delays

The contractor's right to extension of time limits.

The right of the contractor to stop work

§23

E. Extension of time limits and delays

The contractor's right to extension of time limits.

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§24. The contractor shall be entitled to extensions of time limits in case of delay of the work caused by

- (1) Alterations in the nature and extent of the work ordered by the employer, cf. 14.
- (2) Circumstances relating to the employer or delay on the part of another contractor,
- (3) Circumstance for which the contractor cannot be blamed and which are outside his control, e.g. war, unusual natural events, fire, strikes, lock-out or vandalism,
- (4) the occurrence of precipitation, low temperature, strong winds or other weather conditions which prevent or delay the work because they are essentially greater than what is usual for the season and region concerned, or
- (5) public orders or bans which were not issued because of the contractor's own situation.

Subs. 2. However, the contractor must endeavour to avoid or limit the extent of delays by means of such measures as can reasonably be required.

Subs. 3. Where the contractor feels entitled to an extension of a time limit he must inform the employer thereof in writing without delay. The contractor must, upon request, substantiate that the delay was caused by the circumstances relied upon by him.

The contractor's liability in case of delays

§25. Delays, which do not entitle the contractor to an extension of time limits, shall be considered the liability of the contractor.

Subs. 2. Where provisions have been made for liquidated damages or other special penalties, no additional claims arising out of delays can be made in excess thereof.

The contractor's liability in case of delays

§25.

Subs. 2. Delays in relation to the work plan's partial and final termination milestones means that the contractor must pay a penalty, which for the first 5 days is ½ per mile per day of the contracted sum incl. VAT, but at least 75€ per working day, and subsequently 1 per mile per day, but at least 140€ per. working day. The statement of the work plan noted delays is made by the client's site management, and the calculated daily fine will be offset in the

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contractor's next payment request (interim certificate).

Subs. 3. Where no provisions have been made for liquidated damages or other special penalties, the loss suffered by the employer shall be assessed in accordance with the general provisions of Danish legislation on compensation.

The employer's right to extension of time limits

§26. The employer shall be entitled to extensions of time limits in case of such delays of the work as are caused by the exposure of the employer or another contractor to the circumstances mentioned in §24, subs. 1(3), (4) and (5). The employer shall be vested with the same right in relation to alterations as mentioned in §24, subs. 1(1).

Subs. 2. However, the employer shall endeavour to avoid or limit the extent of the delay by means of such measures as can reasonably be required.

Subs. 3. Where the employer feels entitled to an extension of a time limit, he must inform the contractor thereof in writing without delay. The employer must, upon request, substantiate that the delay was caused by the circumstances relied upon by him.

The employer's right to extension of time limits

§26

The employer's liability in case of delay

The employer's liability in case of delay

§27. The contractor shall be entitled to compensation for losses suffered because of delays caused by

- (1) circumstances relation to the employer, cf. §24, subs. 1(2), and where he is guilty of any errors or neglect, or
- (2) liability-entailing delays by other contractors, cf. § 25, subs. 1, or liability-entailing delays on the part of other contractual parties.

Subs. 2. The contractor shall be entitled to indemnity if the cause of the delay falls under

3. GC 92 (General Conditions of Contract)

- (1) §24, Subs. 1(1) and § 24, subs. 1(5), or
- (2) §24, subs. 1(2), however, without falling under subs. 1 or subs. 3 of the present section.

The indemnity shall amount to the loss sustained by the contractor, however, to the exclusion of any loss of profit sustained by him by not being able to perform other works for the duration of the delay or similar consequential losses.

Subs.3. If the cause of the delay falls under §24, subs. 1(3) or §24, subs. 1(4), the contractor shall be entitled to neither indemnity nor compensation.

F. Handing over of the work.

Handing over meeting

§28.

F. Handing over of the work.

Handing over meeting

§28. Just before completion of the work, the contractor must inform the employer in writing of the time of completion (completion notice). The employer shall then convene the contractor to a handing over meeting to take place within 10 workdays of the time indicated, however, cf. *Subs.* 4.

Subs. 2. A major amount of small defects will be considered a significant defect.

Subs. 2. The work shall be taken to be handed over to the employer upon the conclusion of the handing over meeting - - unless material defects were discovered in the course thereof, in which case a new handing over meeting shall be arranged to be held when the contractor has informed the employer in writing that rectification has taken place, cf. *Subs.* 1.

Subs. 3. If the employer does not convene a handing over meeting as provided in subs. 1, the work shall be taken to have been handed over 10 workdays after the stated time of completion. The same shall apply in relation to new handing over meeting as provided in subs. 2, 2nd full stop.

Subs. 4. Where the work comprises several contracts, the employer must await the completion of all contracts before convening the handing over meeting. However, it may have been provided for in the contract or appear from the circumstances

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that contracts, or parts thereof, are to be handed over at different times or that building sections are to be handed over separately.

Handing Over Protocol

§29.

Subs. 5. For engineering works, apart from those mentioned in §36, subs. 1, the individual contracts shall be handed over separately, unless otherwise agreed or indicated by the circumstances.

Handing Over Protocol

§29. During the handing over meeting, a document shall be drafted (the handing over protocol) in which shall be listed any claims for defective work and any other circumstances pointed out by the employer in addition to any comments made by the contractor thereon. It must appear from the document whether the parties consider the work as having been handed over or not.

Subs. 2. The document shall be signed by the employer and the contractor.

Subs. 3. If either party is unrepresented at the handing over meeting, the meeting may proceed without the representation of the said party. The party present must, as soon as possible, inform the other party in writing of the proceedings of the handing over meeting and of the contents of the handing over protocol.

G. Defects

The concept of defects

§30.

G. Defects

The concept of defects

§30. If the work has not been performed in accordance with the contract, with due professional care and skill or in accordance with any instructions given by the employer under § 15, it shall be deemed to be defective. The same shall apply whenever the contractor has failed to provide other services agreed upon in relation to the work.

Subs. 2. If the materials are not the agreed

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materials or are not of a general good quality, cf. § 10, subs. 1, they shall be taken to be defective. However, this provision shall not apply.

- (1) where, in case of a free choice of materials, the contractor substantiates that the materials stipulated in the contract do not exist or are not procurable because of war, import bans, etc.,
or
- (2) where, in case the employer has ordered the use of specific materials, the contractor substantiates that it is impossible to procure such materials in the stipulated condition due to circumstances which, at the conclusion of the contract, the contractor ought not to have foreseen.

In case of (1) and (2), the contractor must as soon as possible notify the employer of the actual or possible occurrence of obstacles, cf. §15.

Subs.3. The work must in any case possess such properties as are guaranteed by the contract.

Subs. 4. The time of handing-over shall be decisive for the establishment of defective work, whether the defects can be established at this point or are hidden.

**Defects established during handing over
§31.**

Defects established during handing over

§31. The contractor shall have an obligation and a right to rectify any defects discovered during handing over.

Subs. 2. The employer must stipulate in writing a time limit for the rectification of defects discovered. The duration of such limit shall be fixed on the basis of the nature and extent of the defects and the circumstances in general. The contractor shall notify the employer in writing when rectification has taken place.

Subs. 3. If, upon the expiry of the time limit mentioned in subs.2, or after having received a notice from the contractor to the effect that rectification has taken place, the employer is of

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the opinion that the defects have not been rectified, he must inform the contractor in writing of any defects within 10 working days.

Defects established after handing over

Subs. 4. If the contractor does not proceed immediately to rectify said defects, the employer shall be entitled to have them rectified at the expense of the contractor or demand a reduction of the contract sum, cf. §34.

§ 32.

Defects established after handing over

§ 32. For the period of 5 years after handing over, the contractor shall have an obligation and a right to rectify defects established after handing over, however cf. §36, subs. 3(3).

Subs. 2. Such defects may be relied upon by the employer only if the contractor was notified thereof in writing within a reasonable period of the time when the defects were, or ought to have been, discovered. However, this provision shall not apply where the contractor is guilty of gross recklessness.

Subs. 3. The employer must stipulate in writing a time limit for the rectification of defects established. The duration of such limit shall be fixed on the basis of the nature and extent of the defects and the circumstances in general. The contractor shall notify the employer in writing when rectification has taken place. Rectification of a defect may be postponed in order for it to be effected together with the rectification of any defects established during the 1-year inspection, provided that such postponement does not cause the defect to aggravate and does not cause any inconvenience to the employer.

Subs. 4. If the contractor fails to rectify the defects established within the limit provided in subs. 3, the employer shall be entitled to arrange for rectification and charge the contractor with the cost thereof or demand a reduction of the contract sum, cf. §34.

Subs. 5. The employer may have defects rectified

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at the expense of the contractor where such rectification is urgent and the contractor is not capable of effecting rectification immediately. The same shall apply where the employer has reason to believe that the contractor will not effect rectification in the proper manner or without delay.

Lapse the contractor's obligation to rectify, etc.

§33.

Lapse the contractor's obligation to rectify, etc.

§33. The contractor's obligation to rectify and the employer's access to effecting rectification at the expense of the contractor, cf. §§ 31 and 32, shall lapse if the costs of rectification are disproportionately large. In the assessment thereof, consideration must be given to the employer's interest in fulfilment of the contract. However, the employer shall in any case preserve his right to a reduction, cf. §34.

The employer's right to a reduction of the contract sum

§34.

The employer's right to a reduction of the contract sum

§34. If the contractor fails to rectify defects as provided by §31, subs. 4 and §32, subs. 4, the employer may choose not to have the defects rectified at the expense of the contractor but, instead, to claim a reduction of the contract sum. Moreover, the employer shall be entitled to a reduction of the contract sum if rectification proves impossible and under the circumstances mentioned in §33.

Subs. 2. The calculation of the reduction shall be based upon the amount payable for such rectification had it actually taken place.

Subs. 3. Where rectification of defects proves impossible or gives rise to disproportionately large costs, the employer may choose whether the reduction is to be fixed by estimate or in one of the following ways:

- (1) either as the difference between the contract sum agreed upon and the contract sum which the parties presumably would have agreed

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upon had a contract been concluded for the work in its present condition,

- (2) or as the difference between the value of the work as provided under the contract without defects and the value of the work in its present condition.

The contractor's liability for consequential damage

§35.

Subs. 4. The employer's right to annul the contract because of defects shall follow the rules provided in § 40.

The contractor's liability for consequential damage

§35. The contractor shall be liable for compensation for losses suffered due to defects in the work, where such defects are caused by errors or negligence on the part of the contractor, or where they relate to properties, the presence of which has been guaranteed in the contract.

Cessation of the liability for defects

§36.

Subs. 2. The contractor shall not be liable for operational losses, loss of profit or other indirect losses.

Cessation of the liability for defects

§36. In connection with building works and attendant engineering works, the employer's claim against the contractor for defects shall be put forward within 5 years of the handing over of the work. After this period, the employer may not put forward any claims against the contractor. The provisions of Act no. 274 of December 22, 1908, on time barring of certain claims, shall not apply to these cases.

Subs. 2. However, the claim of the employer shall continue to exist in relation to those sections of the work to which it applies that:

- (1) the contractor has undertaken to extend the period of his liability,
- (2) it is established during handing over that agreed quality assurance measures have failed materially, or
- (3) the contractor has acted in gross recklessness.

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Subs. 3. For engineering works, apart from such as are mentioned in subs.1, the liability for defects shall cease as provided by the General Conditions of Danish Legislation, the following shall apply:

- (1) The rule in §6, subs. 4, on the reduction of the performance bond, shall be changed to the effect that the bond shall cease.
- (2) The contractor may refrain from fulfilling the provision of §10, subs. 4 on supplier liability. **H. 1st-and 5th -year inspections**
- (3) The time limit for rectification rights and obligations, cf. §32, subs.1 shall be changed to 1 year. **1st year inspection**
- (4) The provision in §38 on 5-year inspections shall not apply. **§37.**

H. 1st-and 5th -year inspections

5th year inspection

1st year inspection

§38.

§37. The employer shall convene the contractor to an inspection of the work to take place within one year of the handing over.

5th year inspection

§38. The employer shall convene the contractor to a final inspection of the work to take place not later than 30 workdays prior to the expiry of a 5-year period after handing over, however cf. §36, subs.3 (4).

Joint inspection rules

Subs. 2. If the employer fails to convene an inspection as provided by subs. 1, the contractor may convene the employer to the inspection. Such convening must be made in writing with a minimum notice of 10 workdays. **§39.**

Joint inspection rules

§39. The convening of inspections under §§37 and 38, subs.1, must be made in writing with a notice of maximum 60 and minimum 15 workdays -

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however, for main contracts minimum 20 workdays.

Subs. 2. In connection with the inspection, a document shall be drafted (the inspection protocol) in which shall be listed any claims for defective work and any other circumstances pointed out by the employer in addition to any comments made by the contractor thereon.

Subs. 3. The employer and the contractor shall sign the document.

Subs. 4. If either party is not represented at the inspection, the meeting may proceed without the representation of said party. The party present must as soon as possible inform the other party in writing of the proceedings of the inspection and of the contents of the inspection protocol.

I. Special provisions on annulment

The employer's right to annul the contract

§40. Following the submission to the contractor of a written notice thereof, the employer may annul the contract:

- (1) if, without entitling him to an extension of time limits, the contractor is the cause of material delay in the performance of the work, and where such delay causes considerable inconvenience to the employer, or
- (2) if the contractor is otherwise the cause of material delay in respect of matters of decisive importance to the employer, unless the interests of the latter have been sufficiently safeguarded in another way, e.g. by the possibility of discontinuing payments or by the provision of security, or
- (3) if the quality of the work performed is such that the employer has reason to believe that the contractor will not be able to complete the work without material defects.

The contractor's right to annul the contract

I. Special provisions on annulment

The employer's right to annul the contract

§40. In case of the contractors delay for more than 15 days according to the time schedule, the client is allowed to terminate the contract unless the contractor make up for delay within 10 working days after demand.

If the contractor fails the quality assurance during the execution the client is in his right to terminate the contract.

The contractor's right to annul the contract

§41.

3. GC 92 (General Conditions of Contract)

§41. In case of material delay, the contractor may, upon submission to the employer of a written notice thereof, annul the contract under such circumstances as are mentioned in §24, subs. 1(2) if the employer does not demonstrate reasonable endeavours for the purpose of furthering work as much as possible.

Subs. 2. Moreover, the contractor may, upon submission to the employer of a written notice thereof, annul the contract if the employer is the cause of material delay in respect of matters of decisive interest to the contractor. However, the contract cannot be annulled if the contractor's interests have been sufficiently safeguarded in another way, e.g., by his possibility of stopping work or by the provision of security.

Bankruptcy, suspension of payments, composition, etc.

§42.

Bankruptcy, suspension of payments, composition, etc.

§42. In the event of the bankruptcy of a party under a contract, and to the extent that nothing in the provisions of the Danish Bankruptcy Act prevents it, the other party may annul the contract immediately.

Subs. 2. If, under the provisions of the Danish Bankruptcy Act, the estate is entitled to enter into the contract, it shall within a period of 5 workdays of a request thereon inform of its intentions in that respect.

Subs. 3. The provision of subs. 1 shall also apply in the case of the suspending of payments by a party under the contract, if negotiations are initiated on a composition scheme, or if the general financial situation of said party proves to be such that it must be assumed that he is unable to fulfil his obligations under the contract. However, the right to determine shall be conditional upon said party not having provided, or not providing, at the request of the other party adequate security for the performance of his obligations under the contract, cf. §§6 and 7.

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Subs. 4. If a party is a limited company or a private company, the other party may annul the contract in case a claim for the dissolution of such company is put forward by the Danish Commerce and Companies Agency. The provision shall not apply if, within 10 workdays of receipt of a claim from the other party, said party furnishes documentation which substantiates that the conditions for dissolution of the company are non-existing, or if said party provides full security for the fulfilment of his obligations under the contract.

Death of a party

§43.

Subs. 5. In case of determination, the provisions of §§ 44 shall apply.

Death of a party

§43. In the event that a party dies and the debt of the deceased is disclaimed by the estate, the provisions of § 42, subs. 1 and 2 shall apply.

Subs.2. Where the administration of the estate is different from the method mentioned in subs.1, the estate and the heirs shall be entitled to enter into the contract, however cf. Subs. 3. The same shall apply to the spouse of the deceased if said spouse retains undivided precession of the estate. The right of entry shall be conditional upon the provision of adequate security for the fulfilment of the obligations under the contract, cf. §§ 6 and 7.

Subs. 3. Upon the death of the contractor, a further condition for a right of entry shall be the appointment of a manager for the work against whom the employer has no legitimate objections. Where the nature of the work is special to the point where, after the contractor's death, it cannot be expected to be duly completed, there shall be no entry.

Joint rules on annulment

§44.

Subs. 4. In case of determination, the provisions of §44 shall apply.

Joint rules on annulment

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§44. Annulment shall be made in writing.

Subs. 2. Concurrent with the annulment, the annulling party shall arrange for the convening in writing of a registration meeting (status meeting) to take place as soon as possible. However, unless the parties agree otherwise, the registration meeting shall be held 1 workday upon receipt of the convening notice at the earliest.

Subs. 3. During the registration meeting, a document shall be drafted (the registration protocol) which shall describe the extent and quality of the work performed. All parties shall sign the document unless an expert, appointed by the Board of Arbitration, cf. § 45, undertakes registration.

Subs. 4. If, despite receipt of a convening notice, a party is not represented at the registration meeting, the meeting may proceed without the representation of said party. The party present must as soon as possible inform the other party in writing of the proceedings of the registration and of the contents of the registration protocol.

Subs. 5. In case of annulment by the employer, the employer or the person charged with completion of the work on his behalf shall be entitled to use such materials and equipment of the contractor as are present on the site, if removal thereof before completion of the work will cause the employer to suffer losses. The payment for the uses thereof shall follow the usual rates.

Subs. 6. In case of annulment by either party, the other party shall be liable for the loss suffered, in accordance with the General Conditions of Danish Legislation.

J. Disputes

Inspection and survey by experts

§45.

J. Disputes

Inspection and survey by experts

§45. If, in the case of disputes between the parties

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or in order to establish proof of a matter, there is a wish for inspection and survey by an appointed expert, a request thereon shall be submitted to the Building and Construction Board of Arbitration in Copenhagen.

Subs. 2. Such request must be accompanied by

- (1) information on the parties involved, their addresses and telephone numbers,
- (2) a written statement containing a brief description of the case and a list of the questions to be answered by the expert (the matter of issue),
- (3) all relevant documents,
- (4) an indication, if appropriate, of the technical qualifications to be possessed by the expert, and
- (5) an indication of whether the inspection and survey is to be treated as urgent, in which case a special fee is payable.

Subs. 3. As a general rule, one expert shall be appointed. Where the Board of Arbitration finds it appropriate, it may appoint two experts or, where special circumstances so require, more than two. In its decision thereon, the Board of Arbitration shall consider any wishes of the parties.

Subs. 4. Another inspection and survey by a different expert may be made only where considered appropriate by the Board of Arbitration. If the dispute has already been referred to arbitration, cf. 47, the Court of Arbitration shall consider requests made for a supplementary inspection and survey or another inspection and survey by the same or different expert.

Subs. 5. The person, or persons, who have requested the expert inspection and survey, shall be liable for the costs arising therefrom, including the fee to the expert as fixed by the Board of Arbitration. If the dispute or part thereof is referred to the Court of Arbitration, the costs and the necessity thereof shall be considered in the fixing of arbitration costs. In such case, the Court of Arbitration shall fix the fee payable to the expert.

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Subs. 6. Where the present general conditions apply to the relationship between the employer and several parties (contractors, suppliers), the provisions of subs. 1-5 shall apply to the interrelations between such parties.

Expert opinions on security provided, etc.

§46.

Subs. 7. The Building and Construction Board of Arbitration shall fix the rules applying to an expert inspection and survey.

Expert opinions on security provided, etc.

§46. At the request of a party, the Board of Arbitration may appoint an expert who shall be asked to give an opinion on the release of security provided, cf. §6, subs. 7, and §7, subs. 3, and on the justification of holding back payments or making set-offs in case of disagreements between the parties as described in § 22, subs.14.

Subs. 2. Depending upon the nature of the dispute, the Board of Arbitration may decide that such opinion is to be given by several experts.

Subs. 3. The request must contain such information, etc., as is listed in §45, subs.2. A copy of the request shall at the same time be sent to the other party under the contract.

Subs. 4. The Board of Arbitration shall stipulate a short period within which the opponent may file a statement. Under special circumstances, the expert may allow the parties to file one more statements within a short period fixed by the expert. Upon the expiry of such period, the expert will as soon as possible and within 15 workdays decide to what extent the request for payment is seen to be justified and award costs, including the fee payable to the expert. The Board of Arbitration shall fix the size of such a fee.

Subs. 5. Under special circumstances, it may be decided that payments to private employers and to contractors are to be conditional upon the provision of security, in which case the expert shall stipulate the type and magnitude of such

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security as well as the conditions applying to payments under it or its cessation.

In case of requests for payment under security provided by the employer, the expert may under special circumstances also refer the contractor to bring the matter before the Court of Arbitration under § 47.

Subs. 6. Under very special circumstances, the Board of Arbitration may extend the time limits provided in subs.4 by up to 10 workdays.

Subs. 7. The payment of amounts under a decision on the payment of security provided shall be effected within 3 workdays of the day when the parties and the guarantor receive notice in writing thereof.

Arbitration
§47.

Subs. 8. The procedure to be followed in cases on expert opinions shall follow the rules fixed by the Building and Construction Board of Arbitration.

Arbitration

§47. The Building and Construction Court of Arbitration in Copenhagen shall decide disputes between the parties, whose awards shall settle matters finally and conclusively.

Subs.2. Matters shall be brought before the Court of Arbitration by the submission of a statement of claim addressed to the Board of Arbitration.

Subs. 3. Such statement of claim must contain

- (1) information on the parties involved, their addresses and telephone numbers,
- (2) the claim of the applicant containing a brief description of the facts upon which the claim is based, and
- (3) indication of such documents and other pieces of evidence as the applicant intends to rely upon. The documents must be enclosed.

Subs. 4. The Court of Arbitration shall, however cf. Subs. 5 and 6, consist of 1 member of the Court's Presidium and 2 experts to be appointed by the Board of Arbitration on a case-by-case

3. GC 92 (General Conditions of Contract)

basis, depending upon the nature of the dispute. The Chairman of the Presidium may decide that one of its deputy members is to be President of the Court of Arbitration.

Subs.5. At the request of either party, the court shall be extended to include 2 more members or deputy members of the Presidium. The additional costs thereby incurred shall be awarded in connection with the Court of Arbitration's decision on the general arbitration costs. It may be decided that, where the court finds the extension of the court to be insufficiently justified, such costs as follow from the extension of the court are to be defrayed by the party requesting it.

Subs. 6. Where the parties so agree, the Court of Arbitration may have 1 member only.

Subs. 7. The procedure to be followed by the Court of Arbitration in the settlement of the disputes shall follow the rules fixed by the Building and Construction Board of Arbitration. Otherwise the Danish Arbitration Act shall apply.

Subs. 8. Where the present general conditions apply to the relationship between the employer and several parties (contractors, suppliers), the provisions of subs. 1-7 shall also apply to the interrelations between such parties.

5. Health and Safety

Basis specification

4. Building site

4.1. General

Apart from stipulations about the building site, this chapter gives information of an informative nature about who implements the various site provisions. The services in connection with the different site provisions are stated in the relevant work specifications.

The specification of services will normally be given in the work specifications but reference can also be made to, for example, the Case Specifications or the drawings.

4.2 Stipulations

4.2.1. Local authority regulations

Work involving the danger of fire or sparks (so-called “hot works”, eg. asphalt roofing or angle grinding, etc.) must be implemented by observing the “Directions for Fire Safety no. 10a and 10b of 10 April, 1994, issued by The Danish Institute of Fire Safety.

4.2.2. Permission from and notification to local authorities

The respective contractors must apply for and attain the necessary permits and give the authorities the relevant notifications in good time.

Project specific specification

4. Building site

4.1. General

The building site is located on C/Biblioteca, 08450, Llinars del Vallés, Barcelona, Spain.

4.2 Stipulations

4.2.1. Local authority regulations

See site plan drawing 4.4 Building Site Plan.

4.2.2. Permission from and notification to local authorities.

The main contractor is responsible for attaining any necessary permission in order to be qualified to do the construction work. The client is responsible for attaining all necessary permission for the building, especially a Building Permission and relevant other authorizations. This includes authority permissions to close a part of the main street for building works, close the section of the backyard which belongs to the plot of the building (with obligation to preserve the roots of some plants), provide the necessary services on the site (electricity, water and sewer, etc.), excavate in the backyard.

5. Health and Safety

4.2.3. Other stipulations

4.3. Transfer and handing over

It is the duty of the contractor to re-establish the areas that are not part of the finished works, but which the contractor uses in connection with the completion of works, so that they appear as they did when the contract was awarded – but only to the extent that this does not conflict with the General Conditions of Danish Liability Legislation.

4.4. Existing conditions

Buildings, crossings, pavements, roads, masts, piping and conduits, courtyards, fences,

4.2.3. Other stipulations

The main contractor will be held responsible for disturbing the neighbours in the surrounding area. He is responsible for taking all necessary measures in order to minimize the negative effects of the building works on the private lives of people who live nearby. This should be done to an extension which is stated by the law, considering the necessary for some noise and other types of disturbance during the day in order to perform the construction. Responsibility for informing the neighbours also belongs to the contractor.

4.3. Transfer and handing over

The main contractor must organize a meeting, with the participation of the project management and the road authorities, to examine the road network before the start of works.

The contractor must make a registration of existing building components bordering up to the work area. Any damage to the afore mentioned structures must be noted before work begins.

The localities are taken-over in a condition cleared of loose items and furnishings. Respective contractors, to the extent it is stated in the work specifications, must remove fixed furniture and equipment.

Covering and protection of building components must be undertaken by each contractor. They must cover and protect their individual materials. Each is responsible for their own materials and all contractors must inform one another of storage and location of their materials, and agree upon it, in the start-up meeting, and keep the others informed during the other site meetings.

4.4. Existing conditions

The existing conditions on site are shown on drawing number < TAN0x1(2BY)001>.

5. Health and Safety

signposts, trees and bushes, must not be damaged.

The necessary provisions must be taken to maintain plants. The cutting and trimming of trees and bushes must not be done without the prior permission of the project management.

It is the duty of the contractor to notify the owner of conduits, pipes and cables (public authorities, companies and private persons) of works and conduct the work in accordance with their directions.

Before excavation near existing piping, the owner must be summoned by the contractor to show the location of said piping, etc.

If gas, water, sewer- and other piping is to be severed from the main pipe, it will be done at the contractor's arrangement and at his/her expense and liability.

4.5. Marking out by the employer

The expense for any marking out above and beyond that of the employer's marking out must be included in the individual contracts.

4.6. Organisation of the building site

4.6.1. Site drawing

The Health and Safety coordinator updates the

The Client must come up with the following information about cable, pipes and conduits:

- sewer, drainage system
- water supply
- heating
- ventilation
- electricity, etc.

During the construction of the roof, a tent is to be erected and maintained by the carpenter, according to the time schedule and the building site plan directions. The information about timing and materials is stated there.

The soil workers are to take care of the roots of bigger bushes and trees in the backyard within the area stated in the building site plan.

All piping and cables servicing the building site are provided and managed by the plumbing and electricity contractors.

The soil workers must notify the relevant authorities immediately in case of any objects found during excavation, which have archaeological value.

Contractor <x> must come up with the following information about cable, pipes and conduits:

- Domestica water and heating
- Sewage and rainwater
- Electricity connection to supplier
- Phone, network and TV

4.5. Marking out by the employer

The employer marks out, once and for all, <2> nos. main reference lines and <1> nos. reference levels as stated in drawing <TAN0x1(2BY)001>. Contractor is responsible for maintaining these settlings and levels. Contractor marks-off and maintains <1> no. fixed level settings for other contractor's use, as described in drawing no. < TAN0x1(2BY)001>.

4.6. Organisation of the building site

4.6.1. Site drawing

5. Health and Safety

site plan, for example, as part of the completing and revising the Plan for Health and Safety.

4.6.2 The building site boundaries

The boundaries of the site are shown on the site plan. If a contractor wishes to extend the site area beyond the boundaries shown, he/she must secure the necessary permission for this after prior agreement with the project management.

4.6.3. Fencing-in the building site

4.6.4. Closing-off

4.6.5 Security guard

4.6.2 The building site boundaries.

The site boundaries are shown on site plan no. 4.4 Building Site Plan.

4.6.3. Fencing-in the building site

Contractor for earth-works establishes, moves, maintains, and removes the site fencing. The scope of the building site fencing is shown on drawing no. 4.4 Building Site Plan. The boundary fence has a height of 2.5 m. The material used for the fence is metal. The time for establishing the fence is stated in the tender time schedule.

4.6.4. Closing-off

The main contractor must establish, maintain and take down any interim covering/protection to the building. Holes for windows must be closed-off with wooden frames clad with plastic foil.

Door openings must be closed-off with interim wooden doorplates with a lock system.

The contractor must ensure daily opening at 07.00 o'clock and closing at 18.00 o'clock of the building site.

4.6.5 Security guard

The employer does establish the security guard system.

The security system is managed by Securitas Direct. and includes routine checks and surveillance at night.

5. Health and Safety

4.6.6. Security against theft form the site

Each individual contractor is responsible for signposting the door of own portable site cabins.

Each individual contractor is responsible for signposting own site work areas.

4.6.8 Screening off /cordonning off of 3rd person.

It is the responsibility of each individual contractor to secure that traffic around buildings and roads/pathways are screen off and secured against falling building materials and other objects from the site.

4.7. Building site traffic areas

4.7.1. Parking

4.7.2. Outdoors traffic areas

4.6.6. Security against theft form the site

The employer does establish the security system against theft from the site.
The security system against theft from the site is managed by Securitas Direct and includes routine checks and surveillance at night.

4.6.7. Signposts

The main contractor delivers and sets-up the following signs in the common traffic and work areas at the beginning of construction on site and removes them after the completion of construction:

- <4> nos. sign board with the text “Mandatory helmet area”
- <3> nos. sign board with the text “ No trespassing”
- <6> nos. sign board with the text “<Building Site>”

4.6.8 Screening off /cordonning off of 3rd person

The main contractor establishes, maintains and removes screens and other provisions towards streets, around buildings, etc. that are set-up in the interest of public safety. The screening is minimum 2.4 m high and made in waterproof plywood.

4.7. Building site traffic areas

4.7.1. Parking

Private parking for workers is provided next to the building site plan.

4.7.2. Outdoors traffic areas

5. Health and Safety

The outdoor traffic areas are shown on the site drawing.

The site roads can be used by heavy lorries and trailers, e.g., element trailers, earth dumpsters, and mobile concrete mixers. All roads are drained and secured against the weather conditions. Outdoor traffic area may, under no circumstances be partly or wholly blocked off with the permission of the project management.

4.7.3. Traffic areas inside the building

Traffic areas and corridors must under no circumstances be blocked off wholly or partly without the permission of the project management.

4.7.4 The covering of holes and rebates in the traffic areas.

Holes, such as light-shafts, wells, etc, in traffic areas is to be covered with boarding or lids that are fixed.

The responsibility for covering holes and keeping them covered is that of the contractor who makes the holes.

The aforementioned contractor does any temporary removal, screening off and re-establishing of these covers during construction.

4.7.5. Establishing of railings in traffic areas

Guard railings must be set-up along all traffic

The soil worker establishes, maintains, secures against weather conditions, relays and removes building site roads, crossings in accordance with the Tender time schedule and the building site drawing no. TAN0x1(2BY)001.

4.7.3. Traffic areas inside the building

Common traffic areas in the building or building excavation is to comprise the existing stairs and areas which, after the completion of the building, will constitute internal corridors, passages, staircases, etc.

The carpenter will deliver, set-up, maintain, move and remove the possible interim staircases and gangways, etc.

Staircases and steel elements can be given a load of up to 400 kg/sq.m. The interim staircases and gangways will, during the course of construction, be replaced by permanent ones.

4.7.4 The covering of holes and rebates in the traffic areas

4.7.5. Establishing of railings in traffic areas

The soil contractor sets-up, maintains and

5. Health and Safety

areas where there is a level jump of more than 2 metres.

Any temporary removal of railings because of a contractor's work must be re-established by the same contractor after the work is completed.

During the work, the contractor must take measures to prevent accidents until the railings are re-established.

4.7.6. Lighting of traffic areas

The extent of the lighting is shown on the building site plan.

4.7.7. Provisions for inclement weather in traffic areas

Inclement weather provisions are planned and set in action in good time and to such a degree that they are able to ward off the adverse effects on time schedules and quality of work.

Clearing of snow and similar work must be, as far as possible, done in the period before normal work starts.

4.7.8. Clearing and cleaning common traffic areas

The contractor must constantly participate in keeping the traffic areas cleared and cleaned.

removes the railings along common traffic areas as shown on building site drawing no. TAN0x1(2BY)001.

4.7.6. Lighting of traffic areas

The soil contractor establishes, maintains and removes lighting in traffic areas.

Lights in building site traffic areas are mounted on light-masts.

Traffic areas in buildings are lit with orientation lights with a minimum strength of 25 lux. This is done with light-chains. Building site lights are controlled using "twilight relays" with a switching on clock device with 24-hour and week programmer.

The employer pays for the cost of lighting common traffic areas.

4.7.7. Provisions for inclement weather in traffic areas.

The soil contractor is responsible for providing inclement weather provisions in common traffic areas of the building site.

4.7.8. Clearing and cleaning common traffic areas

Each contractor cleans and clears the common traffic areas in the building for dust and the like, which cannot be identified to a specific

5. Health and Safety

If a contractor's transport or own work is the cause of spill, said contractor must clear up and remove the spill immediately from the site - - even though the spill happens outside the confines of the building site.

The contractor must regularly, but at least once a week (usually at the end of the working week) clean up after his work activities. The project management can appoint one contractor as the coordinator for clearing up the common traffic areas together with other contractors.

Removal of dust in buildings must be done using vacuum cleaning.

If the project management's stipulations about cleaning up are not followed, the work will be done at the expense of the contractor(s) concerned. The costs will be deducted the contractor(s) outstanding amounts owed.

4.8. Portable cabins and storage areas

4.8.1. Portable site cabin conditions

The location of portable cabins is given on the site plan.
The situation of the individual contractors' site cabins must be agreed with the project management if it is not stated on drawings.

contractor.

4.8. Portable cabins and storage areas

4.8.1. Portable site cabin conditions

The main contractor must establish, run, maintain and remove the following cabins, which are at the disposition of all contractors during the course of construction:

- Portable cabin for 20 persons with toilet, shower, washbasin and locker facilities, and dining room.
- Meeting and office facilities for holding site meetings, etc. The cabin contains a meeting room for 20 persons and 1 separate office with 2 office stations. The cabin is fitted with toilet and washbasin.

Each trade contractor must take care of daily cleaning of the cabins and ensure the supply of soap, toilet paper and paper towels.
Re-establishing of the terrain after the portable cabins is to be done by contractor soil workers.
The location of the cabins is noted on the building site plan drawings 4.4 Building Site Plan.

5. Health and Safety

4.8.2. Storage areas/ Storage yard

The location of storage areas is on the building site drawing.

The storage space for individual contractors within the total site storage area must be agreed with the management. Storage of materials in traffic areas is strictly prohibited.

4.8.3. Tent workshops

Tent workshops can only be established by individual contractors to the extent shown on the site drawing.

4.8.4. Handling of refuse and refuse containers

The individual contractors is obligated to remove his refuse from work sites and storage depots and deposit them in containers and skips or remove them from the site completely, on a regular basis.

All contractors must sort and handle building refuse in accordance with the council's regulations in this area.

Containers and skips are placed in accordance with the building site drawing.

4.8.5. Lighting of portable cabin area and storage areas

4.8.2. Storage areas/ Storage yard

The main contractor establishes, maintains, secures against inclement weather and re-establishes the storage areas shown on site plan 4.4.

The paving on site storage areas is 100mm concrete over the ground.

No storage is to be placed inside the building.

4.8.3. Tent workshops

4.8.4. Handling of refuse and refuse containers

The main contractor must establish, mark and empty the refuse containers during the course of the construction period and remove them once the construction period is finished.

Building-refuse must be sorted in the following fractions:

- None combustible material.
- Combustible material.

Packaging, etc., must be wrapped up and placed in the skip so that it takes up as little space as possible.

All costs in connection with removal of refuse from the containers and skips, including environmental and refuse surcharges, are to be borne by the employer based on documentation of these costs.

4.8.5. Lighting of portable cabin area and storage areas

The main contractor establishes, maintains and removes lighting appliances in accordance with

5. Health and Safety

the building site drawing using minimum 25 lux light strength in common traffic areas, in portable cabin and storage areas.

4.8.6. Provisions against inclement weather in the portable cabin and storage areas

Inclement weather provisions are planned ahead of time and set into action so as to ward off the negative effects of the weather on time schedules and the quality of work.

Clearance of snow and similar work must, where possible, be done before the beginning of normal working hours.

4.8.7. Cleaning in the portable cabin and storage area.

The individual contractors are obligated to clean their respective storage areas.

If the project management's directions are not followed on this matter, the work will be done at the expense of the said contractors - - the expense being deducted from accounts owing them.

4.8.8. First Aid Post

4.8.6. Provisions against inclement weather in the portable cabin and storage areas

The main contractor is assigned the tasks in connection with inclement weather provisions in portable cabin and storage areas.

4.8.7. Cleaning in the portable cabin and storage area.

4.8.8. First Aid Post

The main contractor supplies the First Aid Box and has the responsibility of ensuring that it, at all times, has the necessary minimum content of items cf. The Factory Inspection's requirements.

The First Aid Box is situated in Office cabin and is accessible when work is being done on site.

4.8.9. Fire fighting materials

4.8.9. Fire fighting materials

The main contractor supplies fire fighting equipment and materials.

5. Health and Safety

4.9. Work areas

4.9.1. Covering of holes and rebates in work areas

Rebates and holes in work areas, such as floor slabs and roof surfaces, etc., must be securely covered with fixed covers and boarding.

The responsibility for closing these and maintaining the covers is that of contractor making the hole or rebate in the first place.

Any temporary removal of covers due to work processes by any contractor must be followed by the same contractor replacing and fixing the cover.

4.9.2. Establishing guard railings in work areas

Where slabs, work platforms, scaffold floors and gangways are elevated more than 2 m over the surrounding area, guard railings must be fixed along their free edges.

Any temporary removal of railings due to work by any contractor must be followed by provisions for preventing falls before and during the period of removal, followed by replacement of the railings after the work by the same contractor.

4.9.3. Lighting in common work areas

The contractor must supply own light source during work in his own work areas.

4.9.4. Provisions against inclement weather in work areas

Inclement weather provisions are planned and set into action in good time and to such an extent as

4.9. Work areas

4.9.1. Covering of holes and rebates in work areas

4.9.2. Establishing guard railings in work areas

The main contractor sets-up, maintains and removes railings in work areas.

Individual contractors are responsible for setting up railings in their own work platforms and scaffolding, etc.

4.9.3. Lighting in common work areas

4.9.4. Provisions against inclement weather in work areas

The main contractor is assigned with the task of providing interim heating and drying-out of the

5. Health and Safety

to minimise the effects of the weather on milestones in the project and on work quality. Clearance of snow and similar work shall, as far as possible, be done before the beginning of normal working time.

building.

4.9.5. Clearing-up and tidiness in work areas

4.9.5. Clearing-up and tidiness in work areas

It is the duty of each contractor at all times to keep their work areas tidy from refuse, materials and tools and remove the aforementioned if they are an obstacle for the progress of the construction.

The project management can appoint one contractor to co-ordinate the cleaning-up and tidying-up process together with other contractors on the site's common work areas.

Removal of dust from the building must be by vacuum cleaning.

If a contractor does not withhold the management's directions about tidiness, the management has the right to tidy up the work areas at the expense of the said contractor. The cost for such work will be deducted for the contractor's amount due.

4.10. Technical aids

4.10. Technical aids

4.10.1. Cranes and material lifts

4.10.1. Cranes and material lifts

If contractors decides to use a crane and/or lift above and beyond that stated in the tender documents, they must give a written account for setting-up, power supply, use and maintenance, before the equipment (after permission for the management) is put to use.

The main contractor sets-up, maintains and removes material lifts, cf. The building site drawing no. 4.4.

The lift will be for the free use of all contractors in the period of construction.

Crane for free use of all contractors will not be set-up.

Setting up a crane or lift must only take place with the explicit permission of the project management.

5. Health and Safety

4.10.2 Personnel elevators

4.10.3. Scaffolding

Individual contractors must supply their own scaffolds in their own working areas.

Setting-up and dismantling scaffolding must be done after approval from the project management.

The scaffolding system must be labelled with a plate informing about the erecting contractor, the rental company, and the permissible load.

The contractor must participate in rationalising the collective site's work by allowing others to use his scaffolding when it is appropriate and does not inconvenience the contractor and rental company, and if the scaffold does not suffer any damage.

4.11. Supply to the site

4.11.1. Water and sewer

Tap points are established in accordance with the site drawings.

The individual contractors must make their own provisions, and pay for, the connection of their portable cabins to the main water and sewage system of the site. Connection must be made from the connection points shown on the site drawing.

4.10.2 Personnel elevators

4.10.3. Scaffolding

The main contractor erects, re-builds, maintains and removes common scaffolding. The size or extent of the common scaffolding is shown on the site drawing.

Scaffold type standard and scaffold class standard, covered with plywood and provided with a lift.

The scaffold is at the disposal of all contractors in connection with every works.

The scaffold will be at the disposal of contractors in the period of renewal, and until the materials must be at the top of the building.

The project management co-ordinates the work on common scaffolding.

4.11. Supply to the site

4.11.1. Water and sewer

The main contractor establishes, maintains and removes the water supply system for use in construction on behalf of all contractors.

The main contractor connects-up, maintains and removes interim water- and sewage systems to common portable cabins and meeting and office units, cf. Section 4.8.1.

The employer pays for water consumption and sewage surcharges.

5. Health and Safety

4.11.2. Electricity

The main electrical boards shown on the site drawing are installed.

The individual contractors must bear the cost of connecting their own electrical material up to the main boards.

The employer cannot be held responsible for interruptions in the supply of electricity.

Each contractor must uncouple connections from his sub-board to the main board at the end of each workday.

4.11.3 Telephone

Each contractor is responsible for subscribing, paying for and operation of own phone.

4.12. Special conditions for buildings in use

4.12.1 Work conditions generally

If the localities are in use during the construction period, special consideration to them must be taken.

The following are valid if work is in progress in or around the building:

The contractor is obliged to man the project with persons who are able to show the necessary consideration to tenants/employees in the building. If a person repeatedly fails to show consideration, the project management can expel said person from the site.

Tools must be chosen so that they cause the least possible nuisance for any tenants/employees using the building with regard to noise, dust, vibration and emissions.

Radios and the like must not be used in the

4.11.2. Electricity

The EL contractor installs, maintains and removes the power supply for construction on behalf of all contractors.

The main contractor installs, maintains and removes the power supply to common portable cabins and meeting and office facilities cf. Section 4.8.1.

A similar supply to own portable cabins, material containers, etc., is the responsibility of the individual contractors.

The electricity consumption is paid by the Contractor.

4.11.3 Telephone

The main contractor is responsible for establishing a landline phone for emergency calls for the duration of the work on site.

4.12. Special conditions for buildings in use

4.12.1 Work conditions generally

Work must start at earliest 7.30 o'clock and must be finished by 18.00 o'clock.

The site manager is responsible for administration of keys. The main contractor receives 3 sets of keys.

5. Health and Safety

locality.

Access to localities in use must happen in accordance with the following rules:

All of the contractor's employees who have access to the localities in use must be furnished with identity cards. The contractor has an obligation to report lost ID's immediately. Keys to dwellings must be administrated as follows:

Before the work is initiated, the keys to the dwellings are collected. Tenants can, instead of handing in a key, be at home between the hours of 08:00 and 18:00.

The contractors own site manager must keep a receipt list for keys so that he can always account for who is in possession of the keys. The receipt list must be available for the project management.

Keys that are not used shall be kept in a locked security box, which in turn should be kept in a locked container. If the key gets lost, the contractor must immediately inform the tenant and the project management, and the locks in the apartment in question must be changed at the expense of the contractor.

Keys that are handed-in must not be copied.

The apartments/dwellings must, at all times, be locked - - both when work is being done on them and when the apartment is empty.

4.12.2. Information for tenants

4.12.2. Information for tenants

The project management co-ordinates enquiries from the tenants. The project management is also responsible for informing the tenants.

Notice must be given in writing, by 16:00 on the day before. A copy of the notice must be delivered simultaneously to the project management.

5. Health and Safety

5. Health and Safety

Basis specification

5. Health and Safety

5.1. General information

5.1.1. Organisation

5.1.2. Safety Meetings

The safety coordinator convenes safety meetings and prepares the minutes. All the companies on site must be represented at the meetings by a representative for their site leadership and one from the operatives (safety rep) - - if it is required that there are safety groups on site.

Any comments to the safety meeting's minutes must be voiced at the following safety meeting. If this does not happen, the former minutes will be considered as approved.

5.2. Plan for Health and Safety

The person to whom the employer has transferred the duty of completing the Health and Safety Plan and coordinating safety work on site is named the Safety Coordinator.

The contractor must participate with the Safety Co-ordinator's work with and follow up of the Health and Safety Plan.
The reporting of the building site to the Factory

Project specific specification

5. Health and Safety

5.1. General information

The main contractor's Health and Safety plan will be handed to each sub-contractor before the beginning of the construction period.

5.1.1. Organisation

The project's stakeholders are following:

Employer:

Project management:

Safety Co-ordinator:

Site Inspection:

Design Manager:

5.1.2. Safety Meetings

Safety meetings will be held every 2nd week.

5.2. Plan for Health and Safety

The employer has transferred his obligations to complete and follow-up the Health and Safety Plan, together with his co-ordination duties, to the main contractor.

Proposal for the content of the Health and Safety Plan:

1. Plan for Health and Safety (copy of chapter 5.1 and 5.2 from BSB with contractor)

5. Health and Safety

Inspector, before work starts, is the duty of the Safety Coordinator.

Inspection of the required safety provisions is the duty of the contractor appointed to do it.

If another contractor's health and safety provisions are insufficient, the first named contractor must elevate the problem without costs to the employer.

During pauses in or at the end of the works in question, the contractor must establish or re-establish the health and safety provisions so the safety requirements are fulfilled at all times.

Transfer of the contractor's responsibilities for inspection and maintenance of the respective health and safety provisions can only be achieved after written approval from the safety coordinator.

5.3. The work environment

5.3.1. General information

5.3.2. Limiting noise inconvenience

The contractor must use tools that causes as little inconvenience/nuisance re noise to the user and others on the site.

For persons using noisy tools and equipment, the Factory Inspection's rules as stated in Departmental Order 801, of 4 October 1993, must be observed.

This means that no persons, not even other contractors, must be exposed to noise levels over 85 dB (Airborne) - - without the use of hearing protectors. For noise levels over 80-dB (A),

supplements)

2. Orientation (copy of chapter 2 from BSB with contractor supplements)

3. Time Schedule and Work Plan (new section)

4. Building Site (copy of chapter 4 from BSB with contractor supplements)

5. Work environment (copy of chapter 5.3 from BSB with contractor supplements).

6. Provisions in connection with dangerous works (copy of chapter 4 from BSB with contractor supplements)

7. The surrounding environment (copy of chapter 6 from BSB with contractor supplements)

8. readiness-, evacuation-, and exercise/drill plan (new section: Fire-fighting equipment, rescue equipment, etc.)

9. Building Site Plan

5.3. The work environment

5.3.1. General information

5.3.2. Limiting noise inconvenience

5. Health and Safety

hearing protectors must be available.

5.3.3. Limiting of damage and inconvenience from vibrations

The contractor must choose tools that emanate the least hand-/arm vibrations, or use methods for suspending the tools so that they don't have to be handled as such. If vibrations exceed 130 dB(HA), the contractor must vibration-curb the tool or use other work methods.

5.3.4. Limiting inconvenience caused by dust

The contractor must take steps to curb and limit dust emission from its source. Direct suction should be used on tools where it is technically feasible.

5.3.5. Limiting ergonomic inconvenience

The contractor must avoid manual transport that causes lift, carrying, push, pull and similar strain on the body. He must use technical equipment for this.

5.4. Provisions to be taken against dangerous works

The respective contractors must establish specific work procedures that describe the safety aspects of the work.

The contractor must plan work that involves the use of dangerous chemical substances.

The contractor must gather and revise information about chemical substances that are used in the performance of the contract, and make sure that they are handled in accordance with the stipulations issued by the Factory Inspection. A list of the materials and substances that, under the circumstances of the technical requirements, give the least possible strain on the work environment – and considerations to substitution -- must be documented for the project management.

5.3.3. Limiting of damage and inconvenience from vibrations

5.3.4. Limiting inconvenience caused by dust

5.3.5. Limiting ergonomic inconvenience

5.4. Provisions to be taken against dangerous works

Dangerous work:

- work on roofs
- scaffolding
- demolition

5. Health and Safety

The directions for use of for products must be accessible on site. There must be personal protection gear at the disposal of operatives as described in The Directions for Employers.

6. The surrounding environment

Basis specification

6. The surrounding environment

6.1. General information

6.2 Noise

6.3. Vibration

6.4. Dust

6.5. Emissions to the atmosphere

Project specific specification

6. The surrounding environment

6.1. General information

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6.2 Noise

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6.3. Vibration

6.4. Dust

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6.5. Emissions to the atmosphere

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7. Quality Assurance

Basis specification

7. Quality Assurance

7.1. General information

7.2. Project management

The employer will carry out inspections independent of the contractor's control.

7.2.1 Site meetings

Site meetings will be held on at a fixed time and day of the week.

Any comments to the minutes of the site meetings must be put forward at the following meeting, otherwise the minutes will be considered approved.

7.2.2. "Kick-off" meetings

A kick-off meeting is held before the start of works

7.3. Quality Plan

It is the task of the contractor to establish a quality plan.
The Quality Plan must comprise the following subjects:

- Organisation of the contract
- Control of documents
- Control of purchases
- Qualifications
- Process scrutiny
- Control Plans
- Demands to subcontractors and suppliers
- Processing mistakes and shortcomings in materials and work processes (rejections)
- Processing deviance from project documents.

Project specific specification

7. Quality Assurance

7.1. General information

7.2. Project management

7.2.1 Site meetings

7.2.2. "Kick-off" meetings

The time and date for the kick-off meeting is agreed with the project management.

7.3. Quality Plan

At latest 10 workdays after the work being awarded the contractor, he/she must send the Quality Plan to the project management.

At latest 15 workdays after the working-in revisions to the Quality Plan, the contractor must send the revised Quality Plan to the project management.

7. Quality Assurance

7.4 The contractor's control and documentation

7.4 The contractor's control and documentation

7.4.1. General information

7.4.1. General information

Control and documentation is part of the contractor's services.

The contractor must ensure that:

- a) running quality control of the works and deliveries is done
- b) produce documentation that the control has been performed and the specified quality demands have been achieved.

Where the supplier of deliveries to the contract is a member of a public approved quality control system, it is considered sufficient to specify the type of control system in the work specifications.

If the project management evaluates that control and/or documentation should be extended, because of failure or mistakes in the works, the contractor must follow this request without cost to the employer.

The contractor must keep quality assurance and O&M-documentation separate during implementation and at handing over.

7.4.2. Documentation of quality

7.4.2. Documentation of quality

The control activities of the control plan must be documented and demanded. Documentation must be accessible for the project management during the construction process. Documentation includes sub-works and supplies from subcontractors and suppliers.

7.4.3. Operation and Maintenance documentation (O&M)

7.4.3. Operation and Maintenance documentation (O&M)

The contractor must deliver information about materials and components, used in the contract, for aiding the working-up of the operational plan for the building. This must include amounts and

7. Quality Assurance

times for the materials, etc. used and built-into the construction as described in the work specifications.

7.4.4. Archiving the documentation

The contractor must immediately establish a systematic archive system and maintain it for the duration of the project. The system must include all the documentation that comes in during the project regarding quality of materials, equipment, construction, and prefab components and the qualifications of the staff who may be required to have special qualifications.

7.4.5. Management of the performance documentation

The contractor must establish an archive system for identification and steering of performance documents and alterations/supplements to these. The system must also include documents of the subcontractors.

The system must minimum have the following elements:

Registration of valid documents

The list should be able to be altered and the alterations should be registered.

The lists must be sent to all document users.

A procedure must be agreed as to how alterations are marked in documents and how the documents and their alterations are identified.

7.5 Project preview

The contractor must participate in “project preview” before construction start under the chairmanship of the project management.

Before the process of project preview, contractors must thoroughly go through all the project documents, drawings, etc., and make a detailed study of the processes necessary to

7.4.4. Archiving the documentation

7.4.5. Management of the performance documentation

7.5 Project preview

7. Quality Assurance

implement the plans. This result must be available in writing.

Before the process of project preview, contractors must evaluate how they will use their resources and other production apparatus to execute the work.

During project preview, the designers will report on conditions, which will require special care in execution because these may deviate from ordinary practice and require special control procedures.

Project preview does not alter the distribution of responsibility and risk between employer and contractor, not even if it results in alterations to the project.

The project management will convene the “project preview” process and work out an agenda and do the minutes of the meeting.

The purpose of the project preview is, through dialogue between contractor and the designers, to:

- Utilise the contractors trade abilities better
- To uncover aspects that may be risky or lead to failure and be difficult to execute.
- To solve interpretation problems in the project
- To discuss possible adjustment to the control plan
- To review the Health and Safety plan and review questions about the environment.

7.6. Local authority inspection

7.7. Guarantee

If it is required that a special guarantee is given for a service, the contractor must notify the project management as soon as the guarantee is available.

7.6. Local authority inspection

7.7. Guarantee

The guarantee must be furnished at latest 20 workdays after the works in question are completed or the delivery is delivered.

7. Quality Assurance

7.8. Handing over

When the work is reported finished to the project management, the contractor must deliver the required copies of quality assurance- and O&M-documentation for the completed works.

7.8. Handing over

Quality- and control documentation must be delivered in 2 copies.

7.9. Quality Assurance after handing over

The contractor's repair of shortcomings after handing over is subject to the same conditions for quality assurance as the other, original services.

7.9. Quality Assurance after handing over

The contractor hands over the quality assurance documentation for repair of shortcomings, to the project management, after the handing over procedure for the repair work on the shortcomings.

8. Scheduling

Basic specification

8. Scheduling

8.1. General Information

8.2. Time Schedule

The tender document's time schedule shows the different contracts' start and end dates and main site based activities.

After accept, the contractor is obligated to participate in working up a detailed work schedule for the project on site within the main timeframe stated in the tender document's time schedule.

For individual trade contracts, the project management will hold up the individual trade contractors' proposal for their detailed schedules and put them together into a complete schedule for the whole project.

When deviations appear on the critical path, the contractors must participate in the revision of the time schedule.

8.3 Inclement weather

Extensions to milestones are given in cases where unusual inclement weather warrant it, under the following conditions:

- Inclement weather must have resulted in the work lying still – or being reduced in tempo, equivalent to minimum ½-workday.
- The activity must be on the critical path of the time schedule for the penalty-bearing

Project specific specification

8. Scheduling

8.1. General Information

Scheduling will be implemented through cooperation between the Architect and the main contractor.

All relative planning and information will be discussed and done at the Start Up meeting.

8.2. Time Schedule

The contractor's activity and work time schedule must be sent to the project management by 15 workdays after the contract has been signed.

8.3 Inclement weather

8. Scheduling

milestone in question.

- The total numbers of inclement weather days for the activity in question must, within a month, exceed the expected number of inclement weather days.

7.3 DOCUMENTO 3 – **TENDER INVITATION**

Documento que se le entrega al industrial invitándolo a poder presupuestar un trabajo dentro de la obra.

To: Marble Trade

Can Marqués Refurbishment and extension, 08450 Llinars del Vallés

Llinars del Vallés Municipality, and Constructora Deumal would like to invite MARBLE COMPANY to tender as a marble contractor concerning the Can Marqués Refurbishment.

The Tender form will be required to be completed and delivered on August 18 / 2018 at 7:00 p.m.

At the following address:

Can Marqués, 08450 Llinars del Vallés.

Tender Criteria

- Lowest Price

Information about the TENDER:

- Type of tender: Open Tender
- Type of Contract: Trade Contract
- Number of Participants No Restriction

TENDER MATERIAL:

- Tender Form
- Letter of invitation to tender
- Case specification
- Work specification
- Drawing and list of drawings dated
- Time schedule dated

CONSTRUCTION TIME:

The construction of the project, in its entirety, will be from **25/09/2017** to **31/10/2018**.

If the bids are sent by mail, it is the responsibility of the contractor that they arrive in due time at the place for tender.

The bids are binding for the bidder 40 working days from the time of the tender.

CONTACT:

All questions must be sent by mail to: Sandra Martín Solà November 27th, 2017 and be answered December 4th, 2017.

Questions received later than that date will not be answered.

Sincerely,
Sandra Martín.

7.4 DOCUMENTO 4 – **TENDER APPLICATION FORM**

Este documento es necesario para que cualquier industrial puede aplicar para realizar un trabajo dentro de la obra, dónde se presupuesta su mejor oferta.

Control plan



Supervision plan



Tender control plan



Control plan

Case: Can Marqués	No. of case: 1	Date: 15/01/2018	Rev:	Page 1 of 1
Location: Bathrooms		Contract/building component: Marble, bathrooms		

Pos. No.:	Subject:	Method/How	Frequency:	Time:	Demands:	Demands to documentation:	Who/ Responsible:
4.1.1	Wall membrane system	Visual Inspection	Representative Sample	Upon receipt from supplier	2mm	Checklist and product documentation	Contractor
4.1.2	Wall tiles and joints	Visual inspection	Representative sample	Upon receipt from supplier	As decribed in project documents, joint 2-4mm	Checklist and product documentation	Contractor
4.1.3	Floor membrane system	Visual inspection	Representative sample	Upon receipt from supplier	2mm	Checklist and product documentation	Contractor
4.1.4	Floor tiles and joints	Visual inspection	Representative sample	Upon receipt from supplier	As described in project documents, joint 2-4mm	Checklist and product documentation	Contractor

7.5 DOCUMENTO 5 – **WORK SPECIFICATION**

Documento entre el cliente y el industrial en el que se describen todos los elementos constructivos, materiales y servicios que están descritos en *Case Specification* pero con más detalle, referentes a su trabajo.

Work Specifications: Marble Trade
Can Marqués, Bathrooms

Project specific specifications

1. Table of contents

2. Scope

- 2.1. General information
- 2.2. Building components
- 2.3. Designing
- 2.4. The building site
- 2.5. Health and safety
- 2.6. The surrounding environment
- 2.7. Quality assurance
 - 2.7.1. General information
 - 2.7.2. Quality control documentation
 - 2.7.3. O&M (operational and maintenance)-documentation
- 2.8. Scheduling the work
- 2.9. Tests and samples.

3. General specifications

- 3.1. Reference
 - 3.1.1. Norms and standards
 - 3.1.2. Directions
- 3.2. Materials and products
- 3.3. Execution of works
- 3.4. Control
- 3.5. Relation to other works
- 3.6. Work environment

4. Building component specifications

The building component-ID, title for the building component specifications

Each building component comprises the following points:

- Scope and location
- Reference to drawings
- Adjacent and adjoining components
- Design
- Materials and products
- Execution of works
- Surfaces
- Samples
- Control
- The work environment

2. Scope

2.1. General information

The work comprises the building components and other services stated in point 2.2, which are described in more detail in the work specifications or in the drawings.

In addition, the work comprises the stipulations in the Case Specifications and any services required in tender forms, for example extra work or omissions that can be connected to the current works.

2.2. Building components

The work comprises all works and deliveries that are necessary for the full completion of building components in the bathrooms. The detailed scope of works and deliveries can be found in the Buildings section descriptions (Chapter 4), and supplemented by drawing material, building history description, etc., But consists essentially of:

Bathroom walls:

- Aerated concrete wall
- Plaster
- Membrane
- Tiles and mortar
- Joints

Bathroom floors:

- Membrane
- Tiles and mortar
- Joint

2.3. Design and detail design

When designing, regulations and instructions on quality assurance of construction work must be observed.

2.4. The building site

Related to Chapter 4. In Case Specification

2.5 Health and Safety

The project material takes into account the function of the building components against the impacts, they are intended for the finished workmanship. During construction, the building parts function and / or effects are different from the finished workmanship, depending on, for example, the selected execution order and / or special impact during the construction period.

The proposed methods of use must be considered and appropriate measures taken to ensure that the safety is permanently ensured and that unacceptable conditions in connection with performance are excluded.

The building management may require documentation that the above requirements

will be met.

2.6 The surrounding environment

The building site is situated in the middle of a residential area. Is true that there are minimum 100m to the first house, but special attention needs to be given to the neighborhood. The following regulations must be fulfilled:

- The noise level on the building site shall be kept on a reasonable level in the day time, lower than 80 dB
- In between 18 – 7.00 o'clock, no noise is allowed.
- No construction works during the weekend and holidays.
- To keep the good working environment; the dust level must be kept to an absolute minimum.
- The building site equipment must be kept clean. All huts, lockers must be checked once a week and cleaned.

2.7. Quality Assurance

Quality assurance of the work executed will be established after every crucial activity is being finished. It will be done by a qualified person.

2.7.1. General information

All contractors shall during the construction period to ensure all work performed with minimal impact on the surrounding environment.

2.7.2. Documentation of quality

As documentation of the contractor's quality monitoring and control of the quality of work the contractor must keep a file that will contain documentation for material control, acceptance testing, verification of performance, end-control and other work in this work specification, procurement control plan specified controls.

Control plans have 8 days after the transfer of work submitted in 3 copies for construction management.

2.7.3. O&M (Operation and Maintenance)-documentation

The following documentation for the work's quality must be delivered:

- MK approved membrane system
- Membrane connection to drain and all other penetrations of the membrane
- Tiles and tile adhesive

2.8. Planning and scheduling of work

Relate to Chapter 7 and 8. In Case Specification

A Contractor Time Schedule will be made in order, for the contractors to be informed when they must participate on the Building site.

2.9. Samples

The following samples, for the benchmarking of outcome product requirements, must be made:

Bathroom 1 will be executed as a reference for the remaining bathrooms, documentation for the following components must be provided:

- Base Plaster
- Liquid membrane system
- wall tiles and adhesives
- Liquid membrane system
- Floor Tiles and adhesives

3. General Specifications

3.1. Reference

This work is for the provision of the marble trade to be used for the buildings bathrooms.

3.1.1. Norms and standards

The norms and standards mentioned below, in their latest editions and with any enclosures are valid for the works - - with any amendments, additions and omissions that are stated in these work specifications and on the drawings.

The notes and directions, etc. stated in the references are to be construed as requirements that only can be deviated from if they are stated in these work specifications and/or on the drawings, or agreed with the project management.

3.1.2. Directions/instructions

Where the directions, reports and other documents in their latest edition, with any enclosures and together with the project documents, are made valid for the works, the stated recommendations, directions, procedures, advice, etc, must be construed as demands.

3.2 Materials and products

The required documentation for the materials and products, such as product certificates, prescriptions, etc., shall be submitted to the building management for review. In the project documents, materials and products must be prescribed by certain manufacturers. There can be other brands if they are equivalent to those prescribed. Supporting documentation must be submitted to the building management.

3.3 Execution of works

The process of executing the marble trade will go hand-in-hand with the drawings and specifications provided from the contractor and the manufacturer in order the work implemented in a proper way and time.

3.4. Control

The following Tender Control Plan must be worked into the contractor's Control Plan. All measurements are minimum dimension.

- Floor:
 - PE plastic membrane 0,2mm
 - MK approved liquid membrane system 2mm
 - Reinforcement strip in corners, 100mm overlap in wall/floor connection
 - Tile adhesive 5mm
 - Porcelain tiles 20mm width, with different dimensions (see drawings)
 - Joint mortar

- Walls:
 - Waterproofing plaster 12.5mm
 - MK approved liquid membrane system 2mm
 - Reinforcement strip in corners, 100mm overlap in wall/floor connection
 - Tile adhesive 5mm
 - Porcelain tiles 20mm width, white different dimensions (see drawings)
 - Joint mortar

3.5 Relation to other works

The marble trade part depends on plumber (drain, pipes and sanitary equipment), electrician (pipes, lights and outlets) and carpentry trades (door, ceiling, window lining).

3.6. Work environment

Relate to Chapter 5. In Case Specification

4. Building Component Specifications

• Extent and location

The work comprises 5 new bathrooms in the new extension of Can Marqués, 08450, Llinars del Vallés, Barcelona, Spain.

• References to drawings

6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16, 6.17, 6.18, 6.19, 6.20, 6.21, 6.22, 6.23.

• Other documents:

- Case specification
- Tender control plan

• Design

- Bathrooms.

- **Materials and products**

All materials must follow UNE regulations, approved and of good quality. Failure to do so will lead to the contractor being liable for all cost incurred as a result of a delay due to the use of subpar materials.

- **Execution**

Must be carried out with the drawings together with the specifications and obvious grave mistakes must be pointed out when notices.

- **Tests and samples**

There will be control when the materials arrive on the building site to ensure the quality of materials. Before the mounting, all the materials which will be used need to be approved.

- **Quality Control**

Following on Tender Control Plan.

- **Work Environment**

Relate to Chapter 5. In Case Specification.

4.1.1 Floor/wall Tiles and membrane:

- **Extent and location**

Floor tiles in bathrooms.

- **Materials and execution**

Wet Room Membrane:

Performed MK approved system wet membrane, and in accordance with applicable law.

Floor tiles:

Unglazed marble tiles, different dimensions, 20mm width. Cream colour, 2-4mm joints.

Tile adhesive and joints:

Performed MK approved system, flexible tile adhesive and sealant. Grouting and elastic joints in a light cream colour agreed with supervision. Performed wetroom silicone elastic joint in accordance with applicable law advice.

- **Adjacent works**

Works will adjoin the following construction elements:

Walls, doors.

- **Drawing references:**

6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16, 6.17, 6.18, 6.19, 6.20, 6.21, 6.22, 6.23.

- **Samples:**

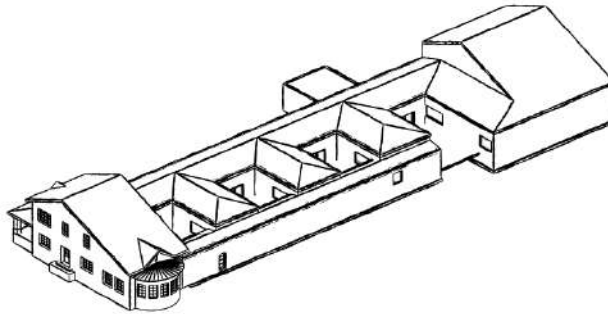
A sample bathroom shall be completed to set the standard of workmanship for the rest of the bathroom installation.

The sample bathroom can be incorporated into the finished works.

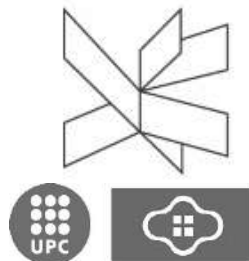
7.6 DOCUMENTO 6 – **PRESENTATION**

FINAL PROJECT

Renovation and extension of Can Marquès



Sandra Martín Solà //261238//
Class AH 73



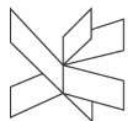
CONTENT

1. EXISTING BUILDING

2. OUTLINE PROPOSAL

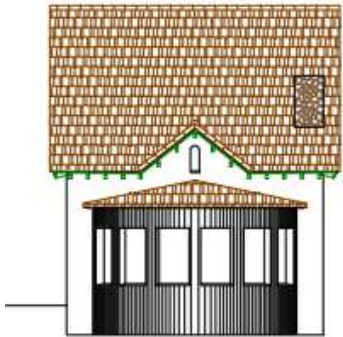
3. DETAIL I

4. DETAIL II

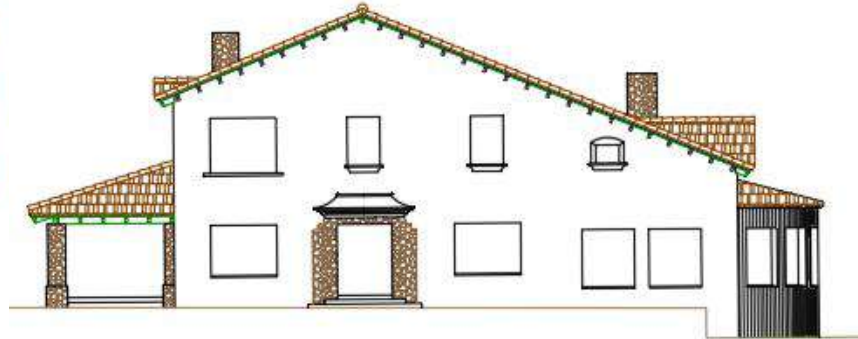


1. EXISTING BUILDING

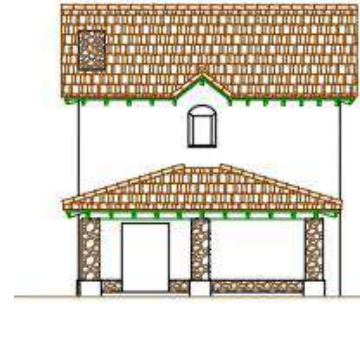
ELEVATIONS



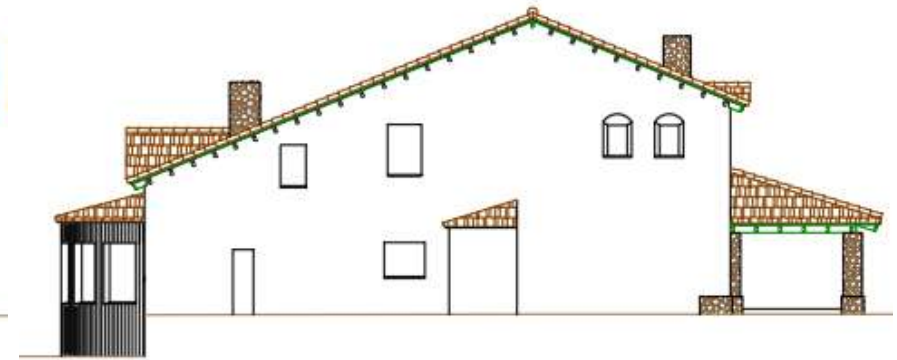
EAST ELEVATION



SOUTH ELEVATION

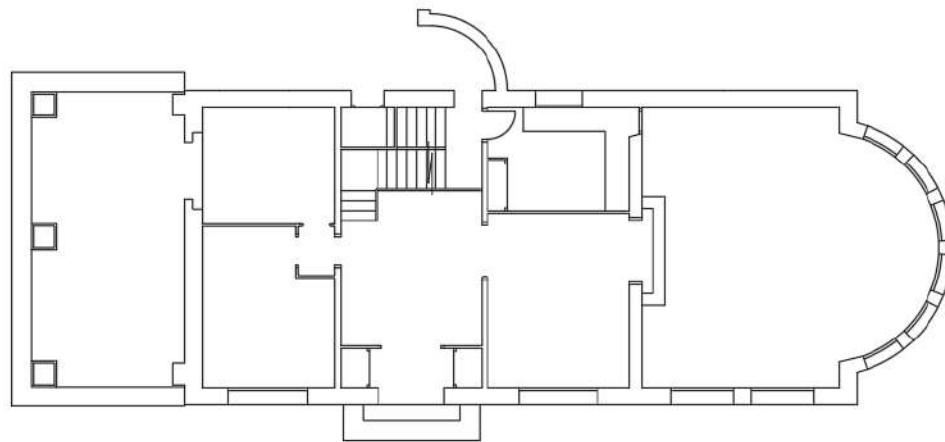


WEST ELEVATION

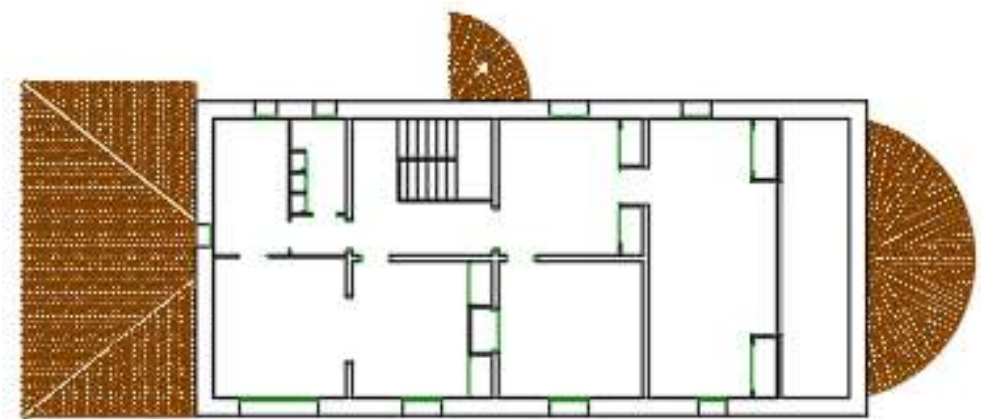


NORTH ELEVATION

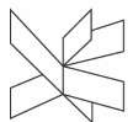
FLOOR PLANS



GROUNDFLOOR PLAN



FIRST FLOOR PLAN



outline proposal

- Drawings
- Site plan
- Sunlight
- Visualization
- Sustainability

analysis

- Sound analysis
- Fire analysis
- Vertical analysis
- U value

BSE

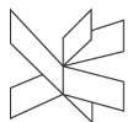
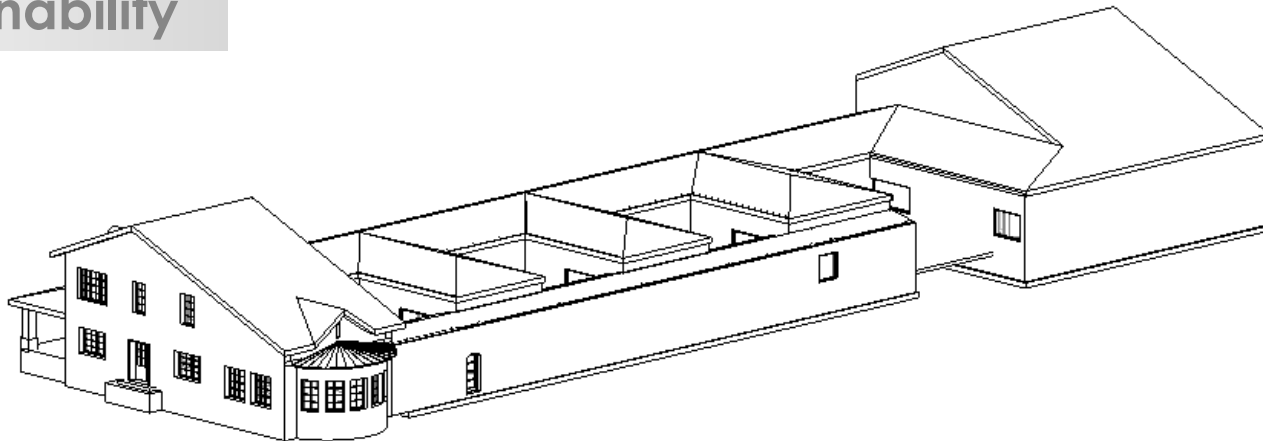
- Design

BPM

- Time schedule
- Planning

LAW

- Agreement



outline proposal

- Drawings

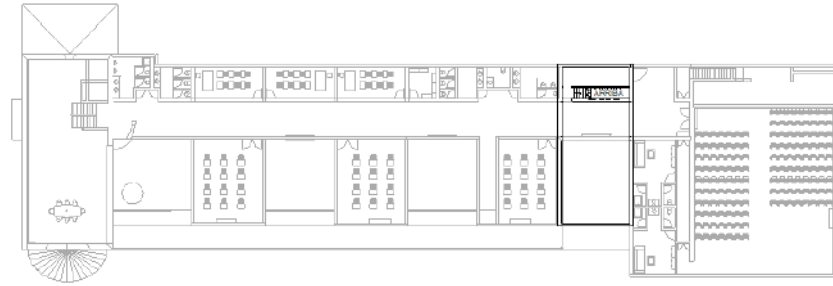
- Site plan

- Sunlight

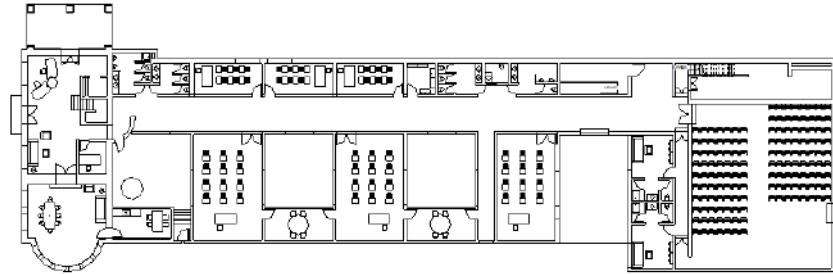
- Visualization

- Sustainability

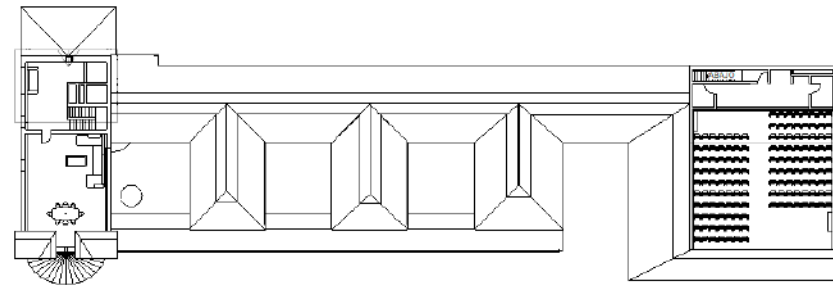
BASEMENT FLOOR
PLAN



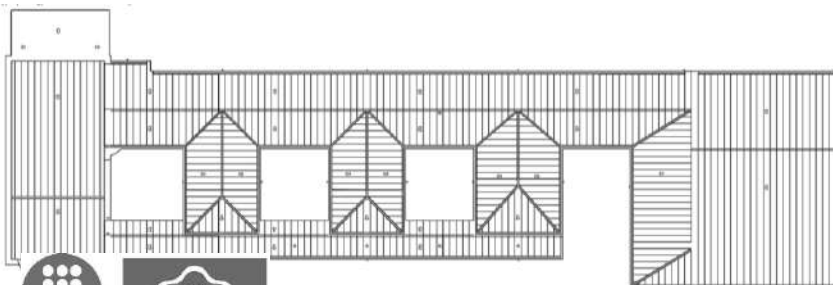
GROUND FLOOR
PLAN



FIRST FLOOR
PLAN

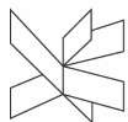


ROOF PLAN



Level	Room	Area
-1. Basement	Technical room	83.689 m ²
0. Ground Floor	Hall	85.883 m ²
0. Ground Floor	Social room	51.315 m ²
0. Ground Floor	Kitchen	17.581 m ²
0. Ground Floor	Toilet 1	14.793 m ²
0. Ground Floor	Toilet 2	11.423 m ²
0. Ground Floor	Class 1	18.513 m ²
0. Ground Floor	Class 2	19.665 m ²
0. Ground Floor	Warehouse 1	18.913 m ²
0. Ground Floor	Warehouse 2	7.575 m ²
0. Ground Floor	Toilet 3	12.635 m ²
0. Ground Floor	Disabled toilet	4.676 m ²
0. Ground Floor	Toilet4	12.937 m ²
0. Ground Floor	Technical room	18.998 m ²
0. Ground Floor	Warehouse 3	50.393 m ²
0. Ground Floor	Polivalent room	188.721 m ²
0. Ground Floor	Dressing room 2	23.871 m ²
0. Ground Floor	Dressing room1	23.773 m ²
0. Ground Floor	Class room 3	54.073 m ²
0. Ground Floor	Office 1	9.592 m ²
0. Ground Floor	Office 2	9.574 m ²
0. Ground Floor	Class room 4	59.080 m ²
0. Ground Floor	Class room 5	60.209 m ²
0. Ground Floor	Office 3	20.280 m ²
0. Ground Floor	Corridor	212.642 m ²
1. First floor	Hall 2	48.264 m ²
1. First floor	Teacher's class ro	76.849 m ²
1. First floor	Control room	44.441 m ²

1.184,30m²
Before 220m²



outline proposal

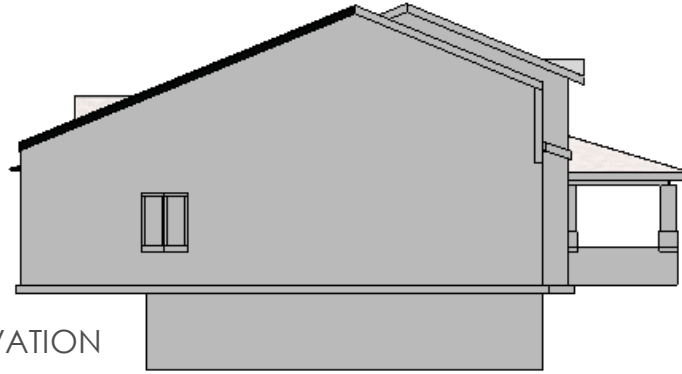
- Drawings

- Site plan

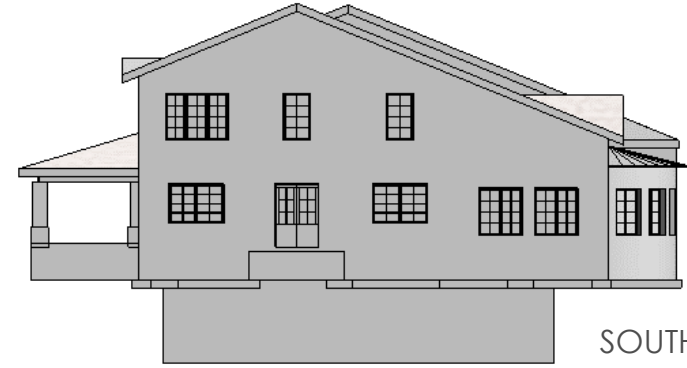
- Sunlight

- Visualization

- Sustainability



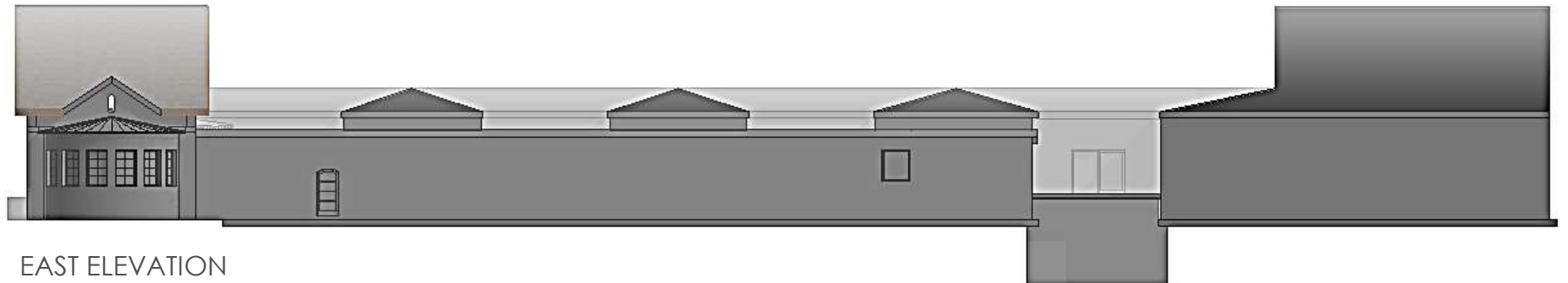
NORTH ELEVATION



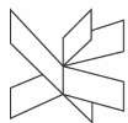
SOUTH ELEVATION



WEST ELEVATION



EAST ELEVATION



outline proposal

- Drawings

- Site plan

- Sunlight

- Visualization

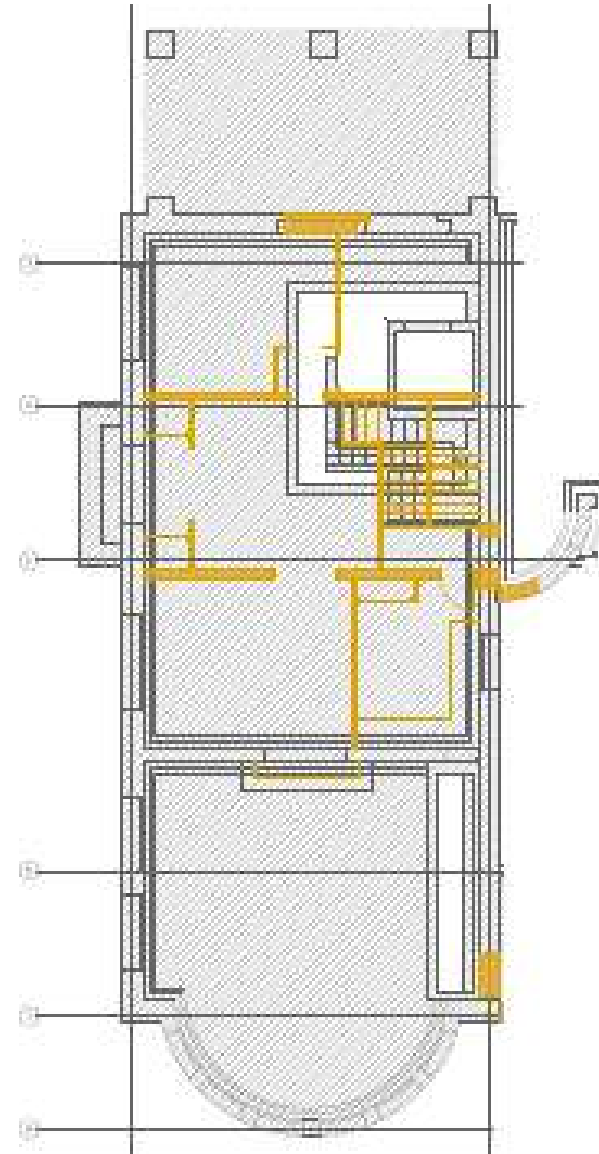
- Sustainability

Existing house
Demolition

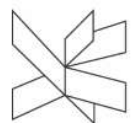
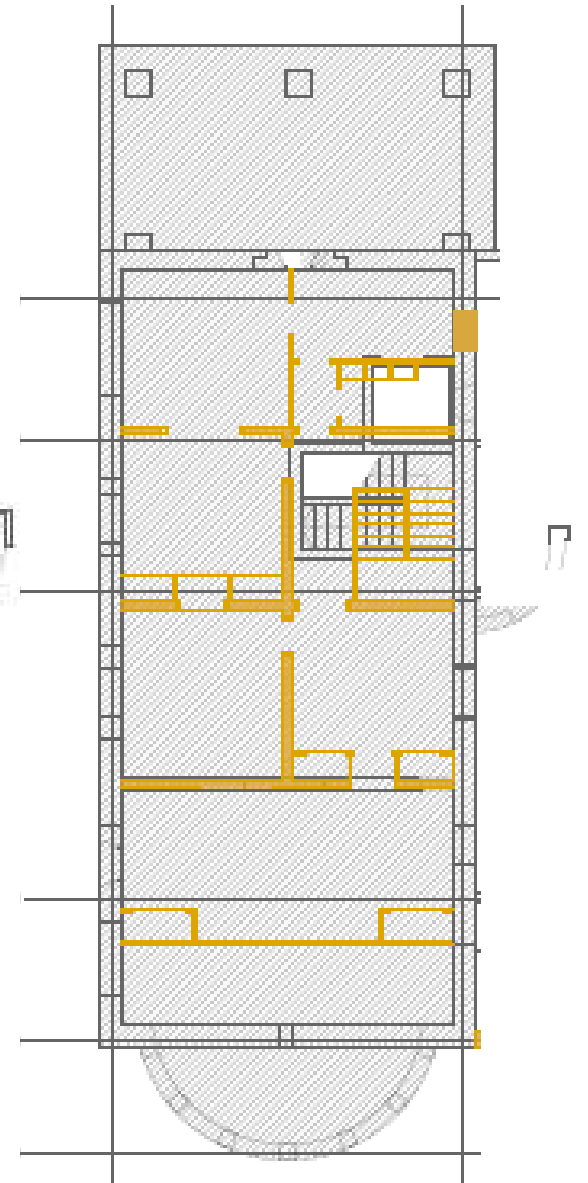


NORTH ELEVATION

GROUND FLOOR
PLAN



FIRST FLOOR PLAN



outline proposal

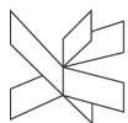
- Drawings

- **Site plan**

- Sunlight

- Visualization

- Sustainability



outline proposal

- Drawings

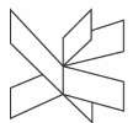
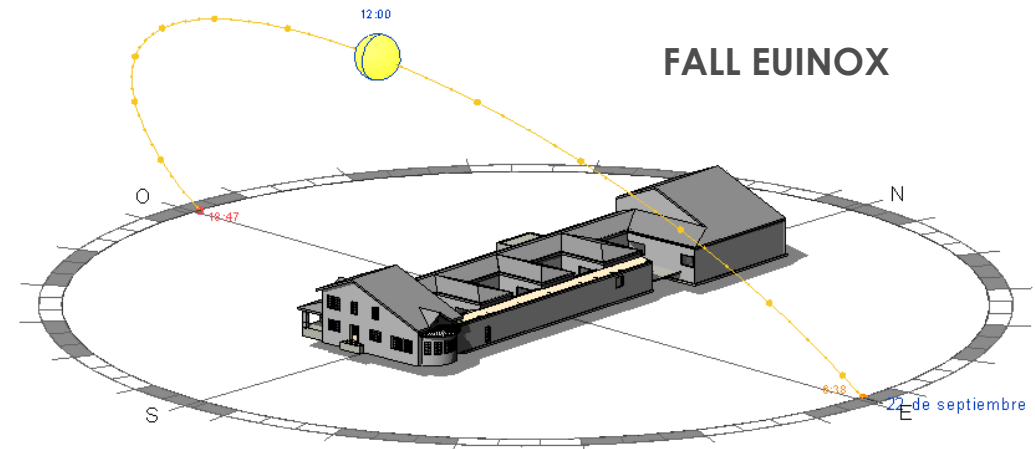
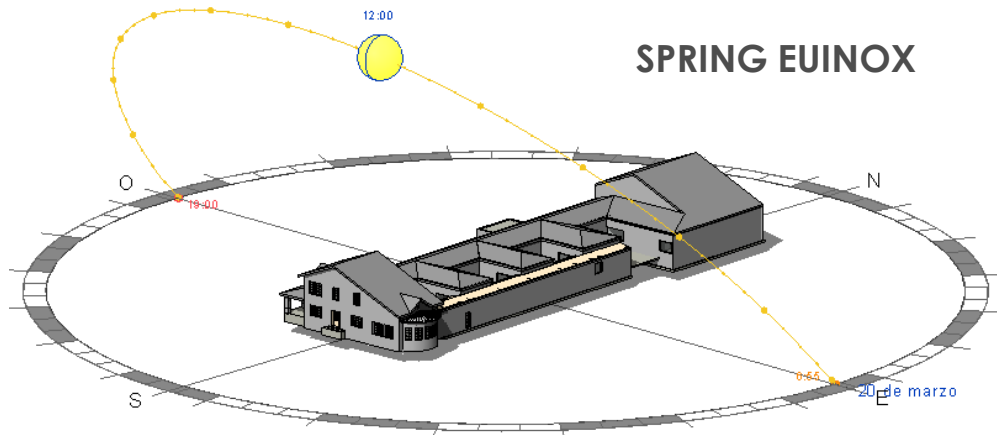
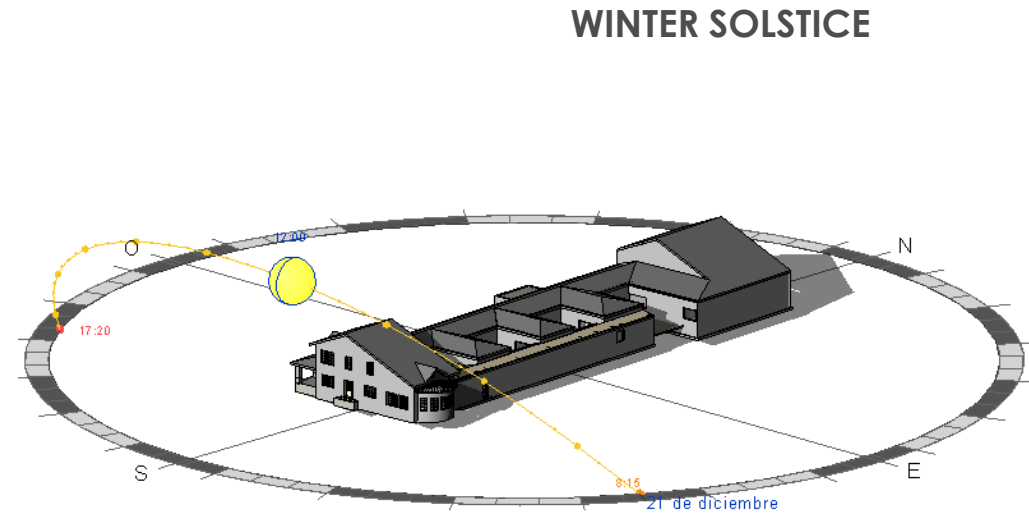
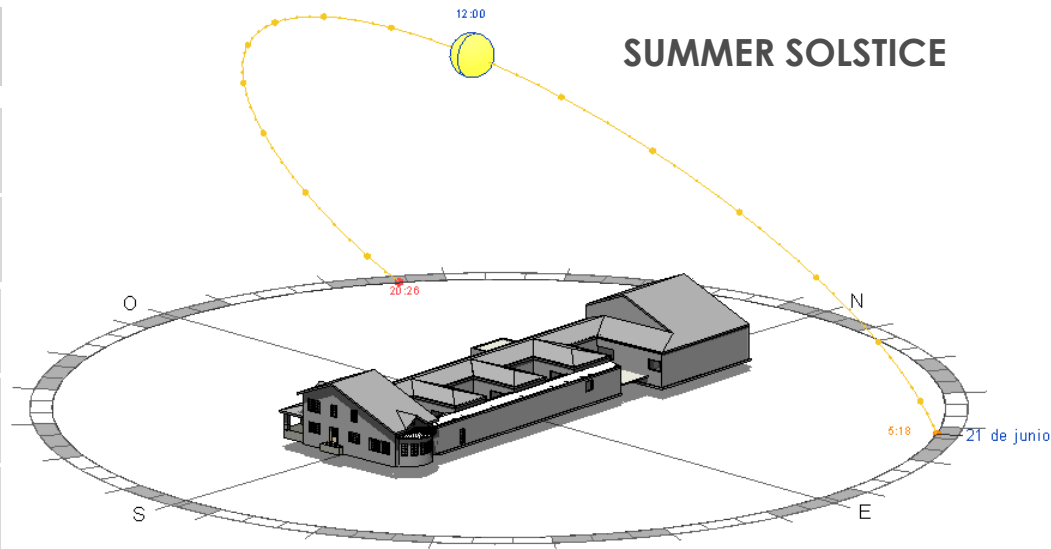
- Site plan

- **Sunlight**

- Visualization

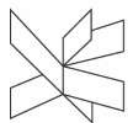
- Sustainability

A solar study was done to better understand the effects of the shadows on our building site. The south and west facades are generally facing the least amount of shadowing.



outline proposal

- Drawings
- Site plan
- Sunlight
- **Visualization**
- Sustainability



outline proposal

- Drawings

- Site plan

- Sunlight

- Visualization

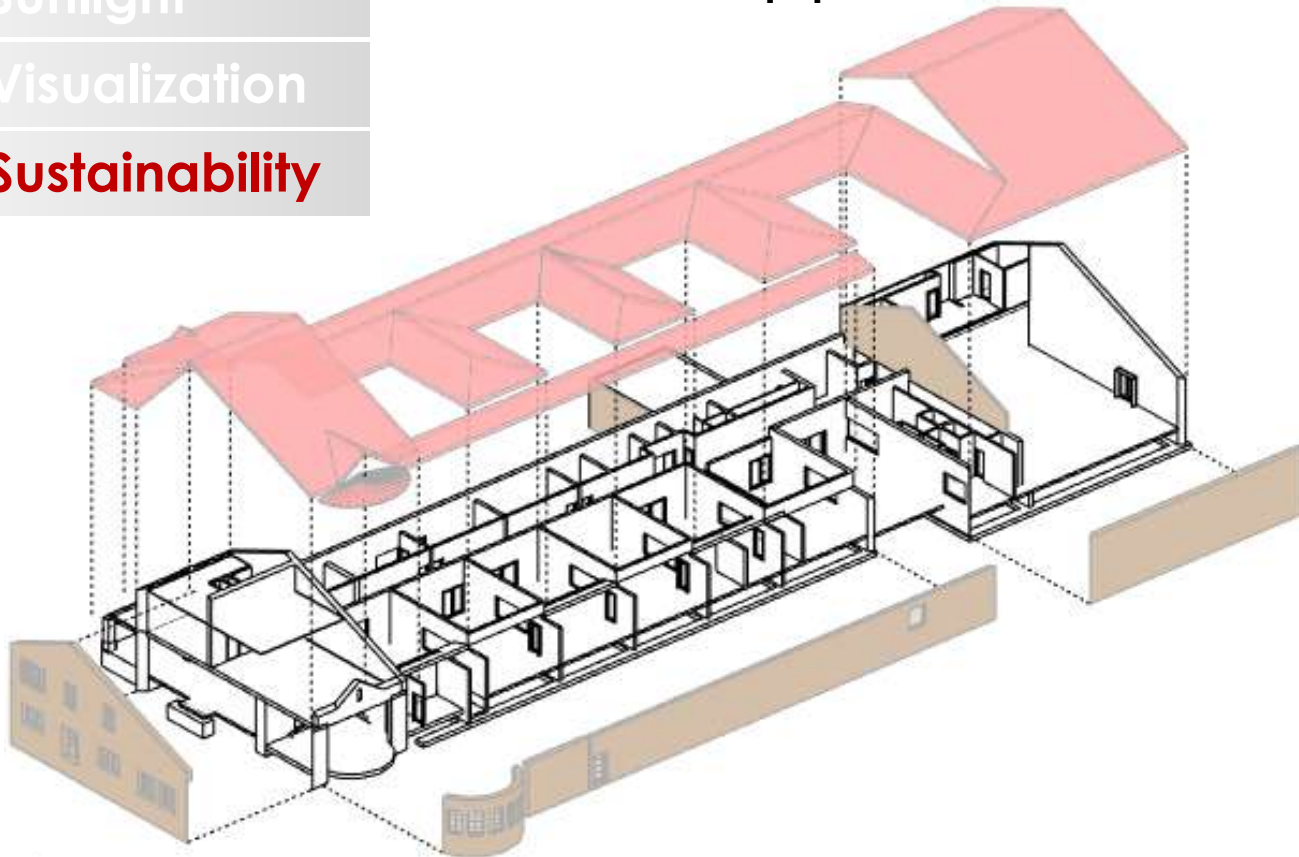
- Sustainability



Efficient lighting fixtures, presence detection light.



Photovoltaic panels and biomass distribution for power generation and equipment.



Rainwater collection for non potable household use.



Natural cross ventilation and >80% sunlight through the interior gardens.



Well insulated window with double glass.



Level access for disabled people.



Green area around the building.



Locally foraged and recycled materials.



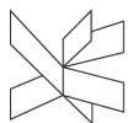
Increase onsite permeability – permeable pavers.



Drought tolerant plants.



External insulation, $<0,56W/m^2K$



outline analysis

- Sound analysis
- Fire analysis
- Vertical analysis
- U value

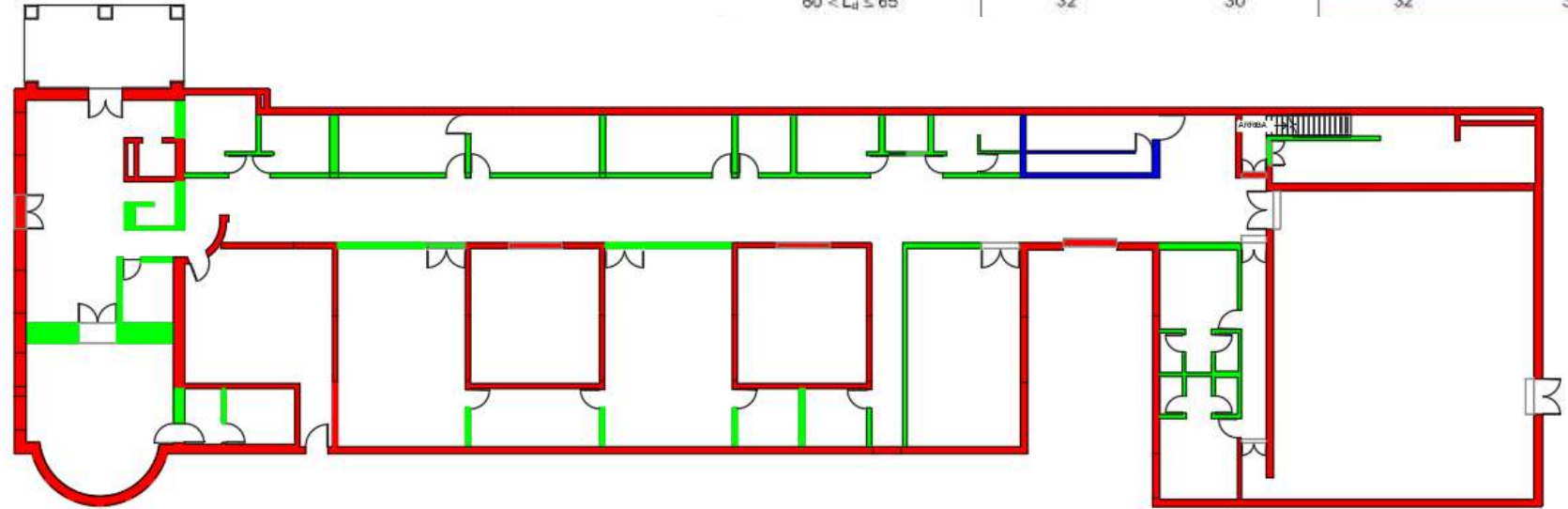
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DB HR
Protección frente al ruido
Table. 4.1

- 50 Db between indoor and traffic
- 30 Db between indoor rooms
- 55 Db Technical room and common space

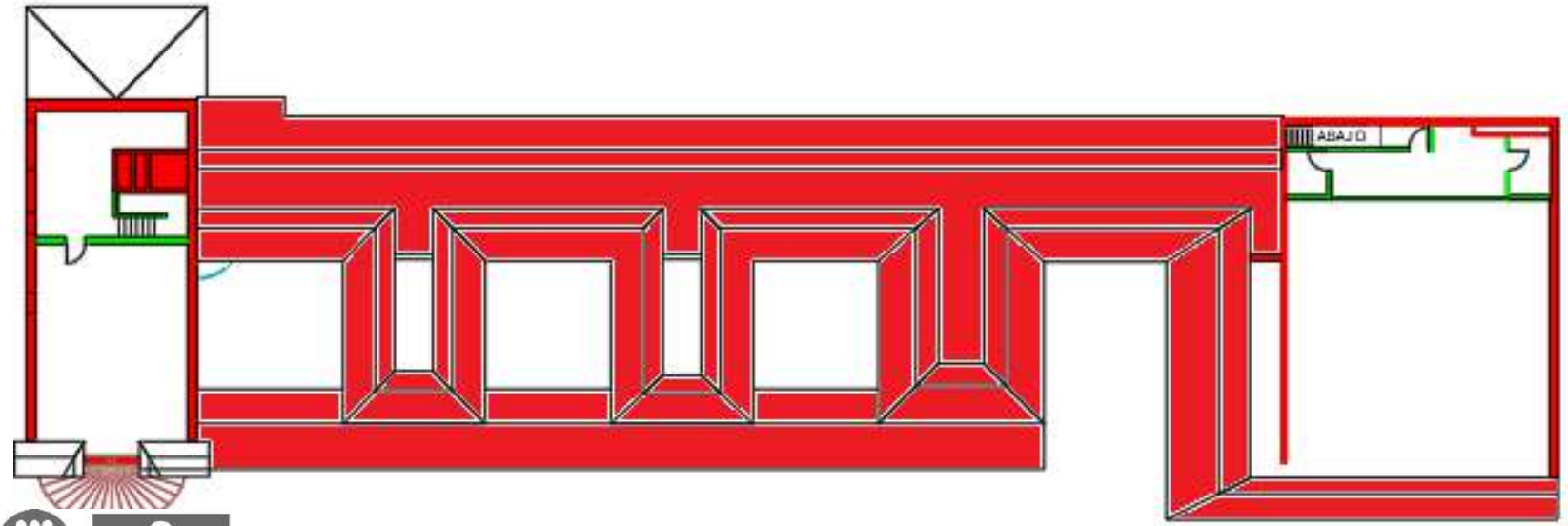
Tabla 2.1 Valores de aislamiento acústico a ruido aéreo, $D_{2m,nT,Air}$, en dBA, entre un recinto protegido y el exterior, en función del índice de ruido día, L_d .

L_d dBA	Uso del edificio			
	Residencial y hospitalario		Cultural, sanitario ⁽¹⁾ , docente y administrativo	
	Dormitorios	Estancias	Estancias	Aulas
$L_d \leq 80$	30	30	30	30
$60 < L_d \leq 65$	32	30	32	30

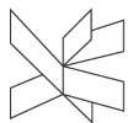
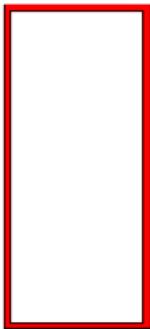
GROUND FLOOR
PLAN



FIRST FLOOR
PLAN



BASEMENT
FLOOR PLAN



outline analysis

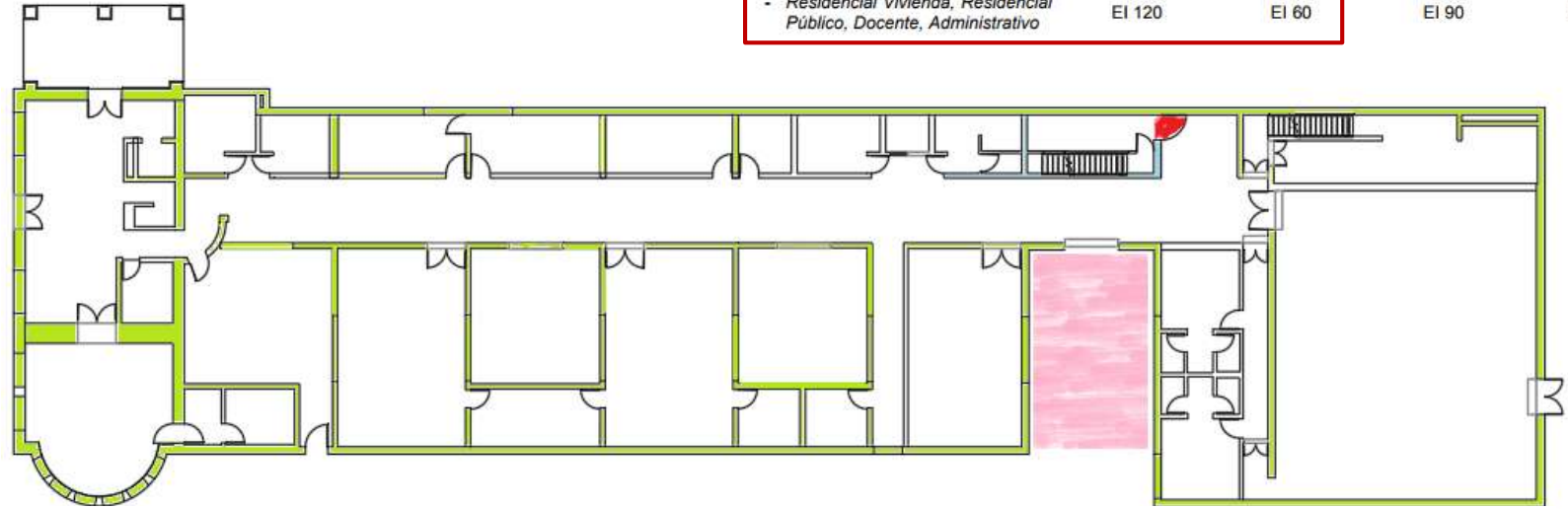
- Sound analysis
- **Fire analysis**
- Vertical analysis
- U value

- EI 60 internal walls and doors, REI 120 External wall
- REI 120 technical room
- EI₂ 45-C5, technical room's door
- Scape route
- REI 60

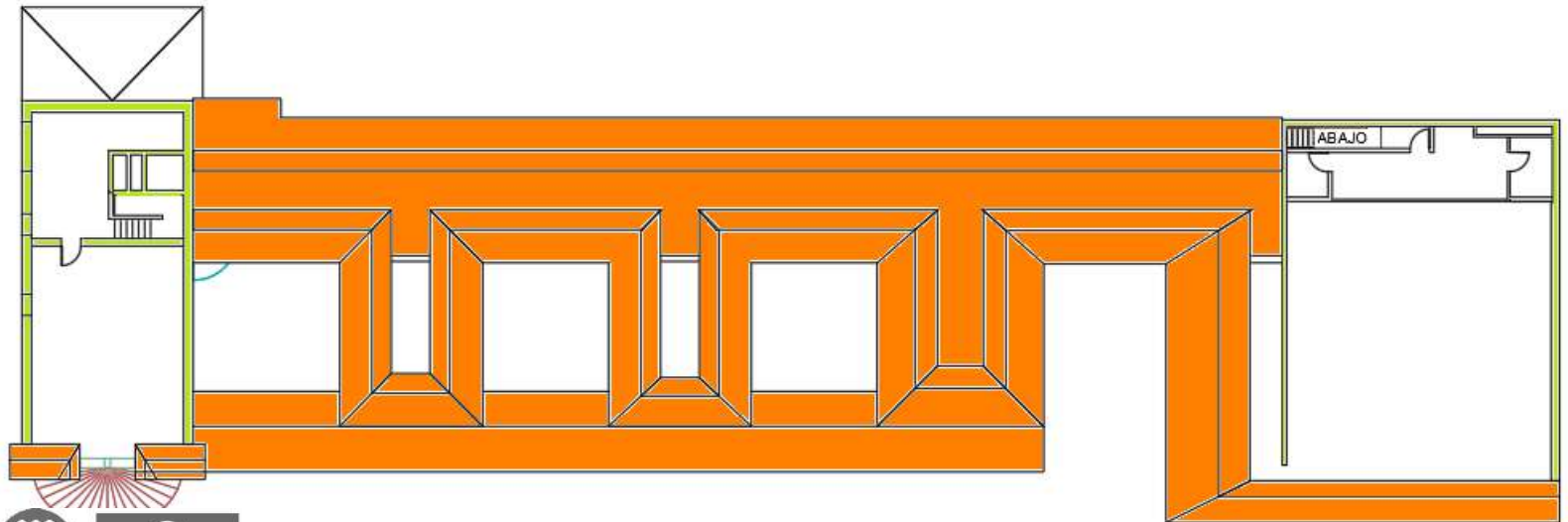
Tabla 1.2 Resistencia al fuego de las paredes, techos y puertas que delimitan sectores de incendio ⁽¹⁾⁽²⁾

Elemento	Plantas bajo rasante	Resistencia al fuego		
		Plantas sobre rasante en edificio con altura de evacuación:		
		h ≤ 15 m	15 < h ≤ 28 m	h > 28 m
Paredes y techos ⁽³⁾ que separan al sector considerado del resto del edificio, siendo su uso previsto: ⁽⁴⁾				
- Sector de riesgo mínimo en edificio de cualquier uso	(no se admite)	EI 120	EI 120	EI 120
- Residencial Vivienda, Residencial Público, Docente, Administrativo	EI 120	EI 60	EI 90	EI 120

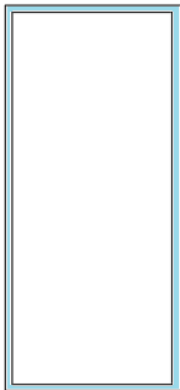
GROUND FLOOR PLAN



FIRST FLOOR PLAN

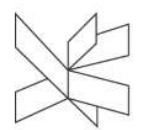


BASEMENT FLOOR PLAN



Font:
DB SI
Seguridad frente al fuego

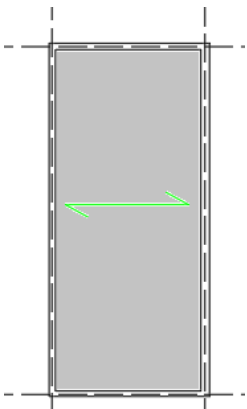
Table. 4.1
NOTE: It is not necessary a fire compartment because the total area is not bigger than 4000m²



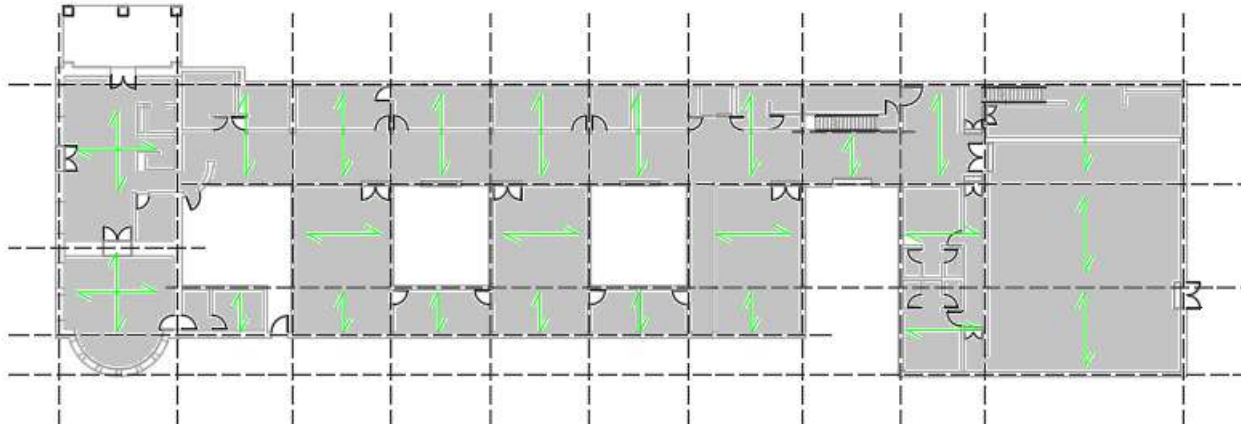
outline analysis

- Sound analysis
- Fire analysis
- **Vertical analysis**
- U value

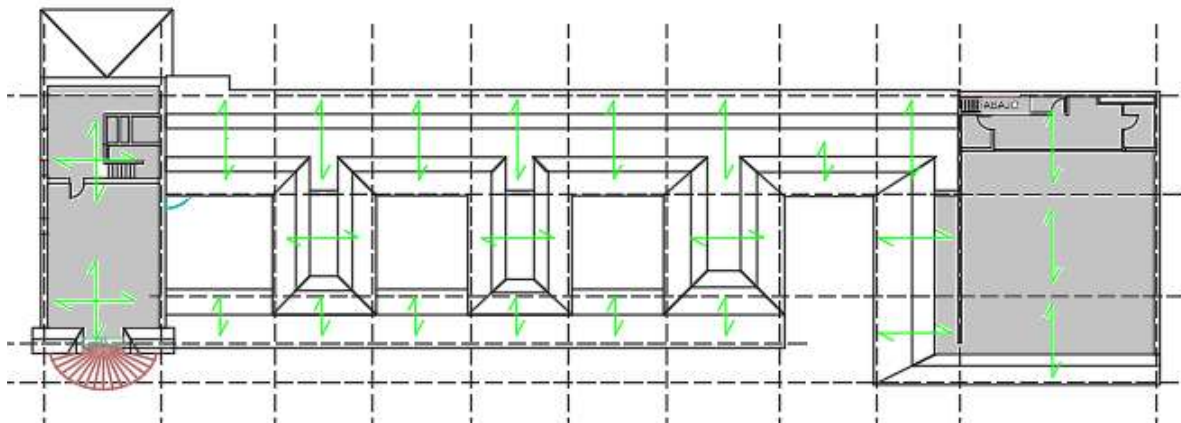
BASEMENT FLOOR PLAN



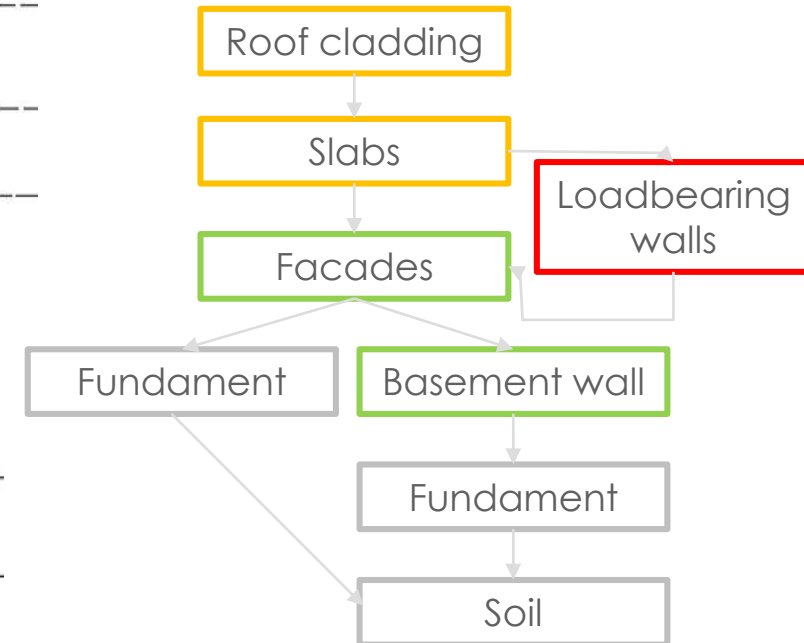
GROUND FLOOR PLAN



FIRST FLOOR PLAN

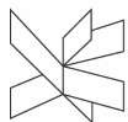


As a principle we have tried to preserve the previous load structure of the existing house. The only changes that we have made are the demolition of some of the internal walls to make opened areas. As a result, the charging system is transmitted as follows:



- Floor – slab function
- ↕ Spanning of the slabs
- - - Walls – column function

- Functions**
- Plate / slab
 - Beam
 - Truss
 - Column / pillar



outline analysis

- Sound analysis
- Fire analysis
- Vertical analysis
- **U value**



1 Roof
U-value:
0,10 W/m²K



5 Basement floor
U-value:
0,10 W/m²K



2 External walls
1. U-value (existing):
0,59 W/m²K
2. U-value (new):
0,45 W/m²K



6 Windows
U-value:
1,40 W/m²K



3 Basement walls
U-value:
0,29 W/m²K

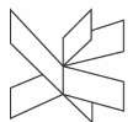


7 Doors
U-value:
1,40 W/m²K



4 Floor partition
U-value:
0,43 W/m²K

<u>Table.D.2.10</u>		
Font:	Transmitancia límite de muros de fachada y cerramientos en contacto con el terreno	U_{Mim}: 0,73 W/m² K
DB HE	Transmitancia límite de suelos	U_{Slim}: 0,50 W/m² K
Ahorro de energía	Transmitancia límite de cubiertas	U_{Clim}: 0,41 W/m² K
Zone C2		



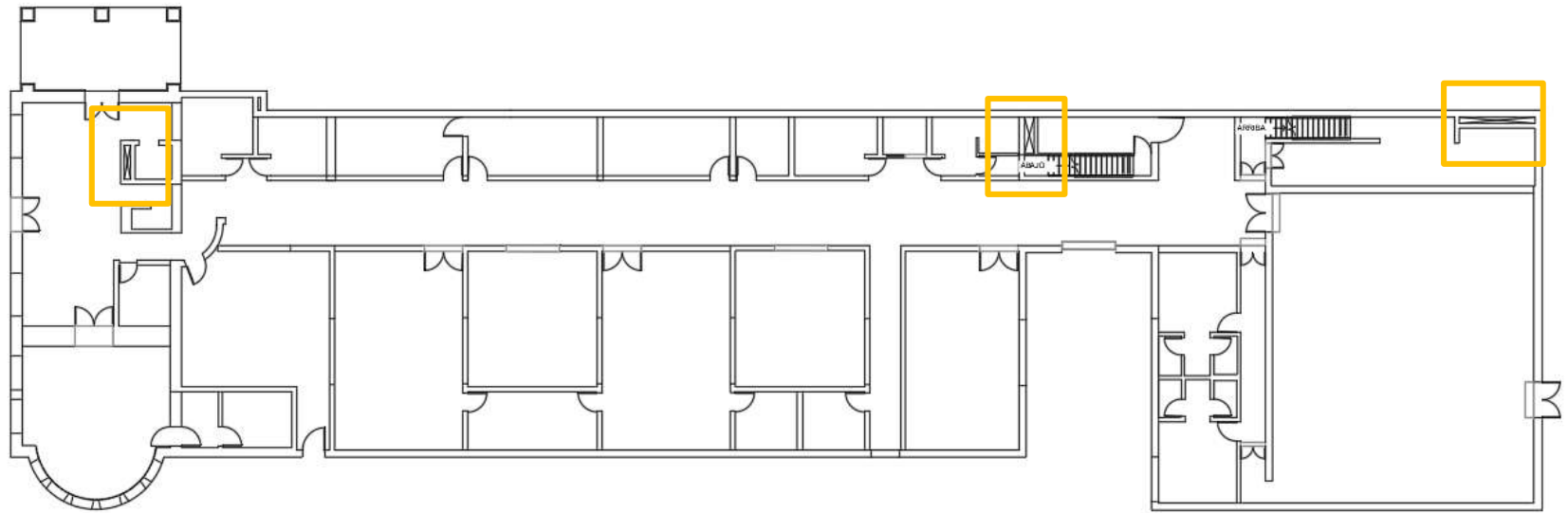
outline

BSE

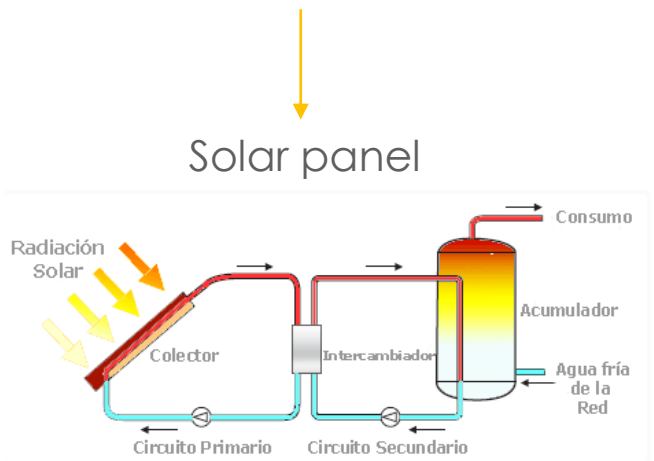
- design

We have got a total of 3 shafts. All pipes and ducts have 50 mm added insulation. The minimum distance for installation from the wall is 50 mm.

- o EL – Electricity
- o CW – Cold Water
- o HW – Hot Water
- o CR – Water circulation
- o WR – Heat Return
- o WF – Heat Forward
- o DR – Drain
- o VF – Ventilation Inlet
- o VR – Ventilation Outlet

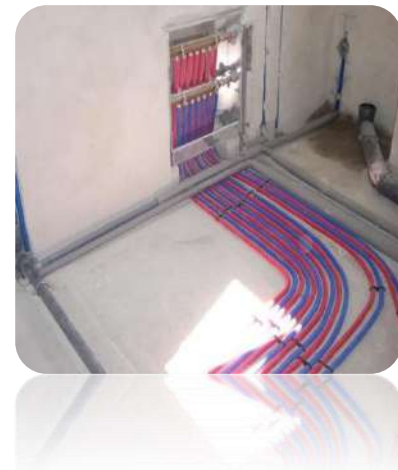


COLD WATER AND HEATING



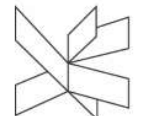
HEATING:

- PVC PIPES



VENTILATION:

- LINDAB CIRCULAR DUCTS SR
- VENTILATION UNIT: V330HEC22



Scheme design and Detail I

BDS

- Floor plans
- Elevations
- Sections
- Details

BSE

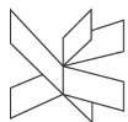
- Water/Heating plan
- Sewer plan
- Rain water plan
- Structure plan

BPM

- Application for a building permit
- Building site plan
- Construction cost estimate
- Time schedule
- Quality assurance

LAW

- Case specification



Scheme design Detail I BDS

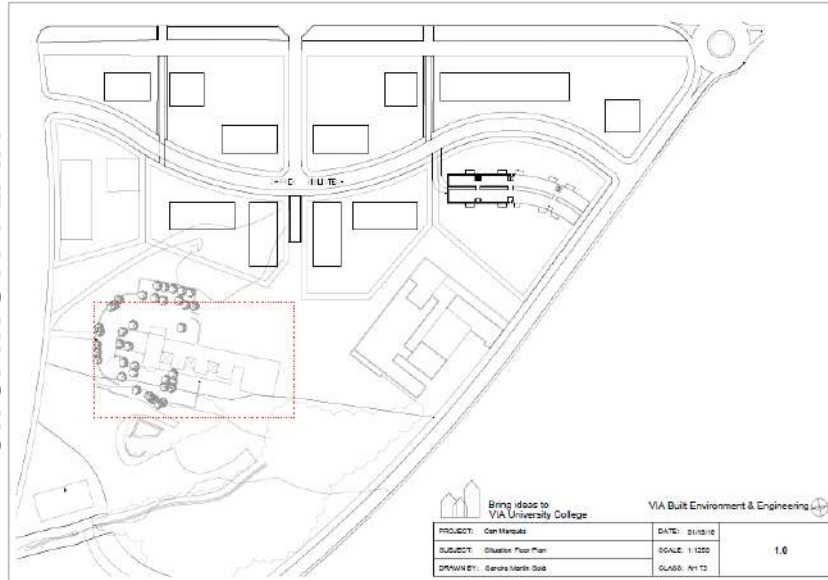
- Floor plans

- Elevations

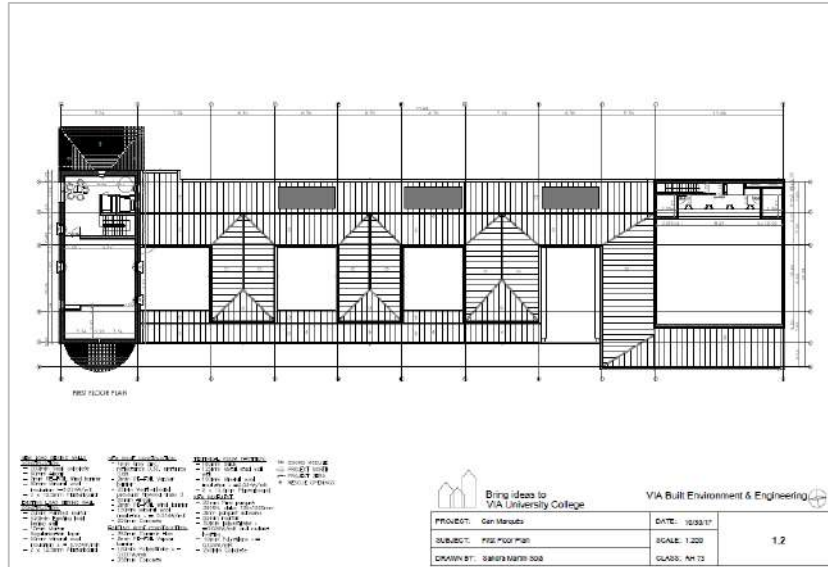
- Sections

- Details

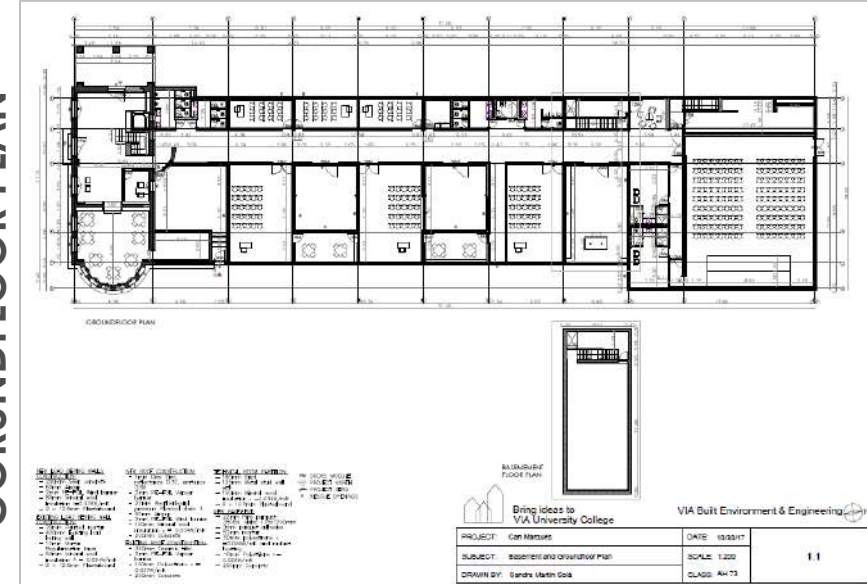
SITUATION PLAN



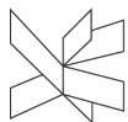
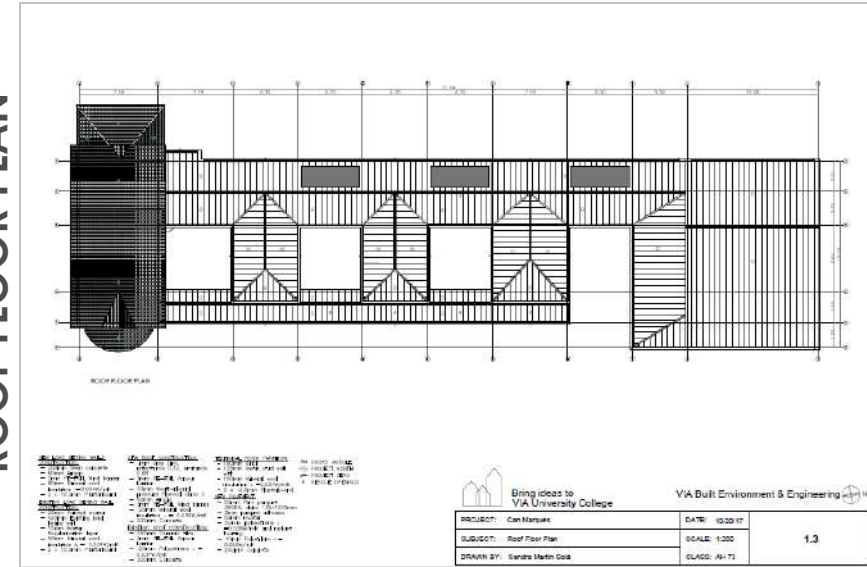
FIRST FLOOR PLAN



GORUNDFLOOR PLAN



ROOF FLOOR PLAN

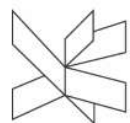
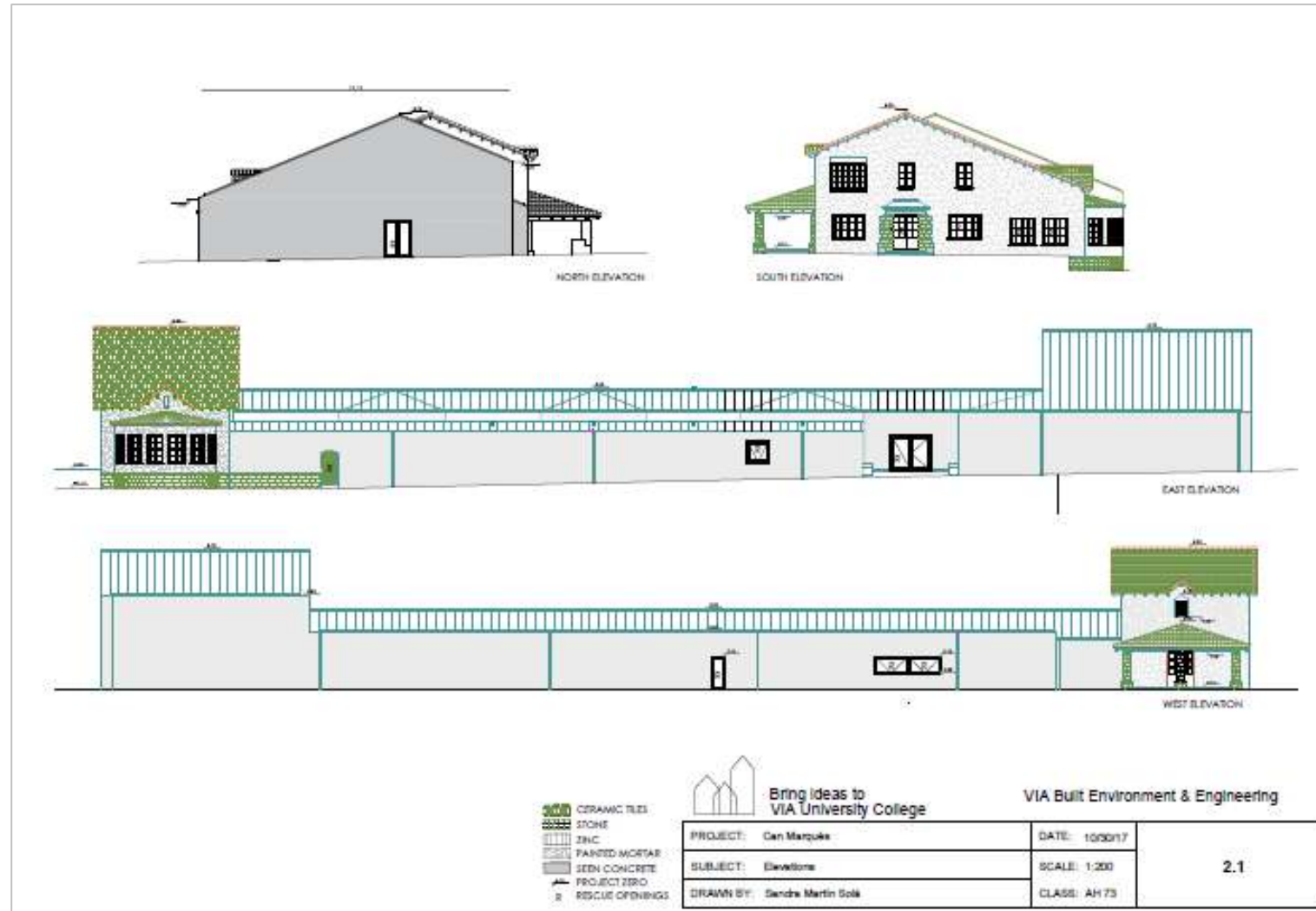


Scheme design

Detail I

BDS

- Floor plans
- **Elevations**
- Sections
- Details



Scheme design

Detail I

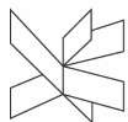
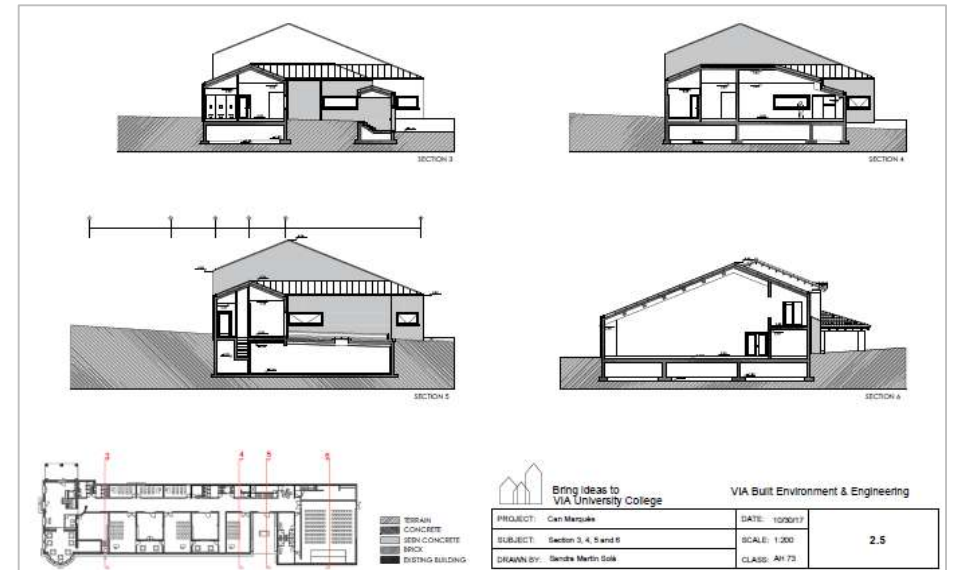
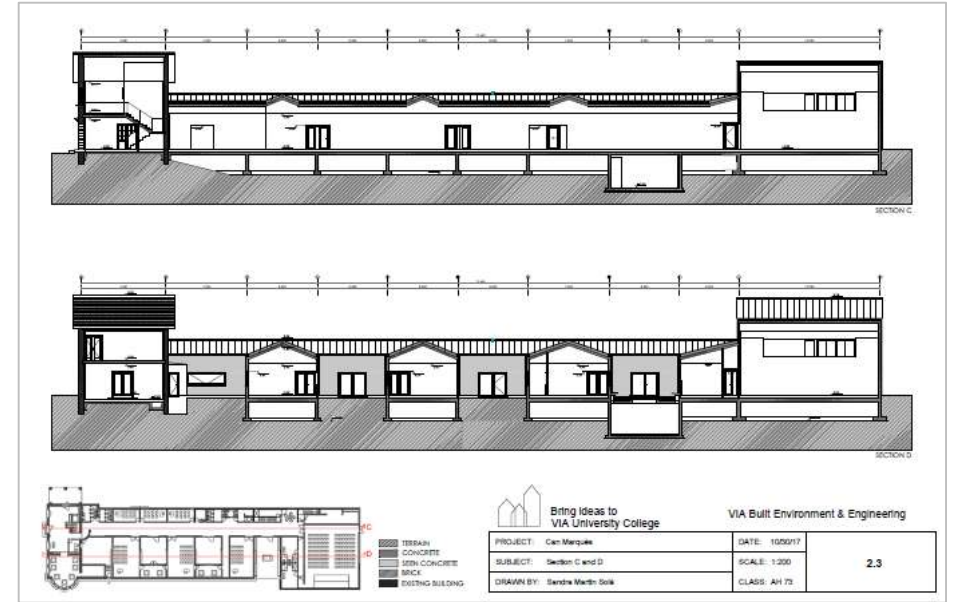
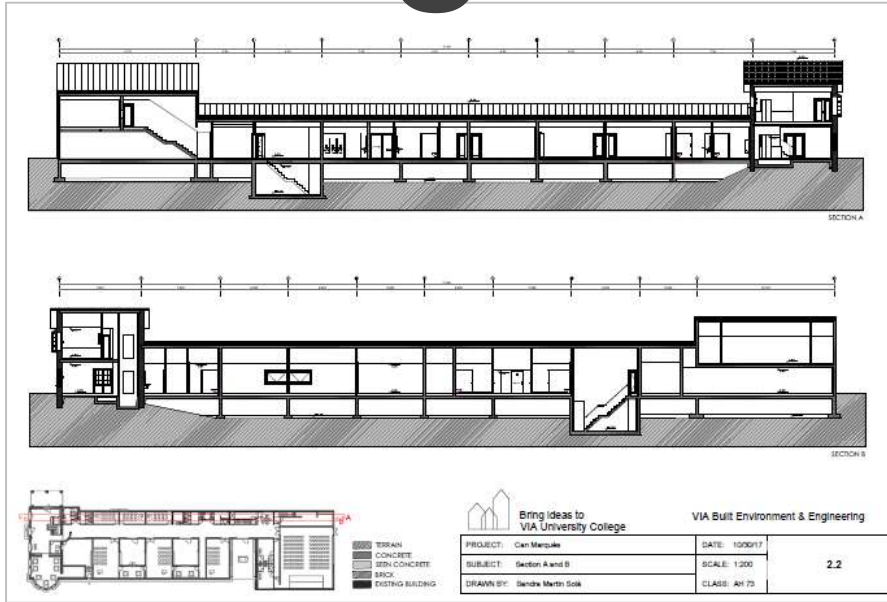
BDS

- Floor plans

- Elevations

- **Sections**

- Details

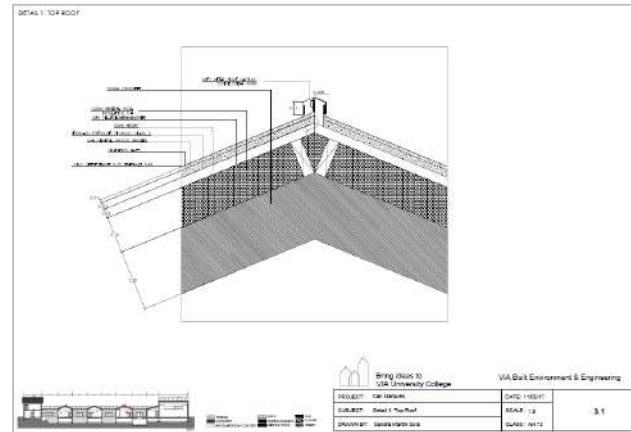


Scheme design Detail I BDS

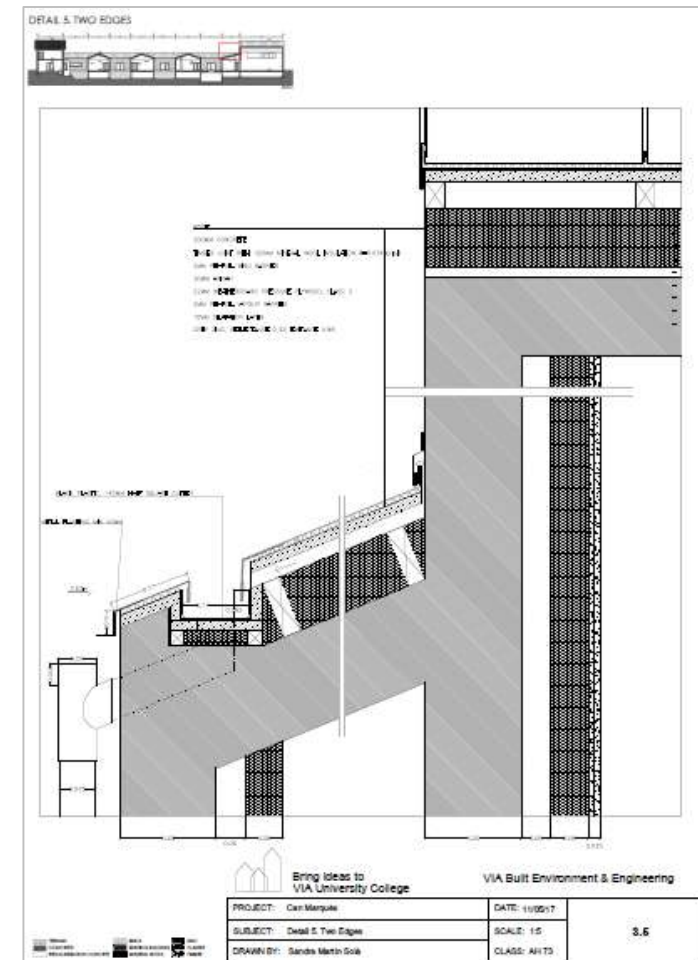
ROOF DETAILS

- Floor plans
- Elevations
- Sections
- **Details**

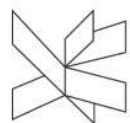
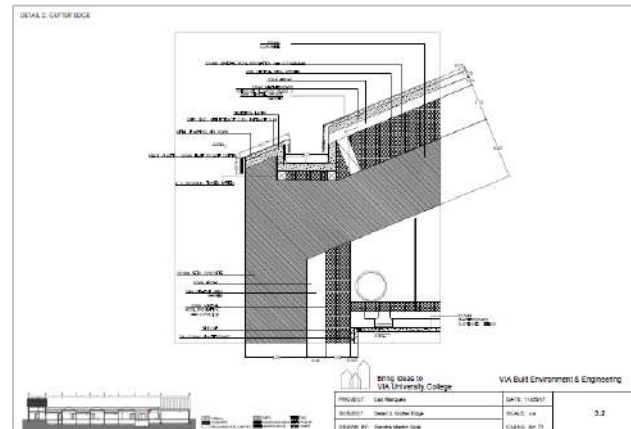
TOP ROOF



TWO EDGES



GUTTER EDGE



Scheme design

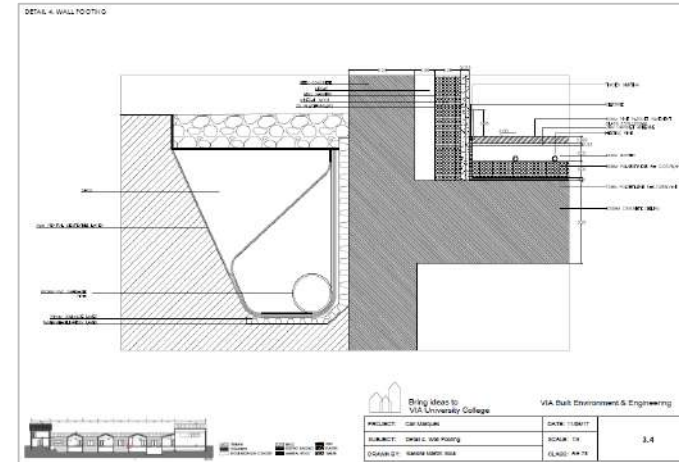
Detail I

BDS

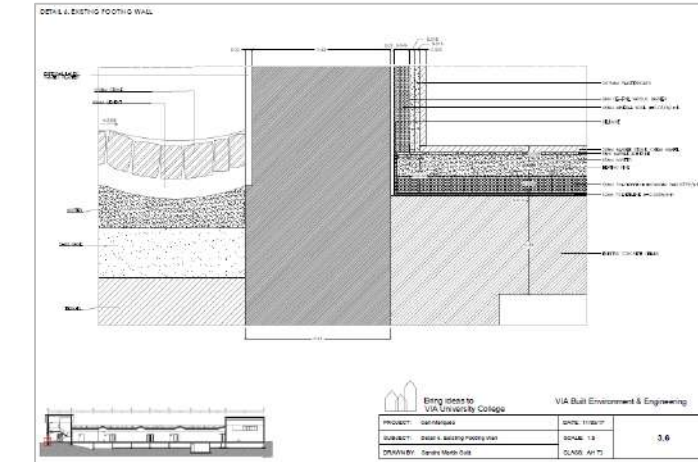
EXISTING BUILDING

- Floor plans
- Elevations
- Sections
- **Details**

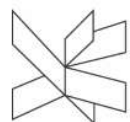
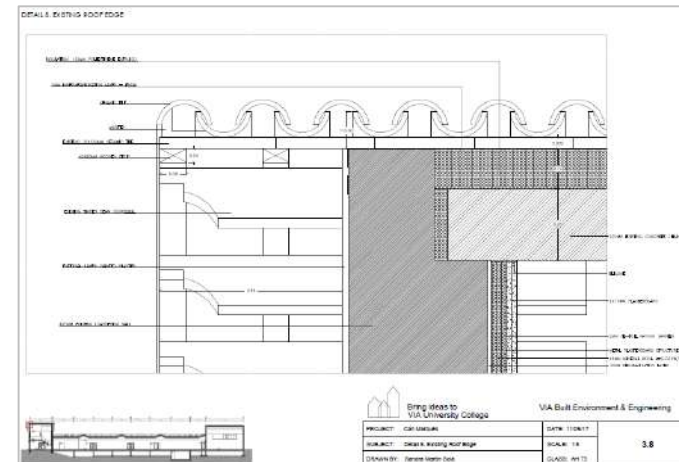
WALL FOOTING



EXISTING FOOTING



EXISTING ROOF EDGE

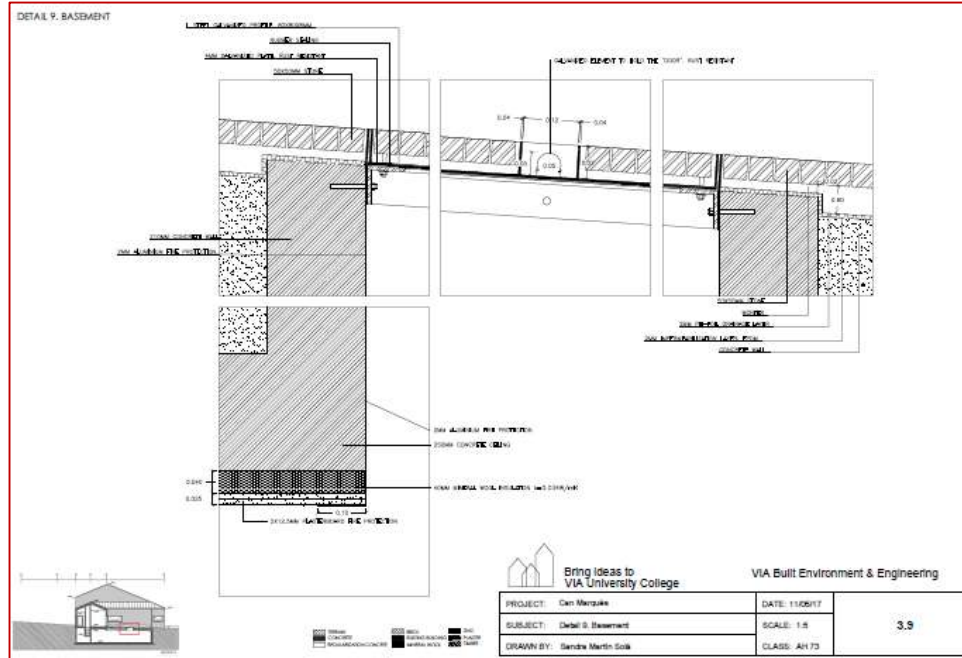


Scheme design Detail I BDS

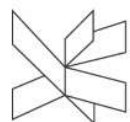
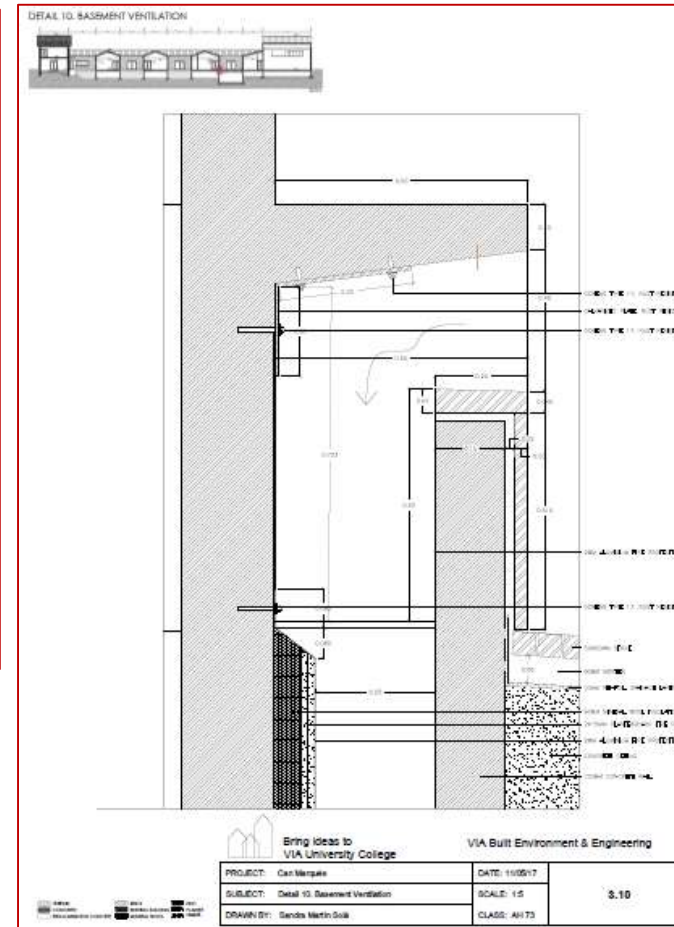
BASEMENT

- Floor plans
- Elevations
- Sections
- **Details**

BASEMENT



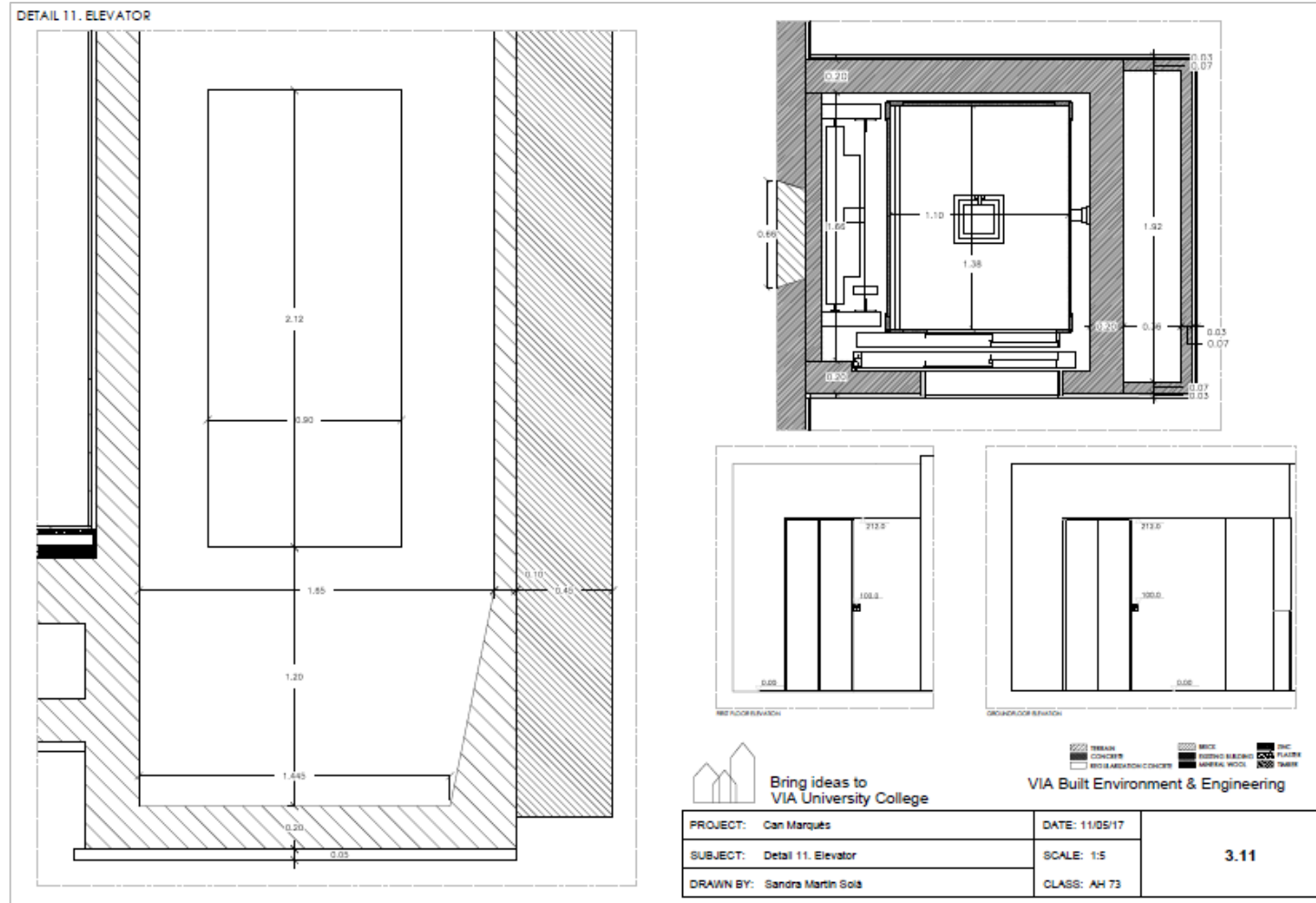
BASEMENT VENTILATION



Scheme design Detail I BDS

ELEVATOR

- Floor plans
- Elevations
- Sections
- **Details**



Dimensiones mínimas

En edificios c
sin viviendas accesibles pa
usuarios de silla de ruedas

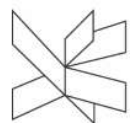
En otros edificios, con super

≤ 1.000 m²

1,00 x 1,25

1,40 x 1,40

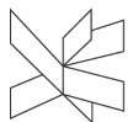
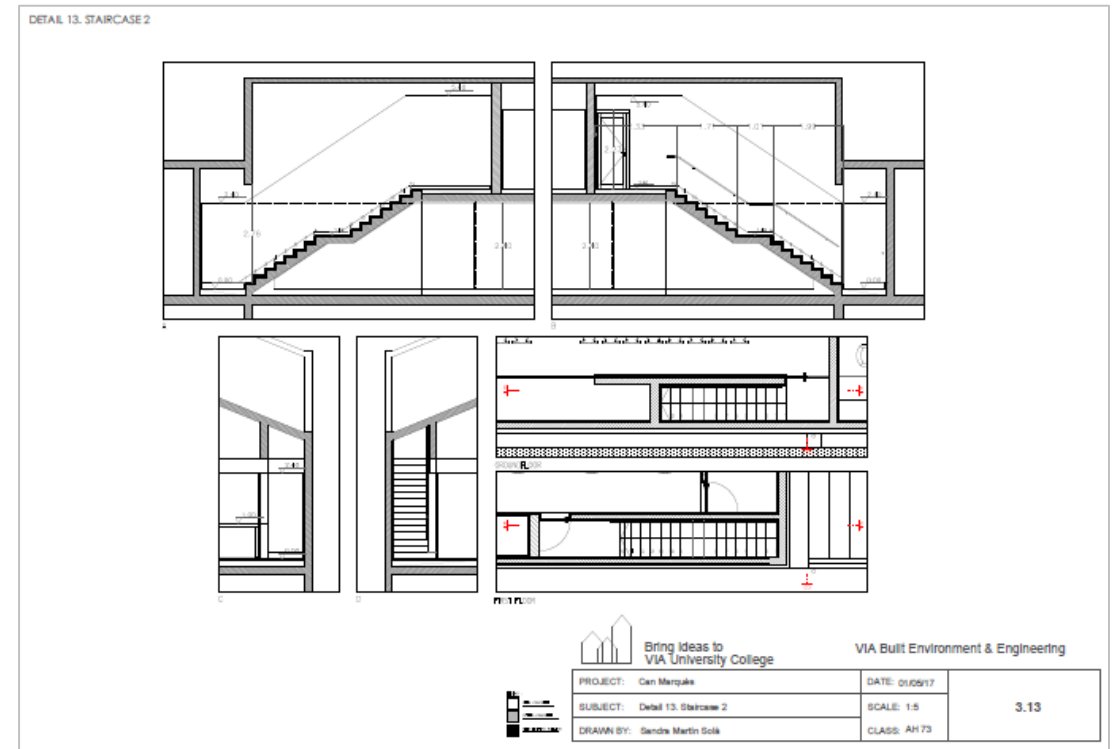
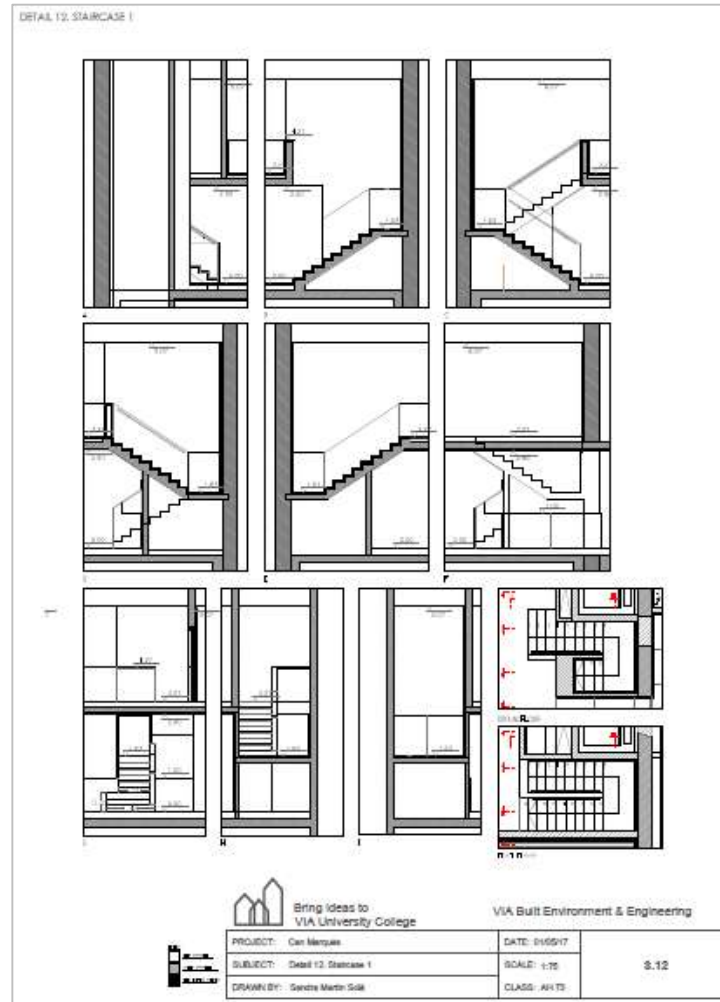
- Con una puerta o con dos puertas enfrentadas
- Con dos puertas en ángulo



Scheme design Detail I BDS

STAIRS

- Floor plans
- Elevations
- Sections
- **Details**



Scheme design

Detail I

BDS

- Water/Heating plan

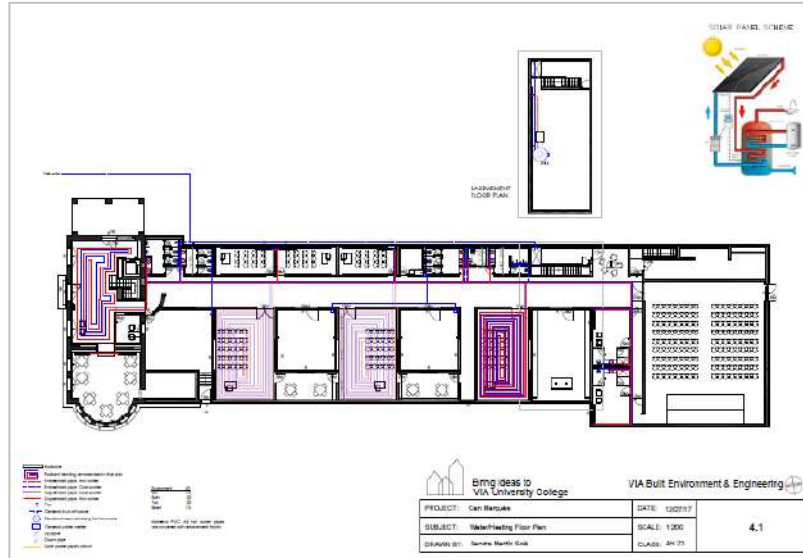
- Sewer plan

- Rainwater plan

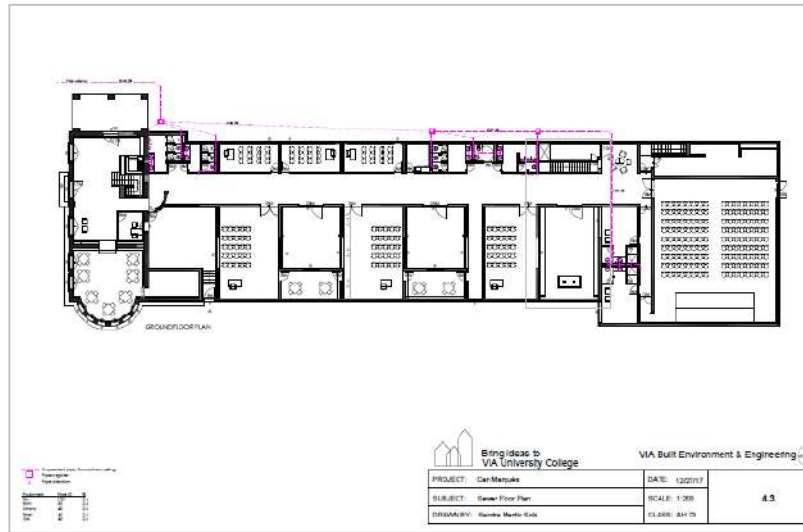
- Ventilation plan

- Structure plan

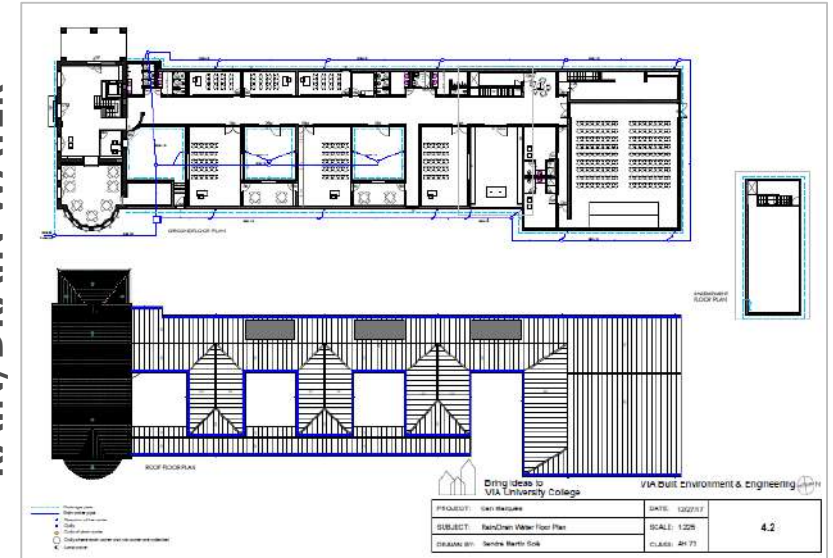
WATER/HEATING



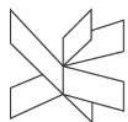
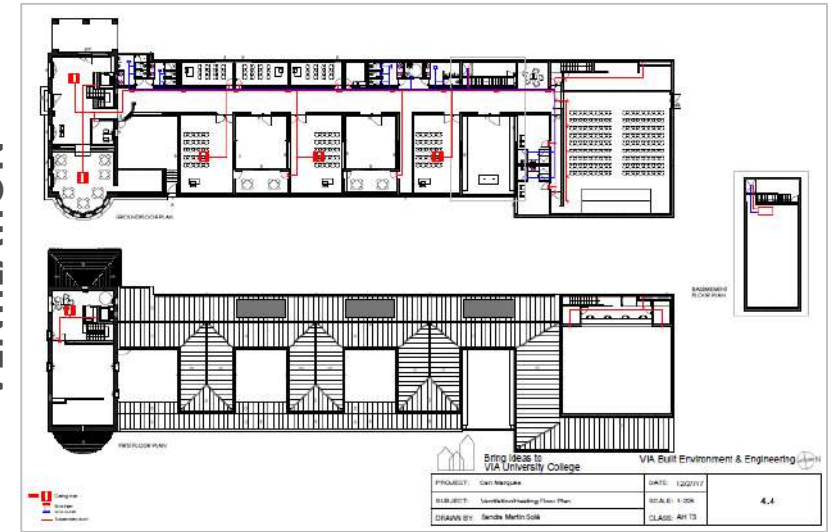
SEWER



RAIN/DRAIN WATER



VENTILATION



Scheme design Detail I BDS

- Water/Heating
plan

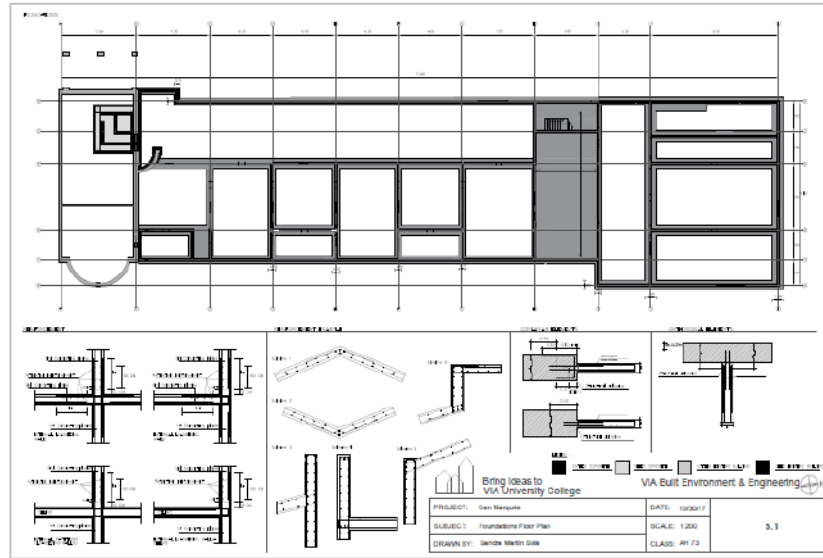
- Sewer plan

- Rainwater plan

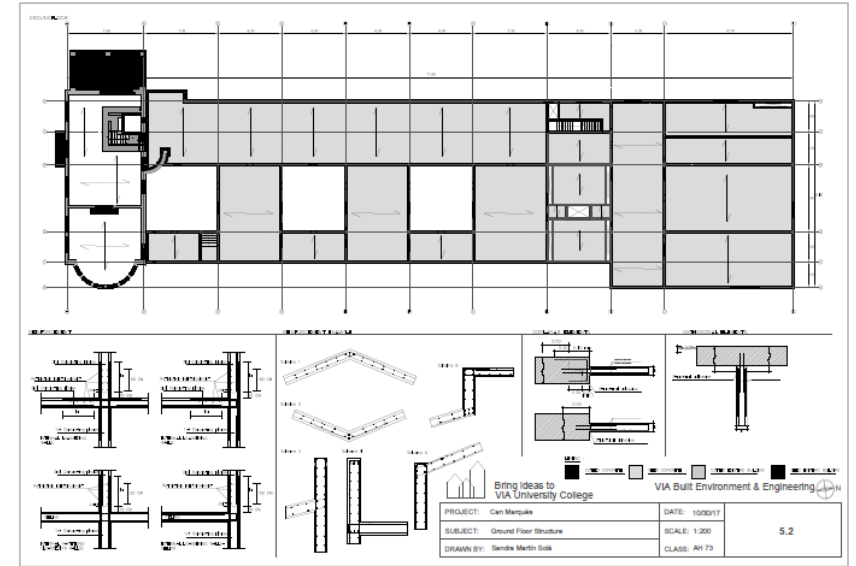
- Ventilation
plan

- **Structure plan**

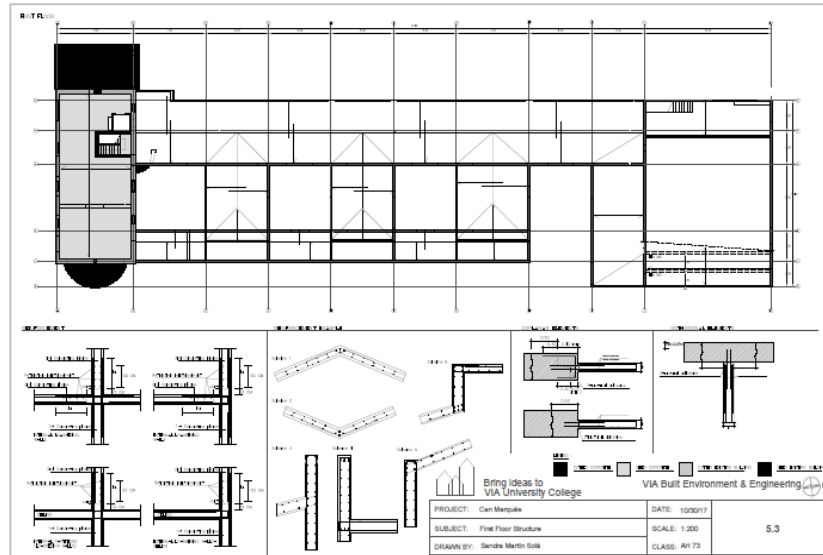
FOUNDATIONS



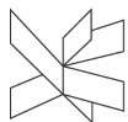
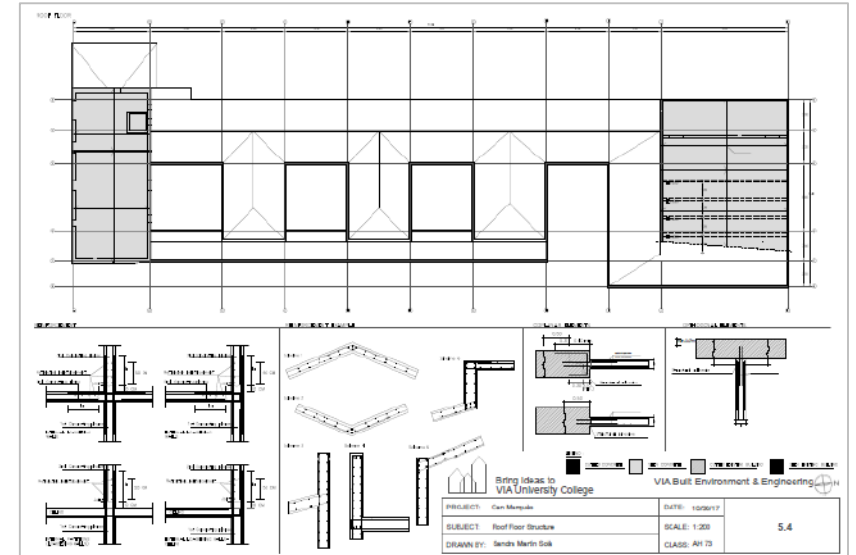
GROUND FLOOR



FIRST FLOOR



ROOF



Scheme design Detail I BPM

- Application for a building permit
- Building site plan
- Construction cost estimate
- Time schedule
- Quality assurance

APPLICATION FOR A BUILDING PERMIT

Received: 04/16

HORSSENS KOMMUNE

Name and address of the Municipality: Horsens Kommune, Rådhusetorvet 4, 8700 Horsens

To be filled in by the Municipality: Project Number, Built up, Street code, House no., II, Stryk

Building Regulations (BR10)

Application for a Building Permit
 Notification of building works

The Property: See guidelines. (Down arrow and house number (identification of location))
Can Marqués

Type of construction: New construction, Extension, Other construction
Specify what you want to construct (for example single family house, semi detached house, garage, shop, workshop, demolition of existing building, moving partition walls, change of usage, putting up signs, adding scaffolds, windmill, farm buildings)
Partial demolition of existing building, change of usage, adding a new detached building.

The construction works do not require a dispensation
 The construction works require a dispensation (A reasoned application shall be annexed to this application)
Necessary appendices must be annexed (see guidelines)

Construction Insurance: Documentation from insurance broker confirming liability enclosed (Only applies to buildings meant for habitation)

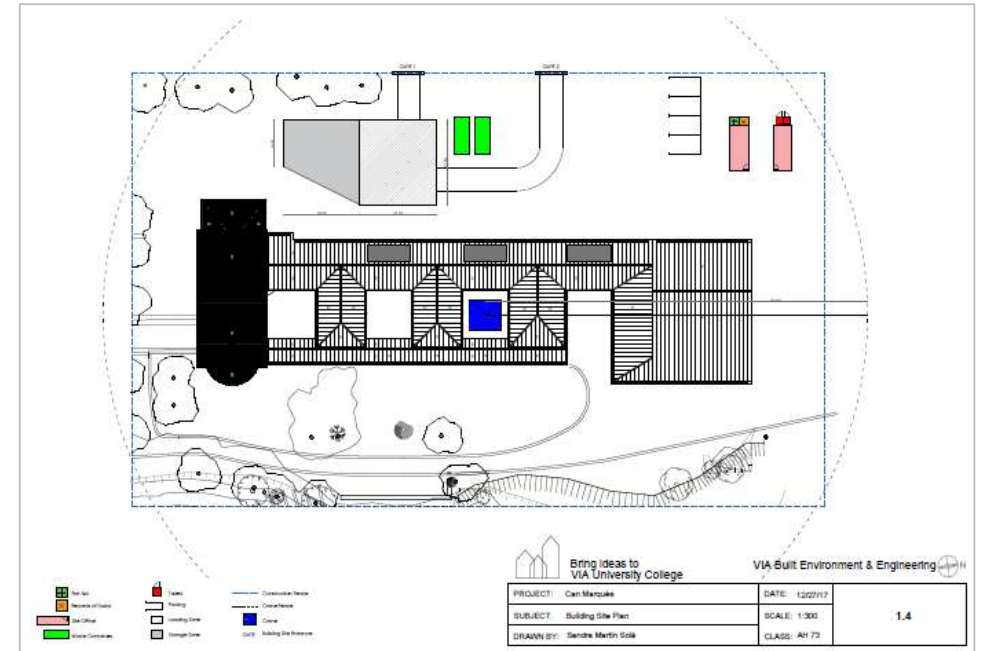
Method of heating: District heating, Electricity, Other

Applicant (architect, engineer or the like):
Name, address, telephone number and Company registration number: Sandra Martín Solà, VIA University College / EP508
E-mail:
Date and signature: 17th of January 2018

Owner of property according to Land Registry: Owners association
The signature of the chairman of the owners association is required unless the applicant by other means can verify the authority to apply on behalf of the owner.
Name, address, telephone number and Company registration number:
Name of owners association, name of chairman, address and e-mail:
Date and signature:
Date and signature:

16.02.24/05001 10/0900

BUILDING SITE PLAN

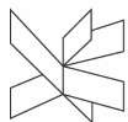


CONSTRUCTION COST ESTIMATE

SUMMARY APPROXIMATE BUDGET

Project: Can Marqués, 08450, Llinars del Vallès
Architect: Sandra Martín
February 2018

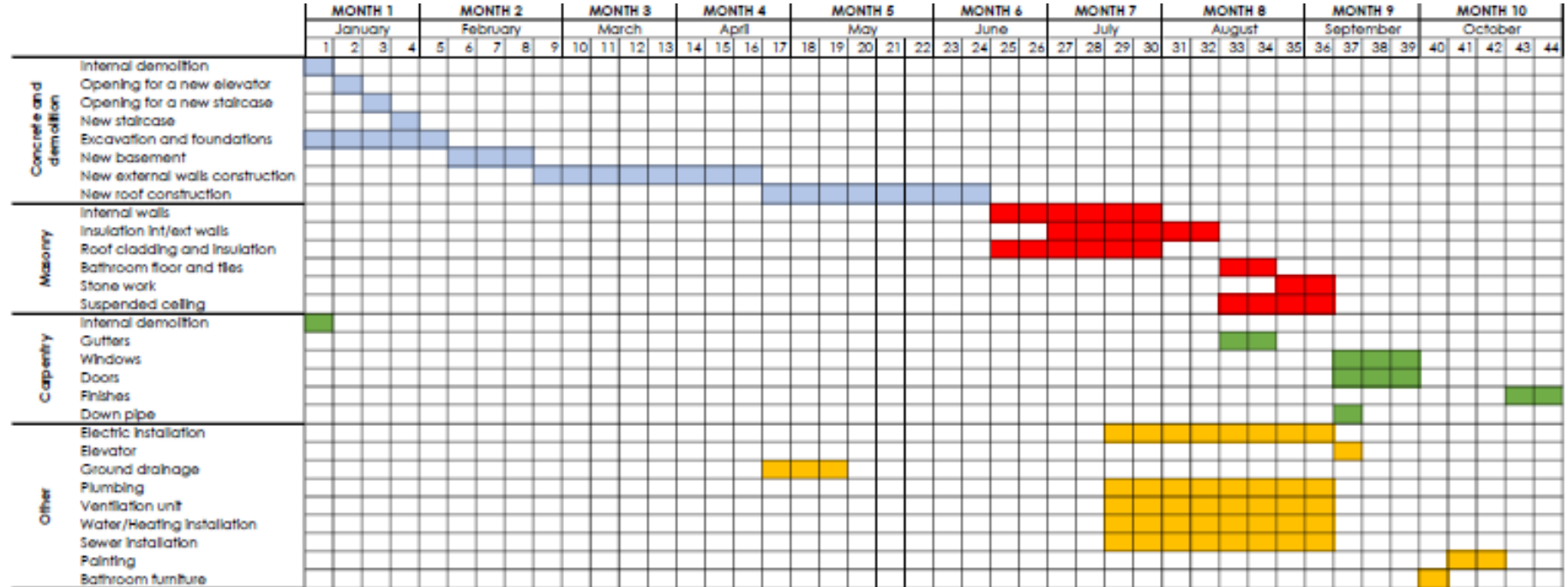
EXECUTION PHASE	AMOUNT
1.0 Excavation	22.750,20€
1.1 Structure	340.353,75€
1.2 Insulation and impermeabilization	115.535€
1.3 Masonry	6.723,05€
1.4 Roof	115.352,27€
1.5 Cladding	156.875,33€
1.6 Pavements and skirting	127.589,55€
1.7 Furniture	6.219,16€
1.8 Carpentry	57.941,02€
1.9 Bathroom accessories	8.846,59€
1.10 Installation	342.118,75€
1.11 Existing house refurbishment	81.548,47€
1.12 Healthy and safety	8.321,98€
TOTAL	1.390.175,12€



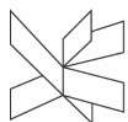
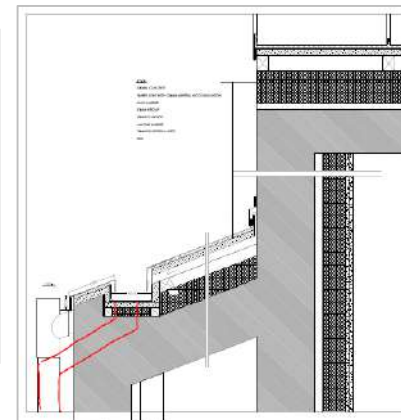
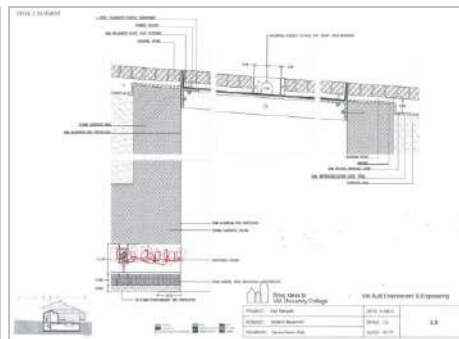
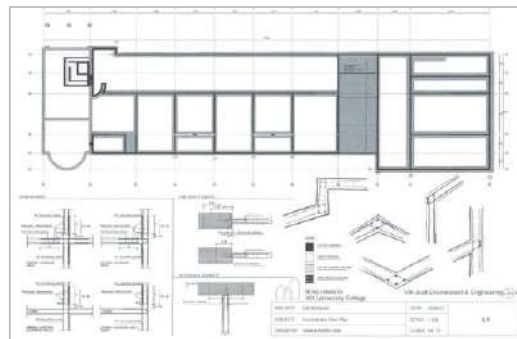
Scheme design Detail I BPM

- Application for a building permit
- Building site plan
- Construction cost estimate
- **Time schedule**
- **Quality assurance**

TIME SCHEDULE



QUALITY ASSURANCE EXAMPLES



Scheme design Detail I LAW

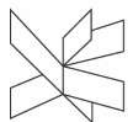
- Case specification

The present general conditions shall apply to contracts for the provision of works and supplies within building and engineering.

Case Specifications

Renovation of Can Marquès

*08450 Llinars del Vallès, Barcelona
Sandra Martín / AH73-A17
February 2018*



Detail II: marble trade

BDS

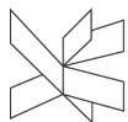
- Floor plans
- Sections
- Details

BPM

- Follow up of fee
- Building site plan
- Time schedule
- Personal planning
- Drawing list I and II

LAW

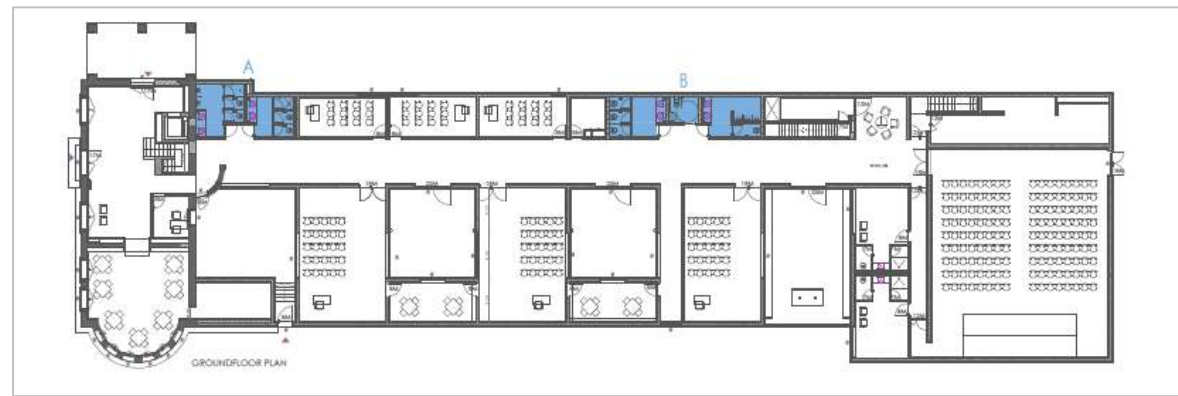
- Work specification
- Tender invitation
- Tender form
- Tender control plan
- Tender time schedule



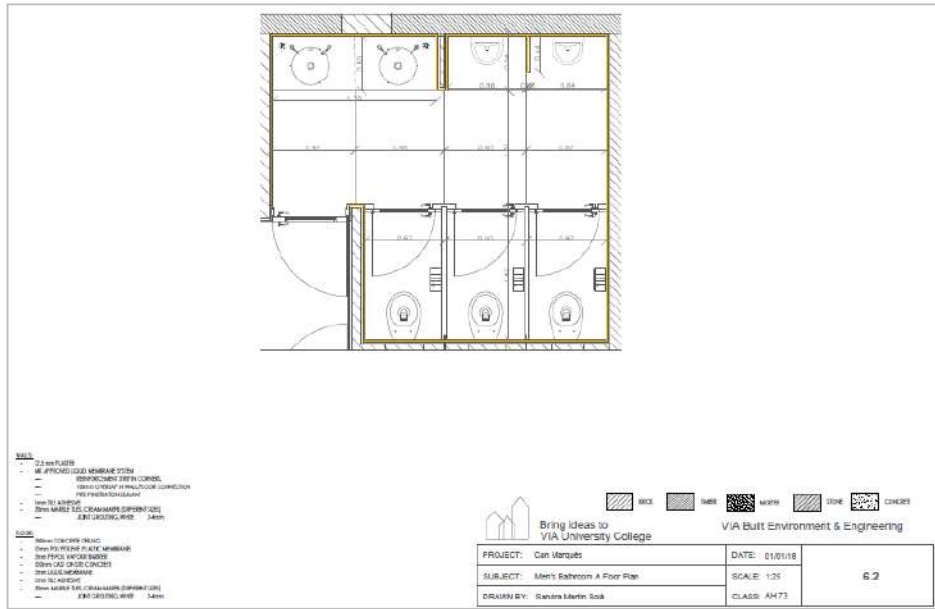
Detail II

BDS

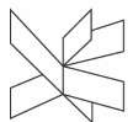
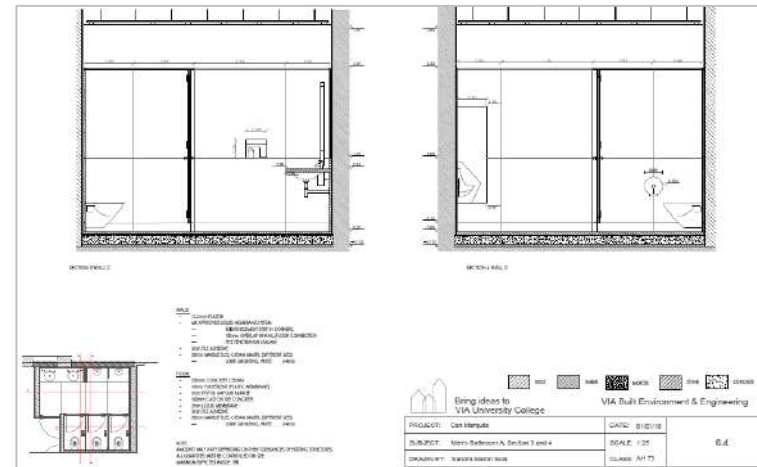
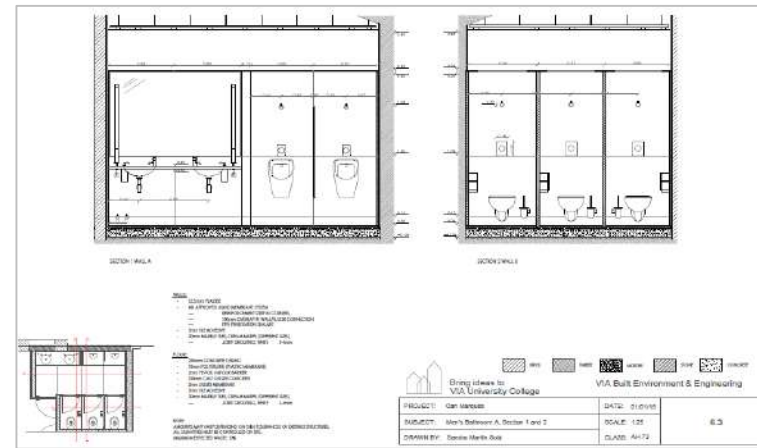
- Floor plans
- Sections
- Details



FLOOR PLAN



SECTIONS

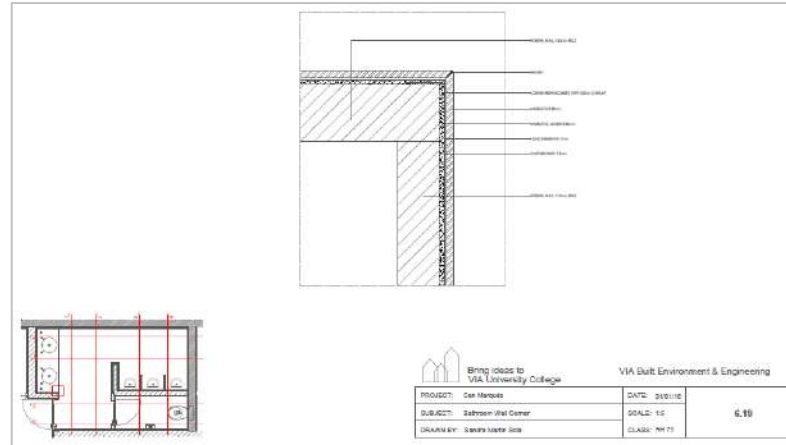


Detail II

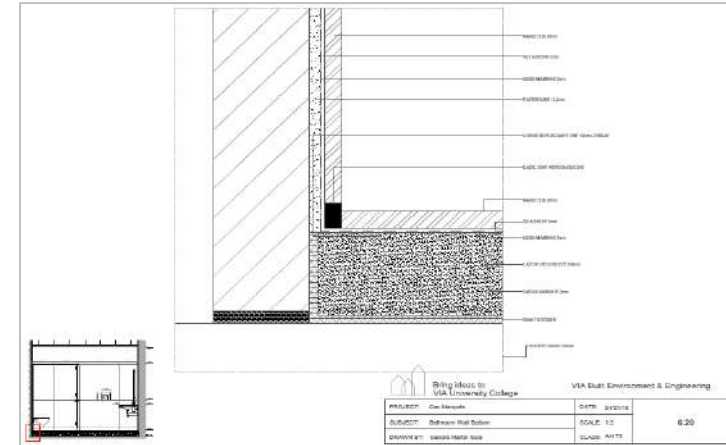
BDS

- Floor plans
- Sections
- **Details**

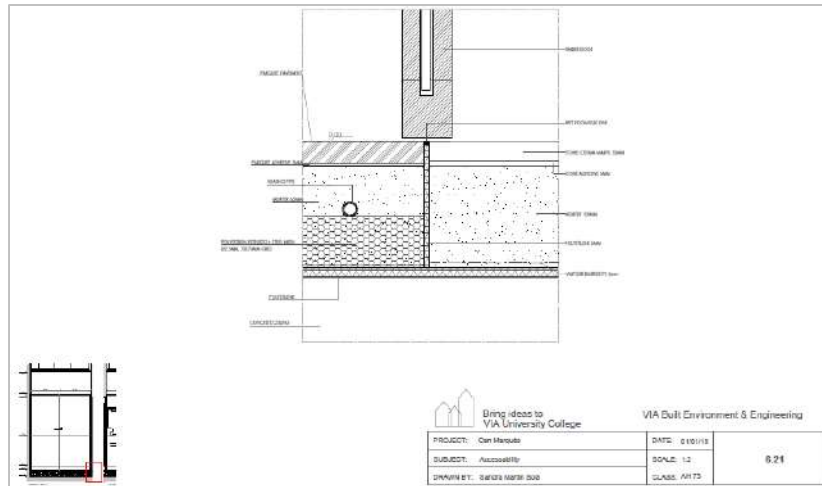
BATHROOM WALL CORNER



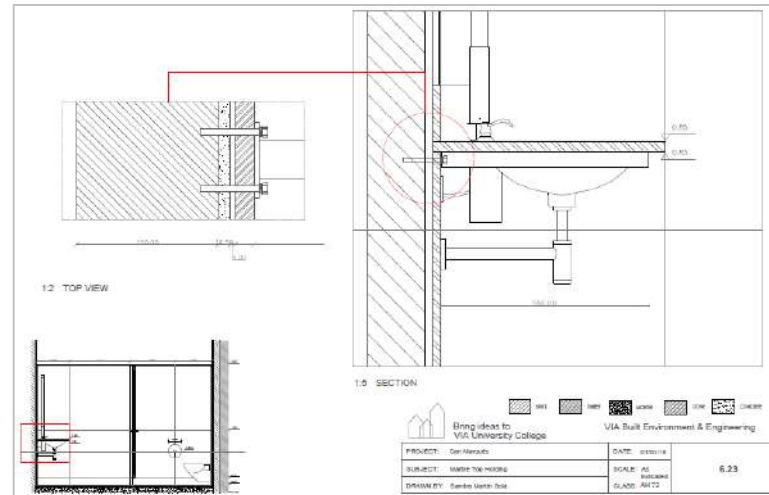
BATHROOM WALL BOTTOM



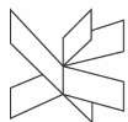
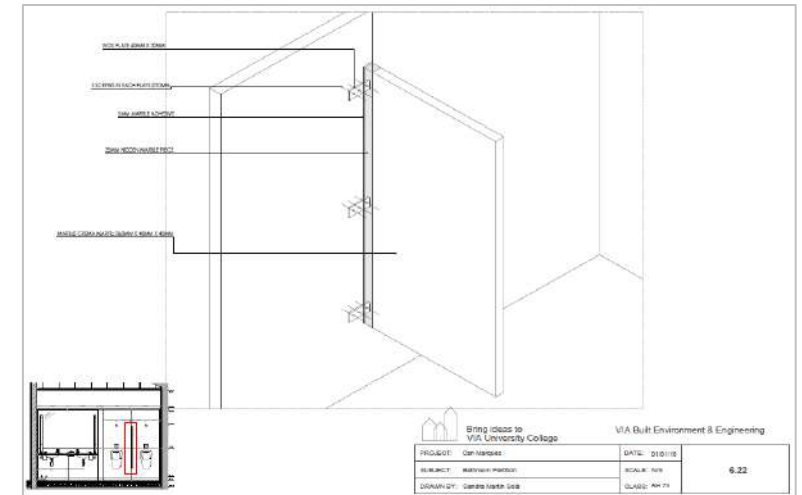
ACCESSIBILITY



MARBLE TOP HOLDING



BATHROOM PARTITION



BUILDING PLANNING MANAGEMENT AND LAW

- Building site plan

- Time schedule

- Personal
planning

- Drawing list I
and II

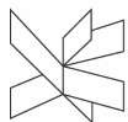
- Work specification

- Tender invitation

- Tender form

- Tender control plan

- Tender time schedule



PROJECT

CLIENT



Outline

Scheme design

Detail I

CONSULTANT



GC 89

Detail II

GC 92



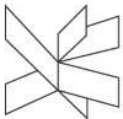
TRADE 1



TRADE 2



TRADE 3...



LAW / BPM

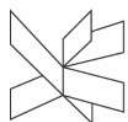


CHANGES GC 92

3. Sub. 5:
40 days for
acceptance period

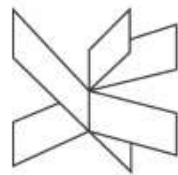
3. Sub. 7:
No security bond
for the client

3. Sub. 25:
Liability of the
client



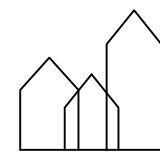
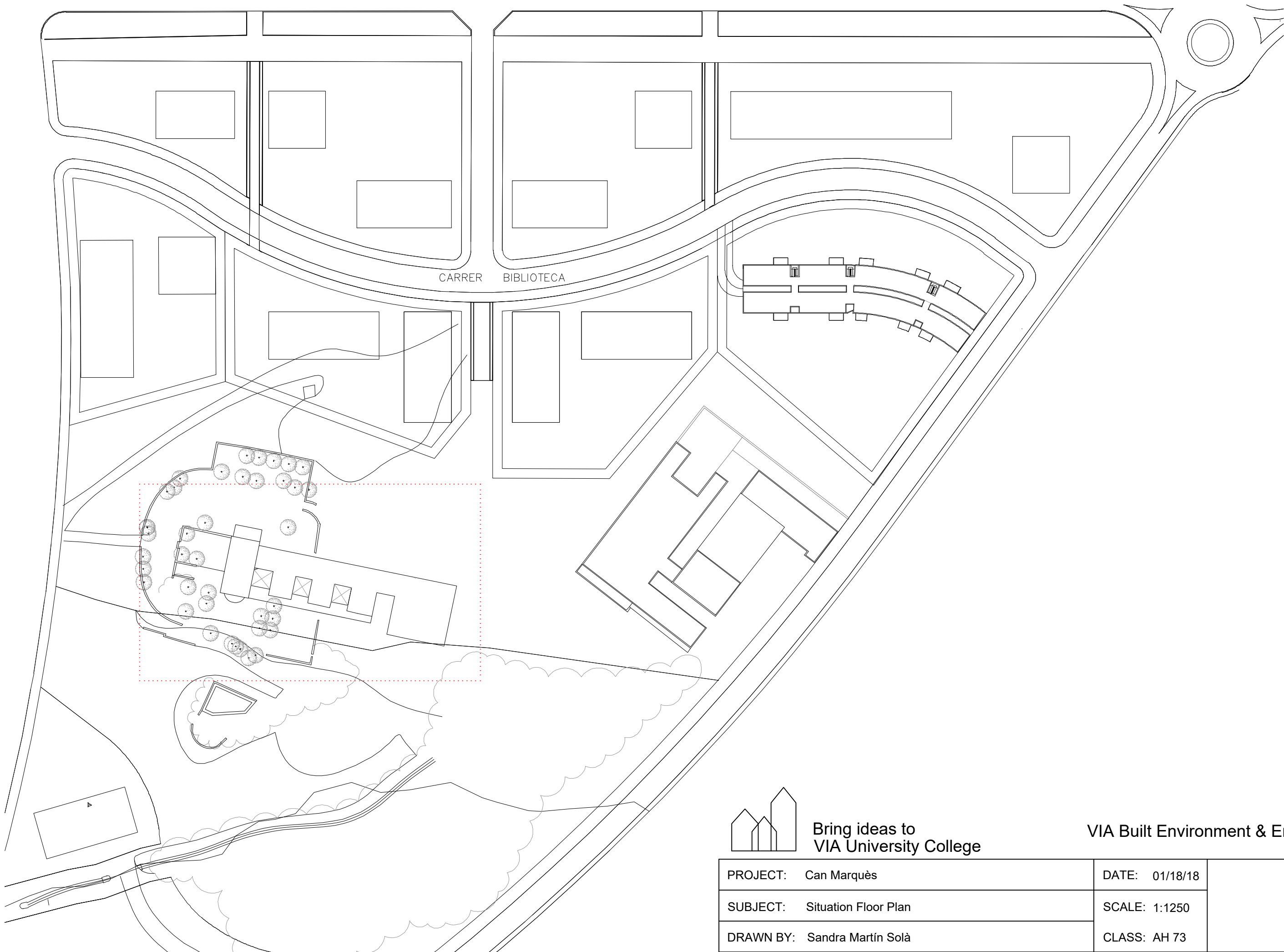
QUESTIONS ?

THANK YOU VERY MUCH FOR YOUR ATTENTION !




Sandra Martín Solà //261238//
Class AH 73

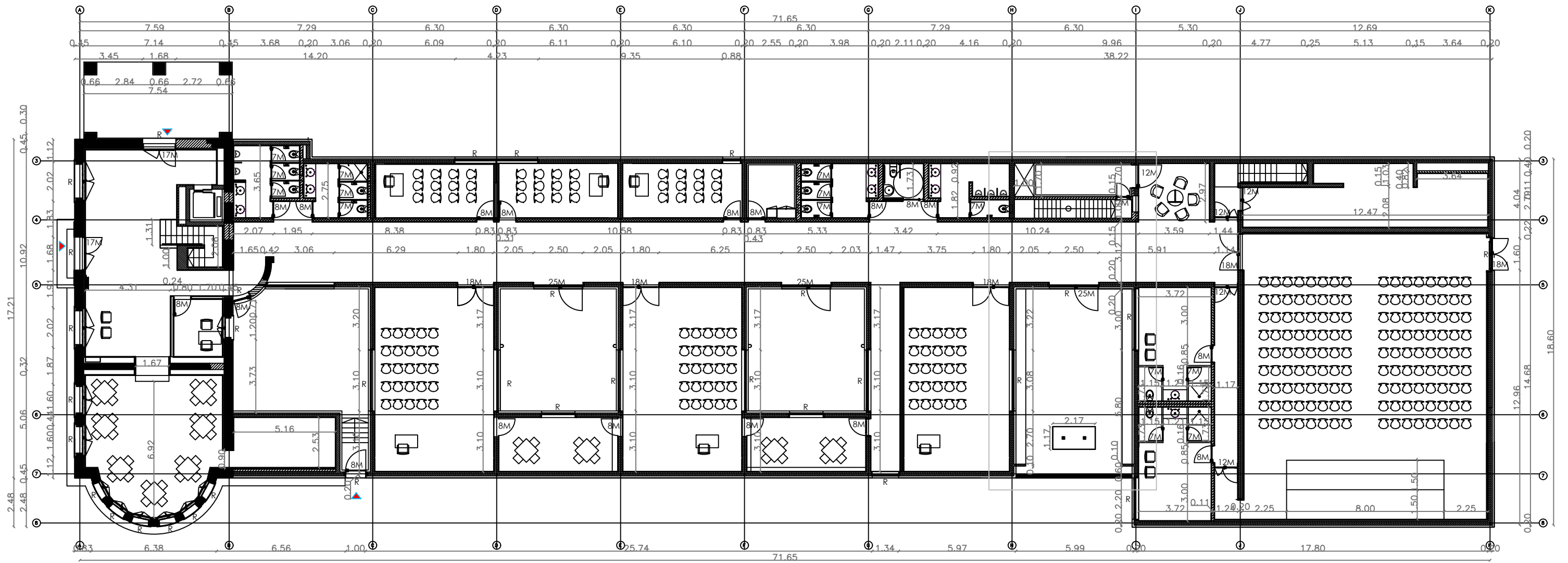
7.7 DOCUMENTO 7 – **MEMORIA GRÁFICA**



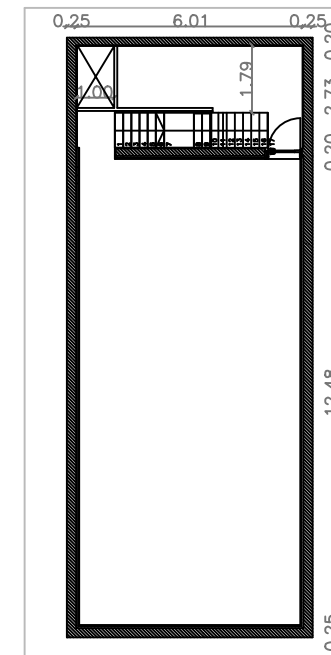
Bring ideas to
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PROJECT: Can Marquès	DATE: 01/18/18	1.0
SUBJECT: Situation Floor Plan	SCALE: 1:1250	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



GROUND FLOOR PLAN



BASEMENT FLOOR PLAN

NEW LOAD BEARING WALLS CONSTRUCTION:

- 200mm Seen concrete
- 60mm Airgap
- 2mm PE-Foil Wind barrier
- 80mm Mineral wool
- Insulation $\lambda=0.034W/mK$
- 2 x 12.5mm Plasterboard

EXISTING LOAD BEARING WALL CONSTRUCTION:

- 20mm Painted mortar
- 420mm Existing load bearing wall
- 10mm Mortar
- Regularization layer
- 50mm Mineral wool
- Insulation $\lambda = 0.034W/mK$
- 2 x 12.5mm Plasterboard

NEW ROOF CONSTRUCTION:

- 1mm Grey Zinc, reflectance 0.32, emittance 0.88
- 2mm PE-Foil Vapour barrier
- 22mm Weatherboard
- pressure Plywood class 3
- 60mm Airgap
- 2mm PE-Foil Wind barrier
- 120mm Mineral wool
- Insulation $\lambda = 0.034W/mK$
- 200mm Concrete

EXISTING ROOF CONSTRUCTION:

- 350mm Ceramic tiles
- 2mm PE-Foil Vapour barrier
- 120mm Polystyrene $\lambda = 0.037W/mK$
- 200mm Concrete

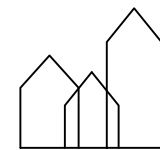
TECHNICAL ROOM PARTITION:

- 180mm Brick
- 125mm Metal stud wall with
- 150mm Mineral wool insulation $\lambda = 0.034W/mK$
- 2 x 12.5mm Plasterboard

NEW PAVEMENT:

- 22mm Pine parquet 3806N, slabs 135x1200mm
- 3mm parquet adhesive
- 50mm mortar
- 50mm polystyrene $\lambda = 0.028W/mK$ and radiant heating
- 10mm Polyethylene $\lambda = 0.028W/mK$
- 250mm Concrete

- 9M DOORS MODULE
- PROJECT NORTH
- PROJECT ZERO
- R RESCUE OPENINGS

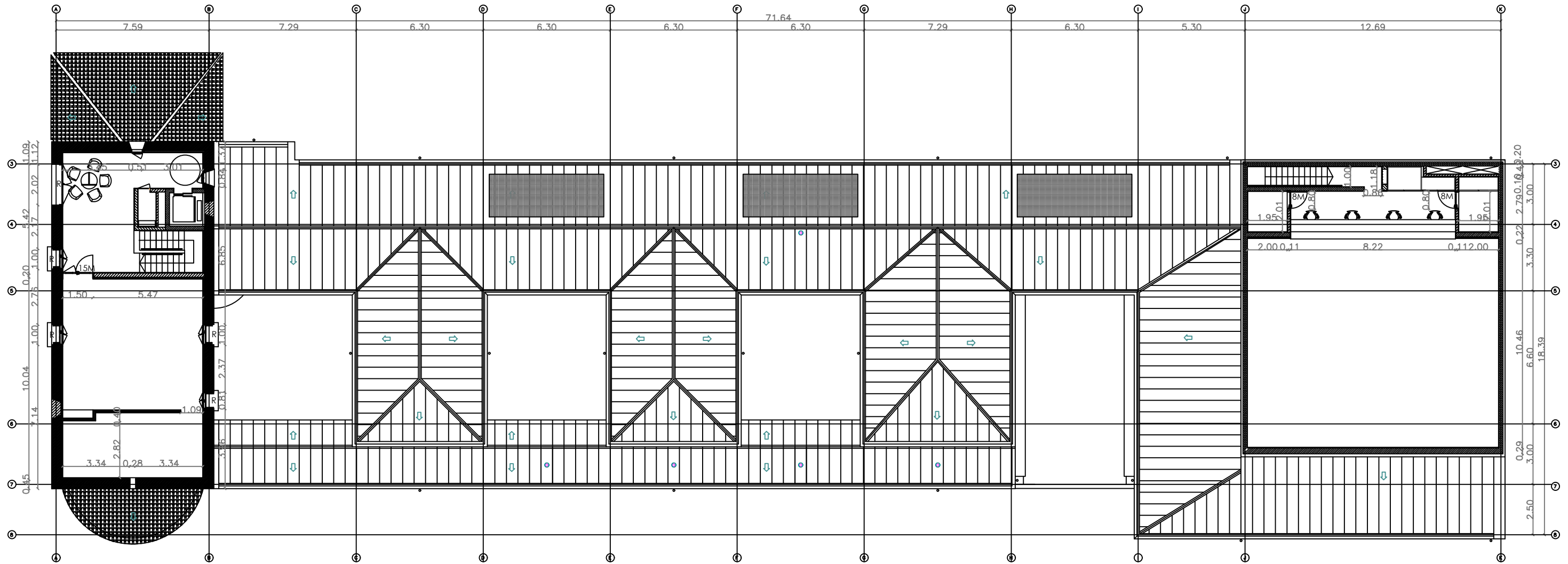


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PROJECT:	Can Marquès	DATE:	10/30/17	1.1
SUBJECT:	Basement and Groundfloor Plan	SCALE:	1:200	
DRAWN BY:	Sandra Martín Solà	CLASS:	AH 73	



FIRST FLOOR PLAN

- NEW LOAD BEARING WALLS CONSTRUCTION:**
- 200mm Seen concrete
 - 60mm Airgap
 - 2mm PE-FOIL Wind barrier
 - 80mm Mineral wool
 - Insulation $\lambda=0.034W/mK$
 - 2 x 12.5mm Plasterboard

- EXISTING LOAD BEARING WALL CONSTRUCTION:**
- 20mm Painted mortar
 - 420mm Existing load bearing wall
 - 10mm Mortar
 - Regularization layer
 - 50mm Mineral wool
 - insulation $\lambda = 0.034W/mK$
 - 2 x 12.5mm Plasterboard

- NEW ROOF CONSTRUCTION:**
- 1mm Grey Zinc, reflectance 0.32, emittance 0.88
 - 2mm PE-FOIL Vapour barrier
 - 22mm Weatherboard
 - pressure Plywood class 3
 - 60mm Airgap
 - 2mm PE-FOIL Wind barrier
 - 120mm Mineral wool
 - insulation $\lambda = 0.034W/mK$
 - 200mm Concrete

- EXISTING ROOF CONSTRUCTION:**
- 350mm Ceramic tiles
 - 2mm PE-FOIL Vapour barrier
 - 120mm Polystyrene $\lambda = 0.037W/mK$
 - 200mm Concrete

- TECHNICAL ROOM PARTITION:**
- 180mm Brick
 - 125mm Metal stud wall with
 - 150mm Mineral wool
 - insulation $\lambda = 0.034W/mK$
 - 2 x 12.5mm Plasterboard

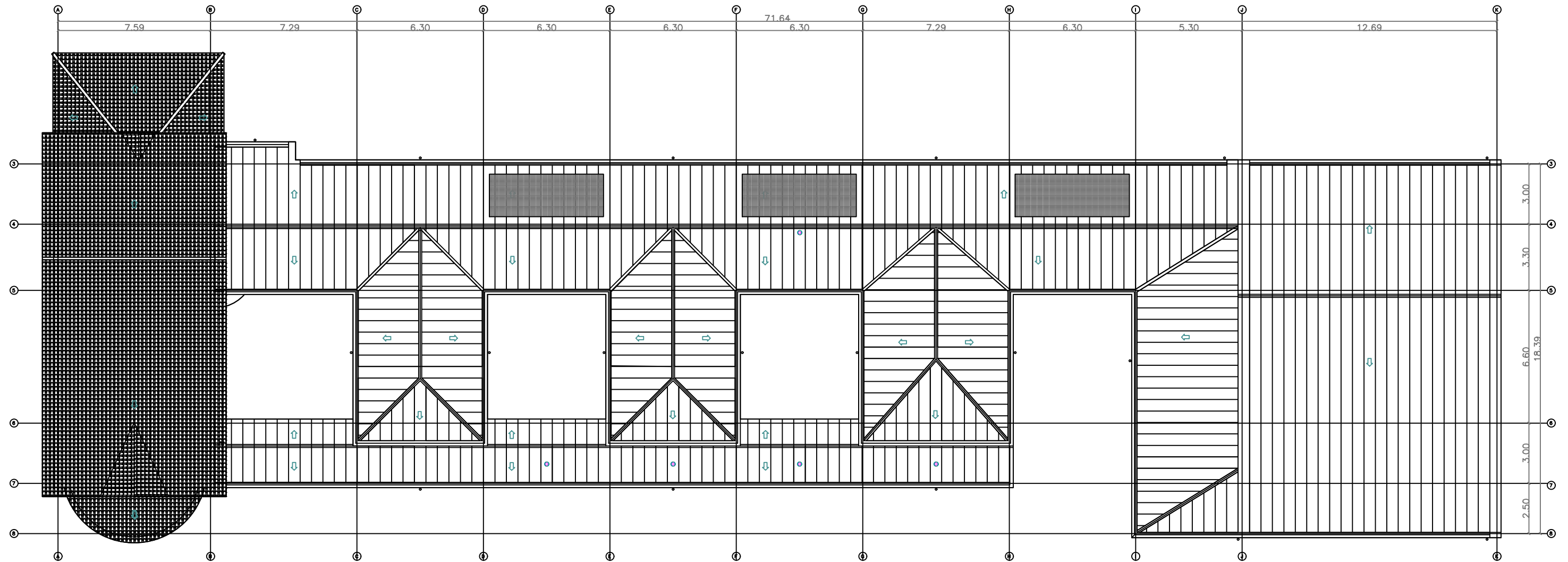
- NEW PAVEMENT:**
- 22mm Pine parquet
 - 3806N, slabs 135x1200mm
 - 3mm parquet adhesive
 - 50mm mortar
 - 50mm polystyrene $\lambda = 0.028W/mK$ and radiant heating
 - 10mm Polyethylene $\lambda = 0.028W/mK$
 - 250mm Concrete

- 9M DOORS MODULE
- PROJECT NORTH
- PROJECT ZERO
- R RESCUE OPENINGS

Bring ideas to
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VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 10/30/17	1.2
SUBJECT: First Floor Plan	SCALE: 1:200	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



ROOF FLOOR PLAN

NEW LOAD BEARING WALLS

- CONSTRUCTION:**
- 200mm Seen concrete
 - 60mm Airgap
 - 2mm PE-FOIL Wind barrier
 - 80mm Mineral wool
 - Insulation $\lambda=0.034W/mK$
 - 2 x 12.5mm Plasterboard

EXISTING LOAD BEARING WALL

- CONSTRUCTION:**
- 20mm Painted mortar
 - 420mm Existing load bearing wall
 - 10mm Mortar
 - Regularization layer
 - 50mm Mineral wool
 - insulation $\lambda = 0.034W/mK$
 - 2 x 12.5mm Plasterboard

NEW ROOF CONSTRUCTION:

- 1mm Grey Zinc, reflectance 0.32, emittance 0.88
- 2mm PE-FOIL Vapour barrier
- 22mm Weatherboard pressure Plywood class 3
- 60mm Airgap
- 2mm PE-FOIL Wind barrier
- 120mm Mineral wool
- insulation $\lambda = 0.034W/mK$
- 200mm Concrete

EXISTING ROOF CONSTRUCTION:

- 350mm Ceramic tiles
- 2mm PE-FOIL Vapour barrier
- 120mm Polystyrene $\lambda = 0.037W/mK$
- 200mm Concrete

TECHNICAL ROOM PARTITION:

- 180mm Brick
- 125mm Metal stud wall with
- 150mm Mineral wool
- insulation $\lambda = 0.034W/mK$
- 2 x 12.5mm Plasterboard

NEW PAVEMENT:

- 22mm Pine parquet 3806N, slabs 135x1200mm
- 3mm parquet adhesive
- 50mm mortar
- 50mm polystyrene $\lambda = 0.028W/mK$ and radiant heating
- 10mm Polyethylene $\lambda = 0.028W/mK$
- 250mm Concrete

9M DOORS MODULE

PROJECT NORTH

PROJECT ZERO

R RESCUE OPENINGS

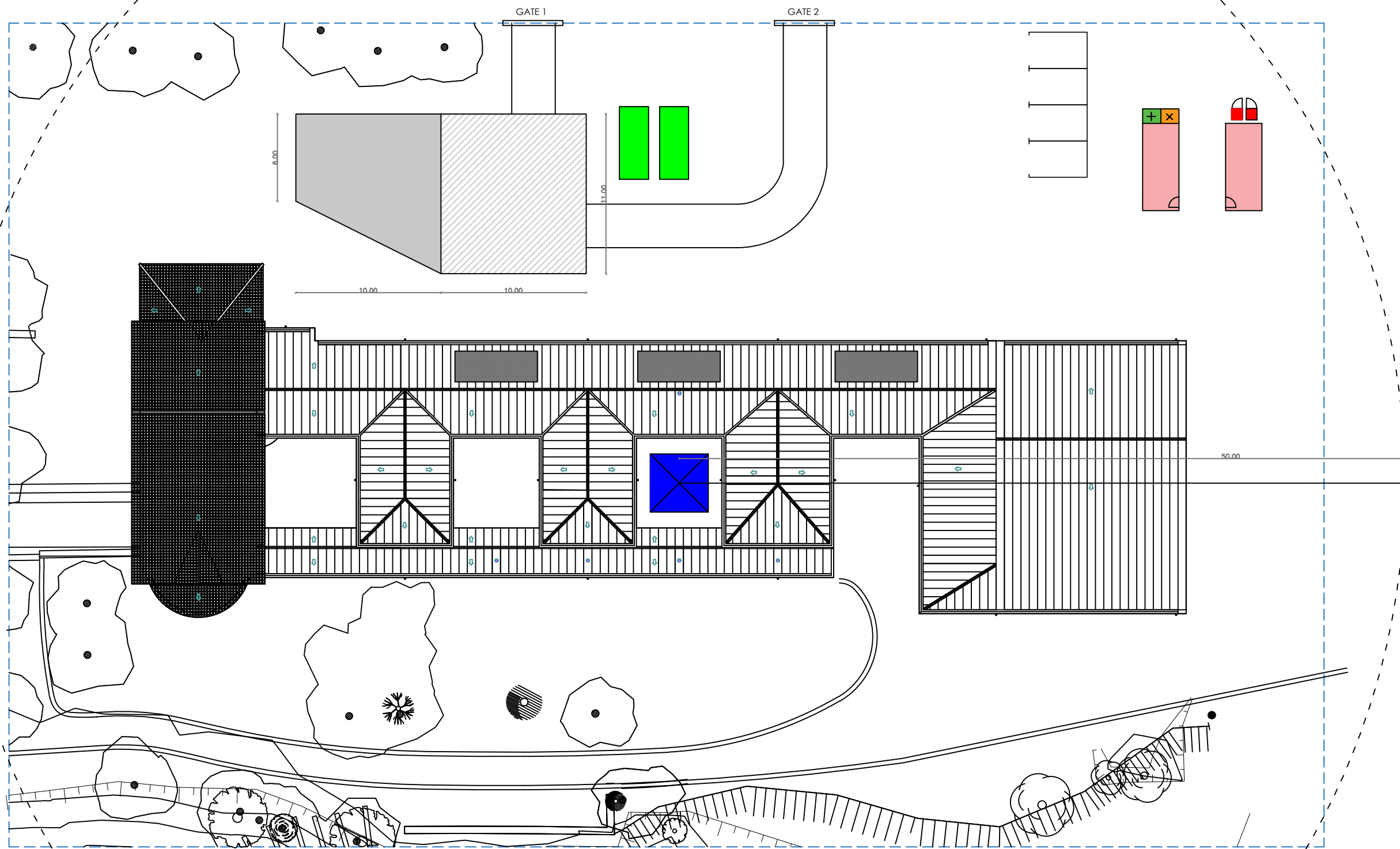










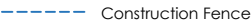



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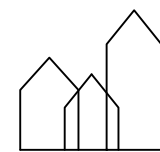
VIA Built Environment & Engineering




PROJECT: Can Marquès	DATE: 10/30/17	1.3
SUBJECT: Roof Floor Plan	SCALE: 1:200	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



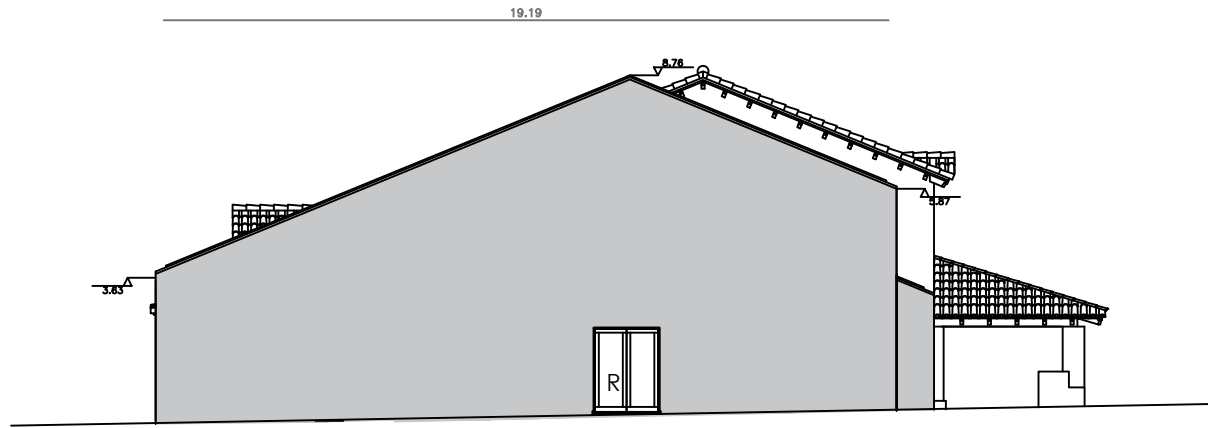
-  First Aid
-  Records of Toxics
-  Site Office
-  Waste Containers
-  Toilets
-  Parking
-  Loading Zone
-  Storage Zone
-  Construction Fence
-  Crane Fence
-  Crane
-  GATE Building Site Entrance



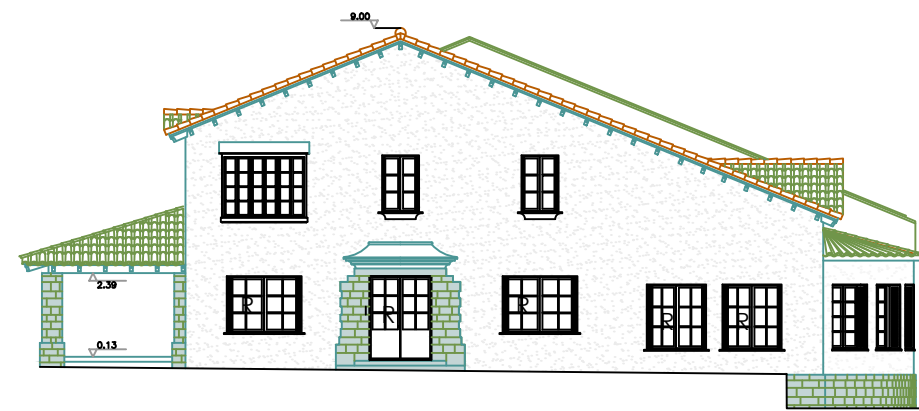
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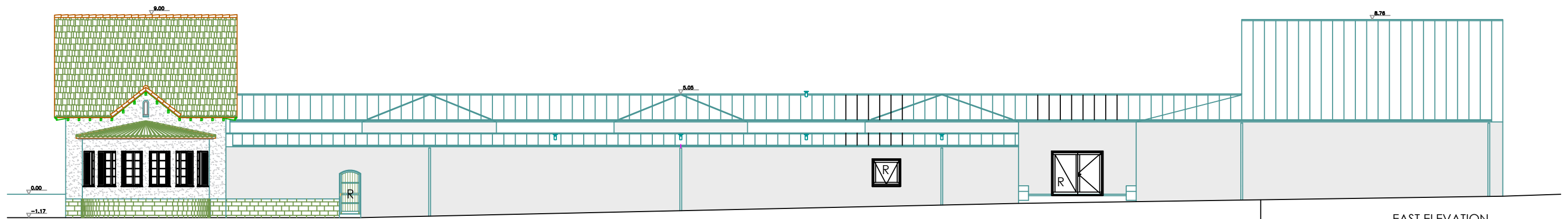
PROJECT: Can Marquès	DATE: 12/27/17	1.4
SUBJECT: Building Site Plan	SCALE: 1:300	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



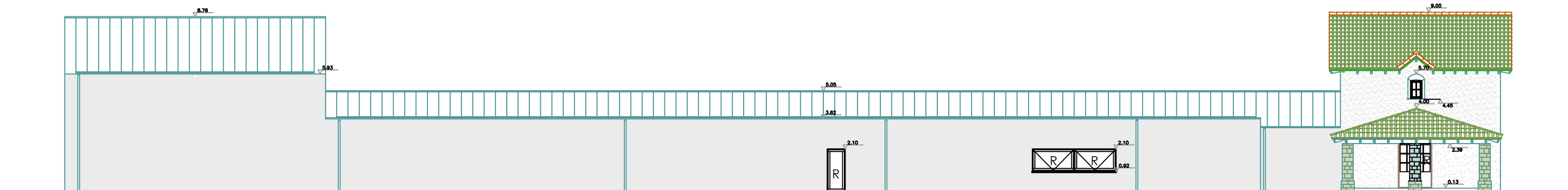
NORTH ELEVATION









SOUTH ELEVATION



EAST ELEVATION



WEST ELEVATION

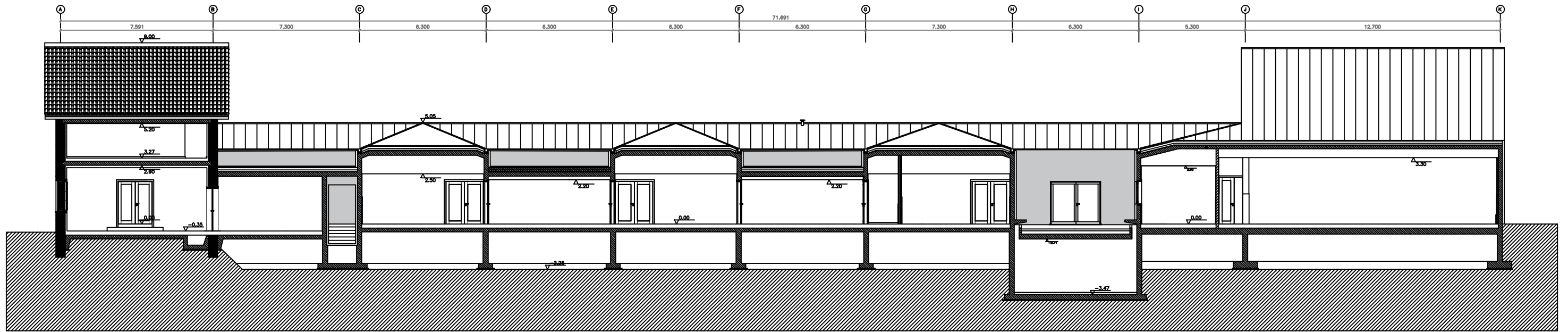
-  CERAMIC TILES
-  STONE
-  ZINC
-  PAINTED MORTAR
-  SEEN CONCRETE
-  PROJECT ZERO
-  RESCUE OPENINGS



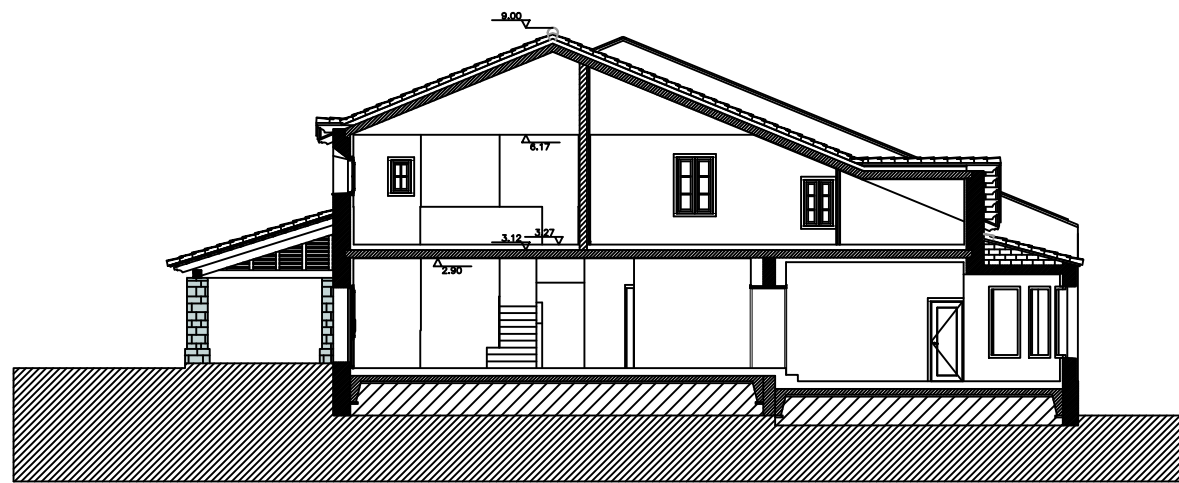
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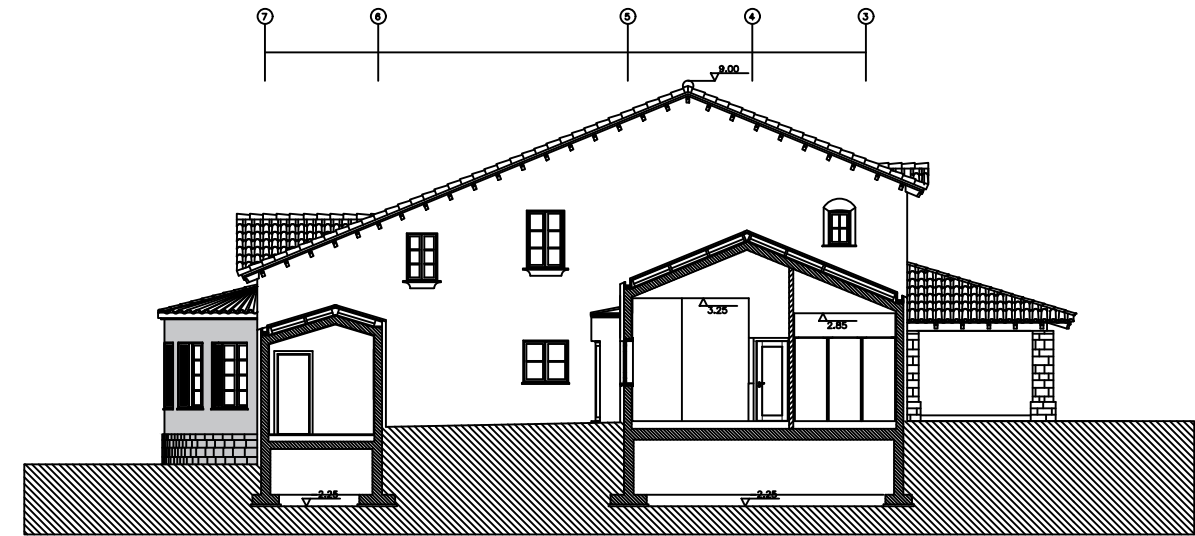
PROJECT: Can Marquès	DATE: 10/30/17	2.1
SUBJECT: Elevations	SCALE: 1:200	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



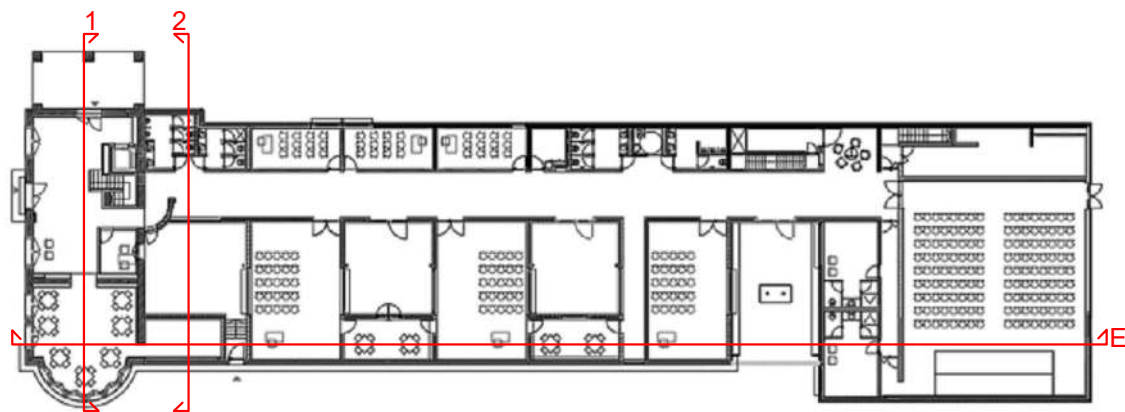
SECTION E








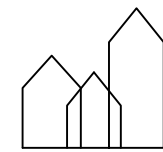
SECTION 1



SECTION 2



-  TERRAIN
-  CONCRETE
-  SEEN CONCRETE
-  BRICK
-  EXISTING BUILDING



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PROJECT: Can Marquès

DATE: 10/30/17

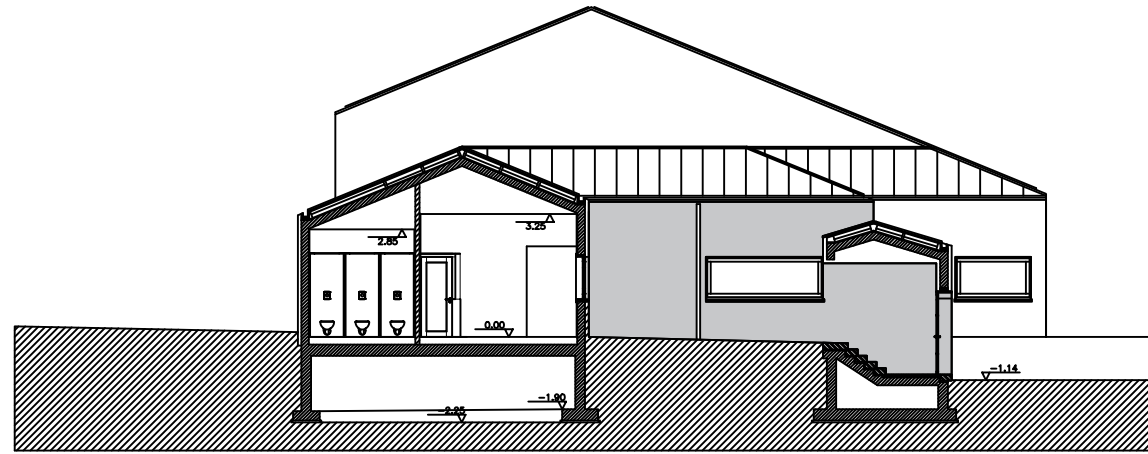
SUBJECT: Section E, 1 and 2

SCALE: 1:200

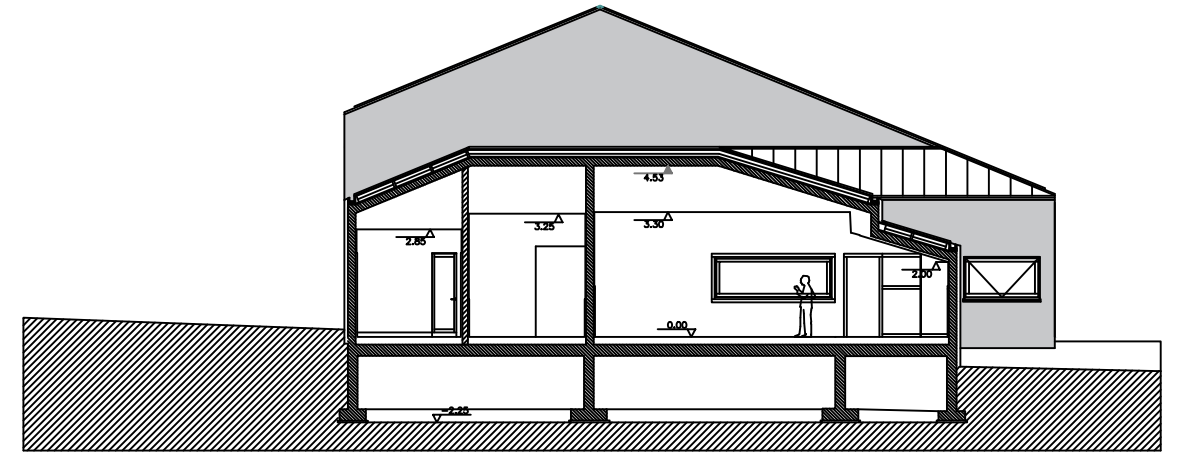
DRAWN BY: Sandra Martín Solà

CLASS: AH 73

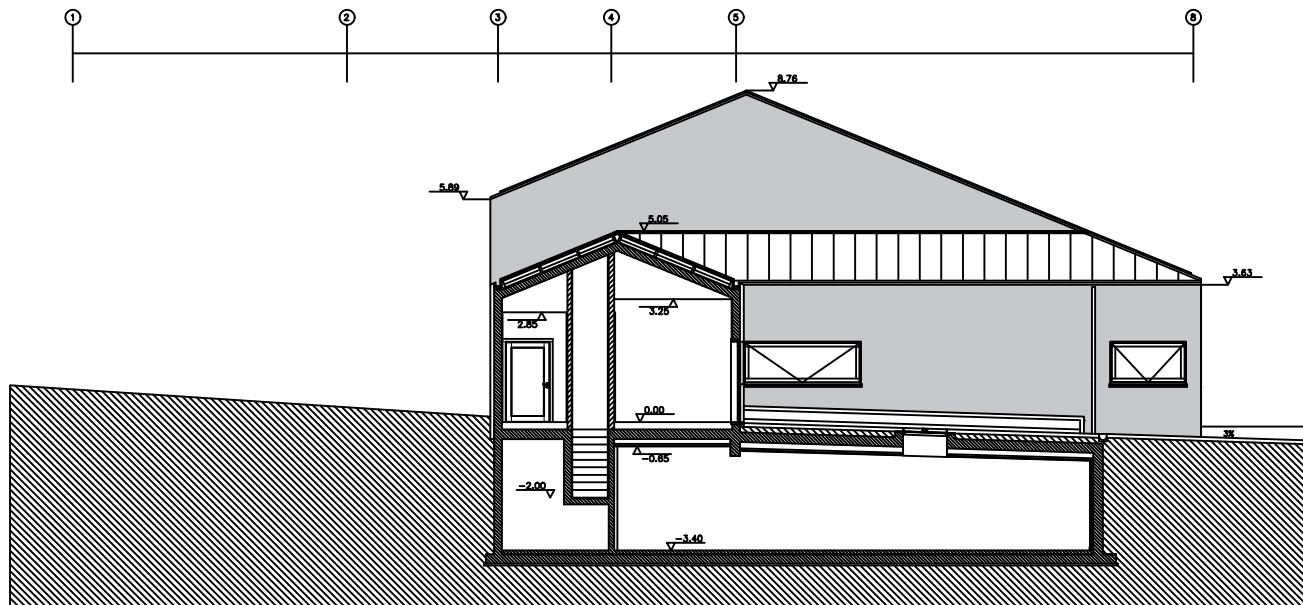
2.4



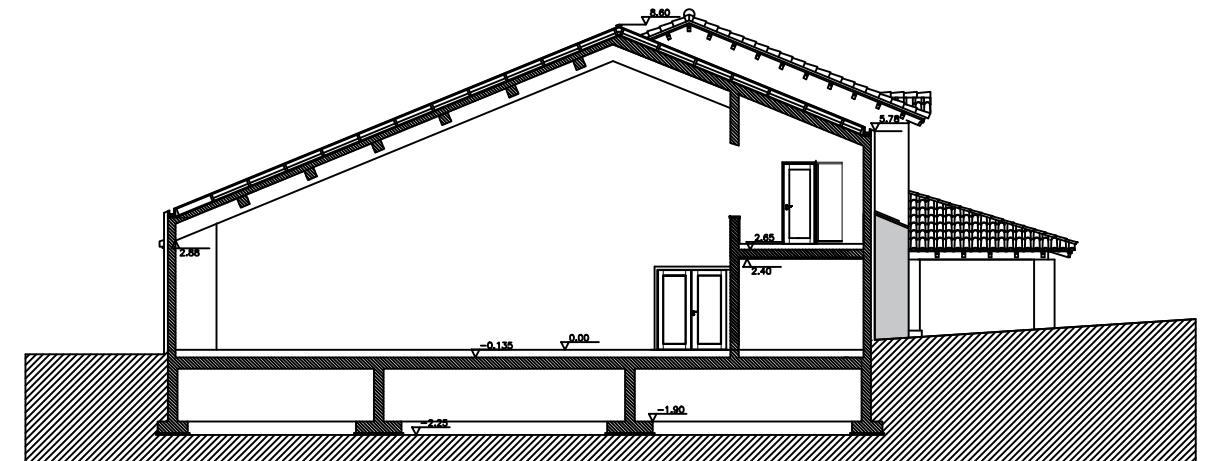
SECTION 3



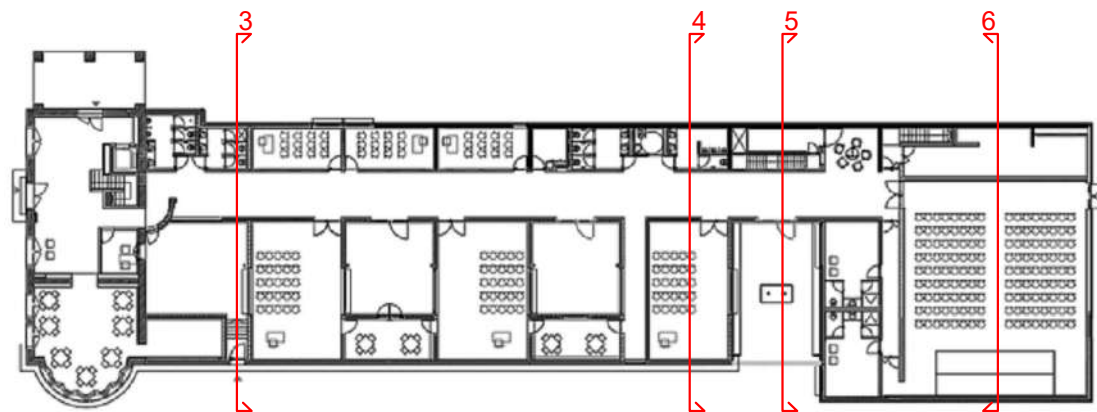
SECTION 4








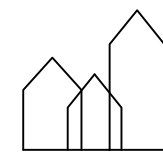
SECTION 5



SECTION 6



-  TERRAIN
-  CONCRETE
-  SEEN CONCRETE
-  BRICK
-  EXISTING BUILDING



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PROJECT: Can Marquès

DATE: 10/30/17

SUBJECT: Section 3, 4, 5 and 6

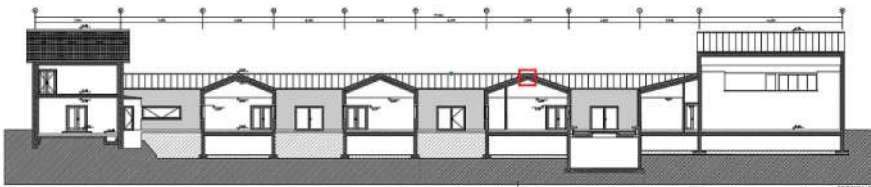
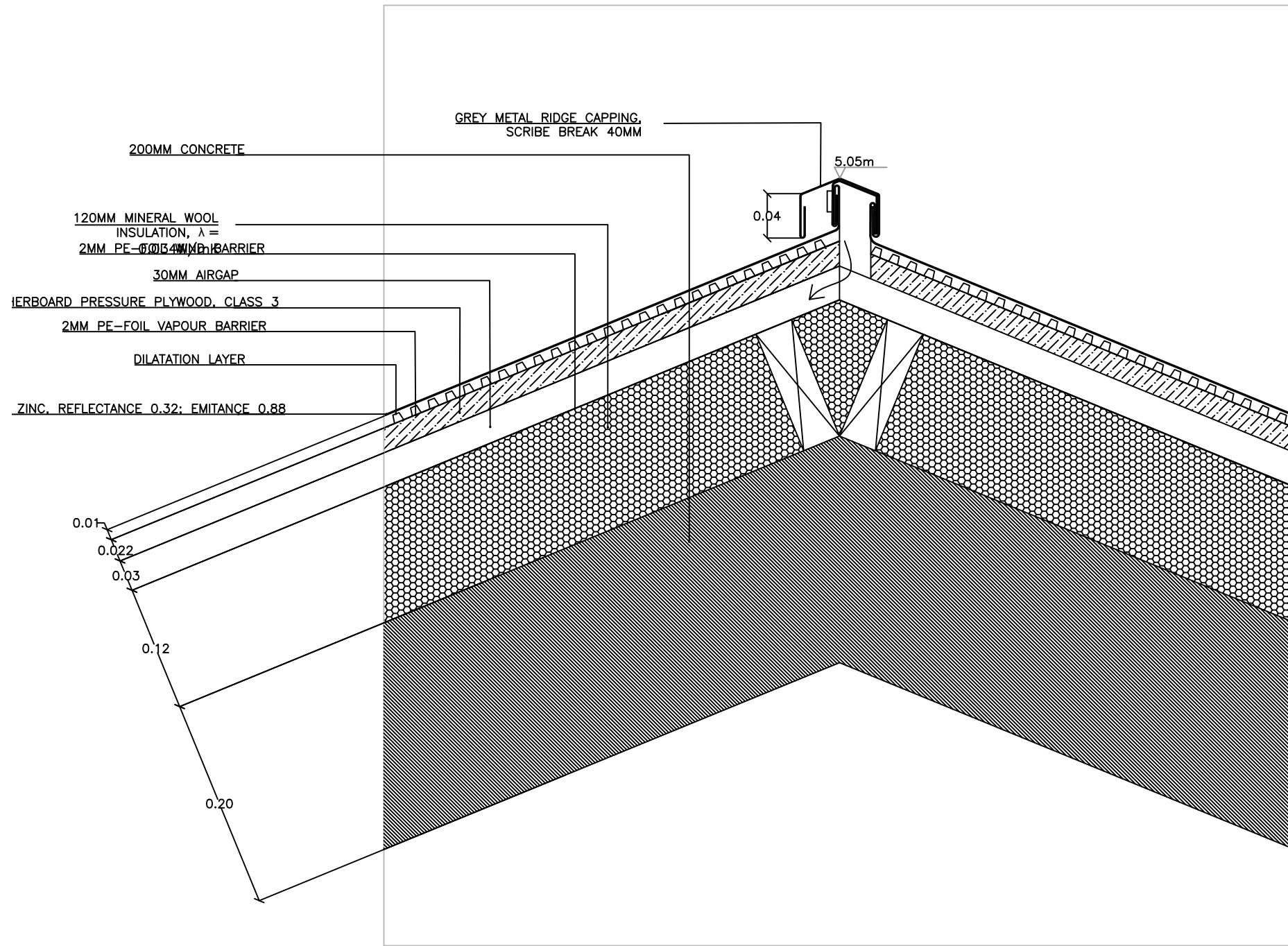
SCALE: 1:200

DRAWN BY: Sandra Martín Solà

CLASS: AH 73

2.5

DETAIL 1. TOP ROOF



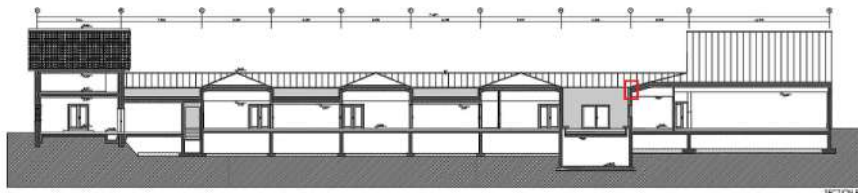
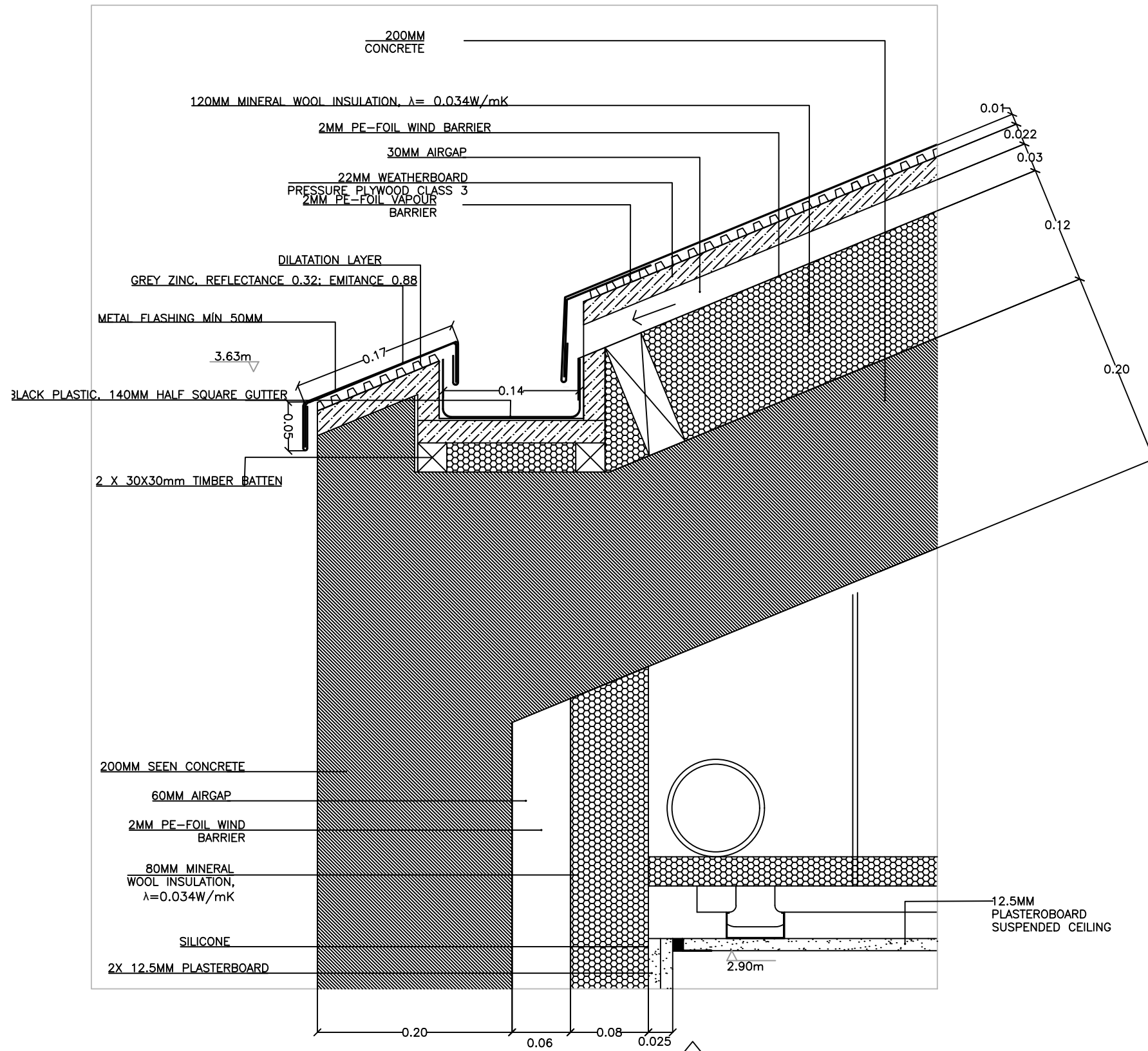
- TERRAIN
 - CONCRETE
 - REGULARIZATION CONCRETE
- BRICK
 - EXISTING BUILDING
 - MINERAL WOOL
- ZINC PLASTER
 - TIMBER

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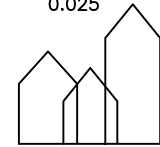
VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 11/05/17	3.1
SUBJECT: Detail 1. Top Roof	SCALE: 1:5	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

DETAIL 2. GUTTER EDGE



- TERRAIN
- CONCRETE
- REGULARIZATION CONCRETE
- BRICK
- EXISTING BUILDING
- MINERAL WOOL
- ZINC
- PLASTER
- TIMBER

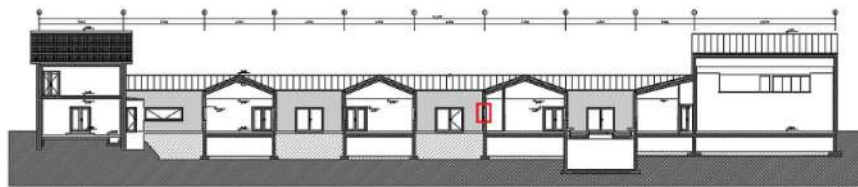
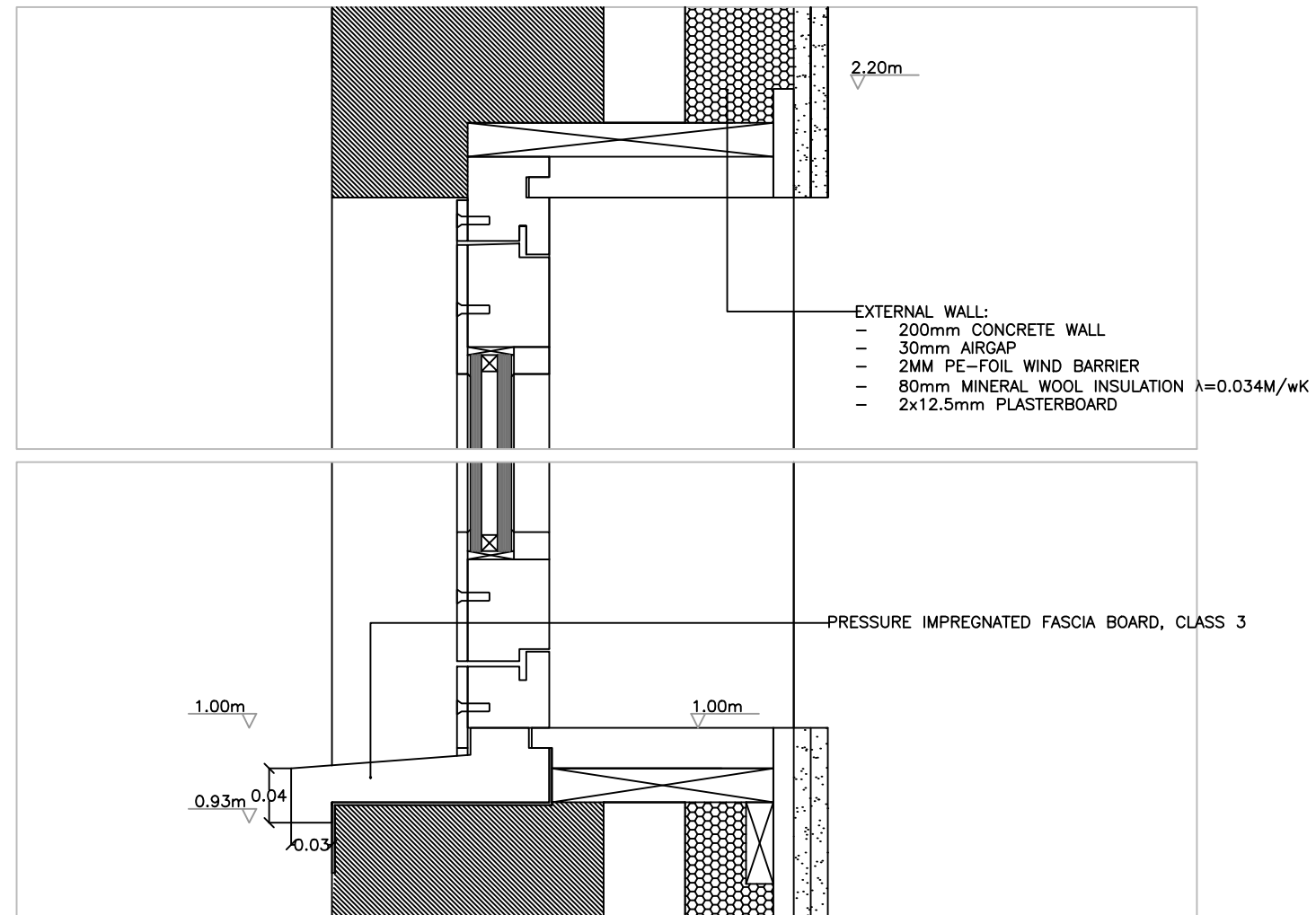


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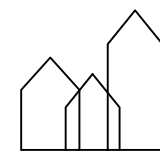
VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 11/05/17	3.2
SUBJECT: Detail 2. Gutter Edge	SCALE: 1:5	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

DETAIL 3. WINDOW-EXTERNAL WALL



- TERRAIN
- CONCRETE
- REGULARIZATION CONCRETE
- BRICK
- EXISTING BUILDING
- MINERAL WOOL
- ZINC
- PLASTER
- TIMBER



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PROJECT: Can Marquès

DATE: 11/13/17

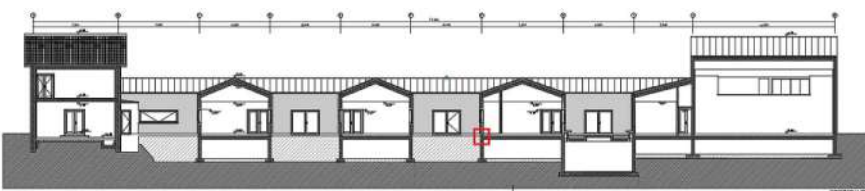
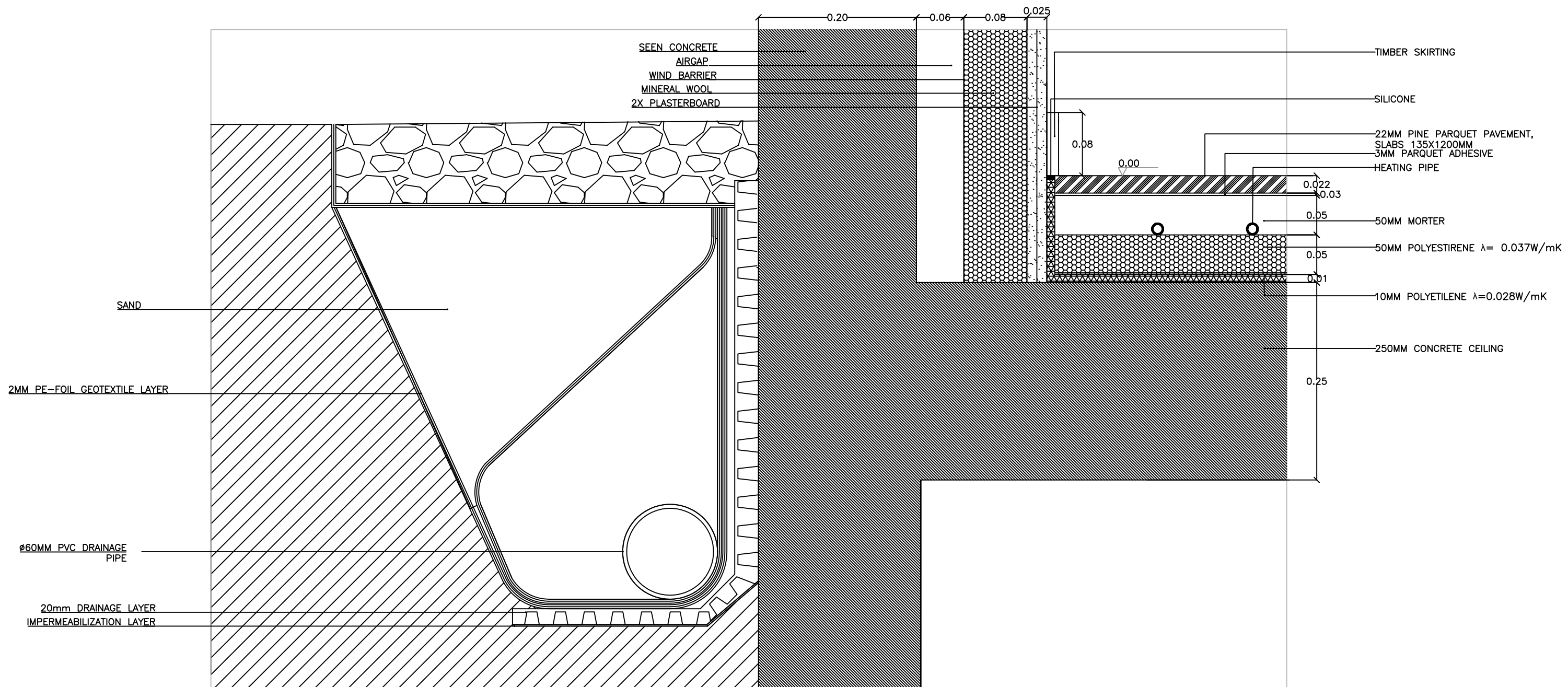
SUBJECT: Detail 3. Window-External wall

SCALE: 1:5

DRAWN BY: Sandra Martín Solà

CLASS: AH 73

DETAIL 4. WALL FOOTING



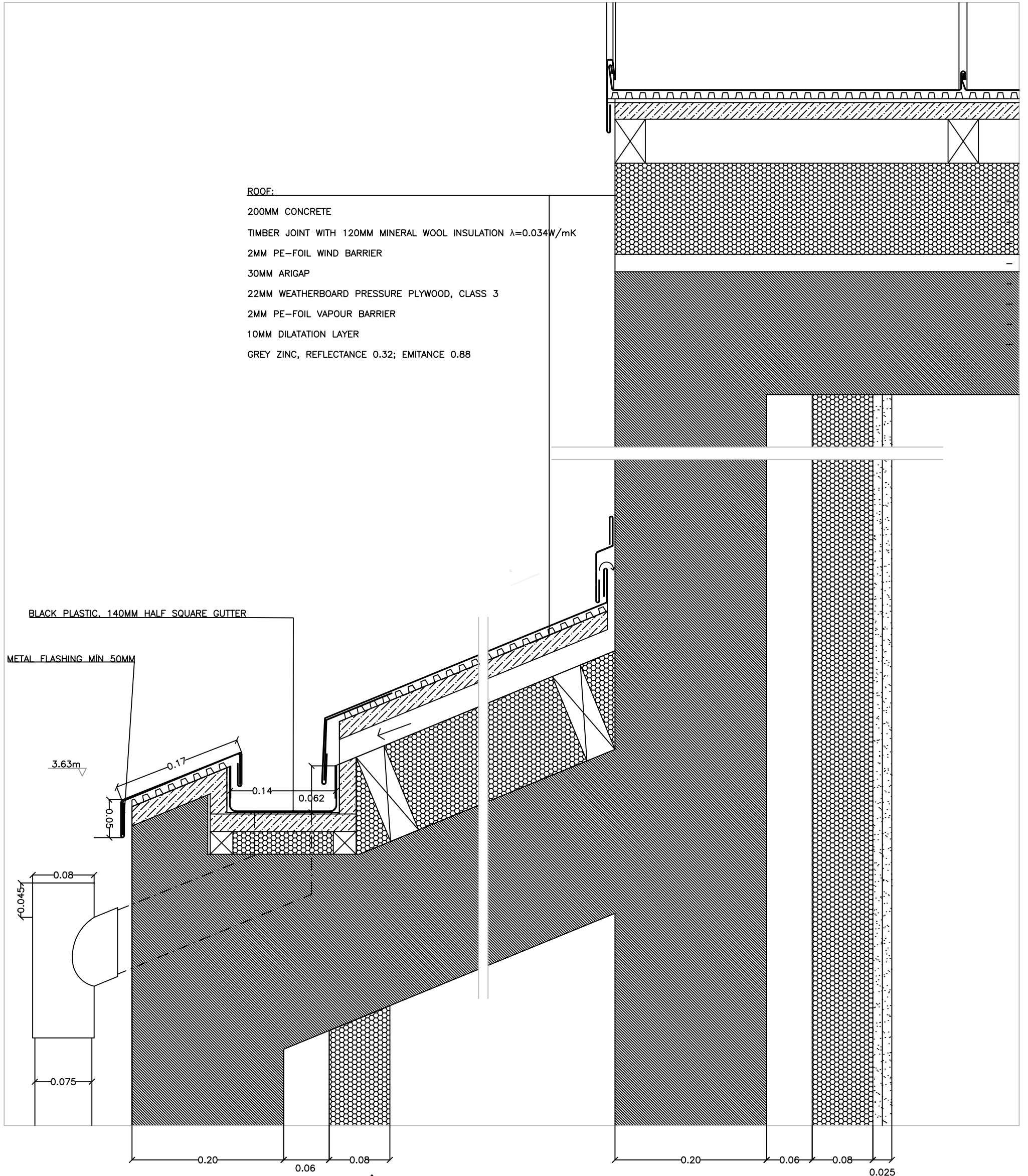
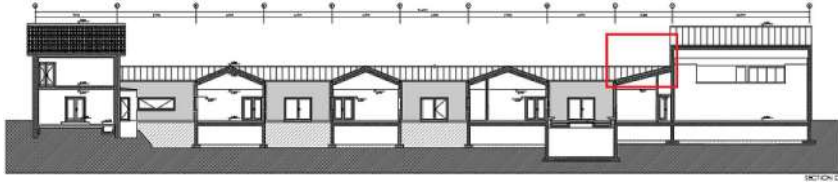
- TERRAIN
- CONCRETE
- REGULARIZATION CONCRETE
- BRICK
- EXISTING BUILDING
- MINERAL WOOL
- ZINC
- PLASTER
- TIMBER

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PROJECT: Can Marquès	DATE: 11/05/17	3.4
SUBJECT: Detail 4. Wall Footing	SCALE: 1:5	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

DETAIL 5. TWO EDGES



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	TERRAIN		BRICK		ZINC
	CONCRETE		EXISTING BUILDING		PLASTER
	REGULARIZATION CONCRETE		MINERAL WOOL		TIMBER

PROJECT: Can Marquès

DATE: 11/05/17

SUBJECT: Detail 5. Two Edges

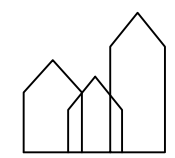
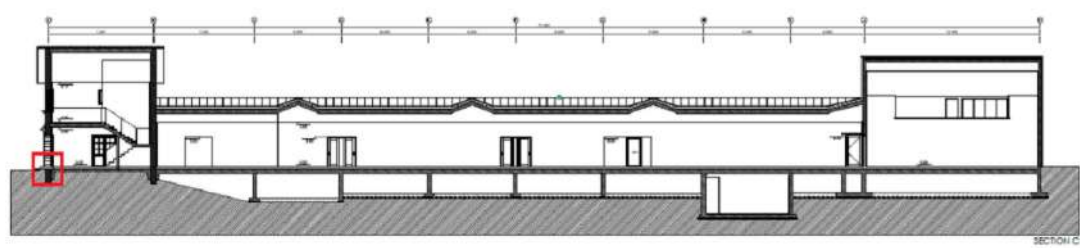
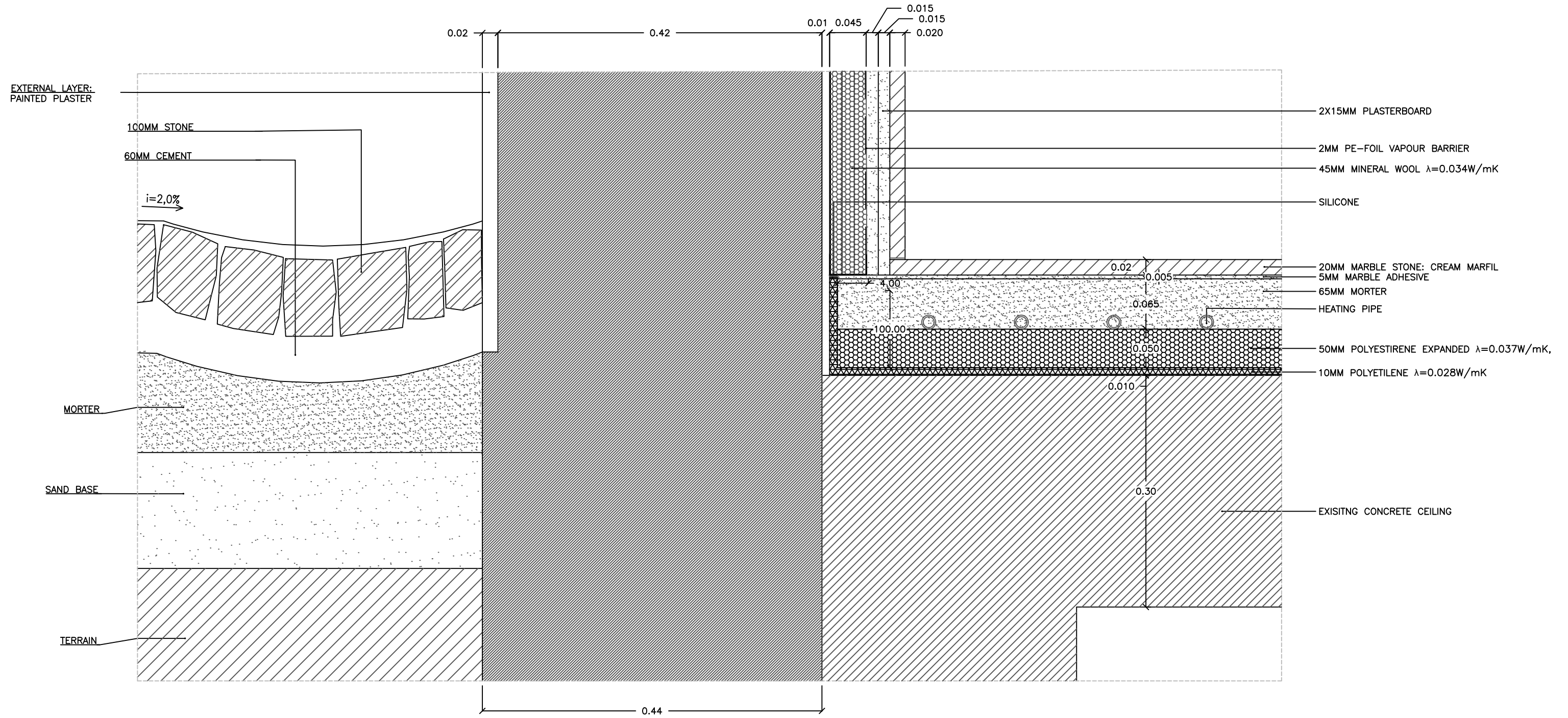
SCALE: 1:5

DRAWN BY: Sandra Martín Solà

CLASS: AH 73

3.5

DETAIL 6. EXISTING FOOTING WALL

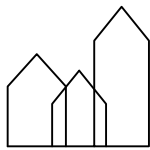
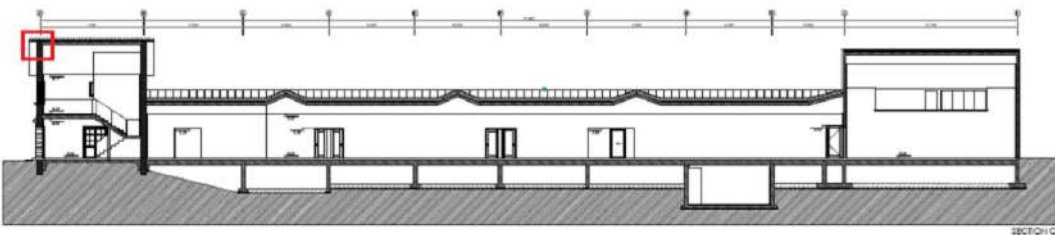
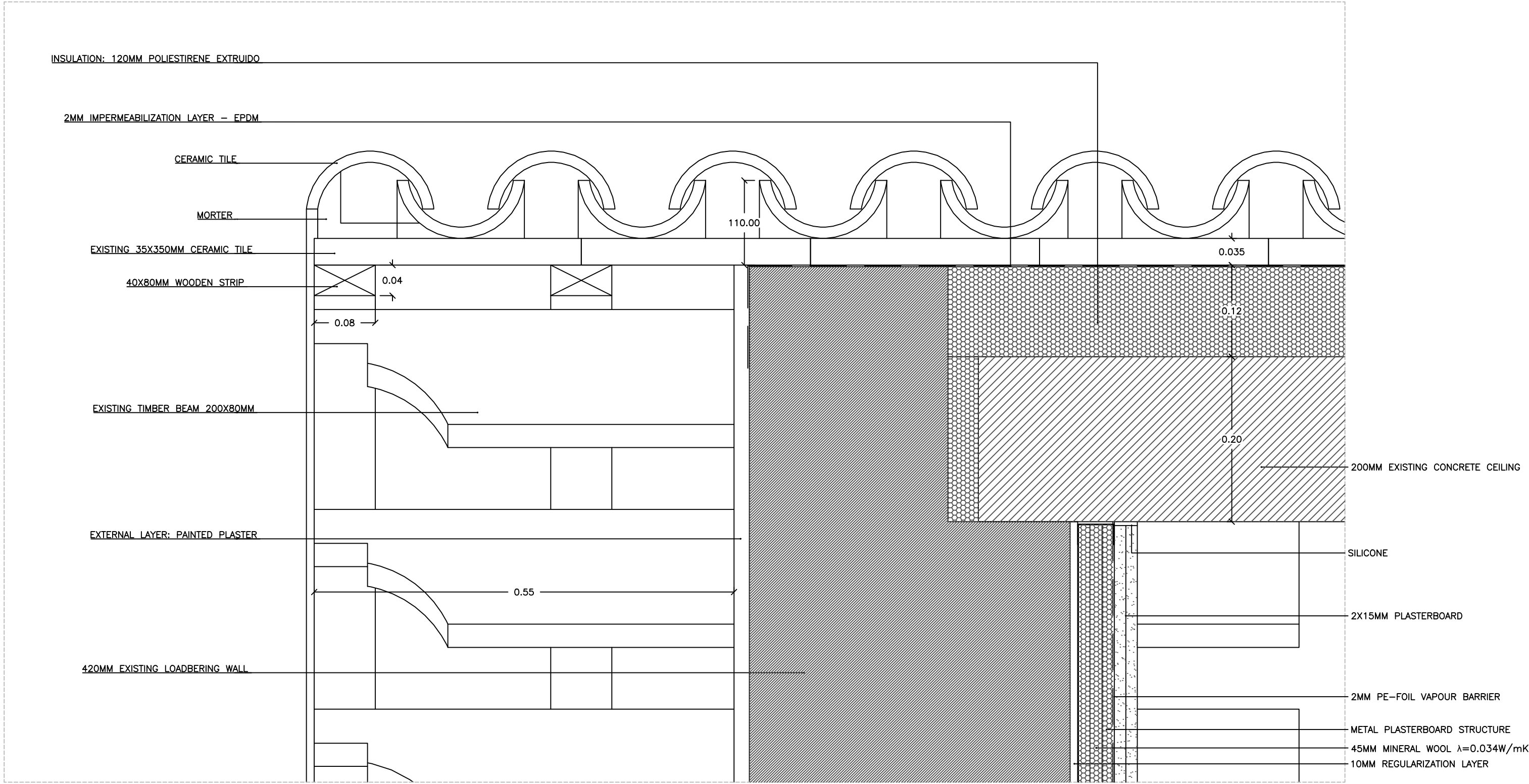


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PROJECT: Can Marquès	DATE: 11/05/17	3.6
SUBJECT: Detail 6. Existing Footing Wall	SCALE: 1:5	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

DETAIL 8. EXISTING ROOF EDGE

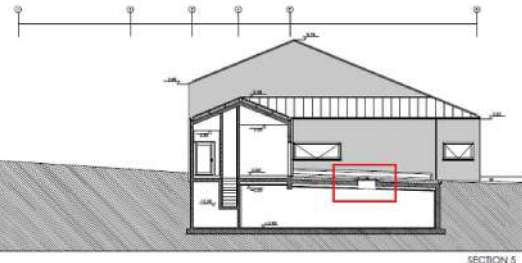
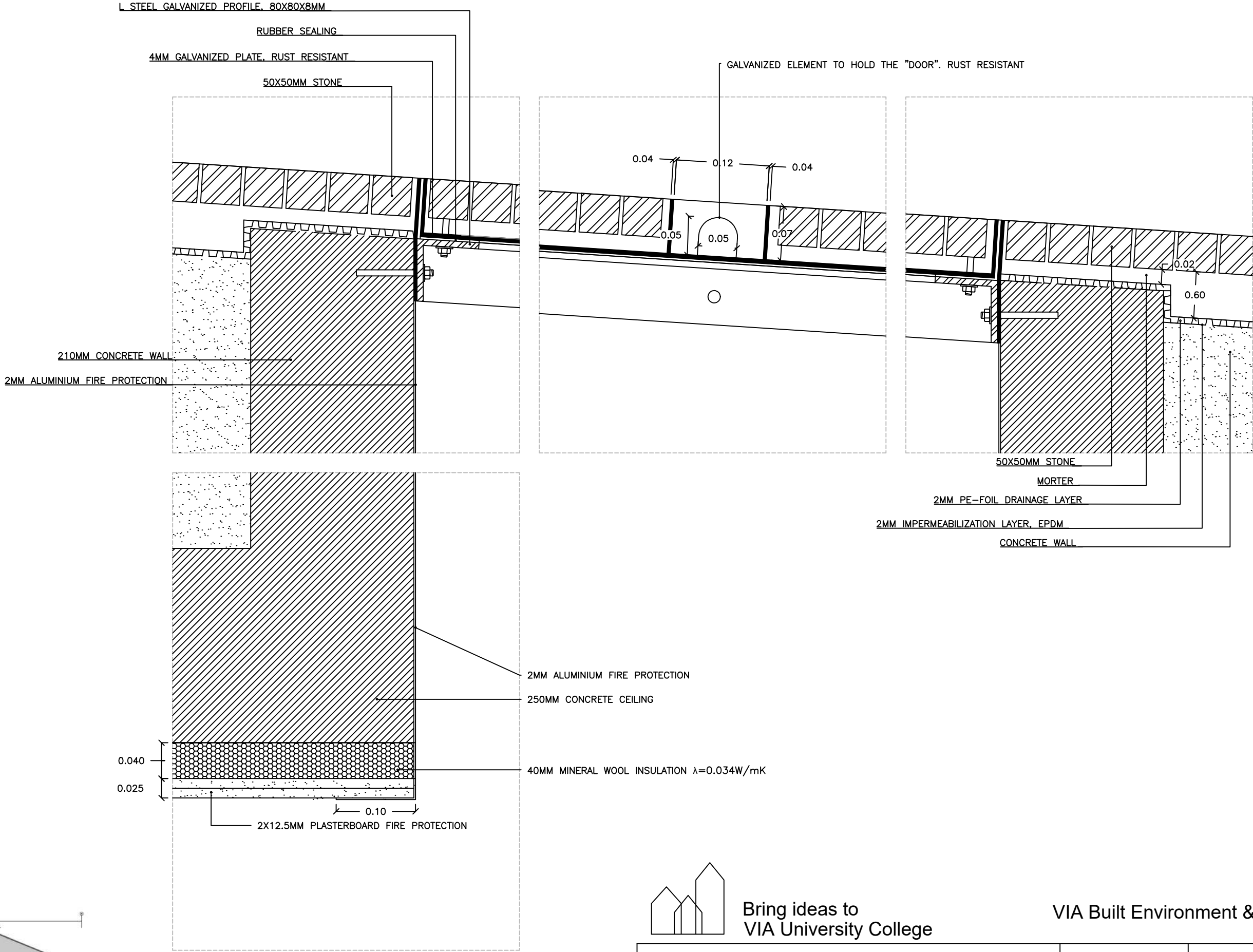


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VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 11/05/17	3.8
SUBJECT: Detail 8. Existing Roof Edge	SCALE: 1:5	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

DETAIL 9. BASEMENT



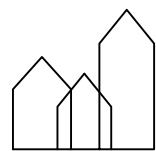
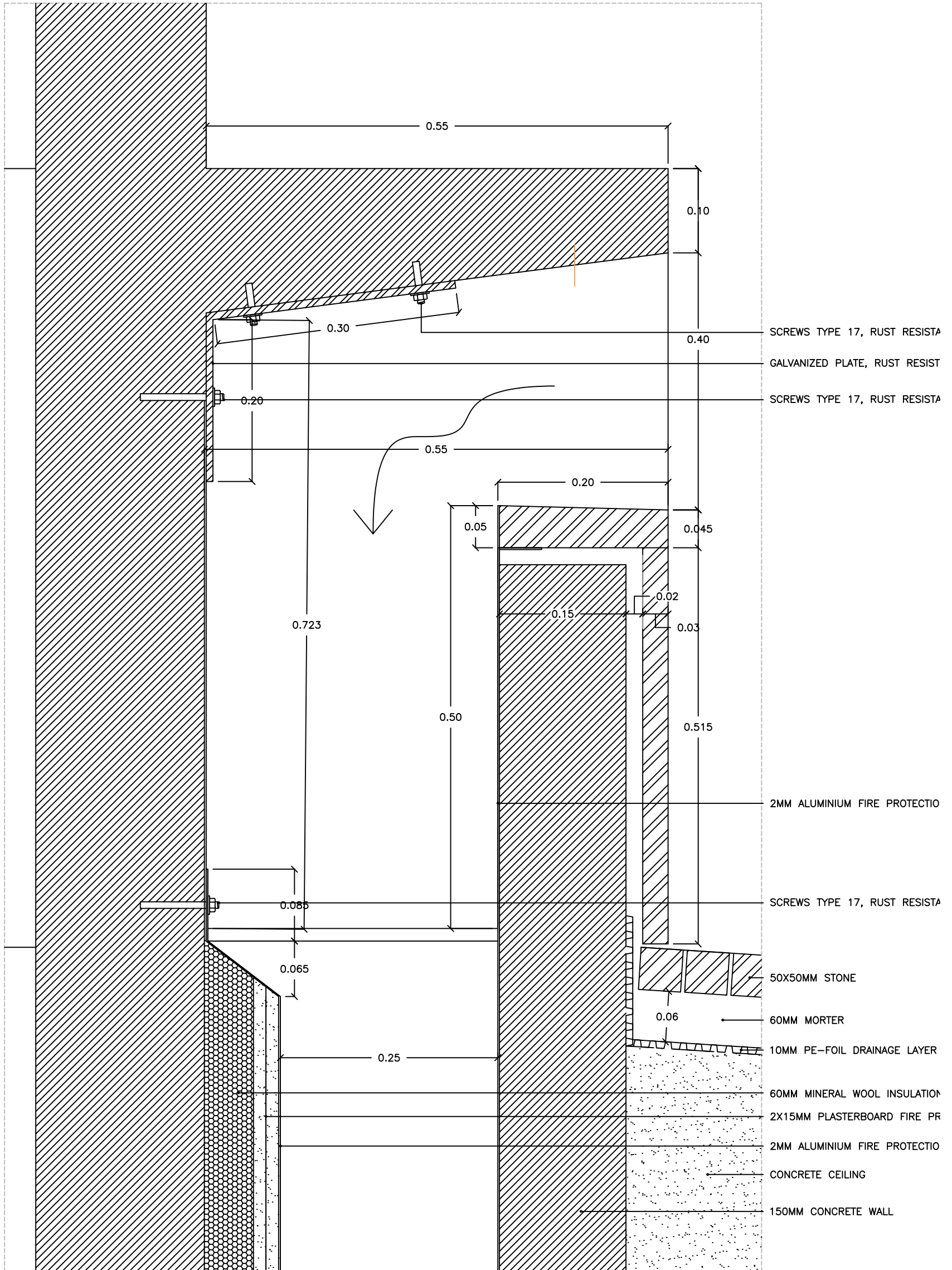
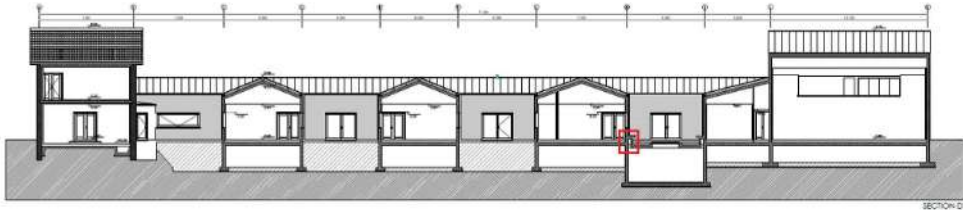
- TERRAIN
- CONCRETE
- REGULARIZATION CONCRTE
- BRICK
- EXISTING BUILDING
- MINERAL WOOL
- ZINC
- PLASTER
- TIMBER

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PROJECT: Can Marquès	DATE: 11/05/17	3.9
SUBJECT: Detail 9. Basement	SCALE: 1:5	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

DETAIL 10. BASEMENT VENTILATION



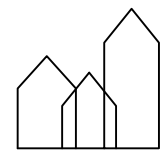
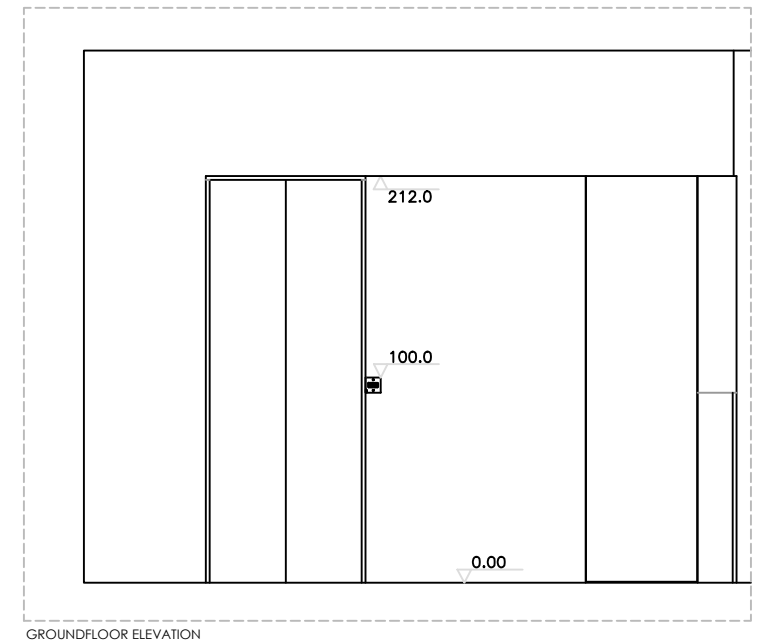
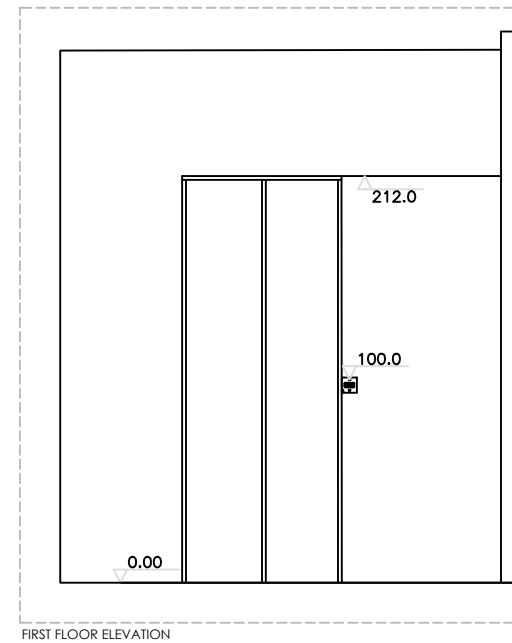
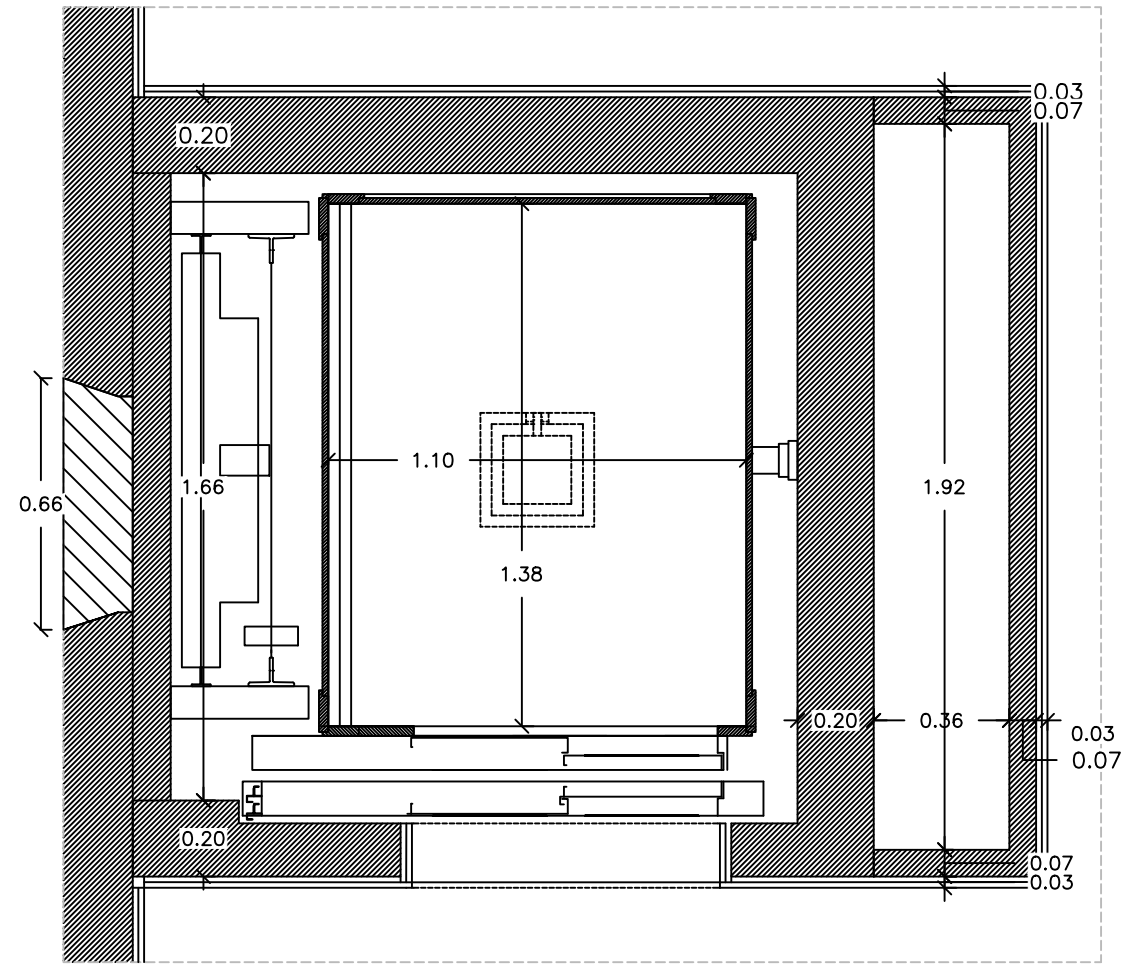
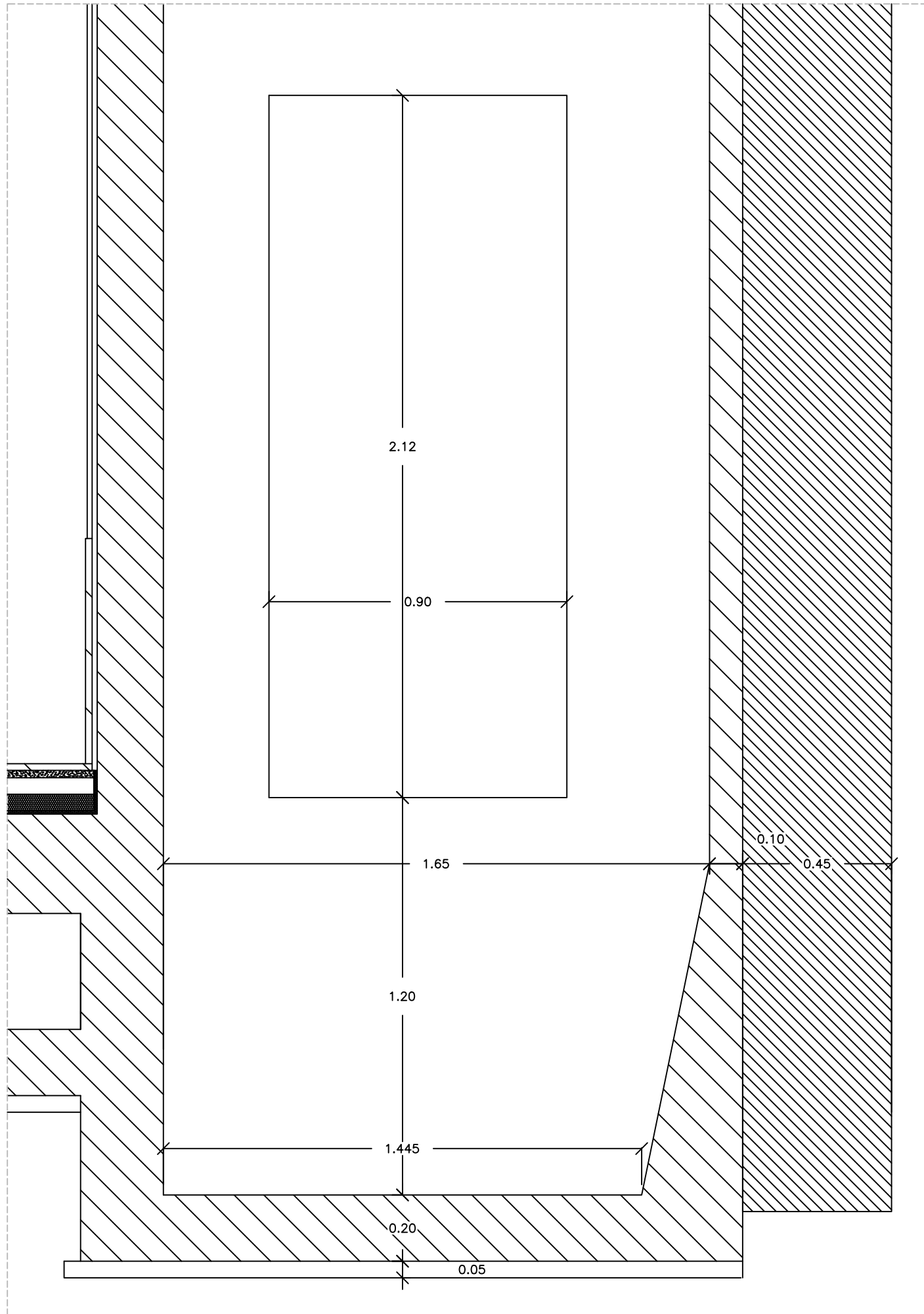
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PROJECT: Can Marquès	DATE: 11/05/17	3.10
SUBJECT: Detail 10. Basement Ventilation	SCALE: 1:5	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

- TERRAIN
- CONCRETE
- REGULARIZATION CONCRTE
- BRICK
- EXISTING BUILDING
- MINERAL WOOL
- ZINC
- PLASTER
- TIMBER

DETAIL 11. ELEVATOR



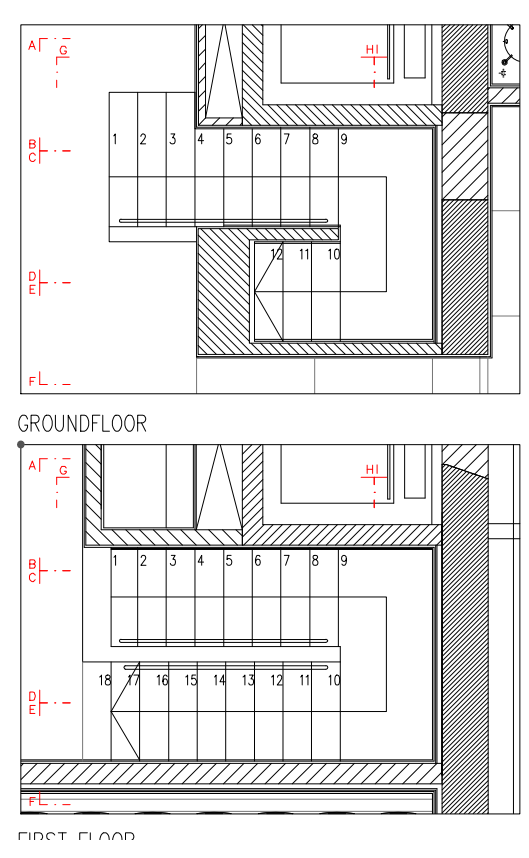
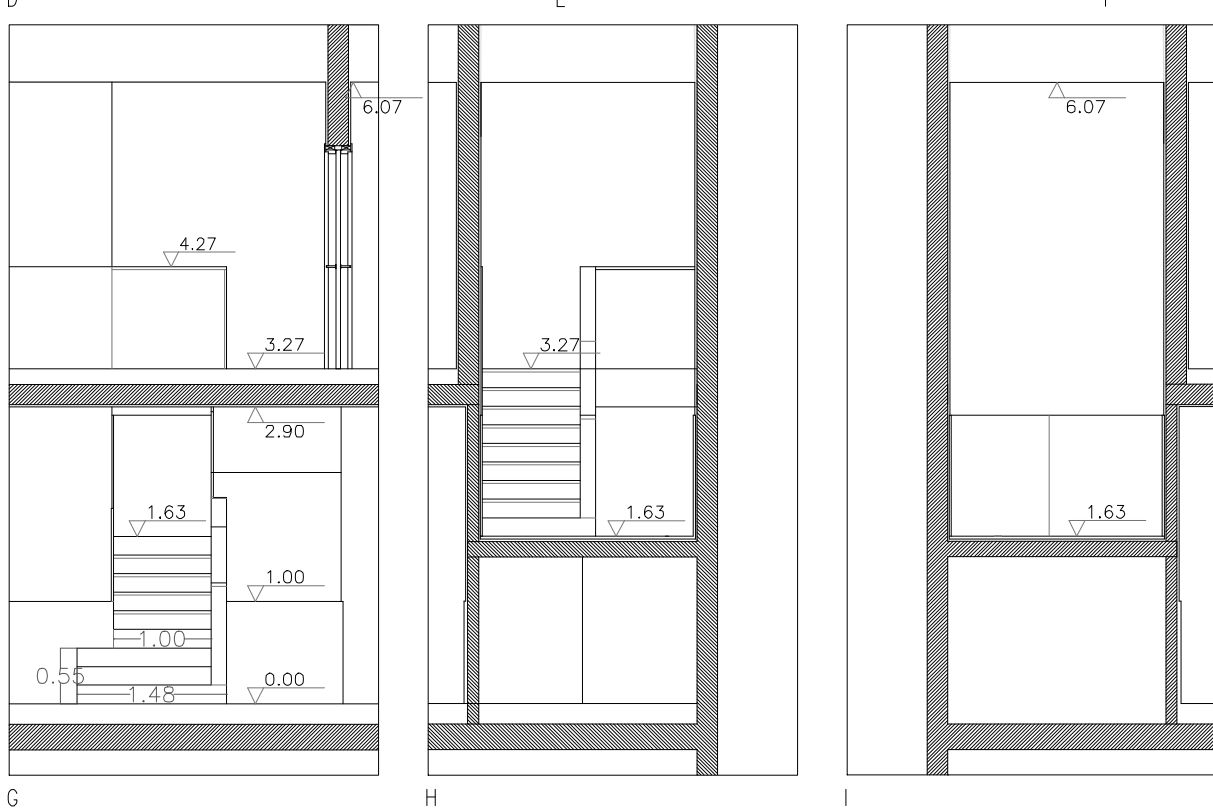
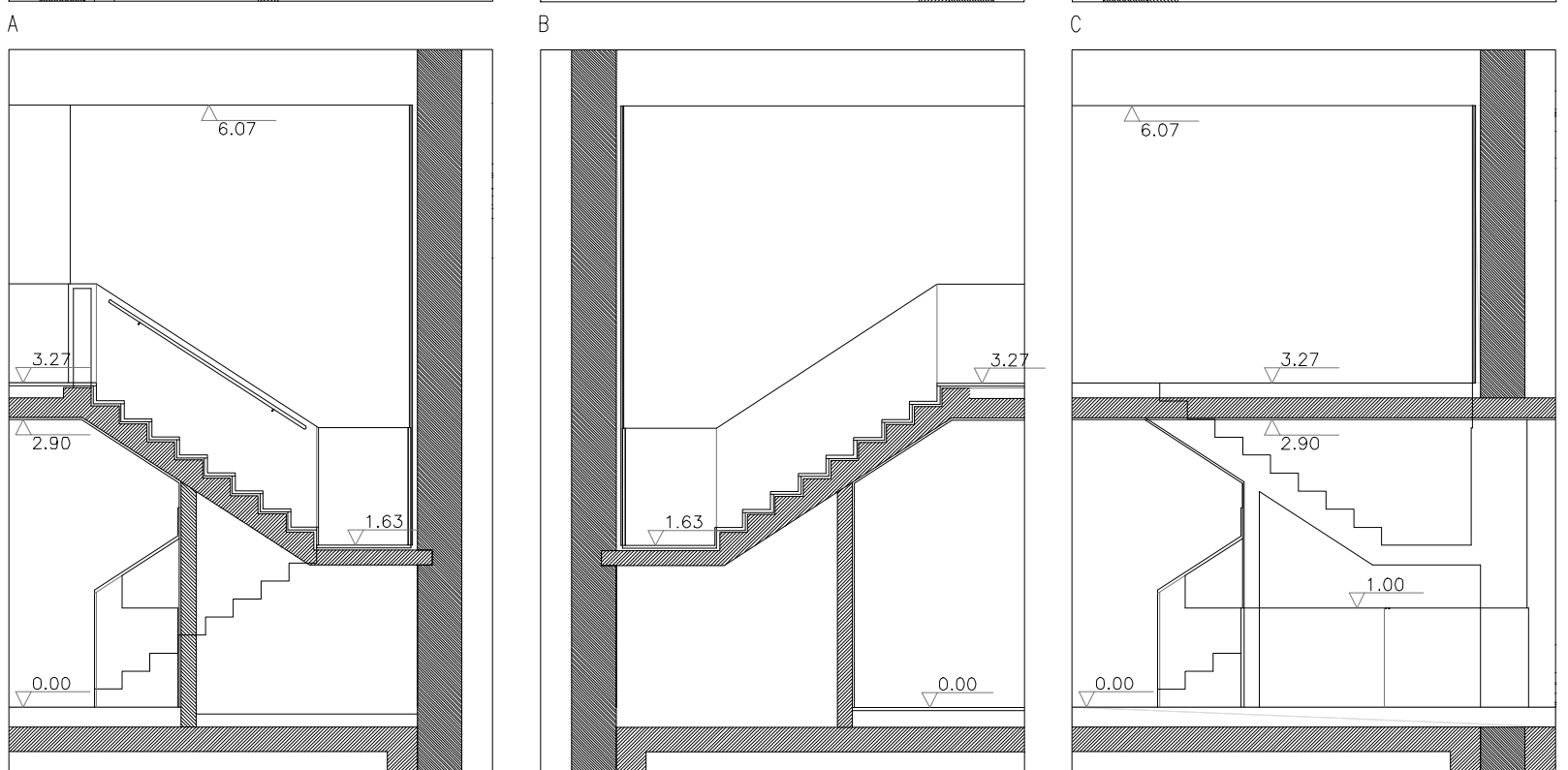
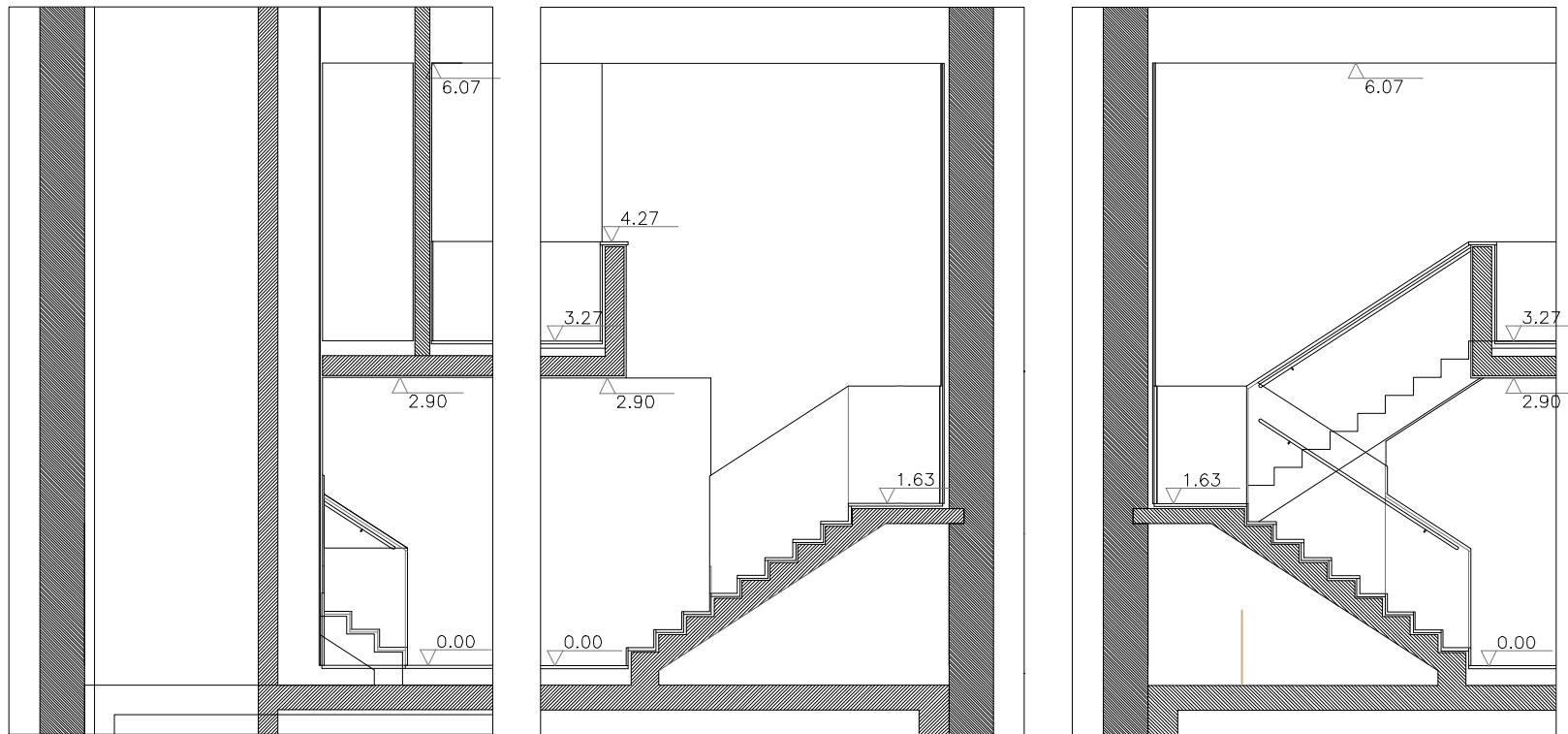
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- TERRAIN
- CONCRETE
- REGULARIZATION CONCRETE
- BRICK
- EXISTING BUILDING
- MINERAL WOOL
- ZINC
- PLASTER
- TIMBER

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PROJECT: Can Marquès	DATE: 11/05/17	3.11
SUBJECT: Detail 11. Elevator	SCALE: 1:5	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

DETAIL 12. STAIRCASE 1



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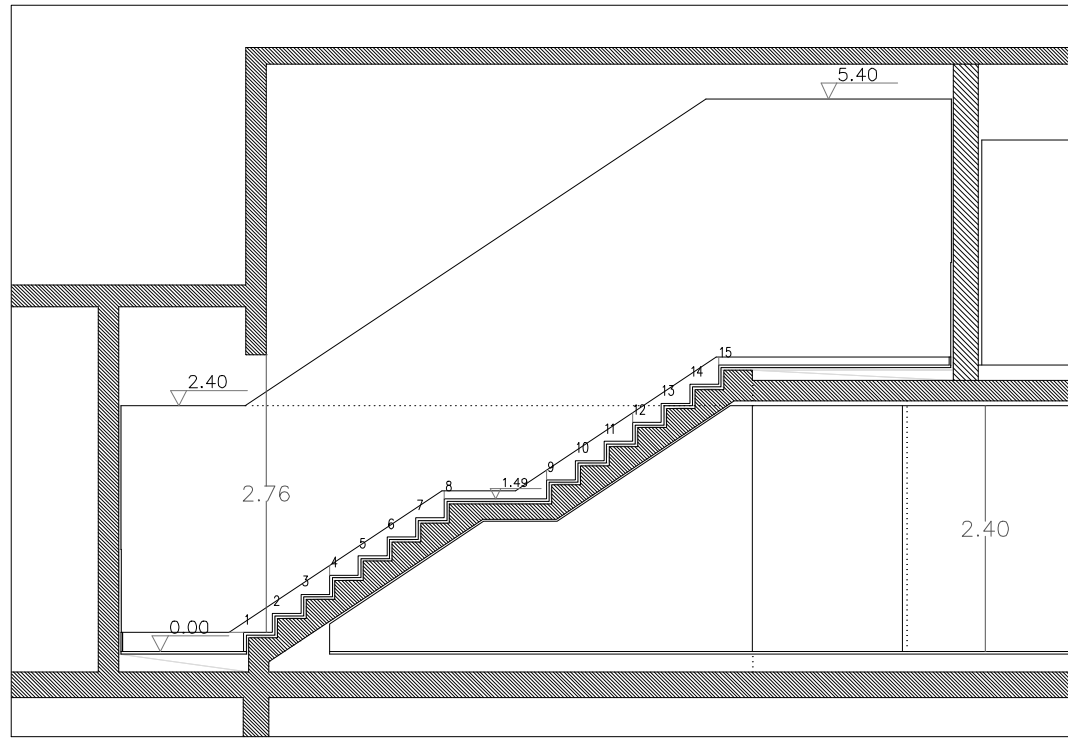
VIA Built Environment & Engineering

LEGEND:

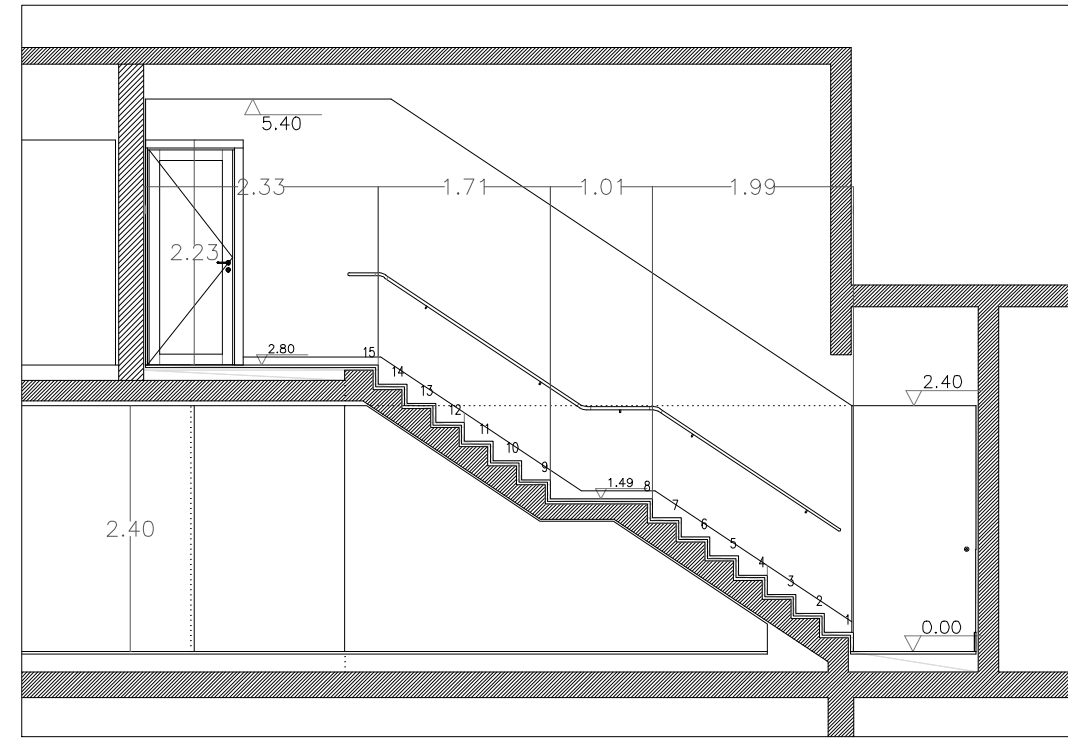
	SEEN CONCRETE
	CUTTED CONCRETE
	SEEN EXISTING BUILDING

PROJECT: Can Marquès	DATE: 01/05/17	3.12
SUBJECT: Detail 12. Staircase 1	SCALE: 1:75	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

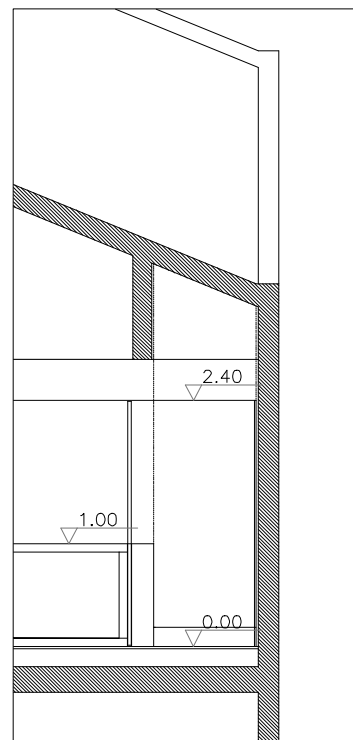
DETAIL 13. STAIRCASE 2



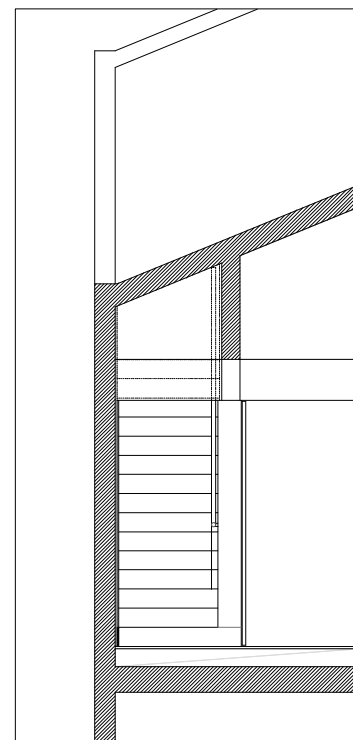
A



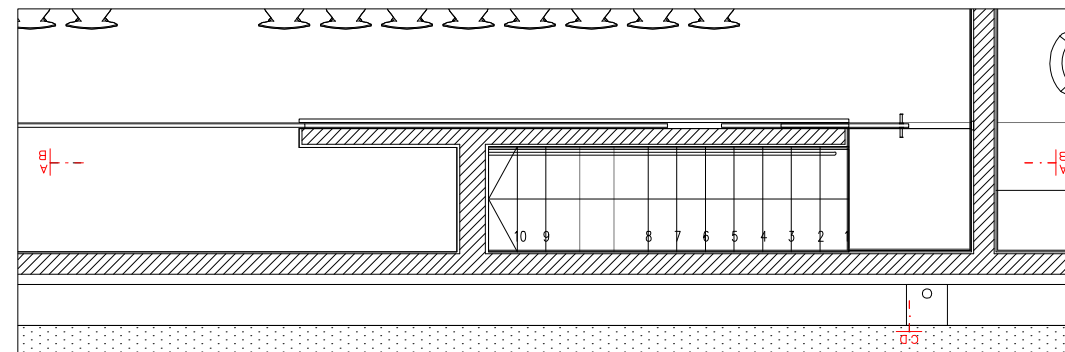
B



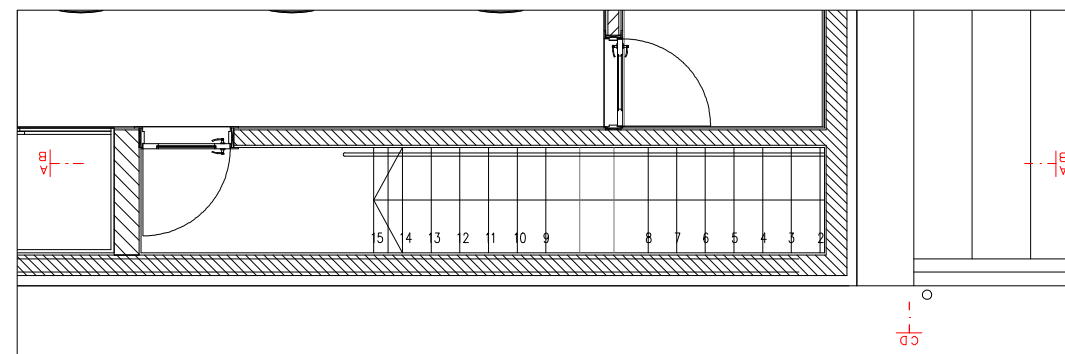
C



D



GROUND FLOOR






FIRST FLOOR



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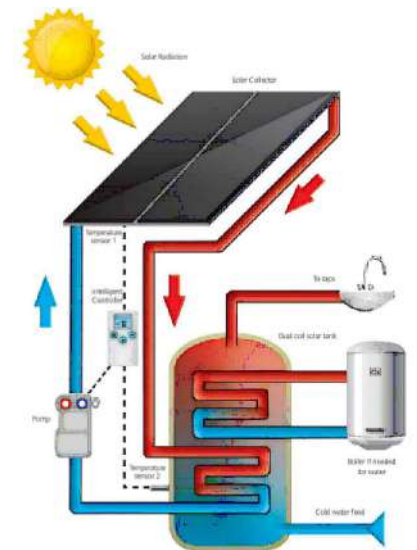
VIA Built Environment & Engineering

LEGEND :

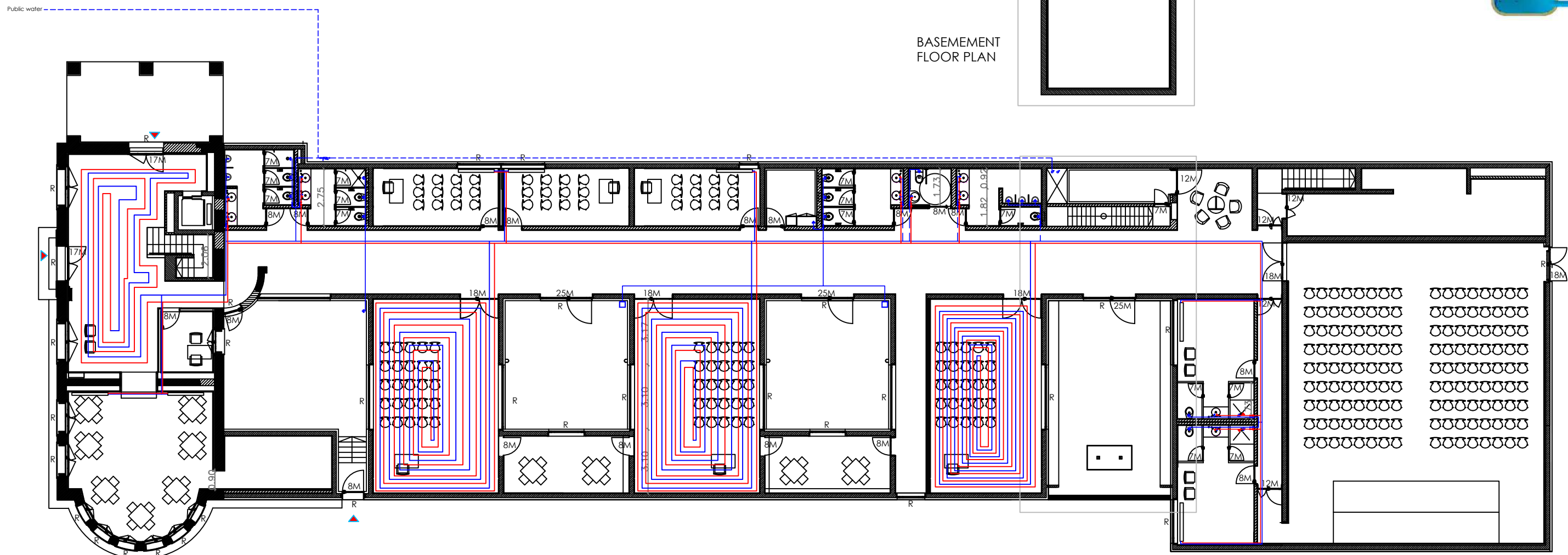
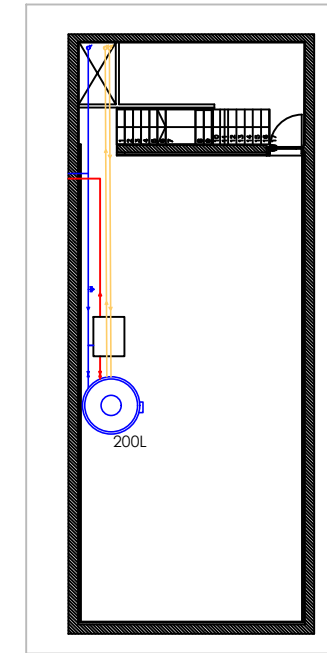
-  SEEN CONCRETE
-  CUTTED CONCRETE
-  SEEN EXISTING BUILDING

PROJECT: Can Marquès	DATE: 01/05/17	3.13
SUBJECT: Detail 13. Staircase 2	SCALE: 1:5	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

SOLAR PANEL SCHEME



BASEMENT FLOOR PLAN



- Radiator
- Radiant heating, embedded in the slab
- Embedded pipe. Hot water
- Embedded pipe. Cold water
- Suspended pipe. Cold water
- Suspended pipe. Hot water
- Tap
- General shut-off valve
- Electrical heat retaining for hot water
- General water meter
- Up pipe
- Down pipe
- Solar panel pipe's circuit

Equipment	Ø
Wc	15
Bath	22
Tap	22
Bidet	15

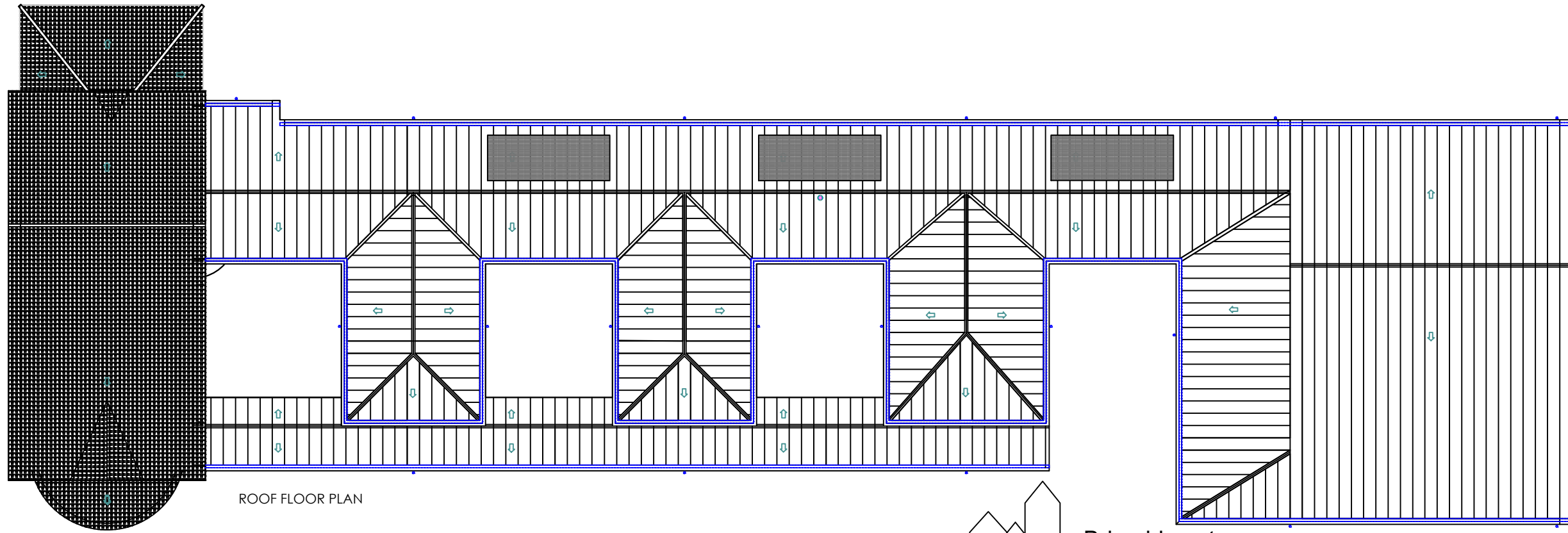
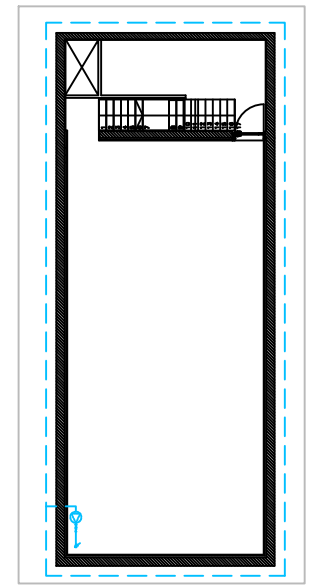
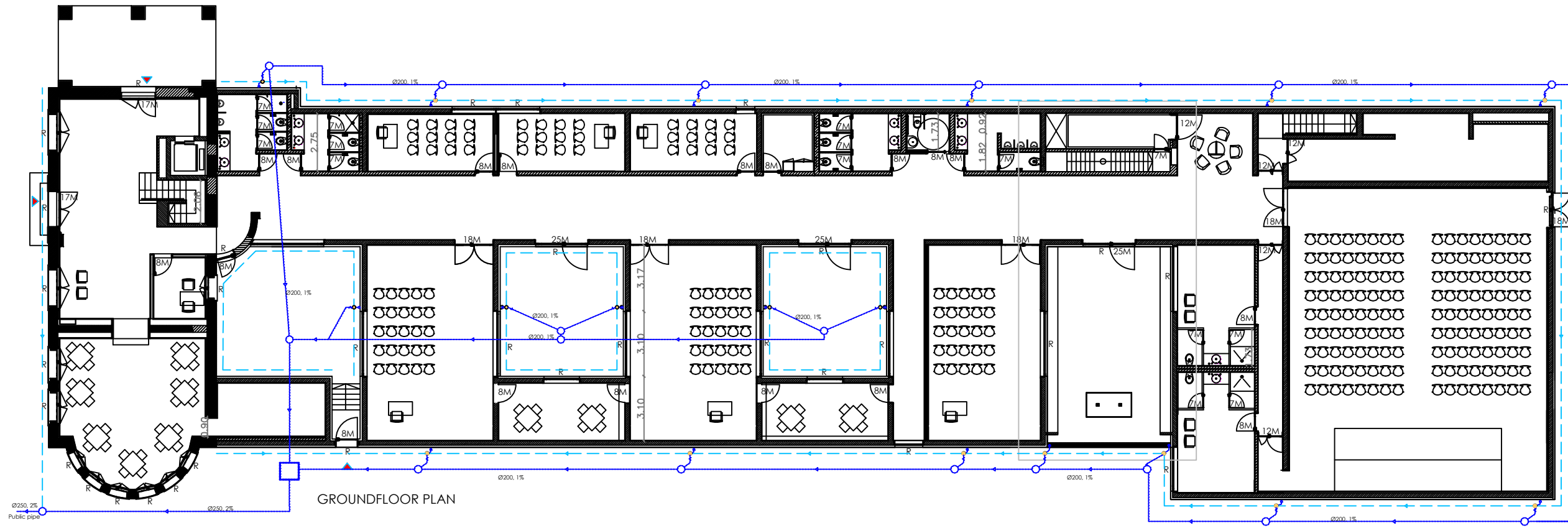
Material: PVC. All hot water pipes are covered with elastomeric foam.



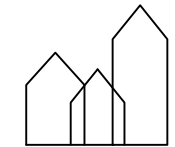
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PROJECT: Can Marquès	DATE: 12/27/17	4.1
SUBJECT: Water/Heating Floor Plan	SCALE: 1:200	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



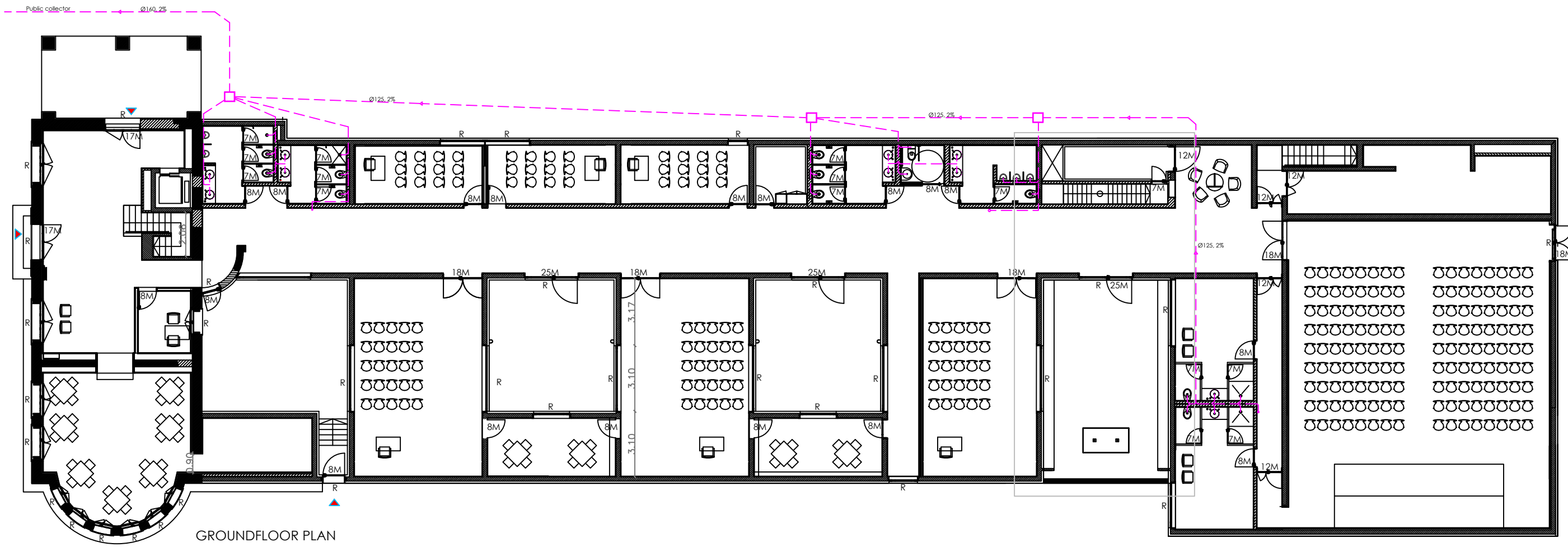
- Drainage pipe
- Rain water pipe
- < Direction of the water
- Gully
- Gully of drain water
- Gully where drain water and rain water are collected
- A Sand catch






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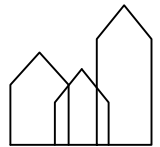
PROJECT: Can Marquès	DATE: 12/27/17	4.2
SUBJECT: Rain/Drain Water Floor Plan	SCALE: 1:225	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



GROUND FLOOR PLAN

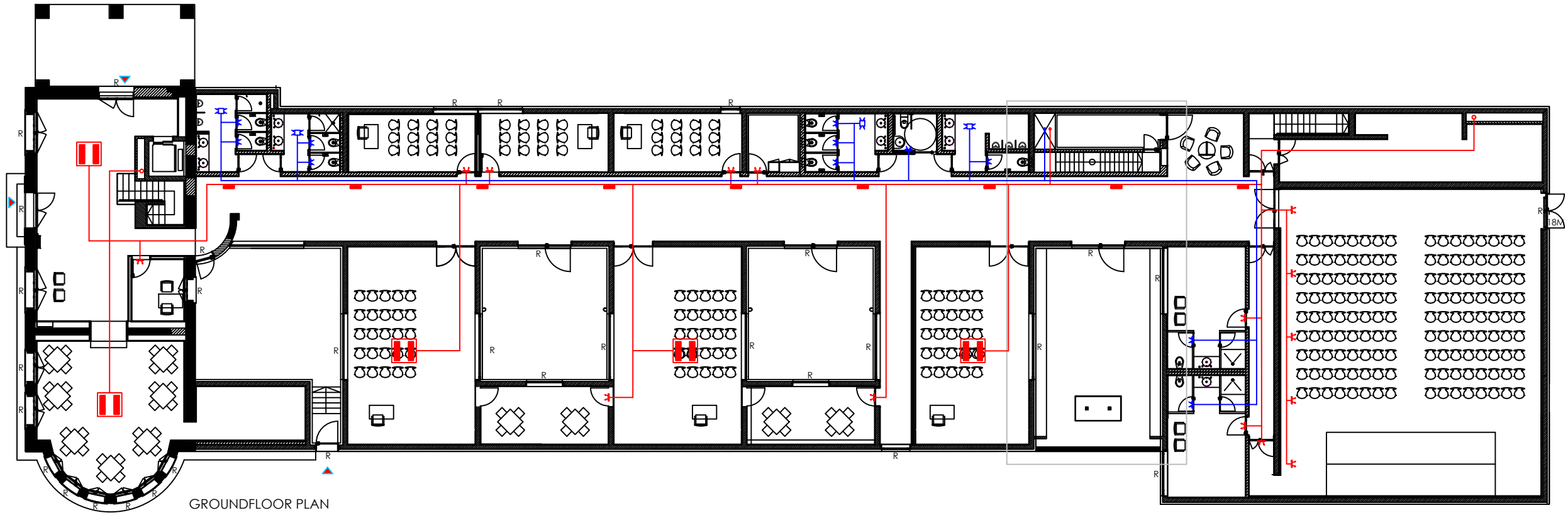
 Suspended pipe, foundations ceiling
 Pipes register
 Pipe direction

Equipment	Pipe Ø	%
Wc	100	2-4
Bath	50	2-4
Urinary	40	2-4
Bidet	40	2-4
Sink	40	2-4

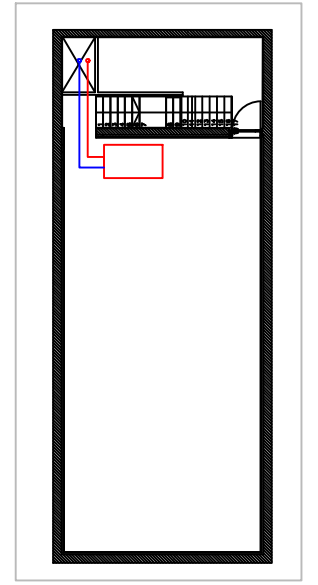

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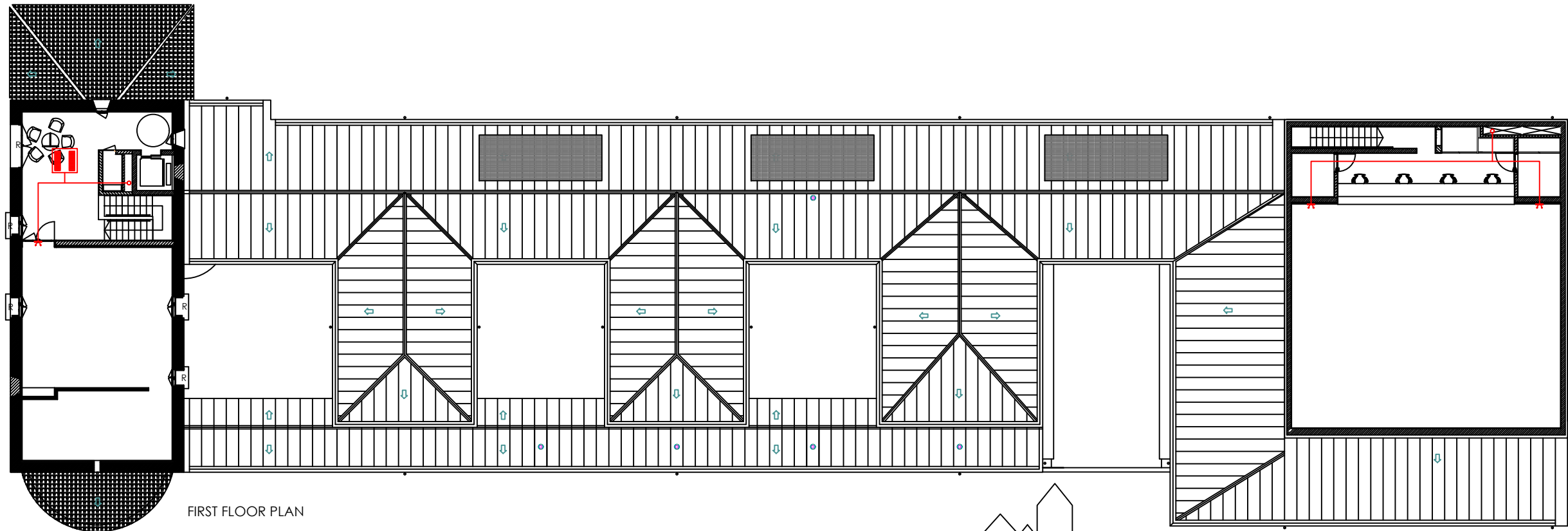
PROJECT: Can Marquès	DATE: 12/27/17	4.3
SUBJECT: Sewer Floor Plan	SCALE: 1:200	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	







GROUND FLOOR PLAN

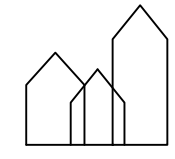


BASEMENT FLOOR PLAN




FIRST FLOOR PLAN

-  Ceiling inlet
-  Wall inlet
-  Wall outlet
-  Suspended duct

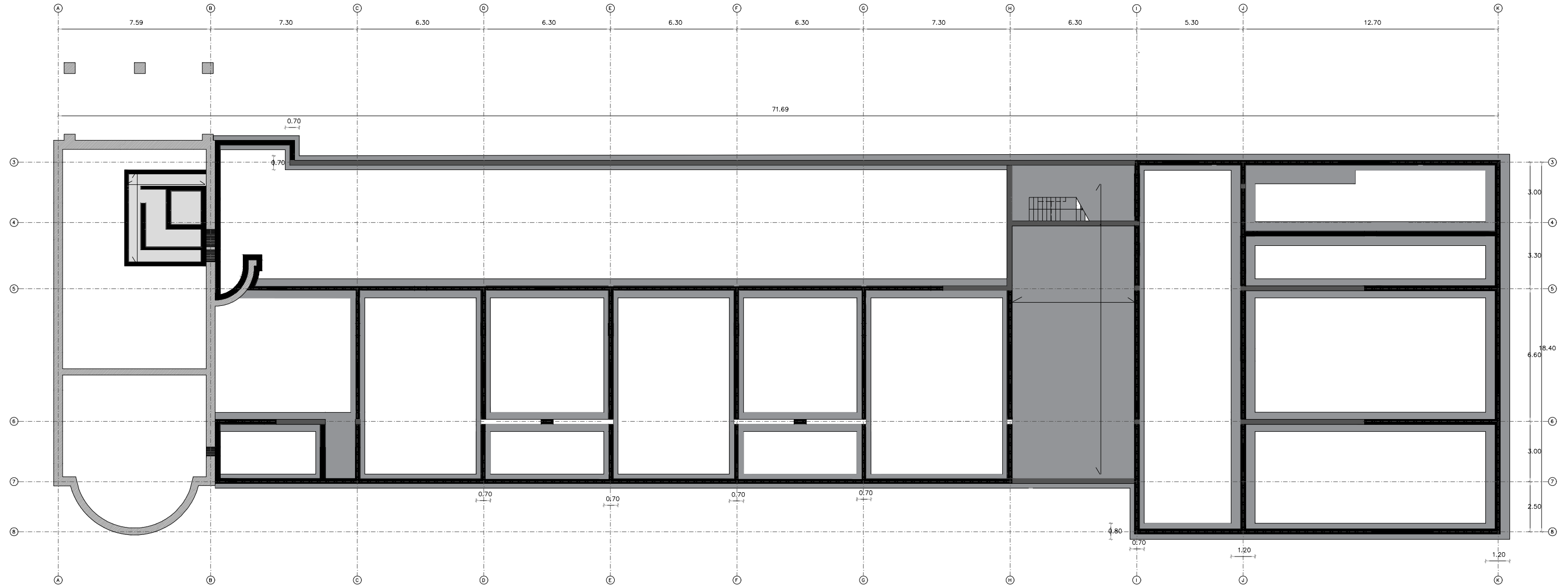


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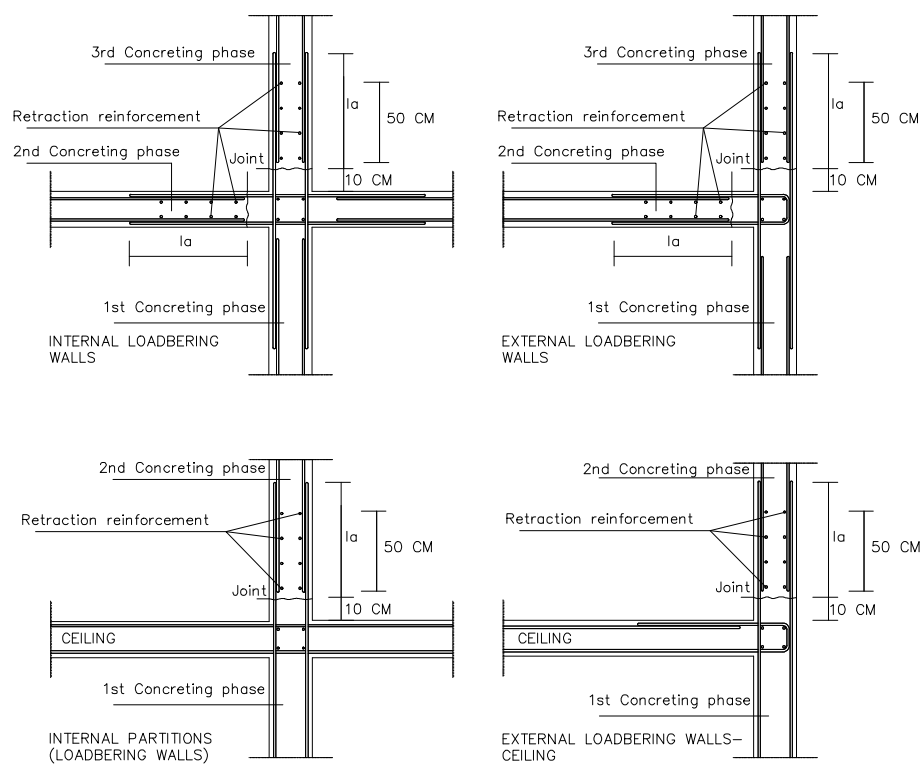
VIA Built Environment & Engineering 

PROJECT: Can Marquès	DATE: 12/27/17	4.4
SUBJECT: Ventilation/Heating Floor Plan	SCALE: 1:225	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

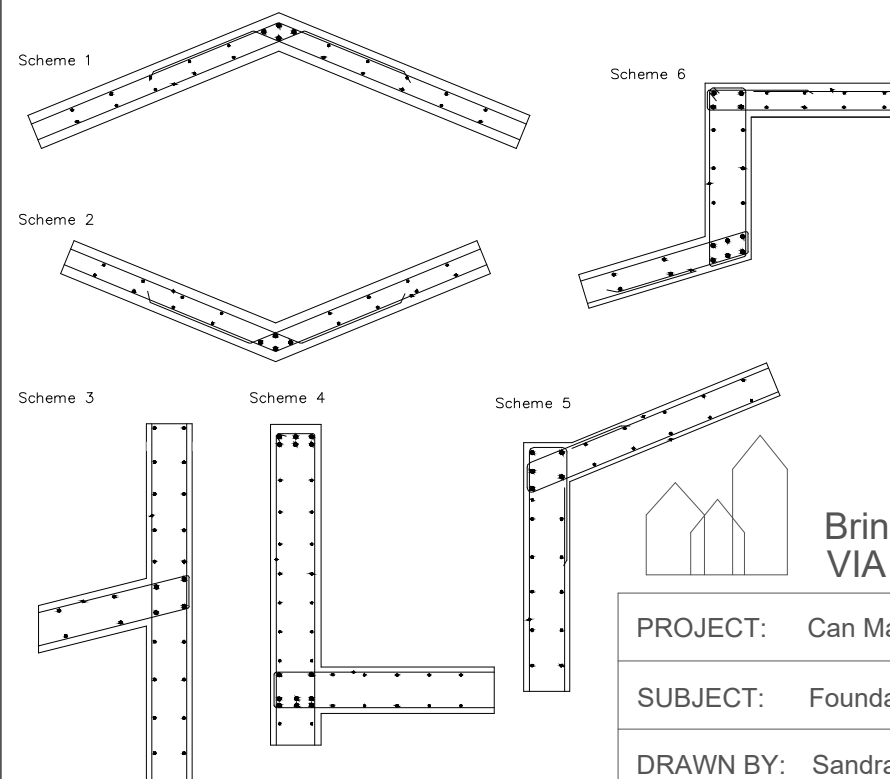
FOUNDATIONS



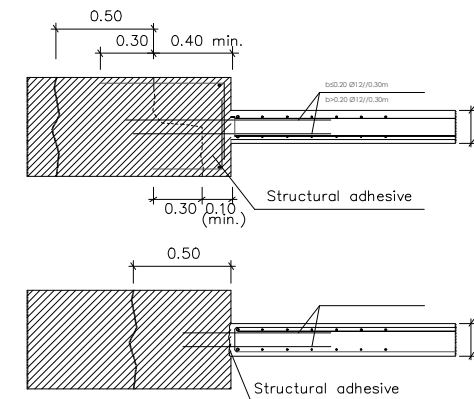
REINFORCEMENT



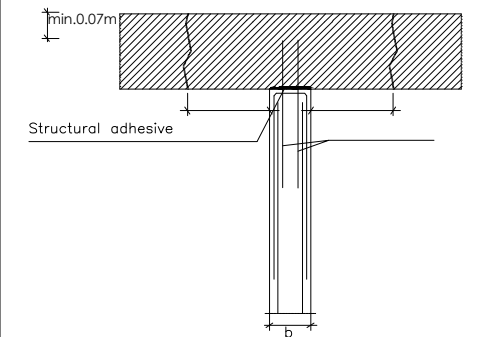
REINFORCEMENT EXAMPLE



COPLANAR ELEMENTS



ORTHOGONAL ELEMENTS



LEGEND :

- CUTTED CONCRETE
- SEEN CONCRETE
- CUTTED EXISTING BUILDING
- SEEN EXISTING BUILDING

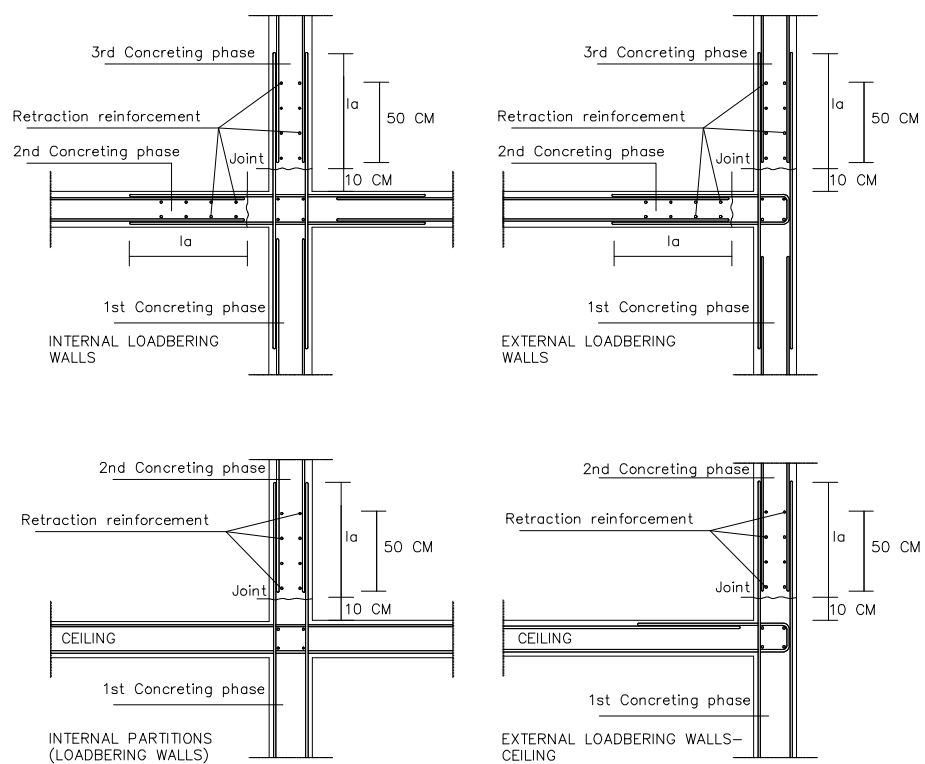
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VIA Built Environment & Engineering

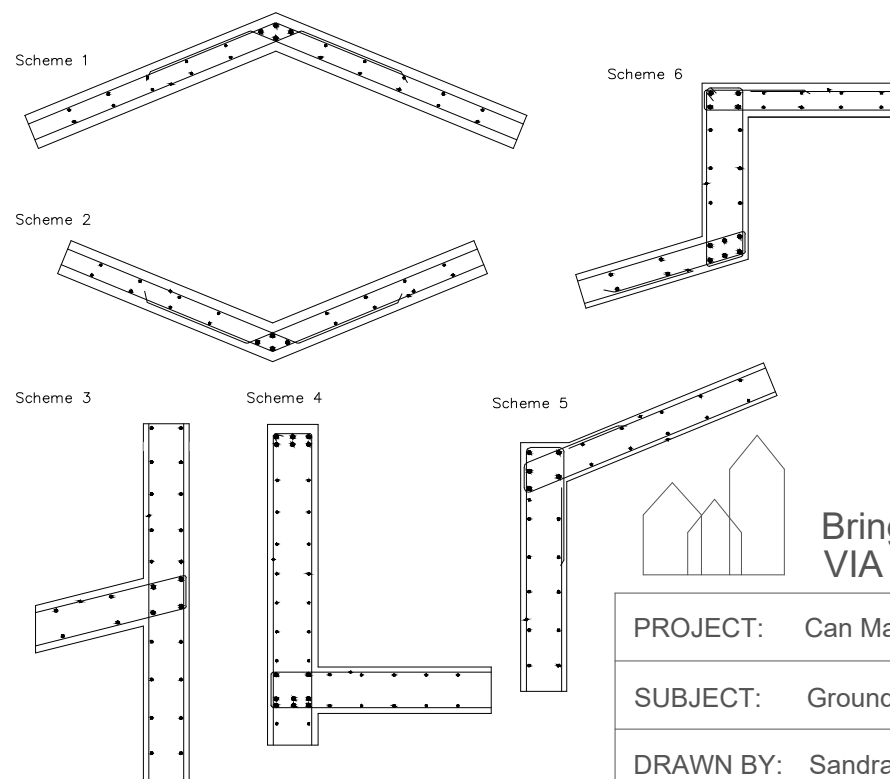
PROJECT: Can Marquès	DATE: 10/30/17	5.1
SUBJECT: Foundations Floor Plan	SCALE: 1:200	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



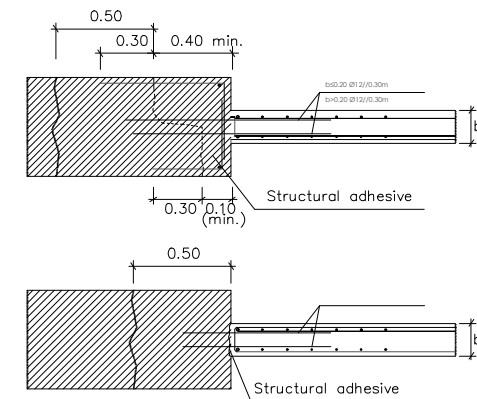
REINFORCEMENT



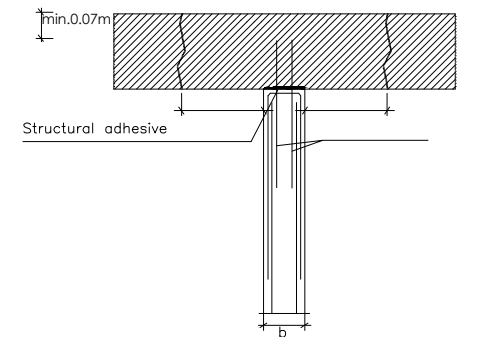
REINFORCEMENT EXAMPLE



COPLANAR ELEMENTS



ORTHOGONAL ELEMENTS



LEGEND :

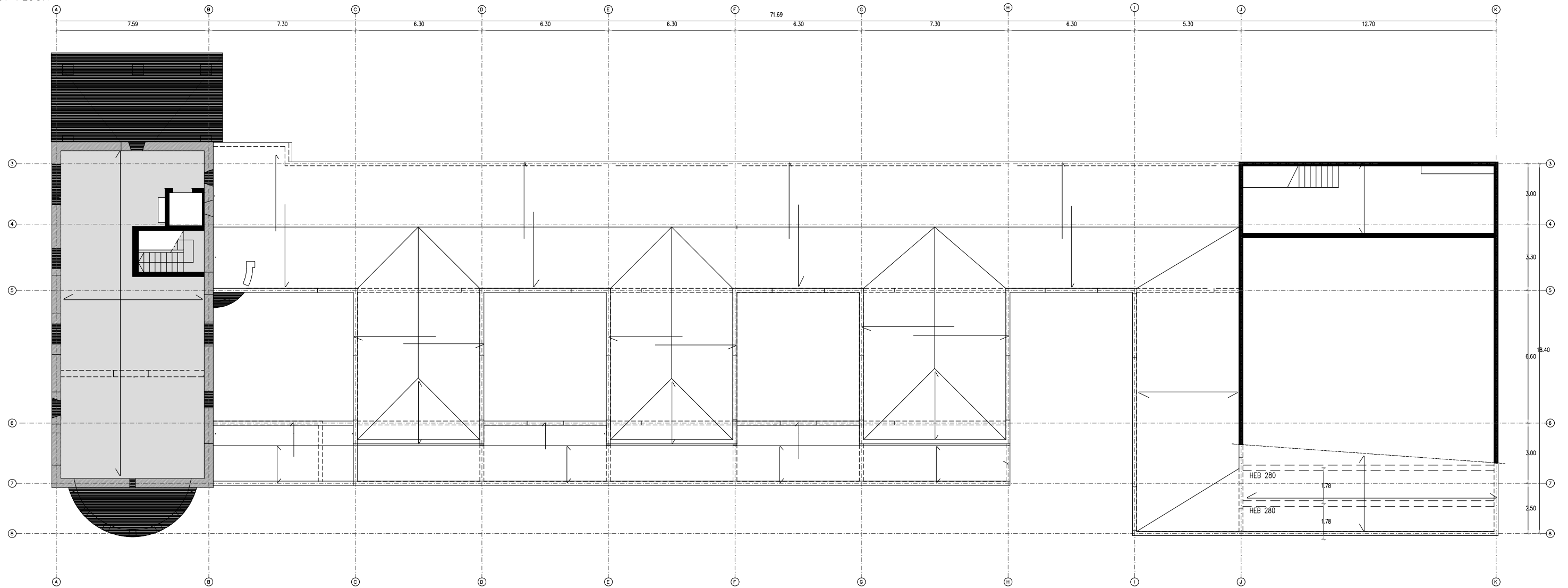
- CUTTED CONCRETE
- SEEN CONCRETE
- CUTTED EXISTING BUILDING
- SEEN EXISTING BUILDING

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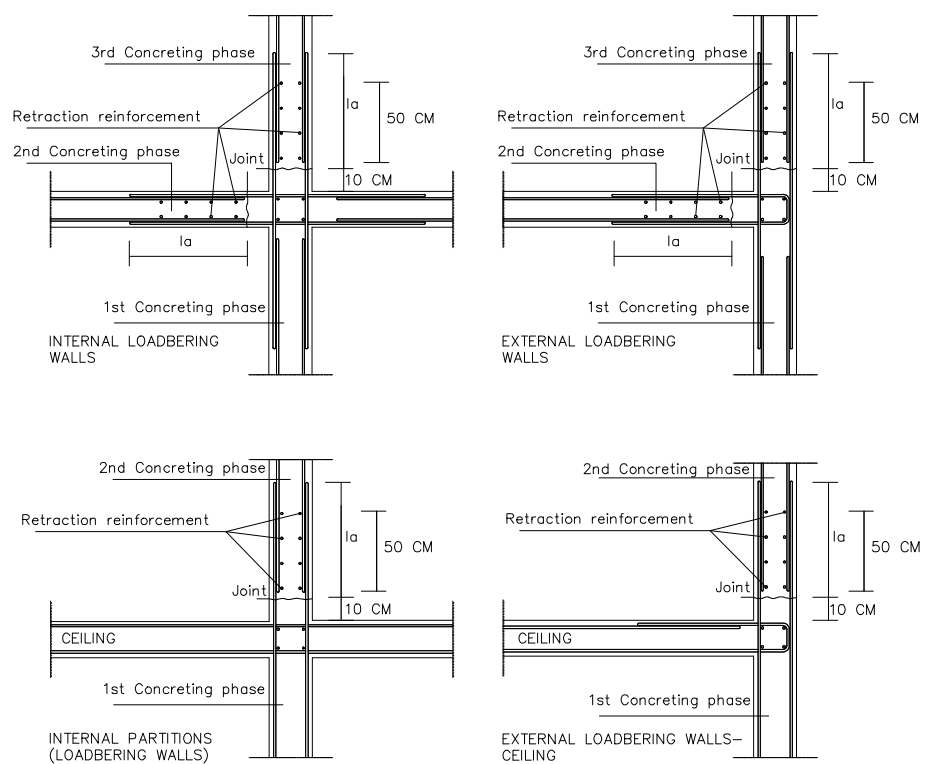
VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 10/30/17	5.2
SUBJECT: Ground Floor Structure	SCALE: 1:200	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

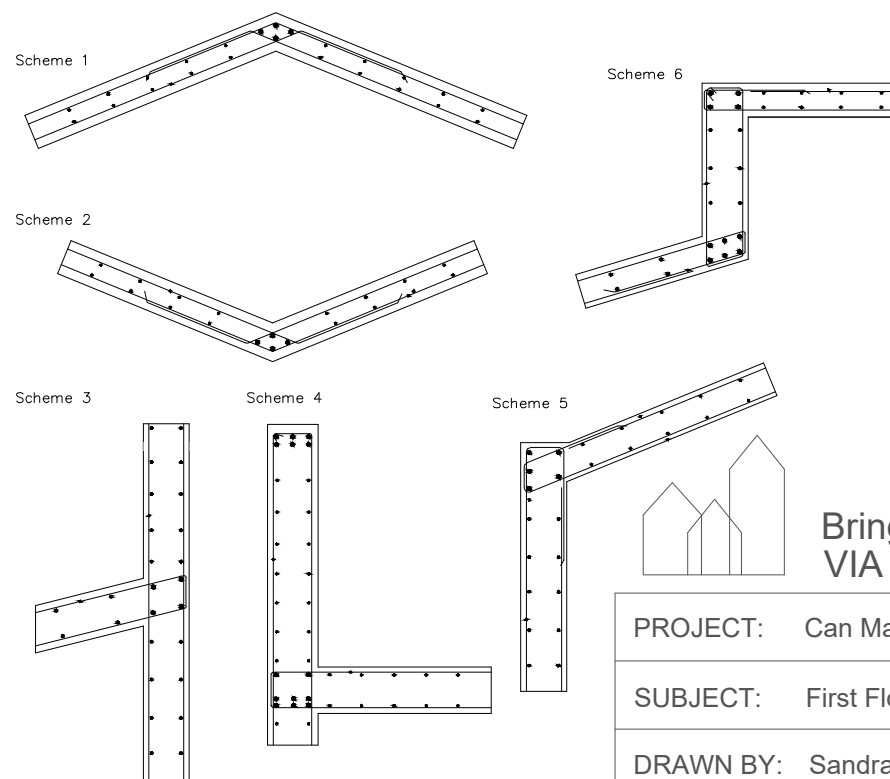
FIRST FLOOR



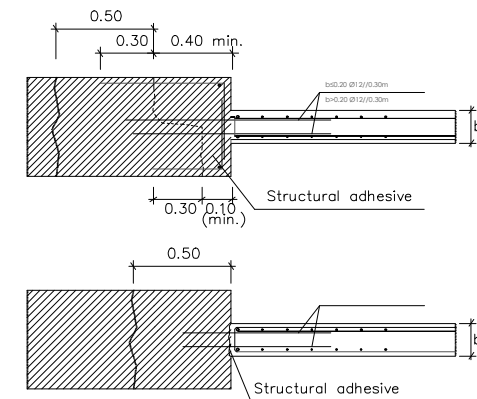
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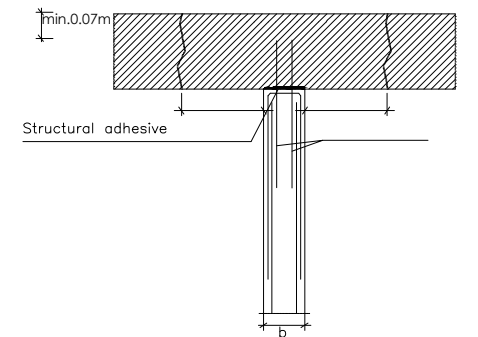
REINFORCEMENT EXAMPLE



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ORTHOGONAL ELEMENTS



LEGEND :

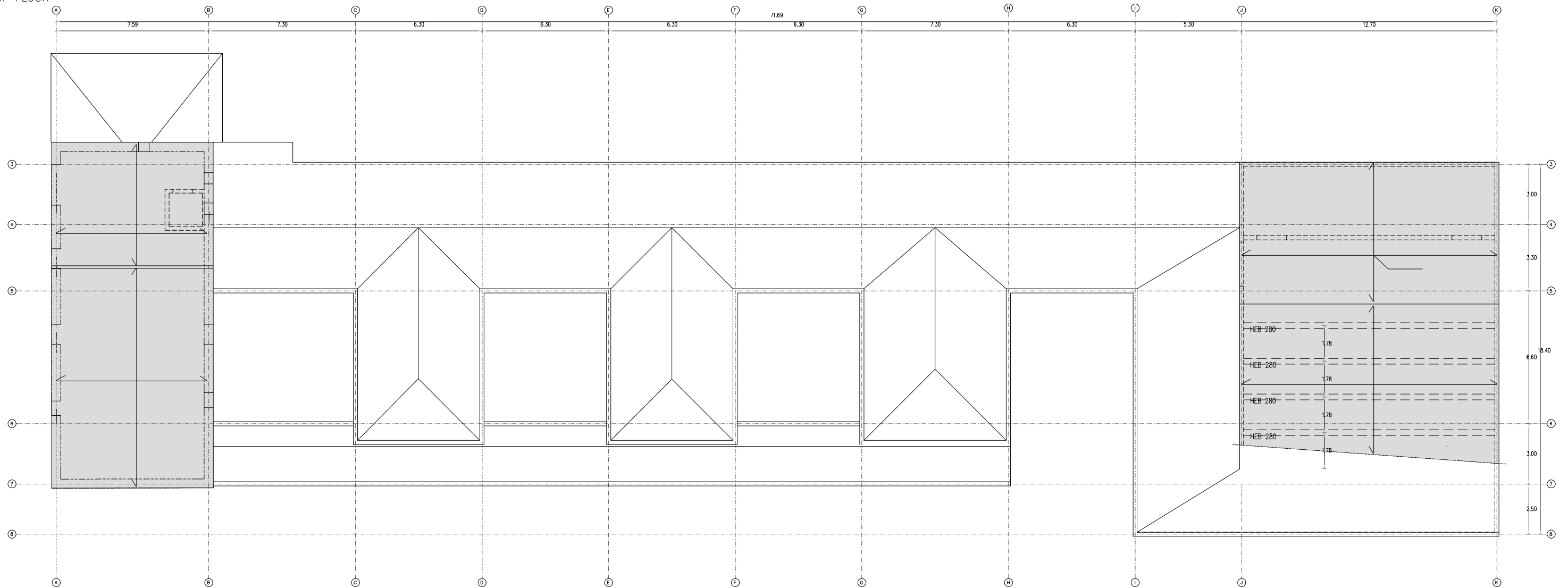
- CUTTED CONCRETE
- SEEN CONCRETE
- CUTTED EXISTING BUILDING
- SEEN EXISTING BUILDING

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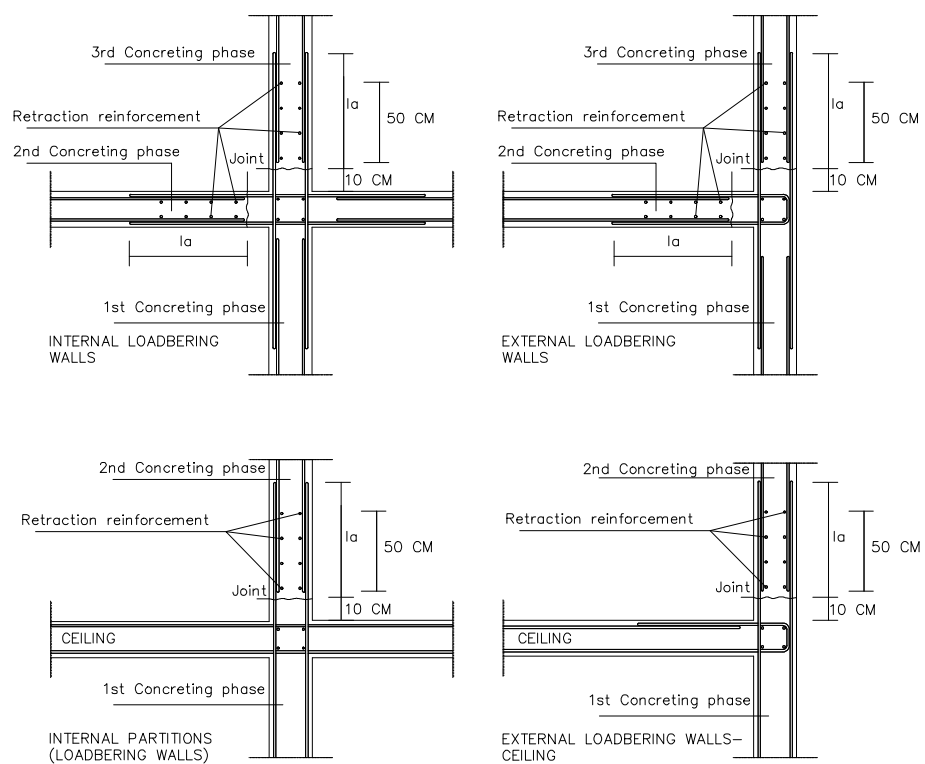
VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 10/30/17	5.3
SUBJECT: First Floor Structure	SCALE: 1:200	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	

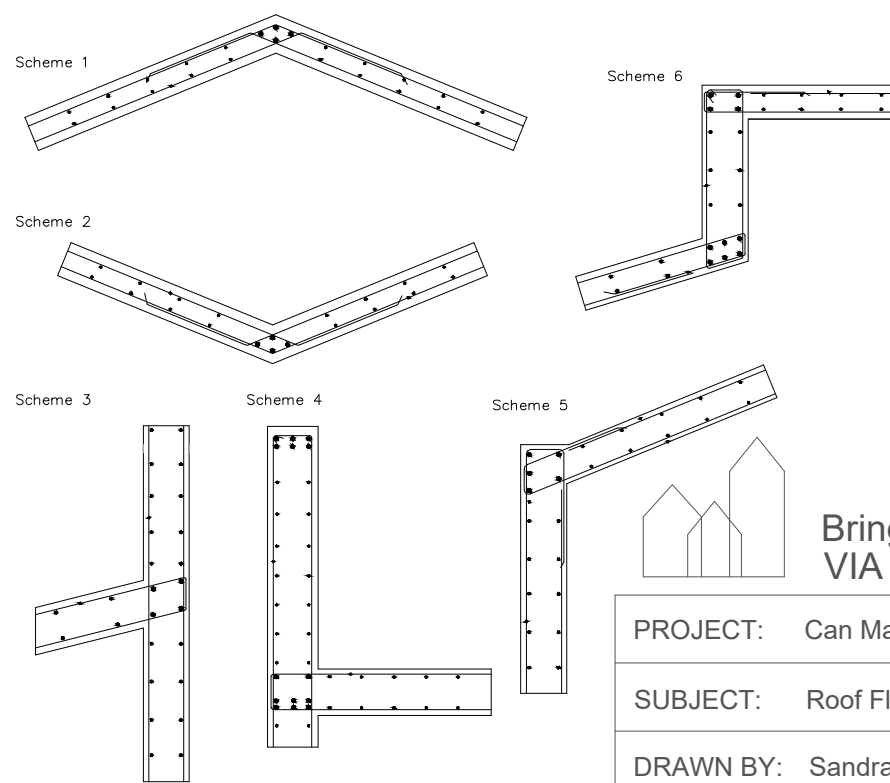
ROOF FLOOR



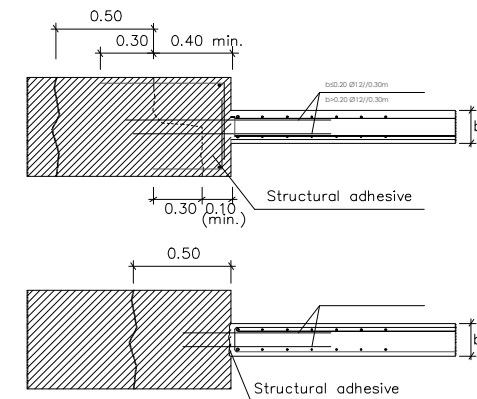
REINFORCEMENT



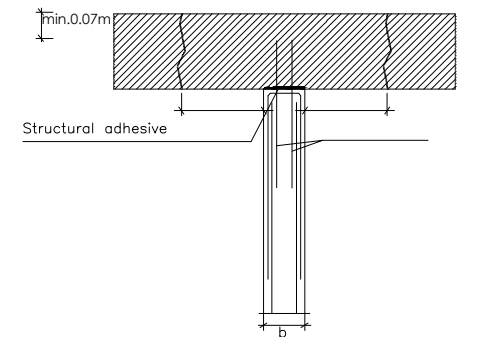
REINFORCEMENT EXAMPLE



COPLANAR ELEMENTS



ORTHOGONAL ELEMENTS



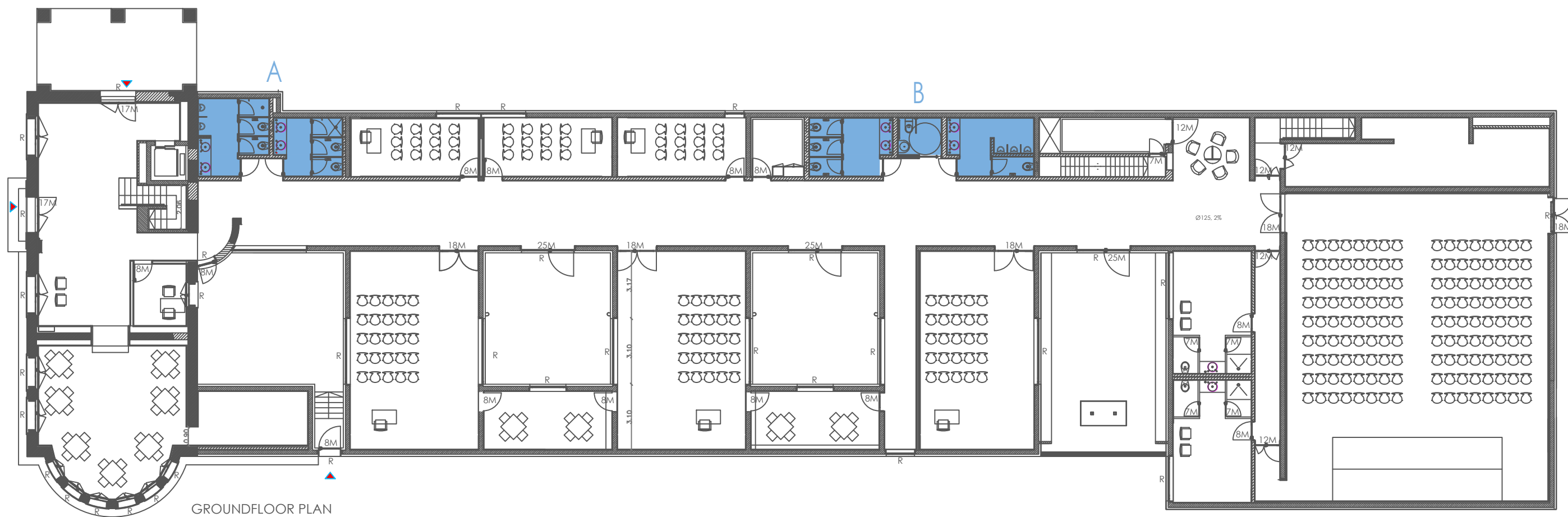
LEGEND :

- CUTTED CONCRETE
- SEEN CONCRETE
- CUTTED EXISTING BUILDING
- SEEN EXISTING BUILDING

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PROJECT: Can Marquès	DATE: 10/30/17	5.4
SUBJECT: Roof Floor Structure	SCALE: 1:200	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



- WALLS:**
- 12.5 mm PLASTER
 - MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
 - 5mm TILE ADHESIVE
 - 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

- FLOOR:**
- 250mm CONCRETE CEILING
 - 10mm POLYETHYLENE (PLASTIC MEMBRANE)
 - 2mm PE-FOIL VAPOUR BARRIER
 - 100mm CAST ON SITE CONCRETE
 - 2mm LIQUID MEMBRANE

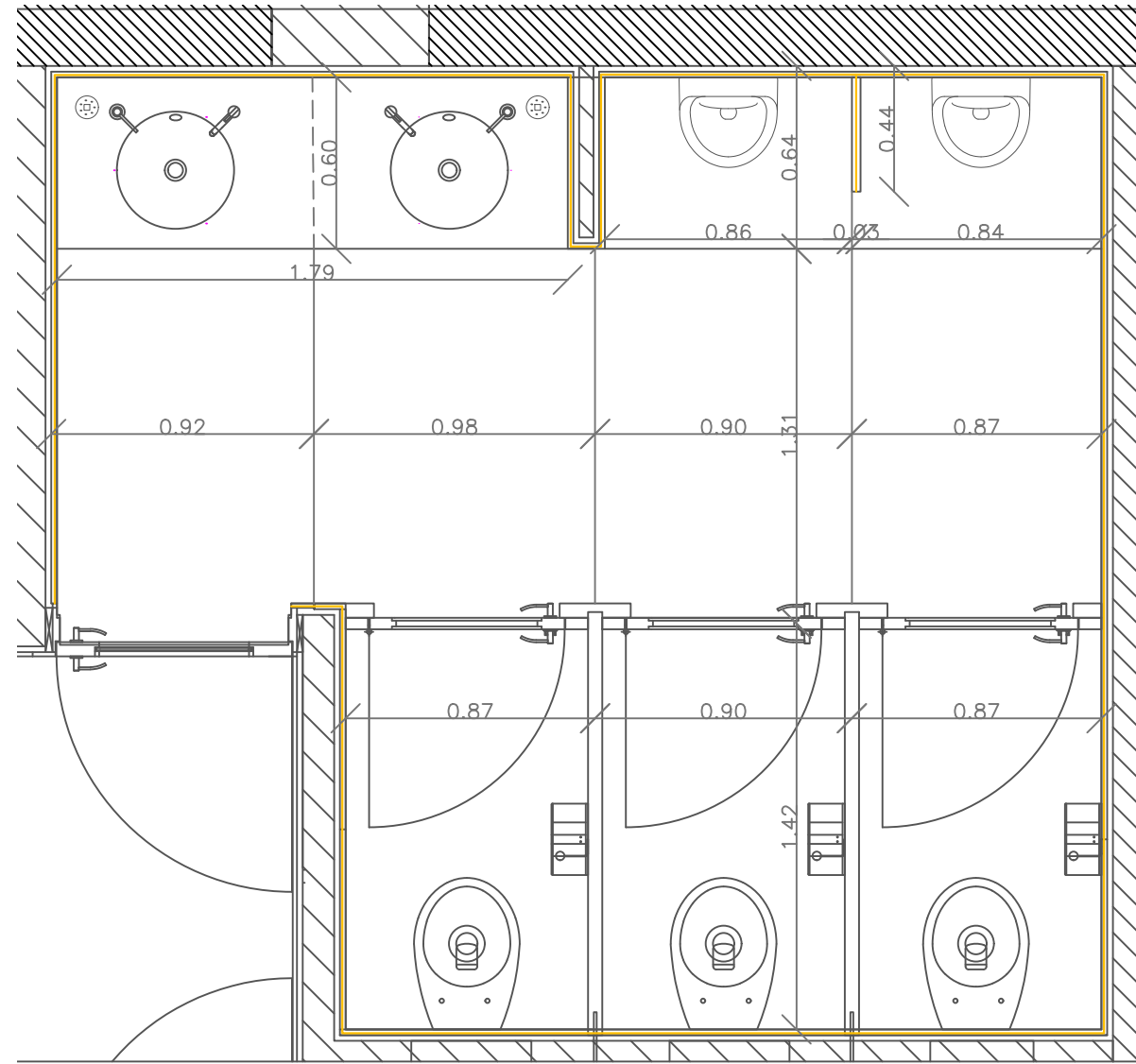


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PROJECT: Can Marquès	DATE: 01/01/18	6.1
SUBJECT: General Floor Plan, Stone Work	SCALE: 1:200	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



WALLS:

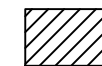
- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm



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BRICK



TIMBER



MORTAR



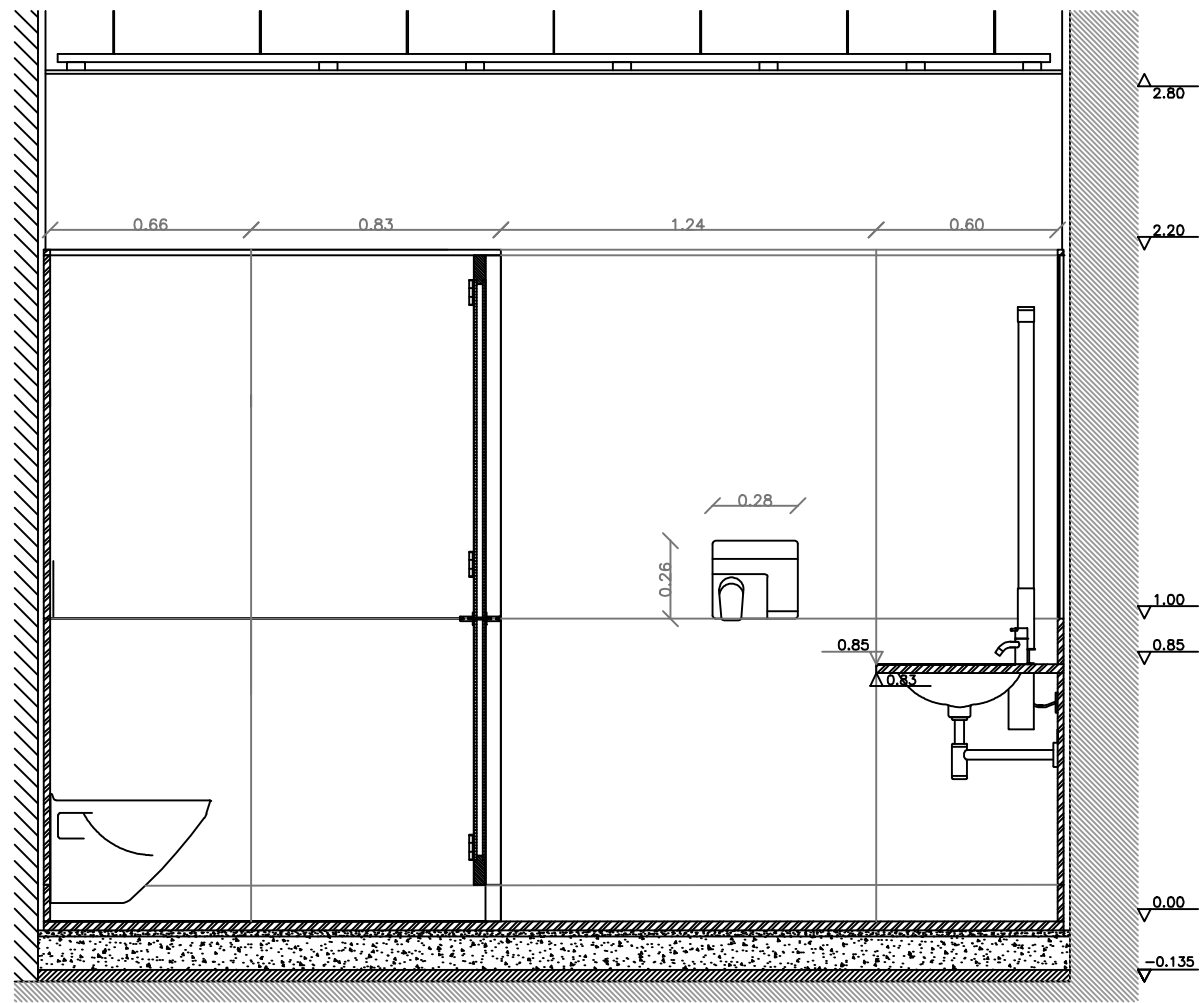
STONE



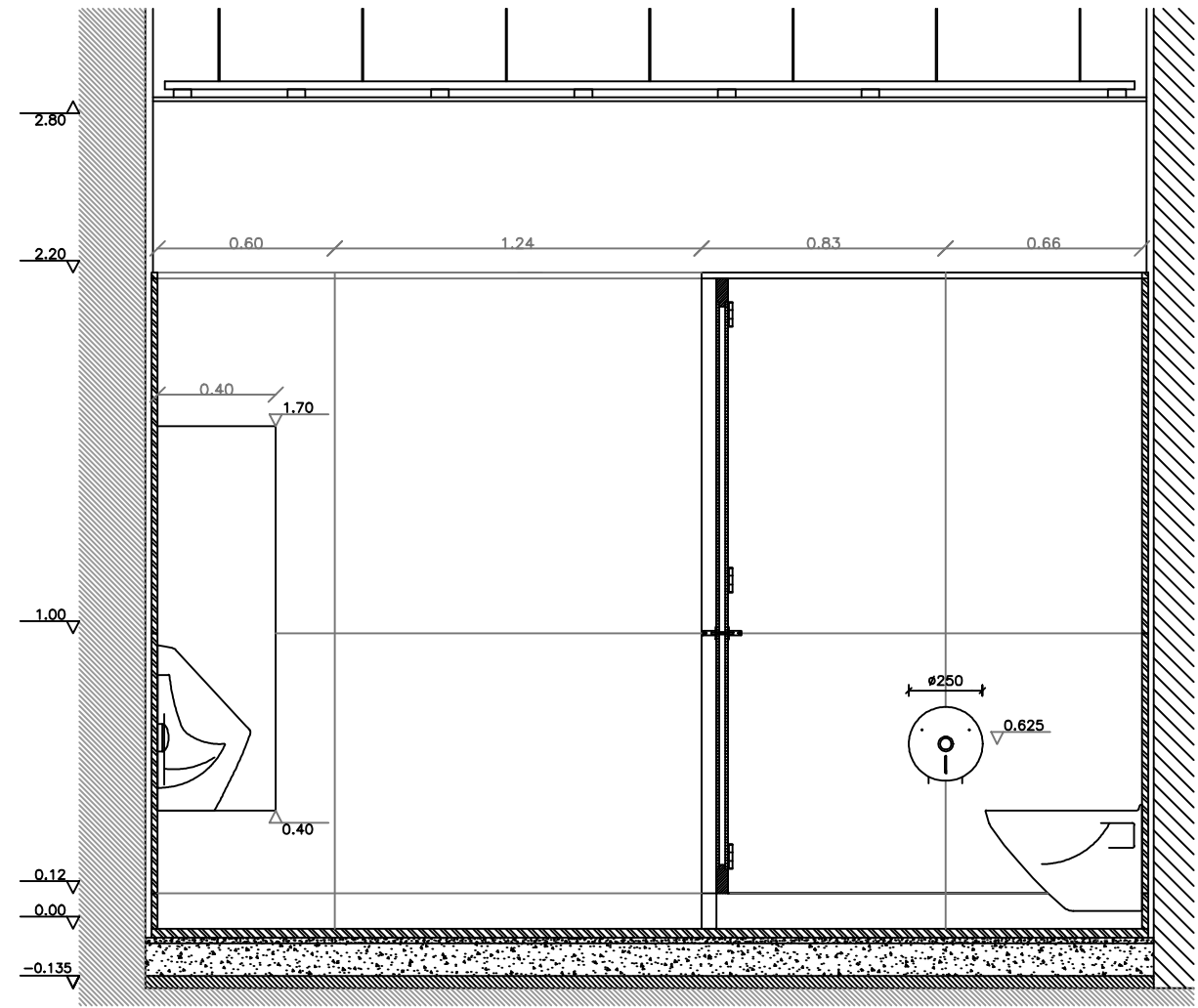
CONCRETE

VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 01/01/18	6.2
SUBJECT: Men's Bathroom A Floor Plan	SCALE: 1:25	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



SECTION 3 WALL C



SECTION 4 WALL D

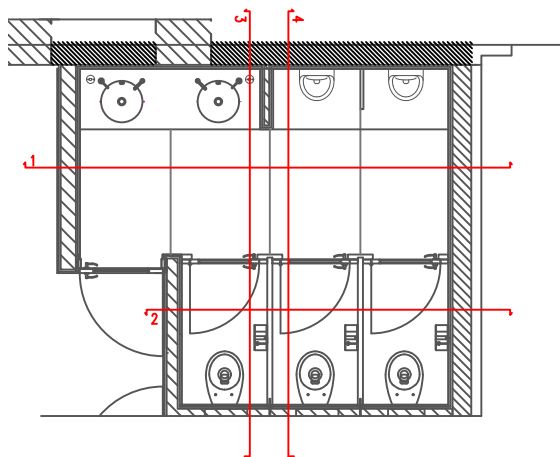
WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

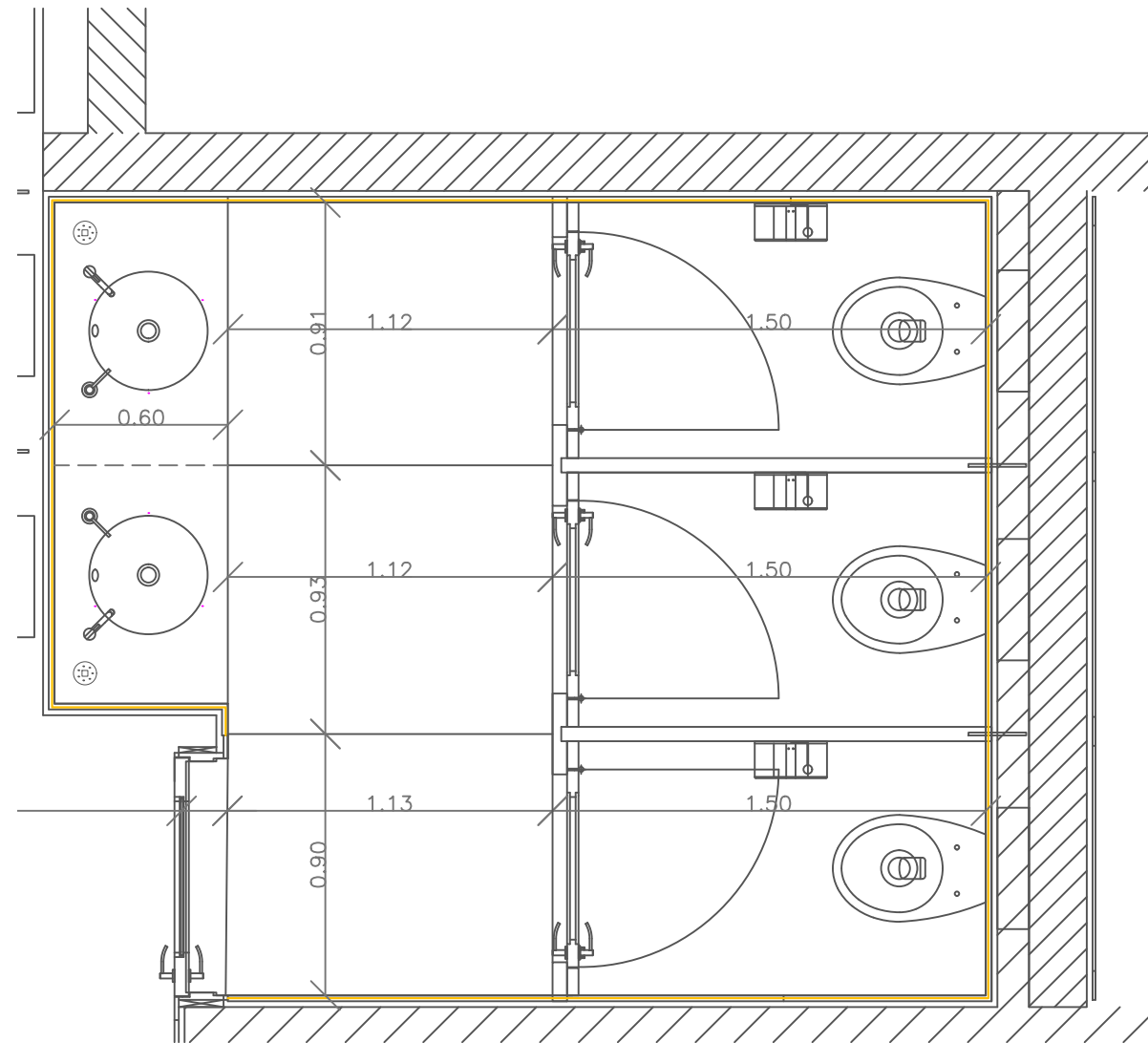
NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%



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PROJECT: Can Marquès	DATE: 01/01/18	6.4
SUBJECT: Men's Bathroom A, Section 3 and 4	SCALE: 1:25	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

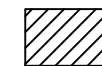
FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%



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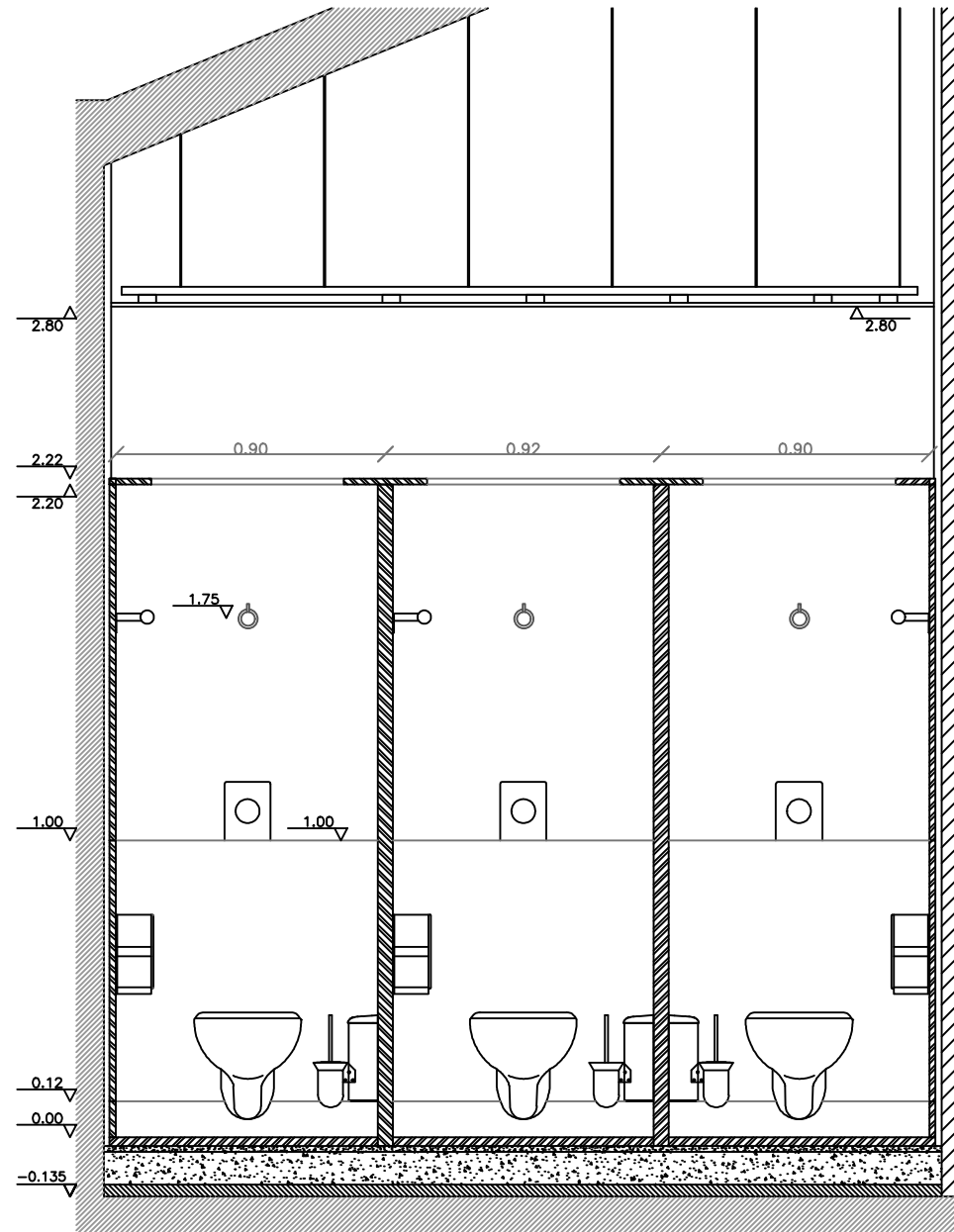
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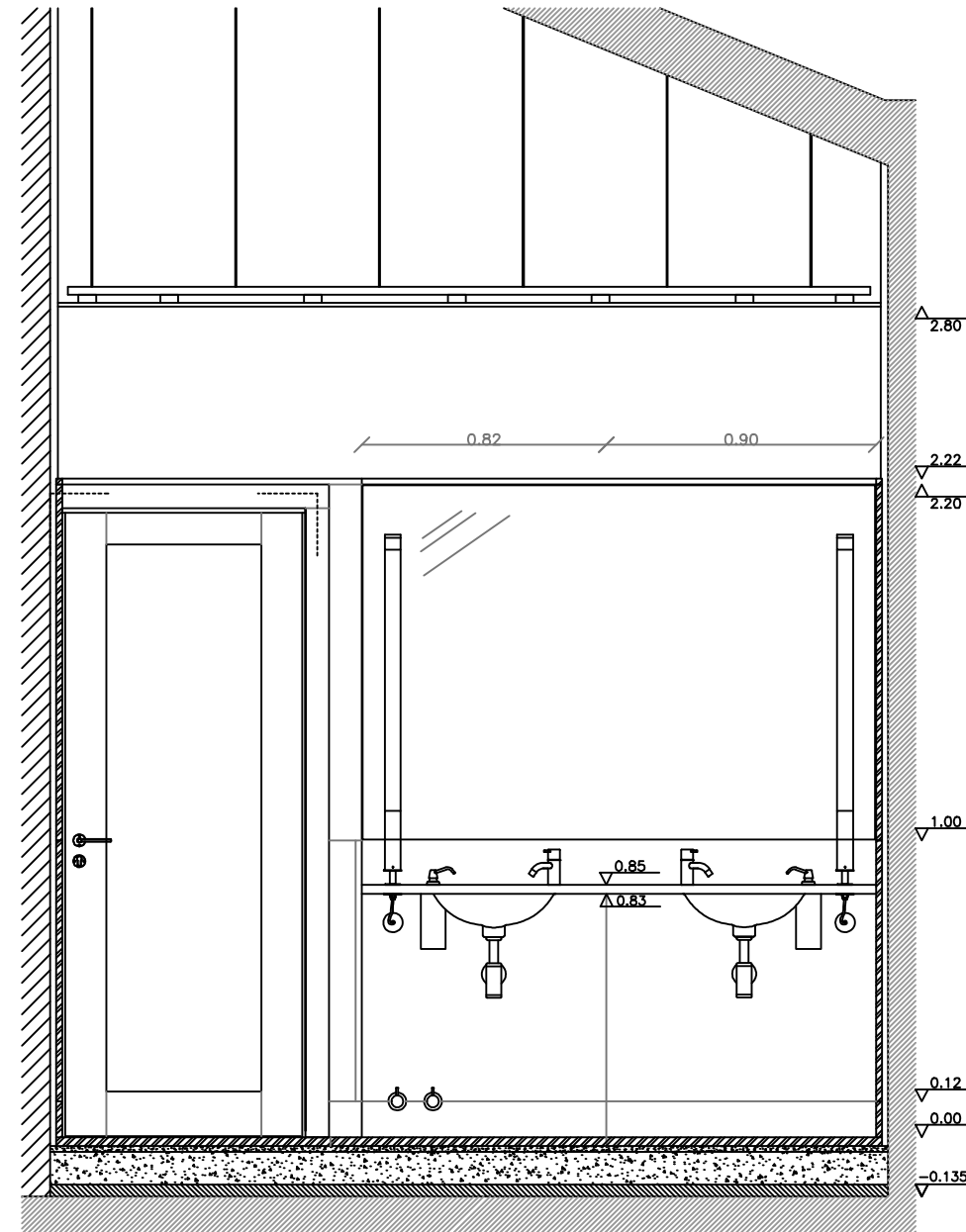
CONCRETE

VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 01/01/18	6.5
SUBJECT: Women's Bathroom A Floor Plan	SCALE: 1:25	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



SECTION 1 WALL A



SECTION 2 WALL B

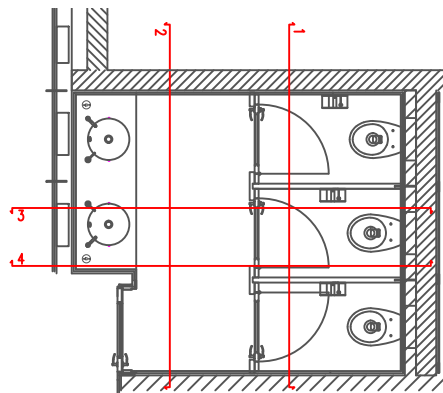
WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

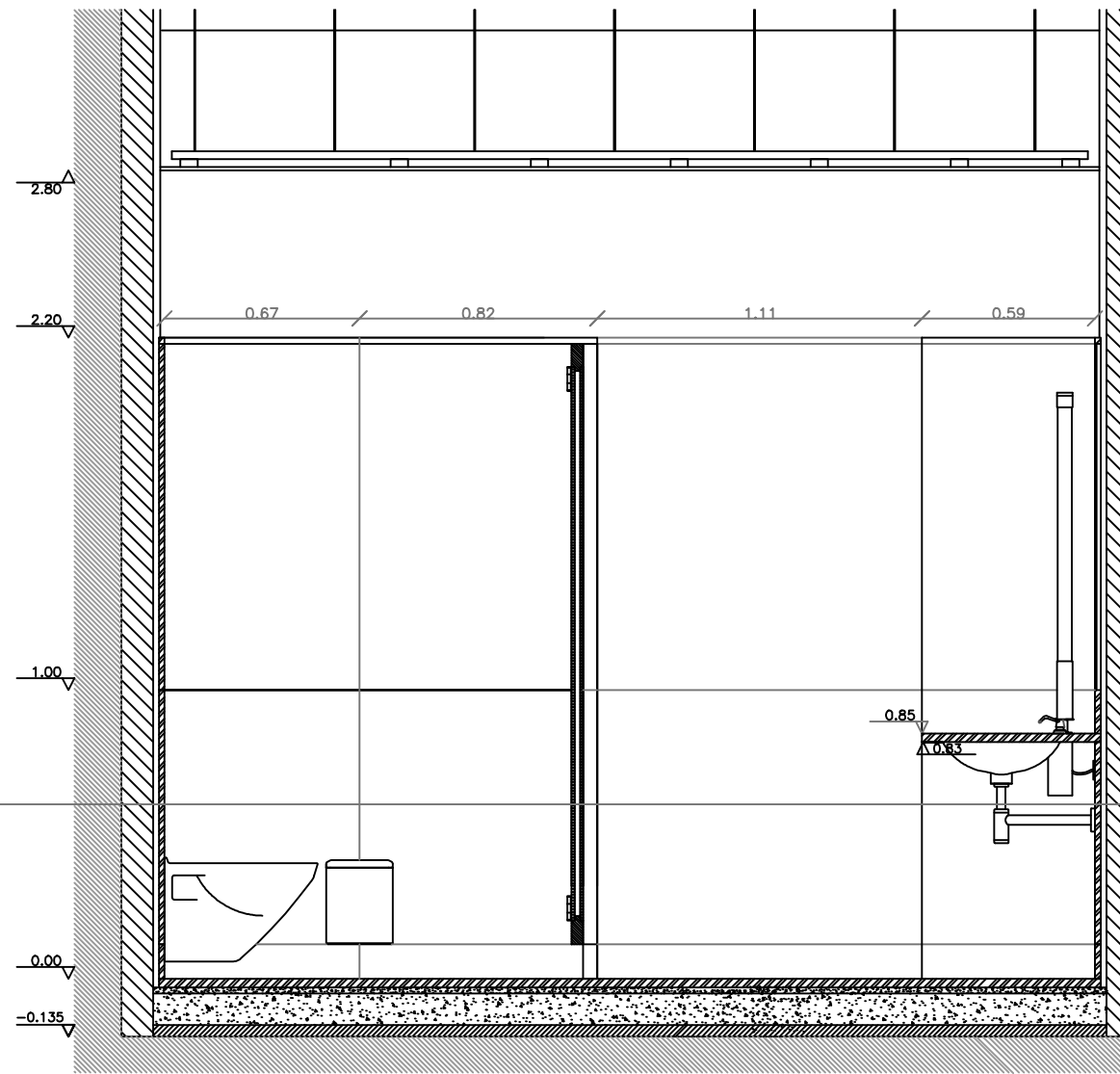
NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%



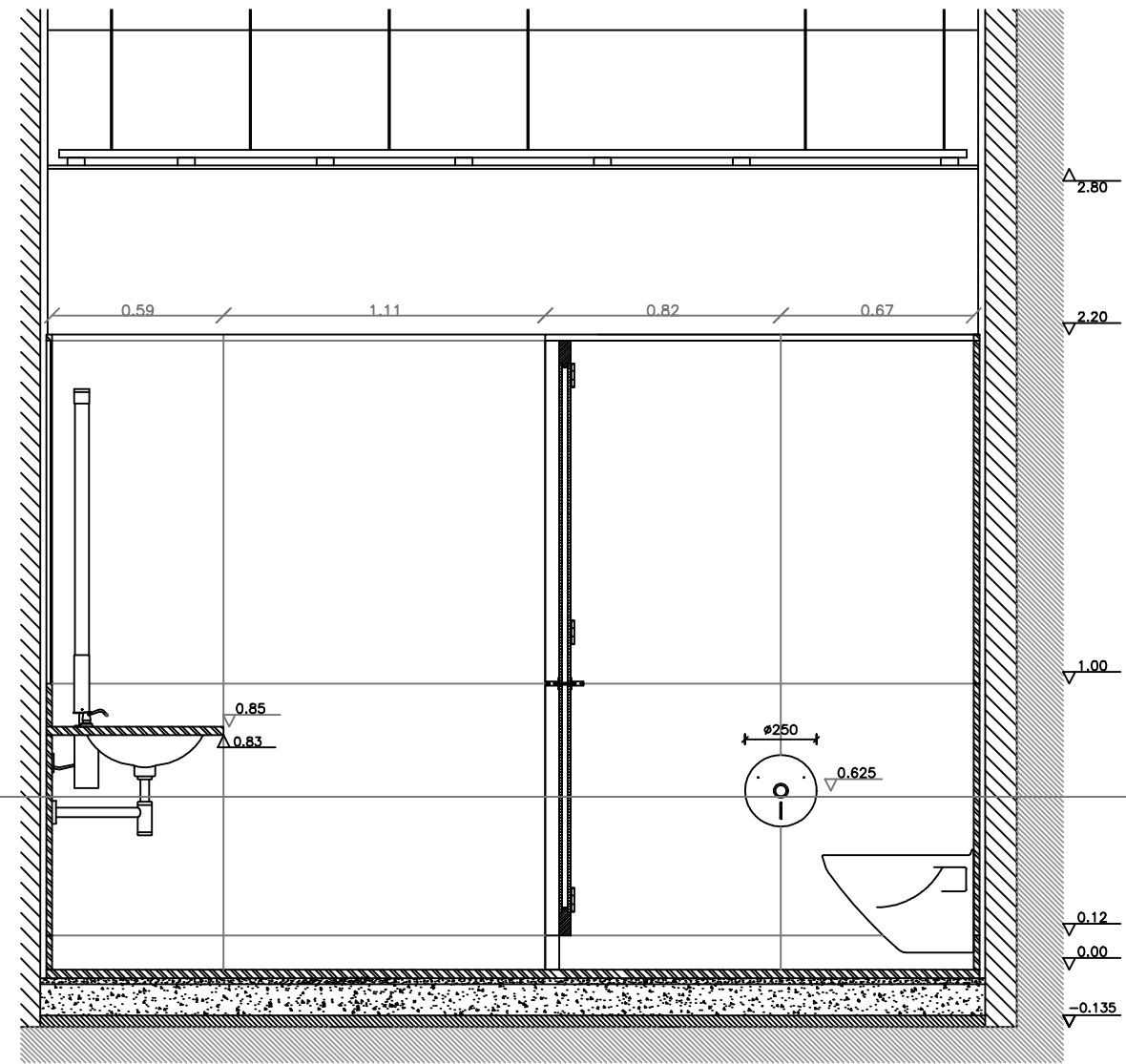
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VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 01/01/18	6.6
SUBJECT: Women's Bathroom A, Section 1 and 2	SCALE: 1:25	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



SECTION 3 WALL C

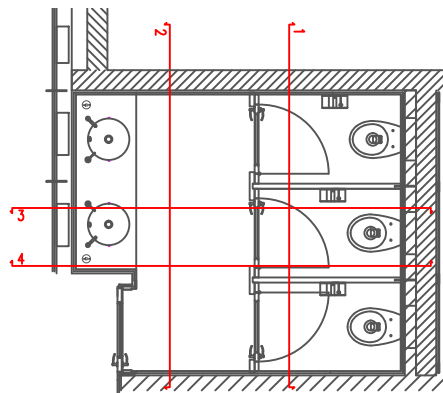


SECTION 4 WALL D

- WALLS:**
- 12.5 mm PLASTER
 - MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
 - 5mm TILE ADHESIVE
 - 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

- FLOOR:**
- 250mm CONCRETE CEILING
 - 10mm POLYETHYLENE (PLASTIC MEMBRANE)
 - 2mm PE-FOIL VAPOUR BARRIER
 - 100mm CAST ON SITE CONCRETE
 - 2mm LIQUID MEMBRANE
 - 5mm TILE ADHESIVE
 - 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

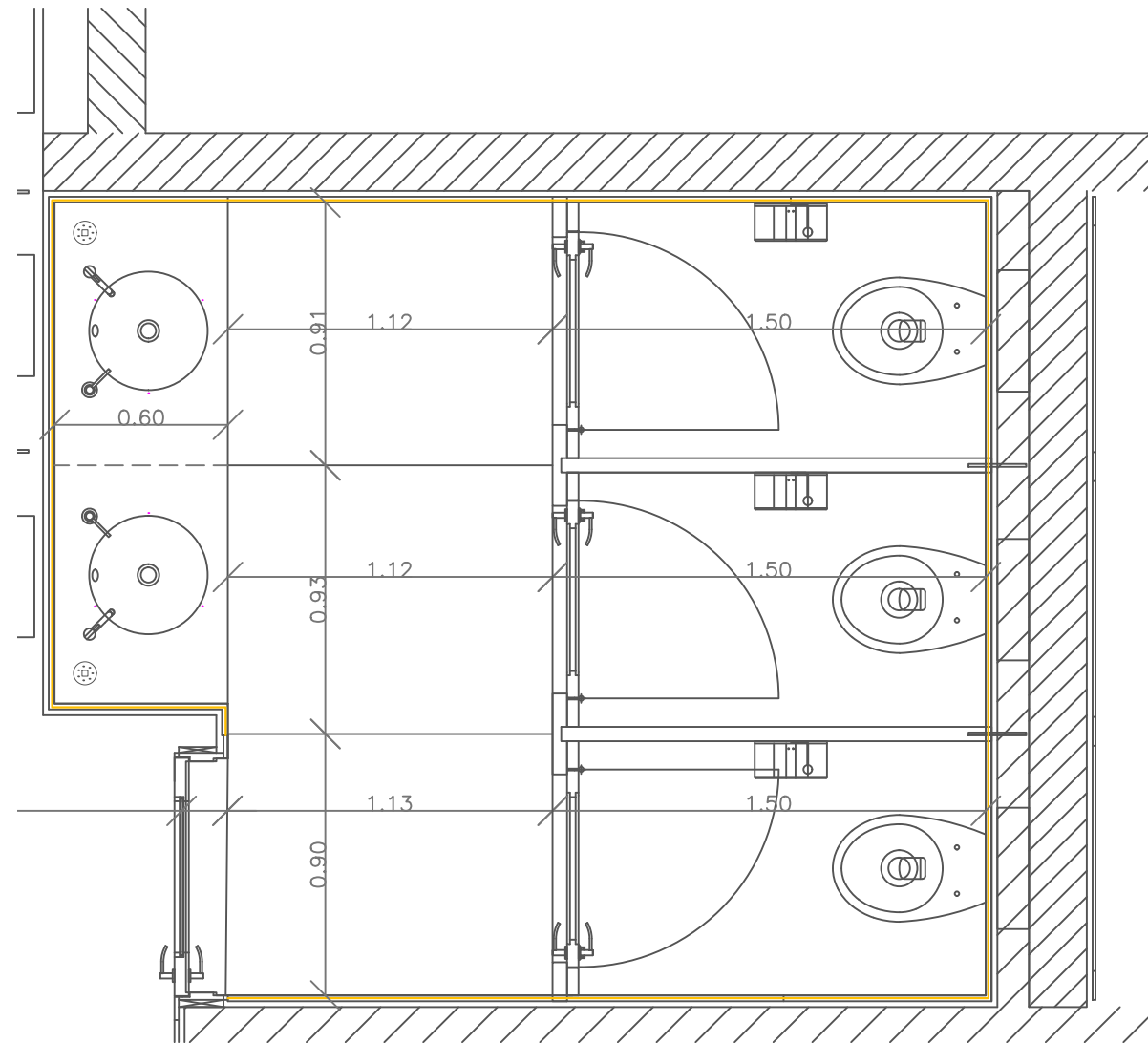
NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%



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PROJECT: Can Marquès	DATE: 01/01/18	6.7
SUBJECT: Women's Bathroom A, Section 3 and 4	SCALE: 1:25	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

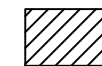
FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%



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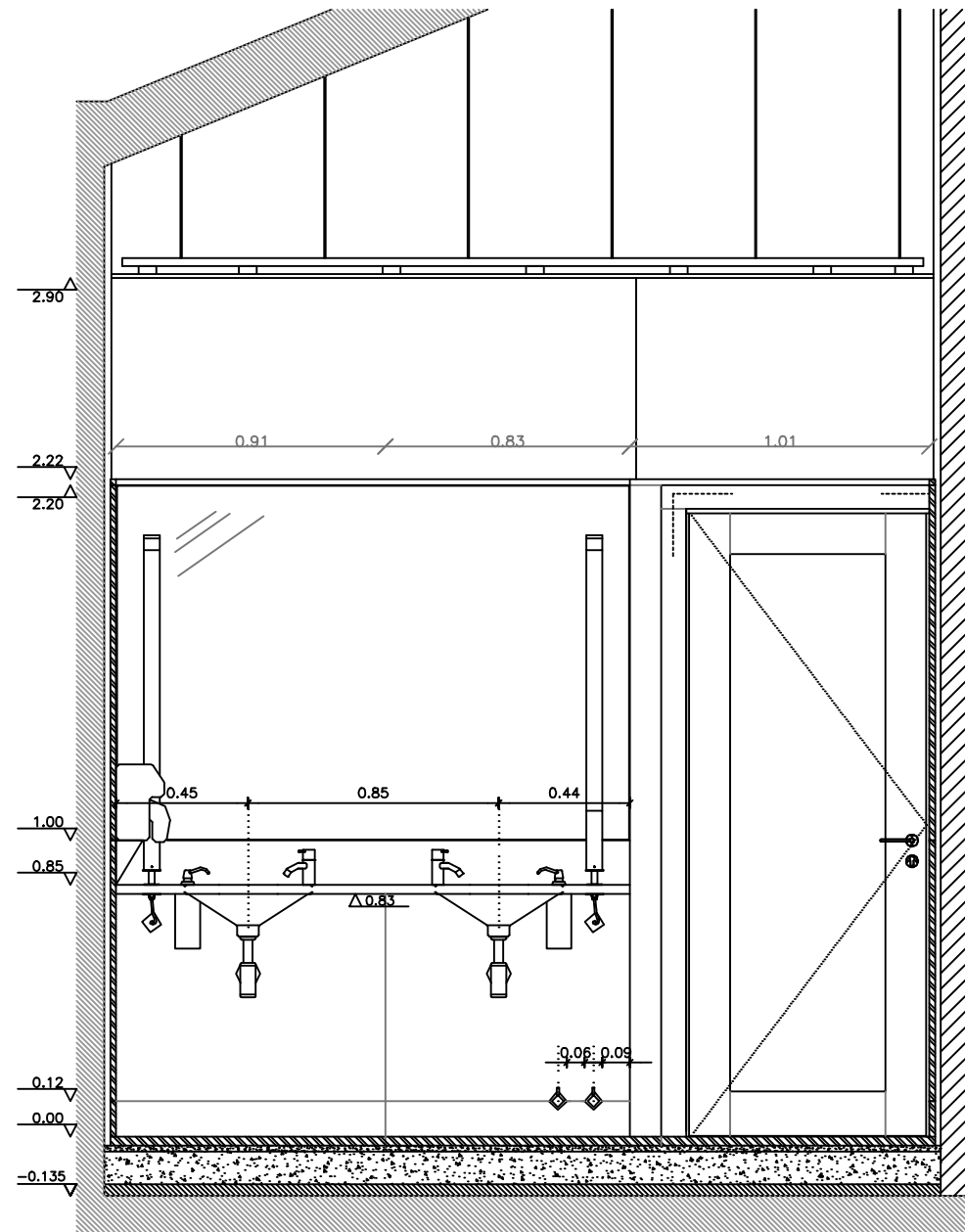
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CONCRETE

VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 01/01/18	6.8
SUBJECT: Women's Bathroom B, Section 1 and 2	SCALE: 1:25	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



SECTION 1 WALL A

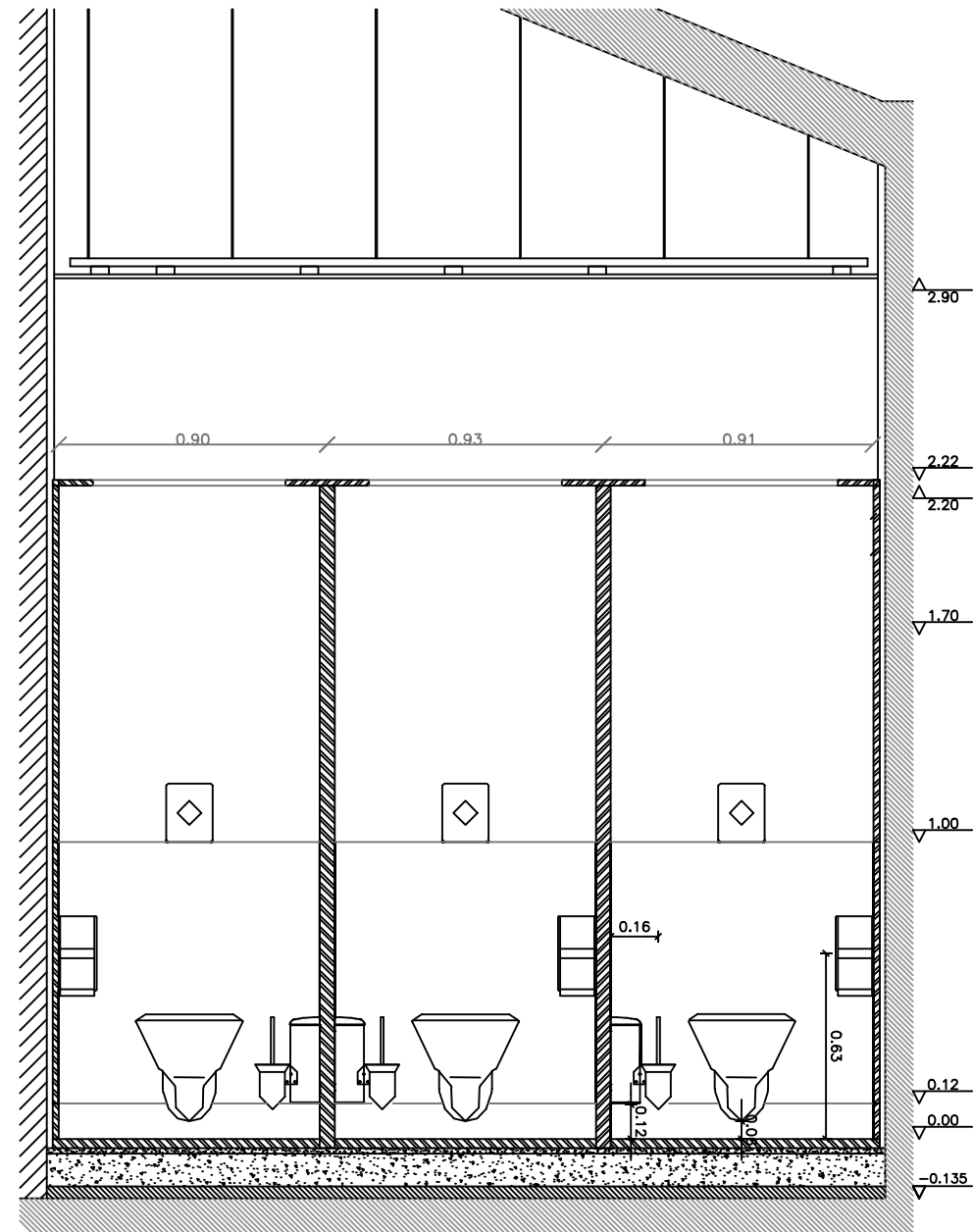
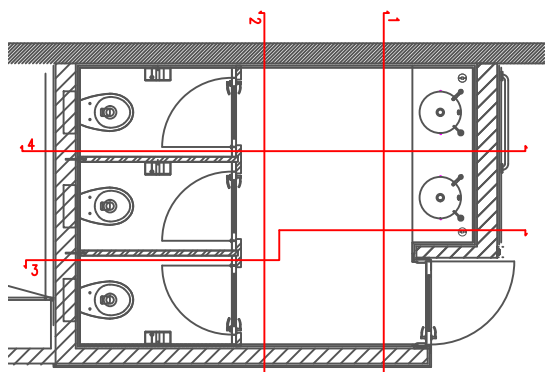
WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%



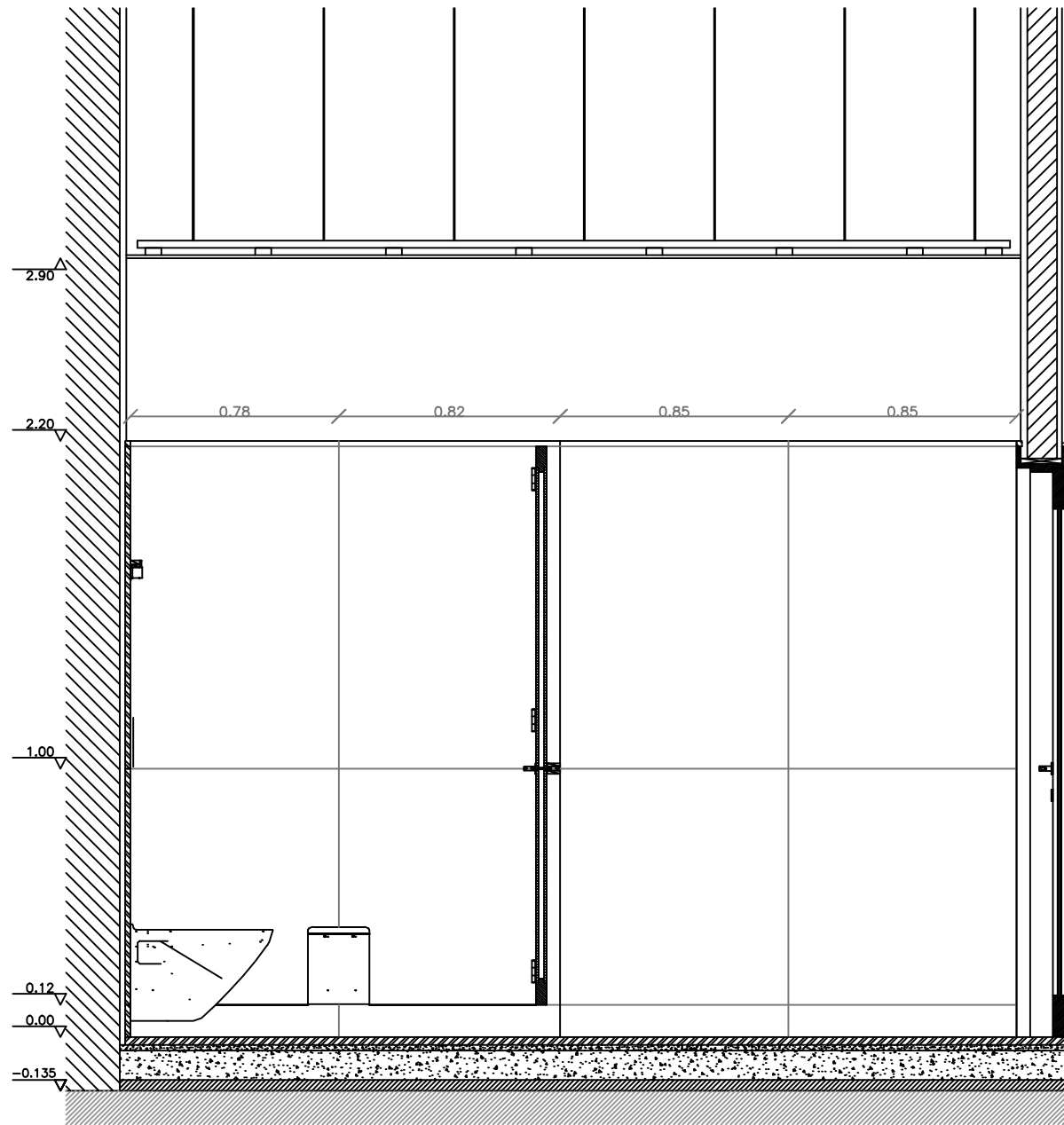
SECTION 2 WALL B



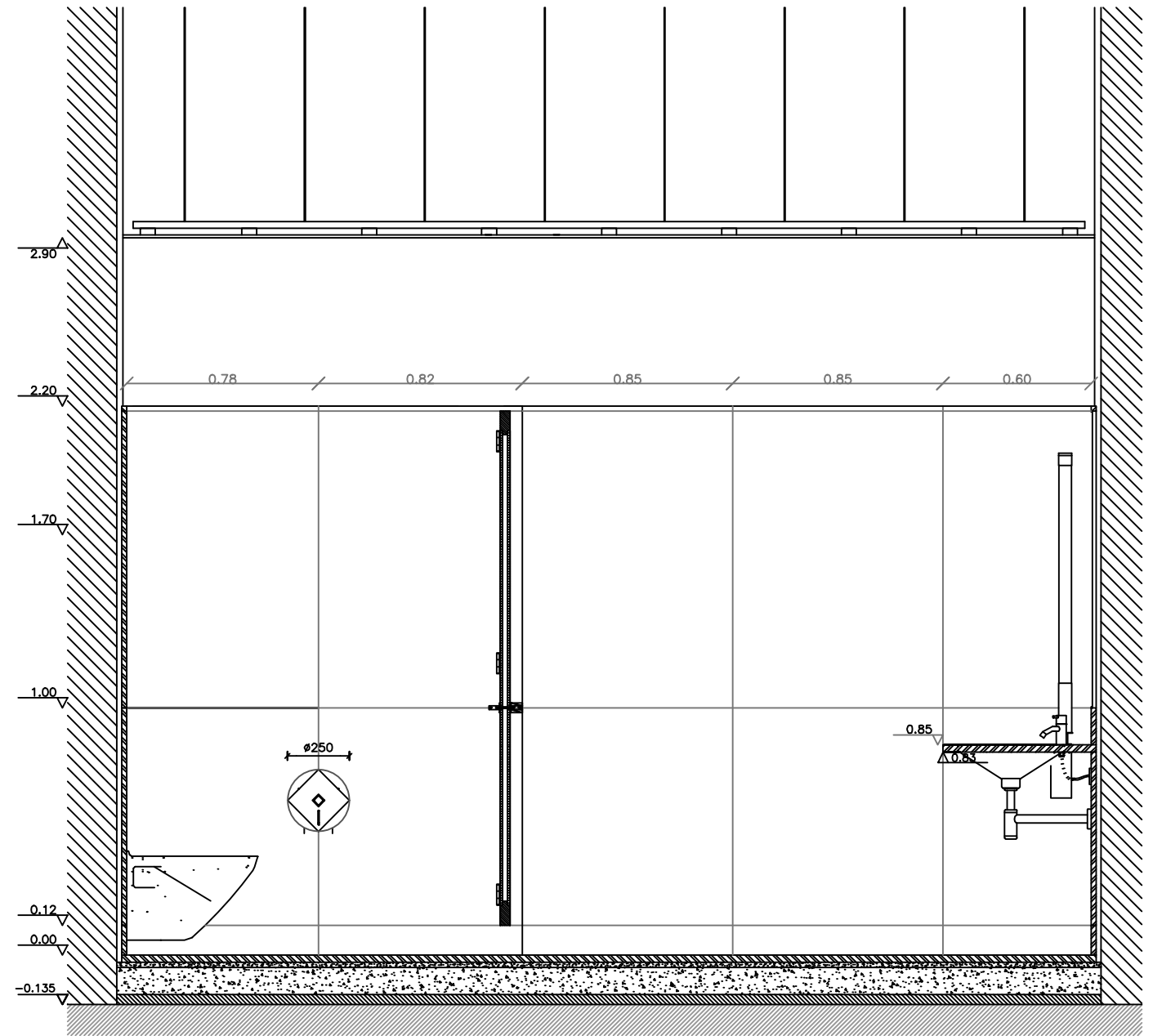
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PROJECT: Can Marquès	DATE: 01/01/18	6.9
SUBJECT: Women's Bathroom B, Section 1 and 2	SCALE: 1:25	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



SECTION 3 WALL C



SECTION 4 WALL D

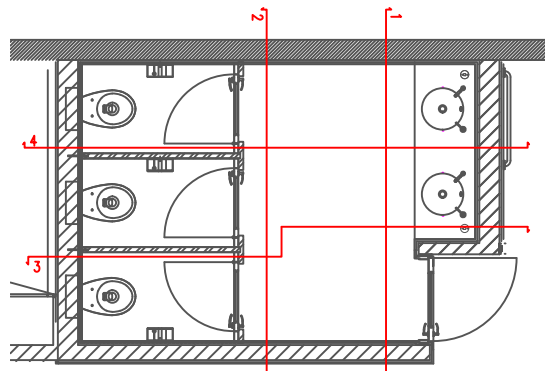
WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

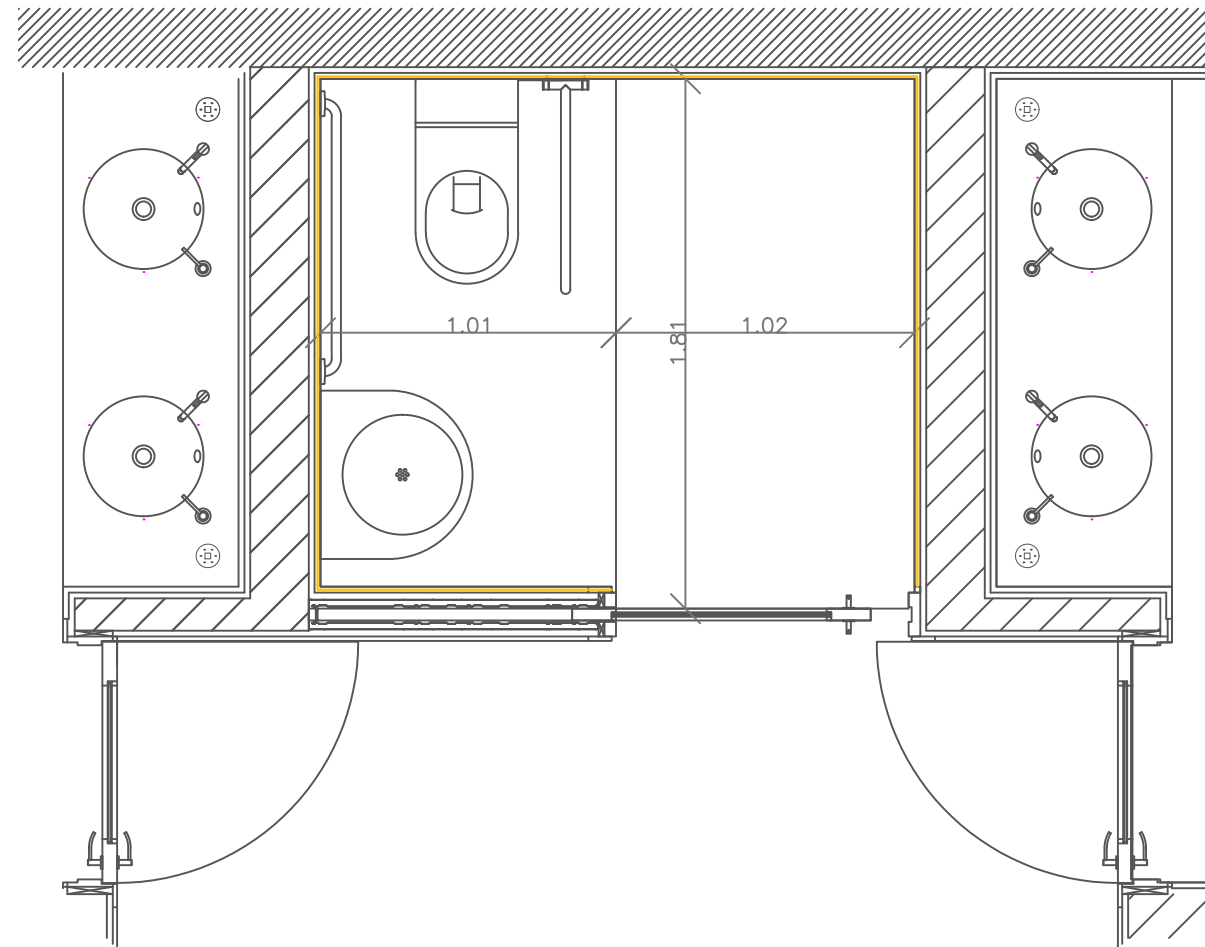
NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%



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PROJECT: Can Marquès	DATE: 01/01/18	6.10
SUBJECT: Women's Bathroom B, Section 2 and 3	SCALE: 1:25	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

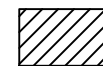
FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%



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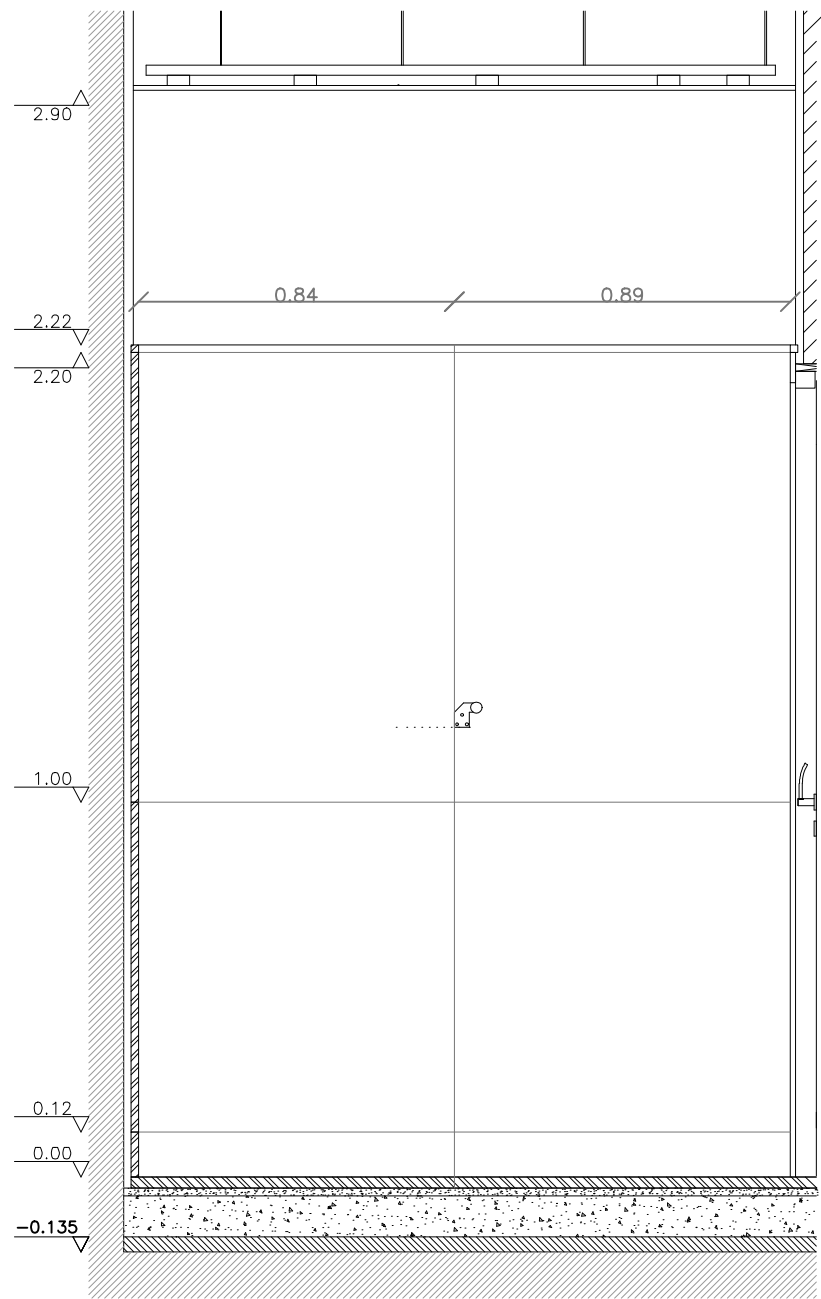
STONE



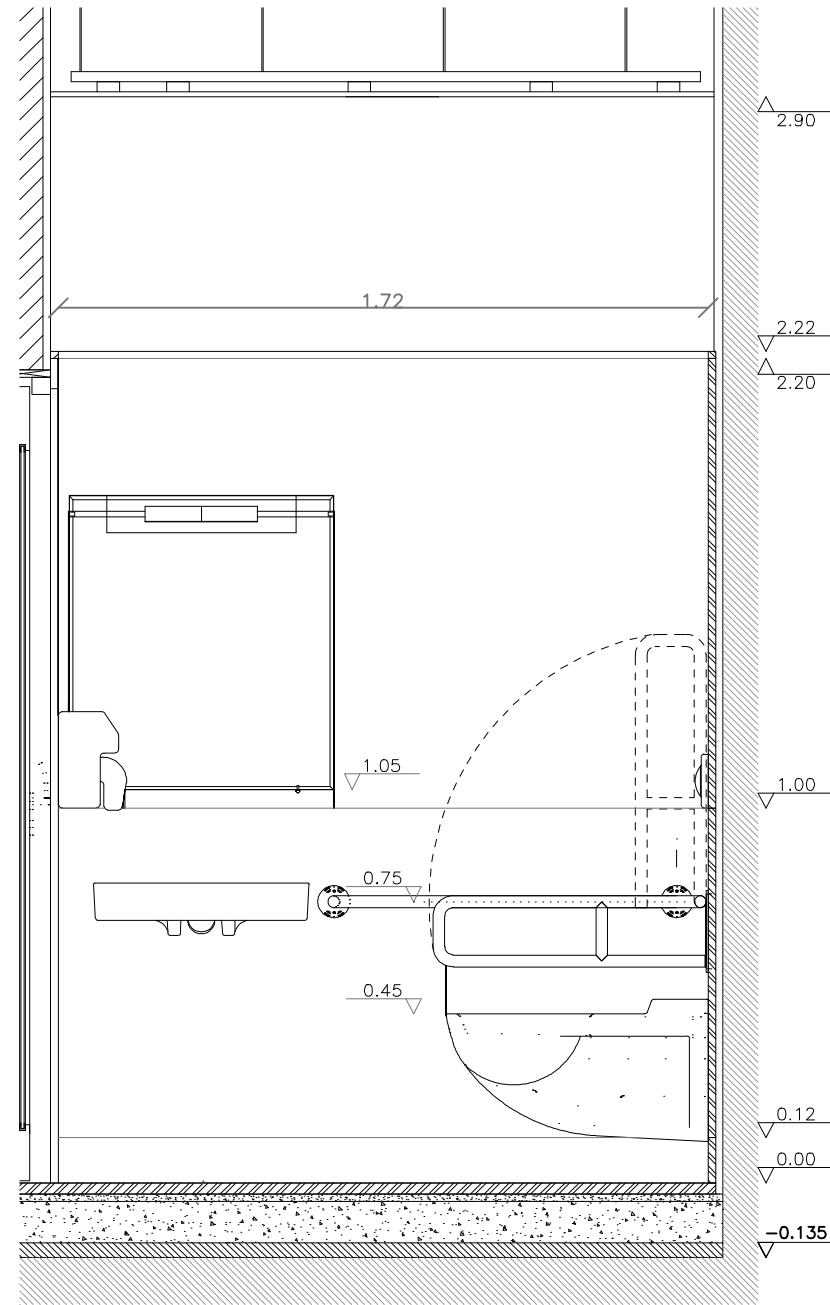
CONCRETE

VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 01/01/18	6.11
SUBJECT: Disabled Bathroom Floor Plan	SCALE: 1:25	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



SECTION 1 WALL A



SECTION 2 WALL B

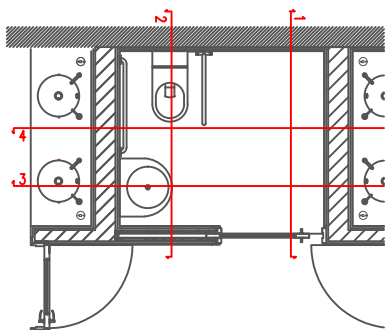
WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%



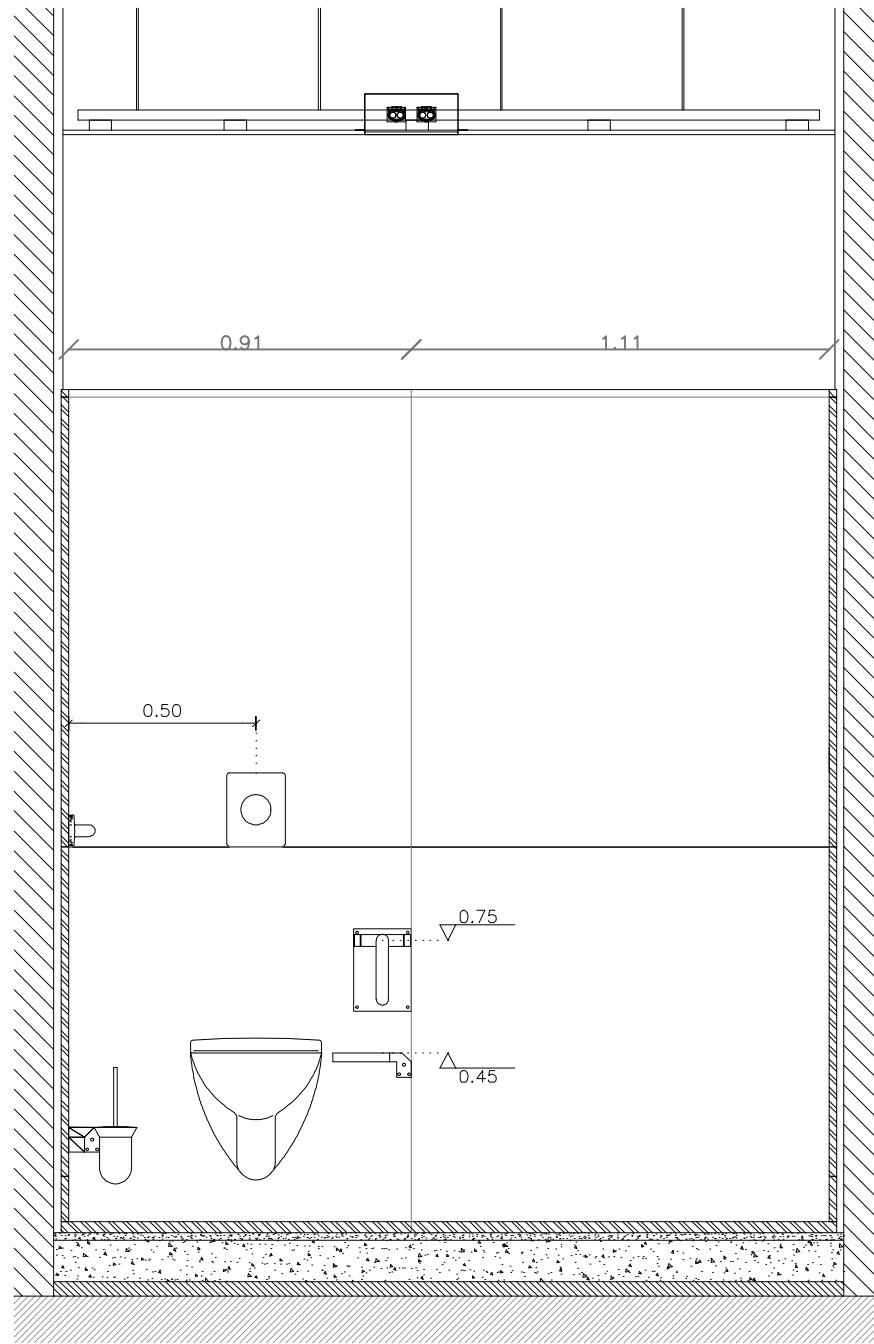
 BRICK	 TIMBER	 MORTAR	 STONE	 CONCRETE
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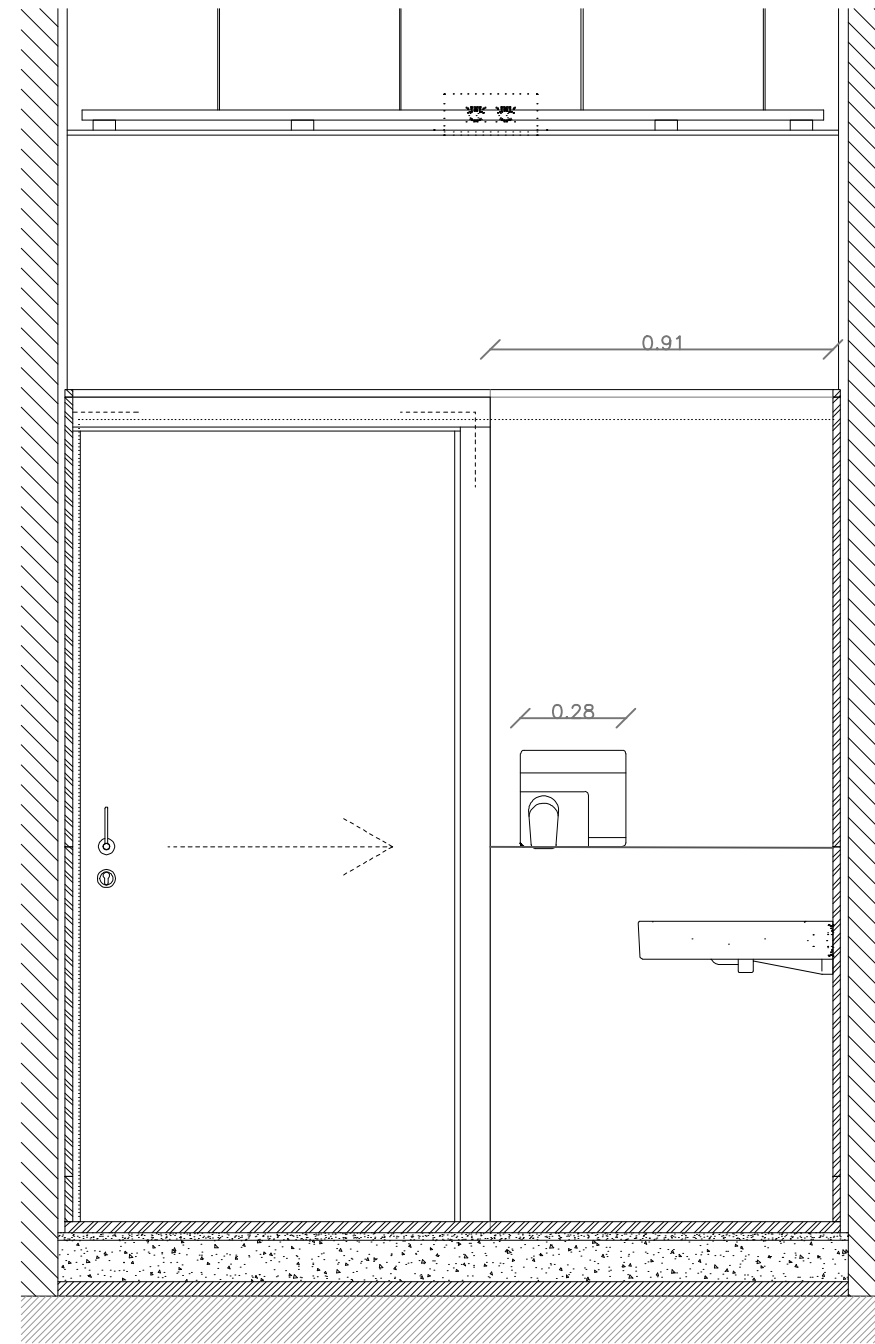
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VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 01/01/18	6.12
SUBJECT: Disabled Bathroom, Section 1 and 2	SCALE: 1:20	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



SECTION 3 WALL C



SECTION 4 WALL D

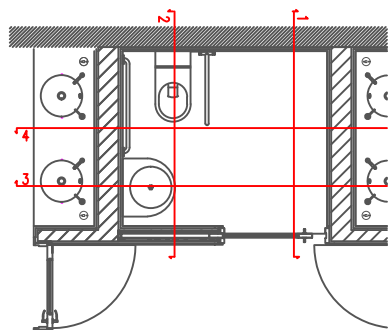
WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

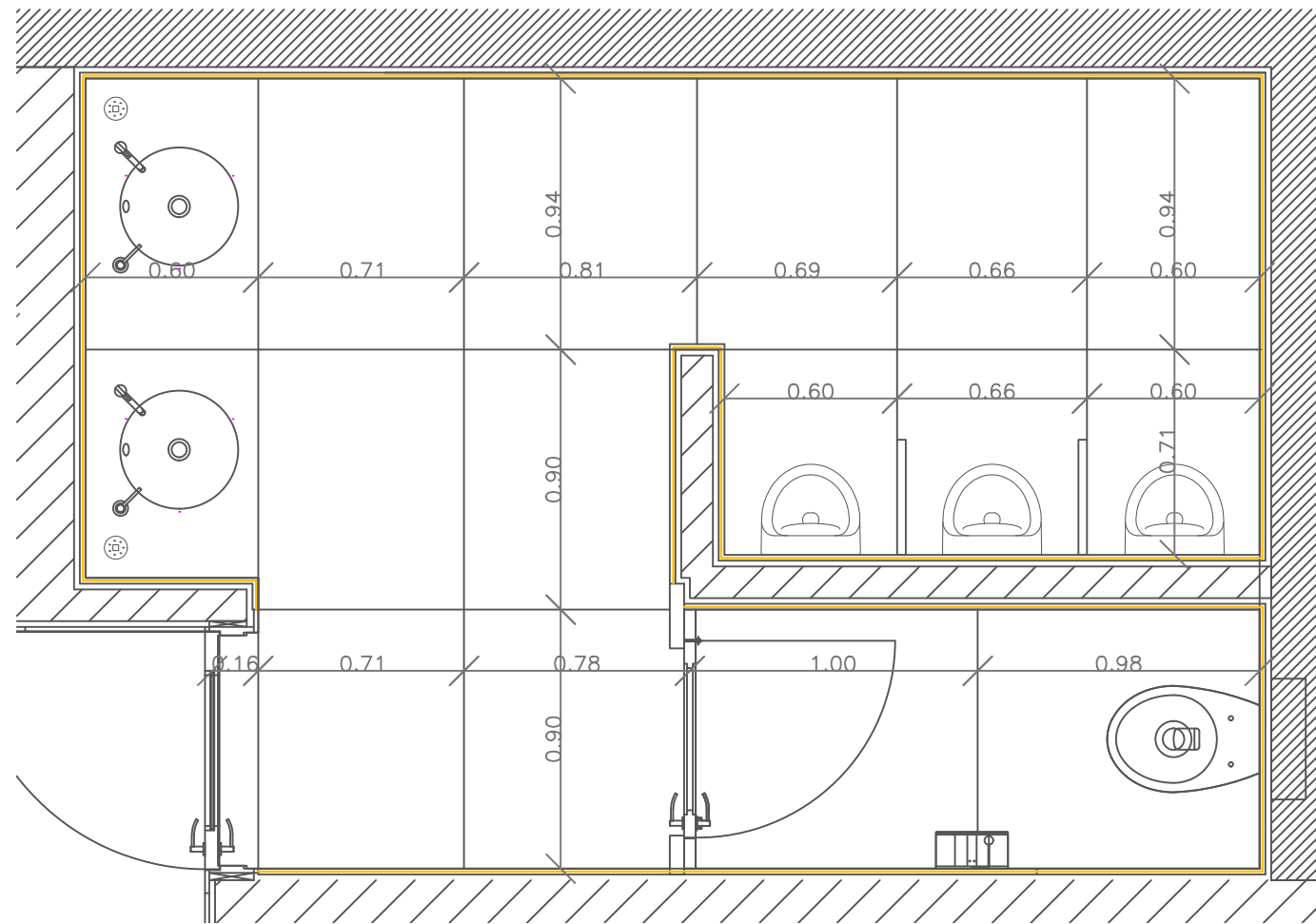
NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%



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VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 01/01/18	6.13
SUBJECT: Disabled Bathroom, Section 2 and 3	SCALE: 1:20	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

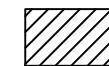
FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%



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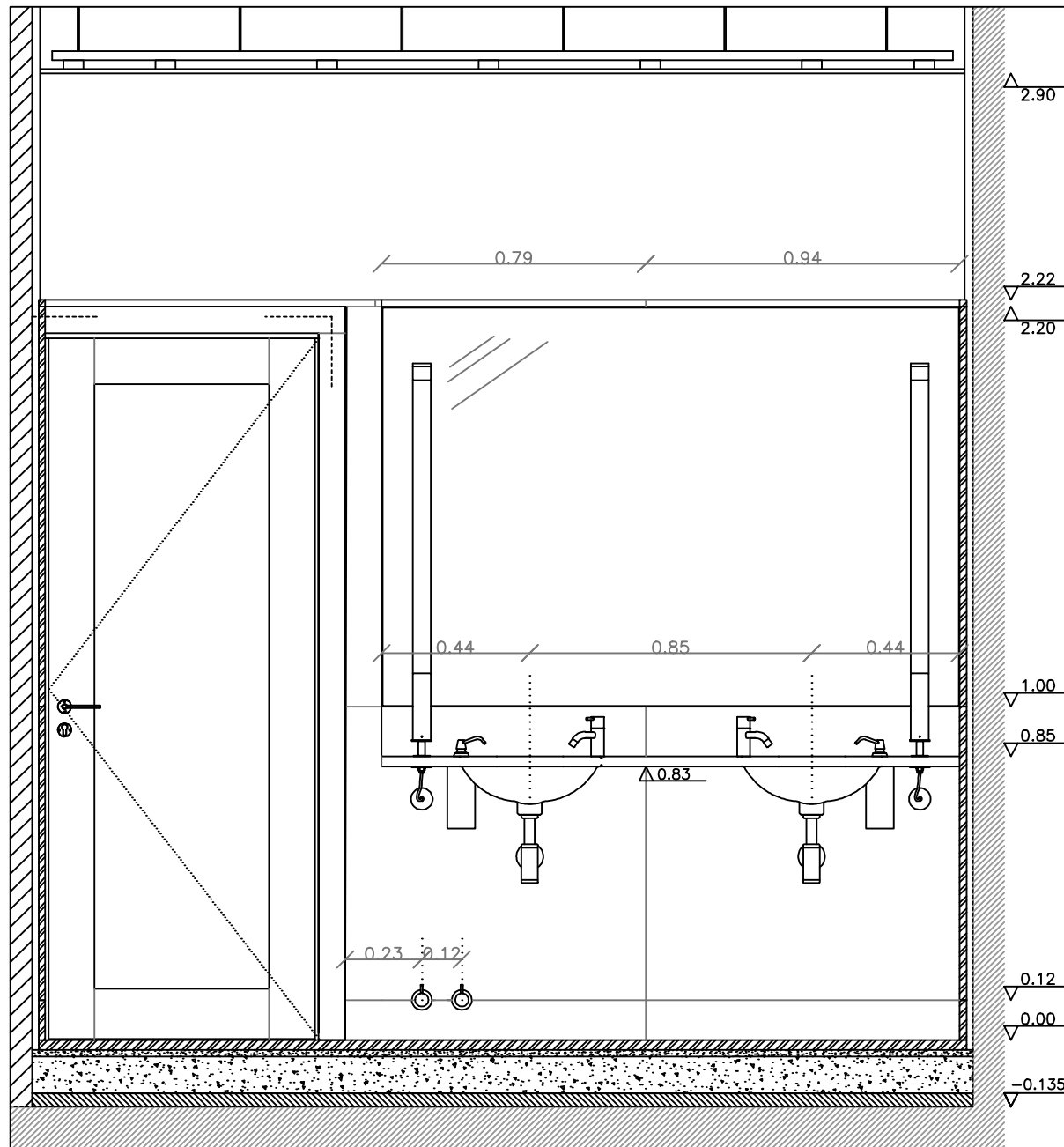
STONE



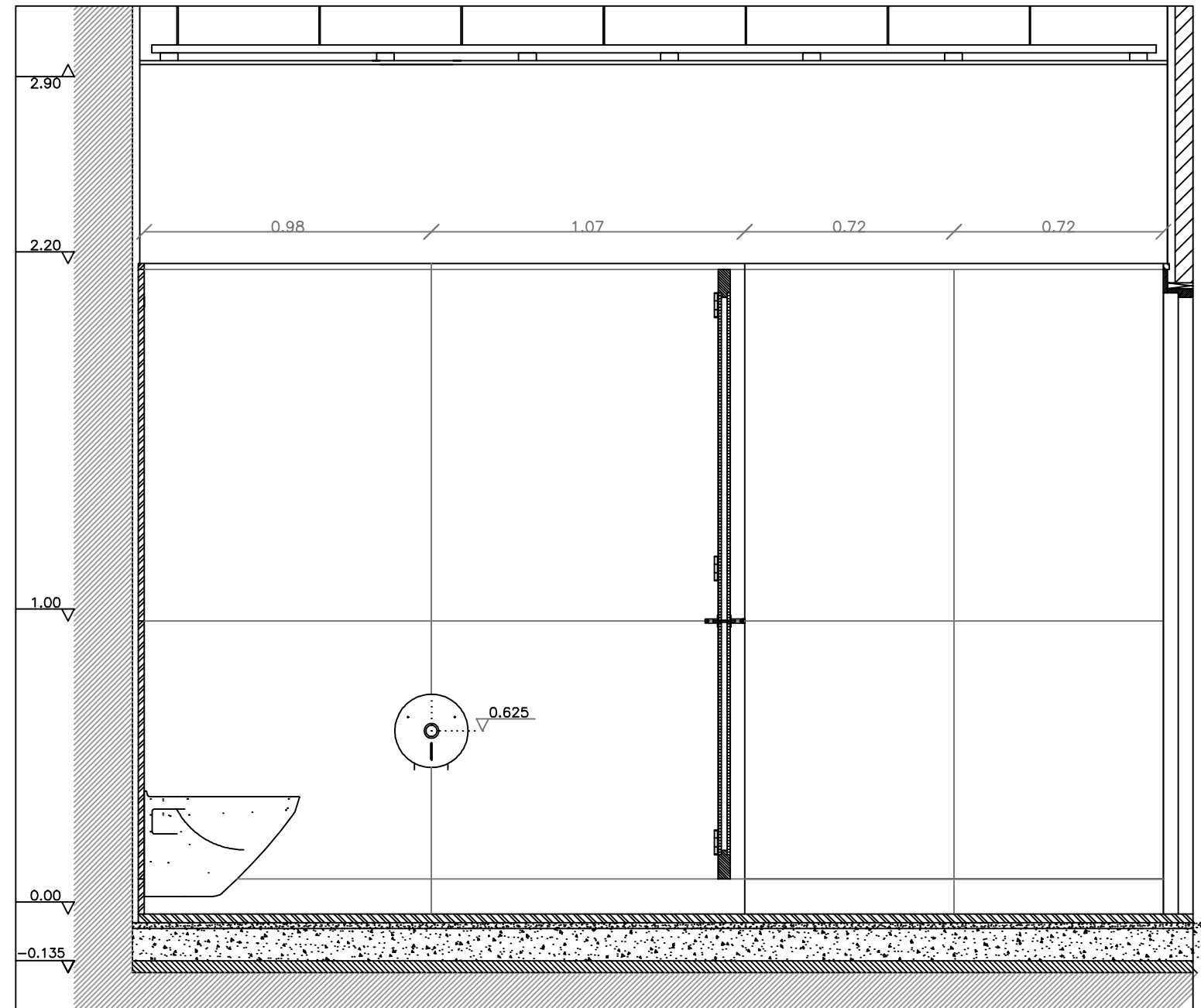
CONCRETE

VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 01/01/18	6.14
SUBJECT: Men's Bathroom B Floor Plan	SCALE: 1:25	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



SECTION 1 WALL A



SECTION 2 WALL B

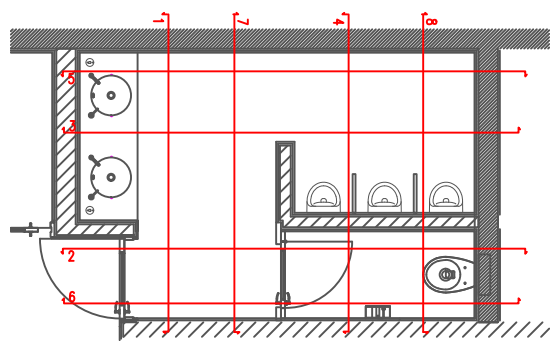
WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%

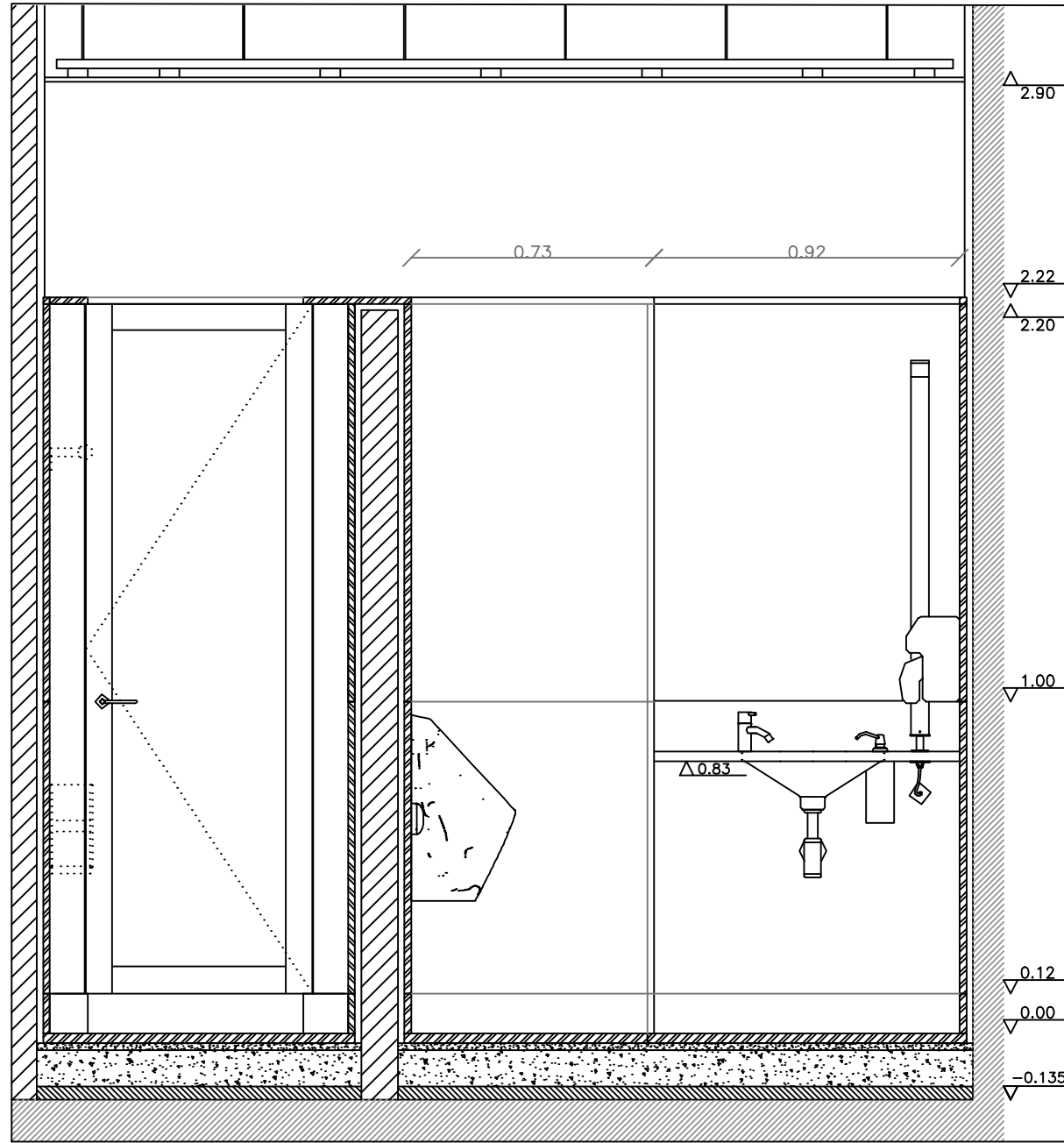


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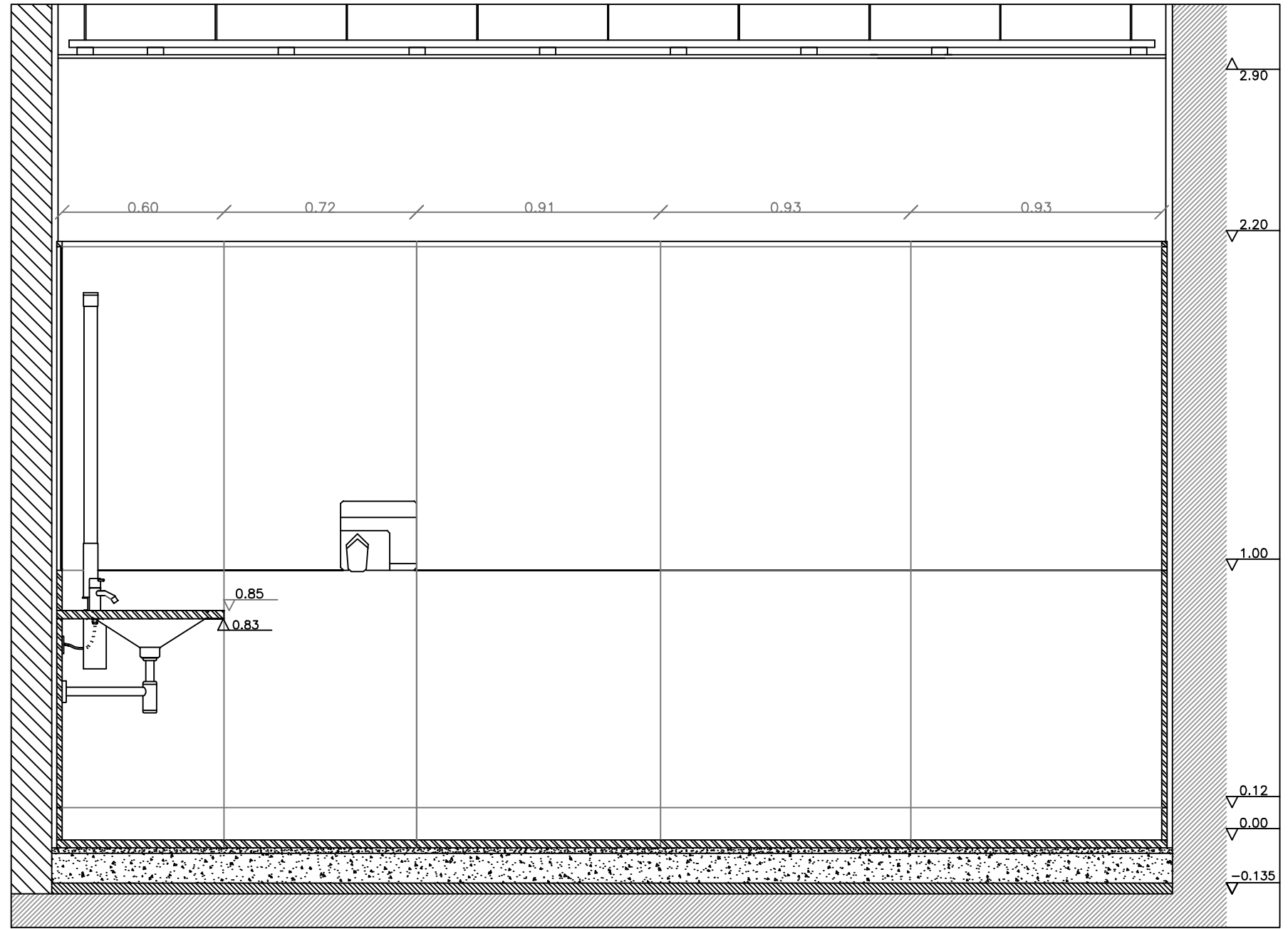


VIA Built Environment & Engineering

PROJECT: Can Marquès	DATE: 01/01/18	6.15
SUBJECT: Men's Bathroom B, Section 1 and 2	SCALE: 1:20	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



SECTION 3 WALL C



SECTION 4 WALL D

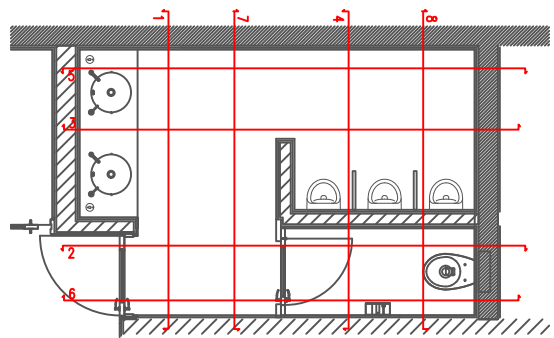
WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%

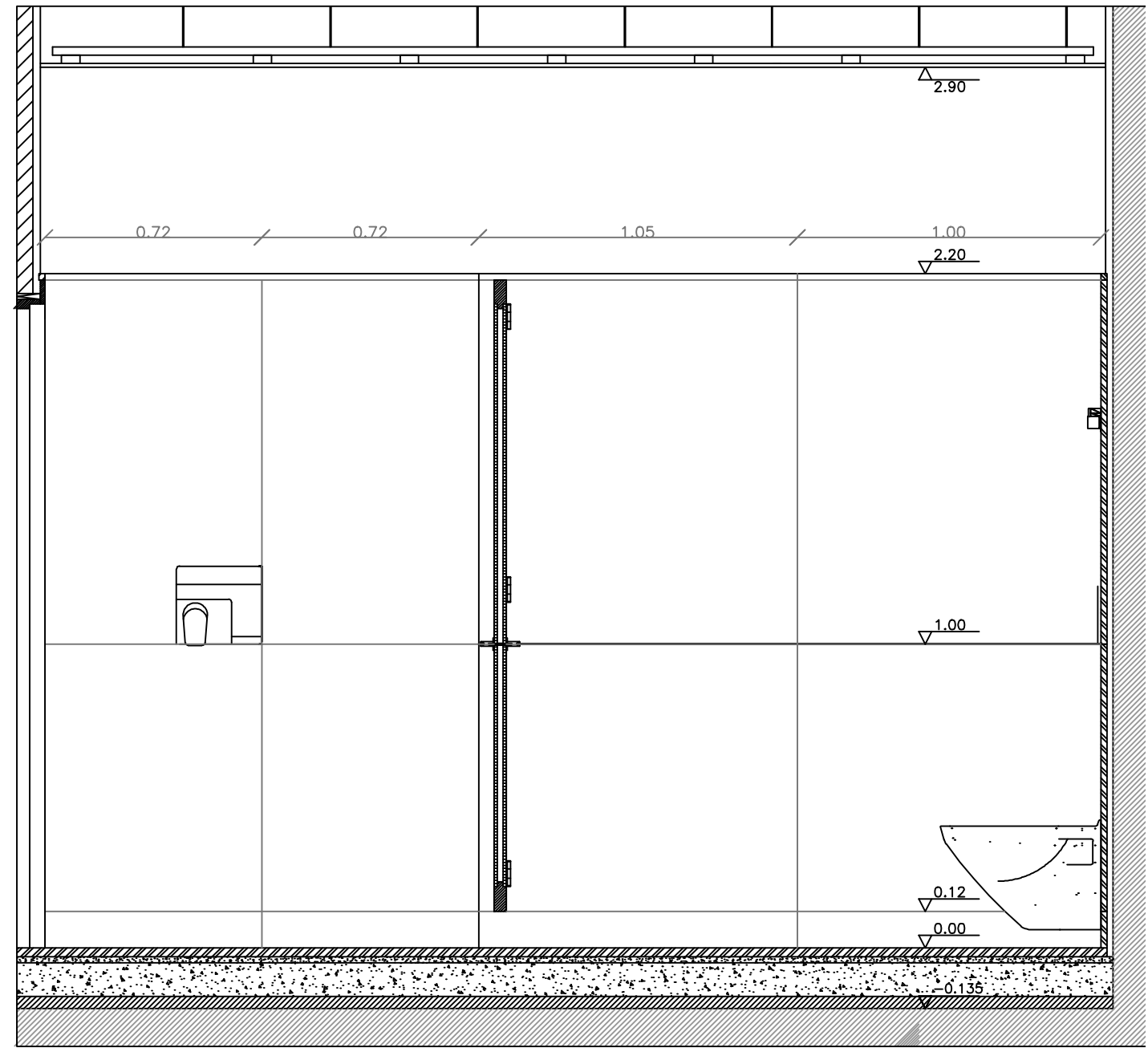
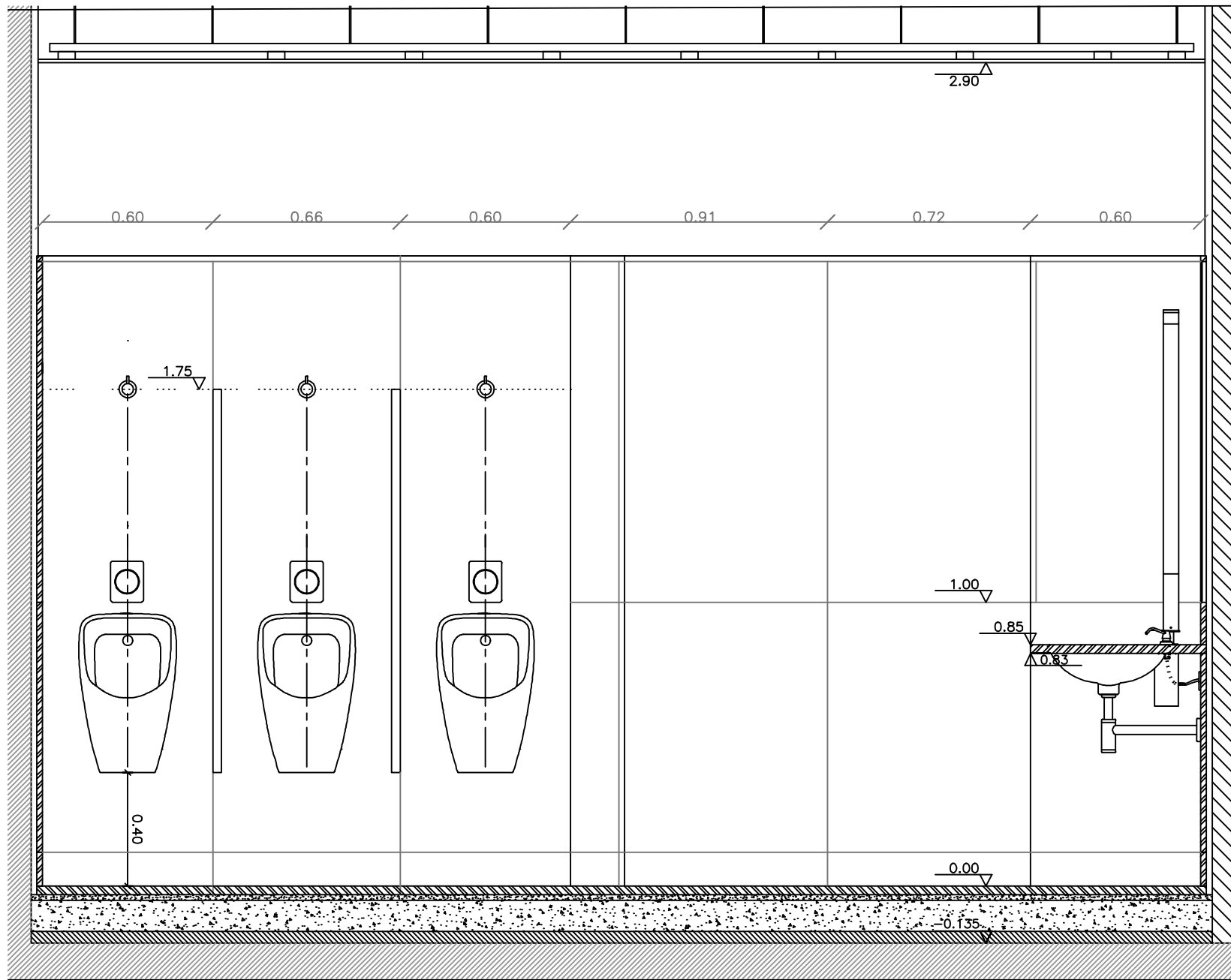


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PROJECT: Can Marquès	DATE: 01/01/18	6.16
SUBJECT: Men's Bathroom B, Section 3 and 4	SCALE: 1:20	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



SECTION 5 WALL E

SECTION 6 WALL F

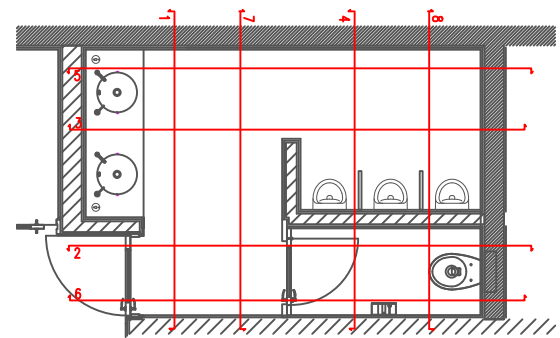
WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

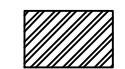
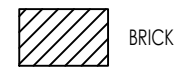
FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%

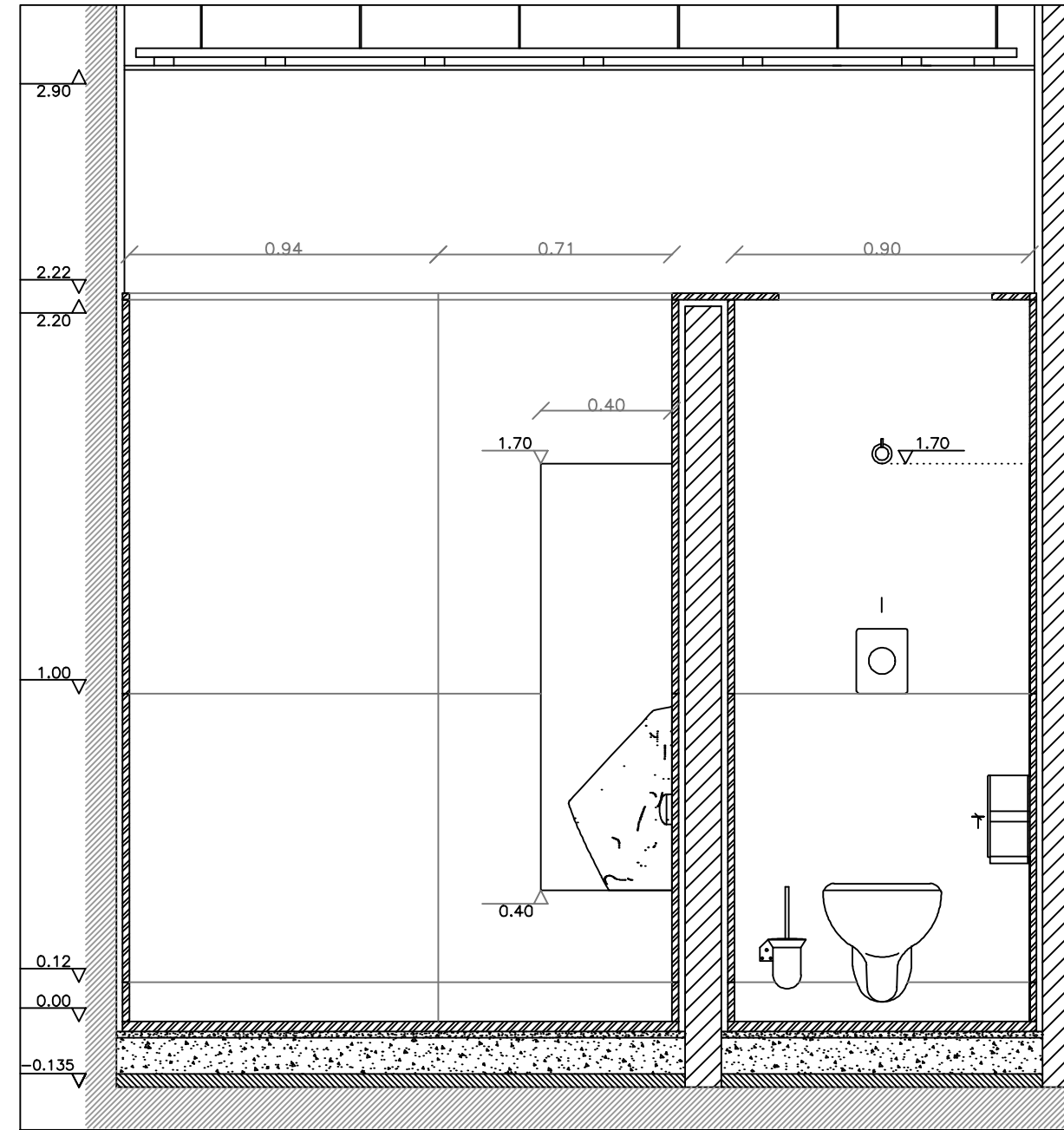
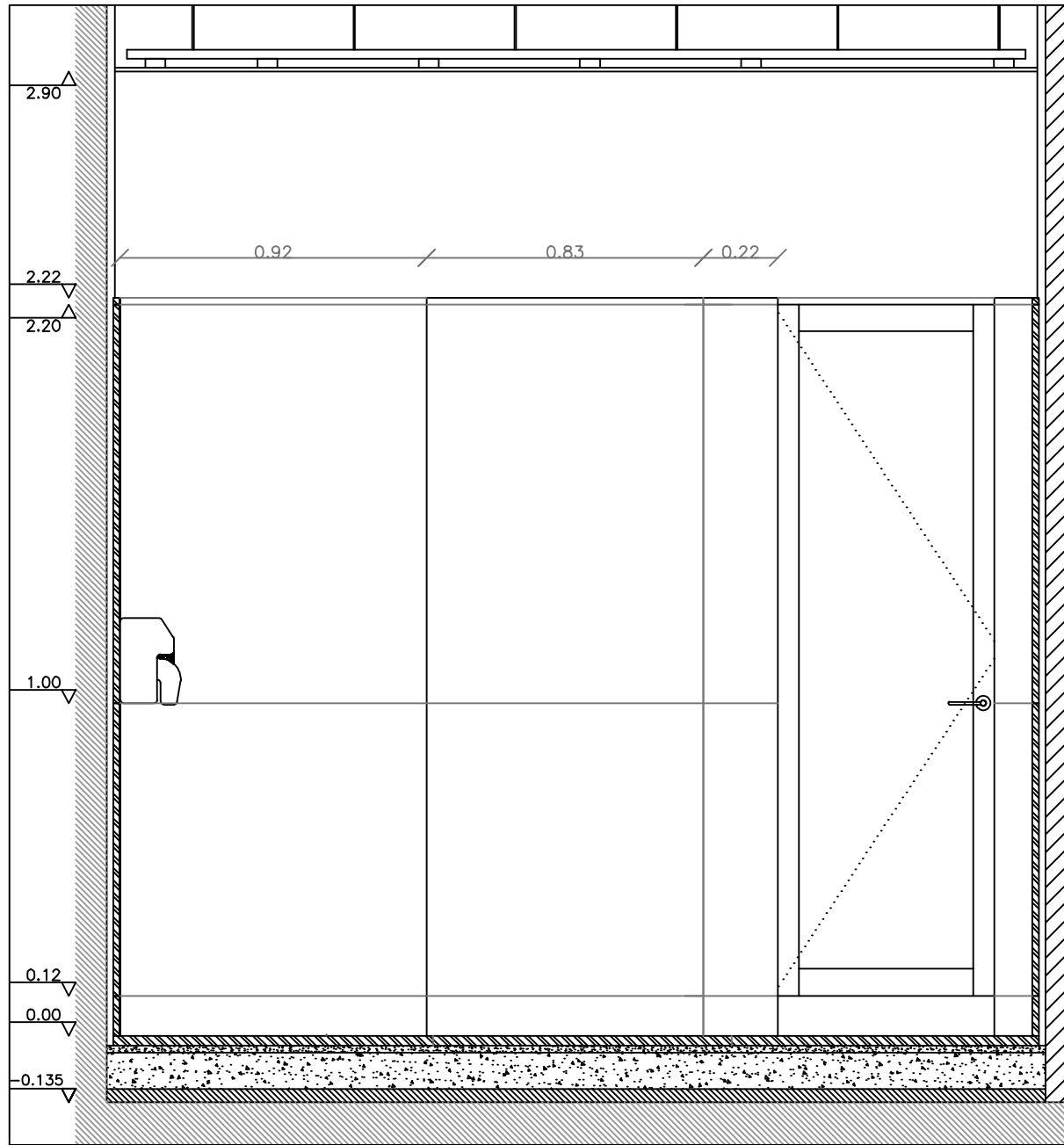


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PROJECT: Can Marquès	DATE: 01/01/18	6.17
SUBJECT: Men's Bathroom B, Section 5 and 6	SCALE: 1:20	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



SECTION 7 WALL G

SECTION 8 WALL H

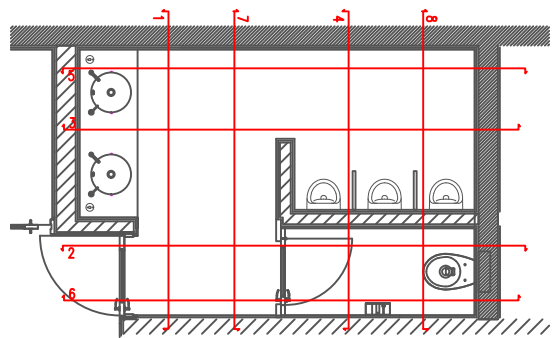
WALLS:

- 12.5 mm PLASTER
- MK APPROVED LIQUID MEMBRANE SYSTEM
 - REINFORCEMENT STRIP IN CORNERS,
 - 100mm OVERLAP IN WALL/FLOOR CONNECTION
 - PIPE PENETRATION SEALANT
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

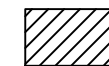
FLOOR:

- 250mm CONCRETE CEILING
- 10mm POLYETHYLENE (PLASTIC MEMBRANE)
- 2mm PE-FOIL VAPOUR BARRIER
- 100mm CAST ON SITE CONCRETE
- 2mm LIQUID MEMBRANE
- 5mm TILE ADHESIVE
- 20mm MARBLE TILES, CREAM MARFIL (DIFFERENT SIZES)
 - JOINT GROUTING, WHITE 2-4mm

NOTE:
 AMOUNTS MAY VARY DEPENDING ON THE TOLERANCES OF EXISTING STRUCTURES.
 ALL QUANTITIES MUST BE CONTROLLED ON SITE.
 MAXIMUM EXPECTED WASTE: 10%



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BRICK



TIMBER



MORTAR



STONE



CONCRETE

VIA Built Environment & Engineering

PROJECT: Can Marquès

DATE: 01/01/18

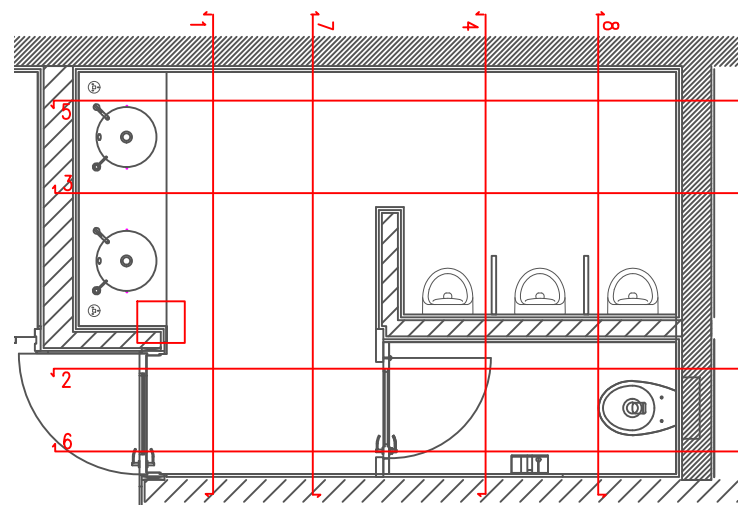
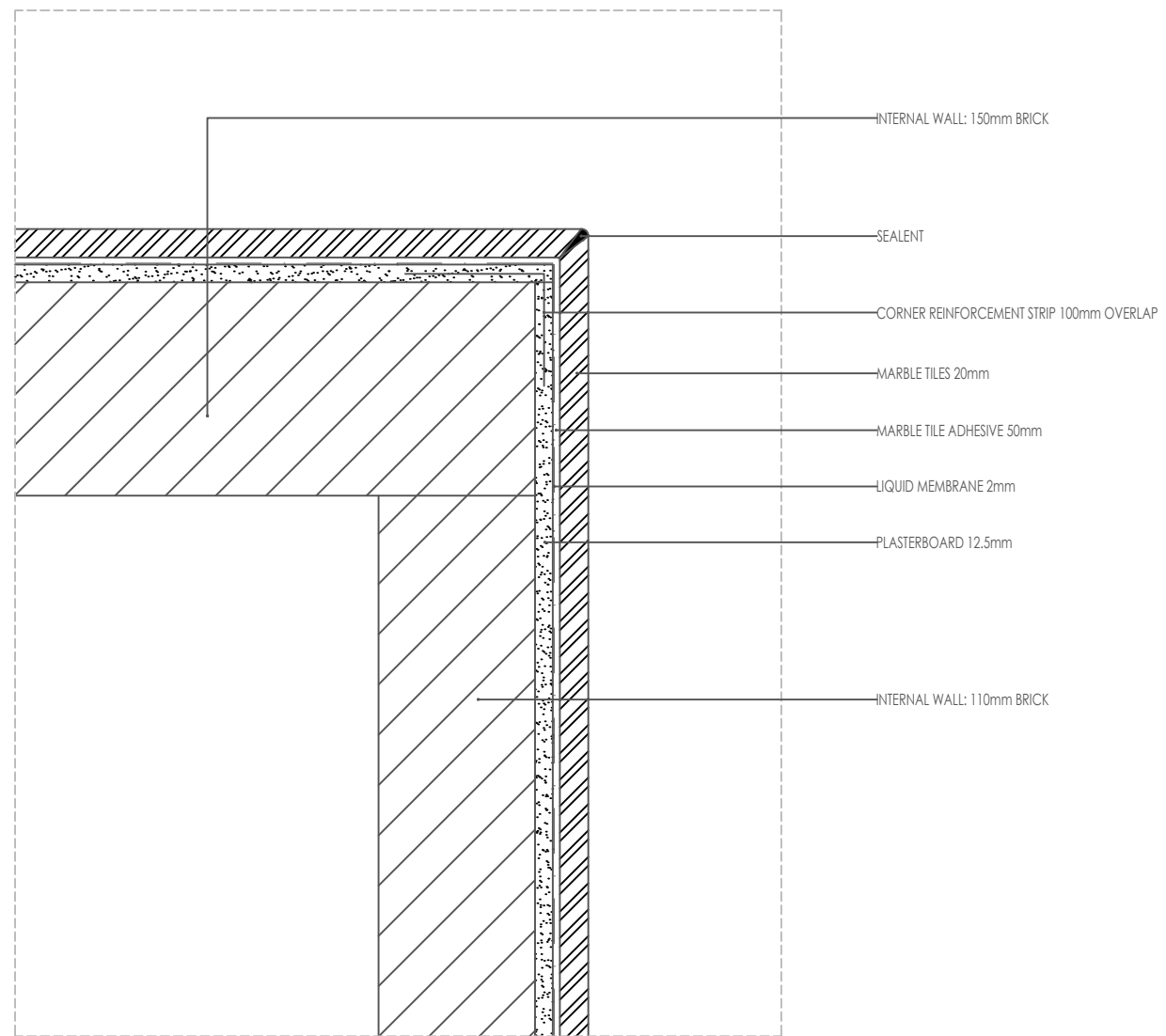
SUBJECT: Men's Bathroom B, Section 7 and 8

SCALE: 1:20

DRAWN BY: Sandra Martín Solà

CLASS: AH 73

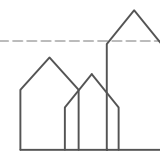
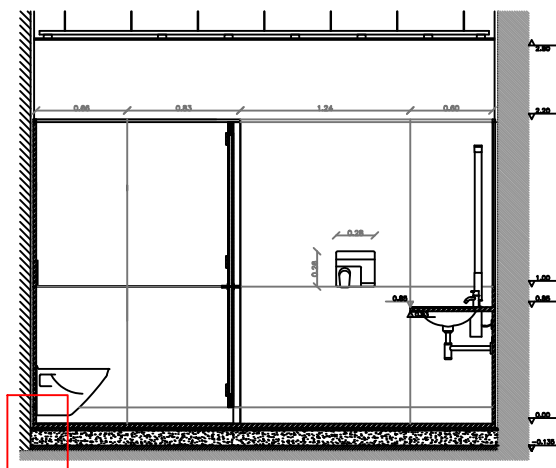
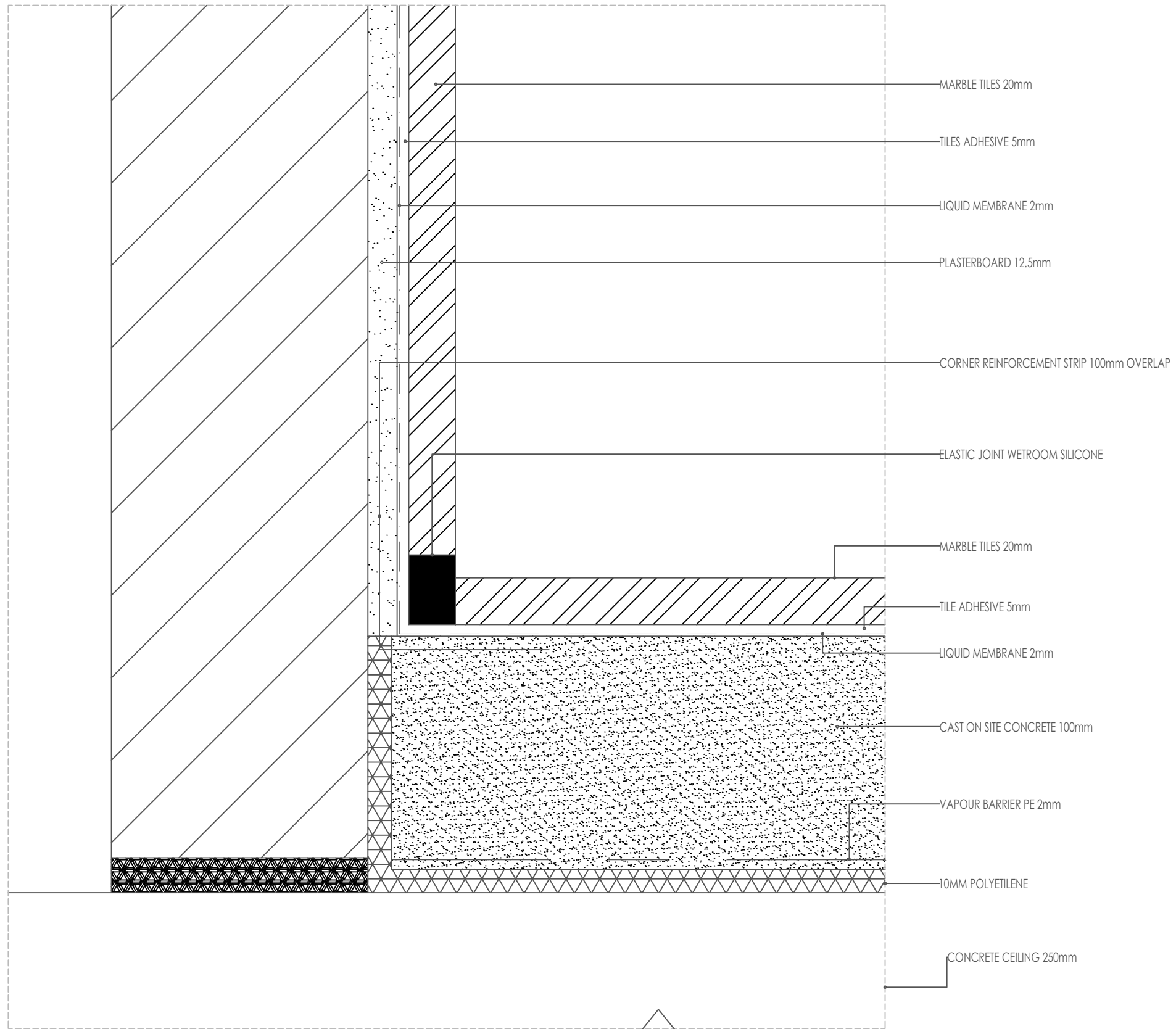
6.18



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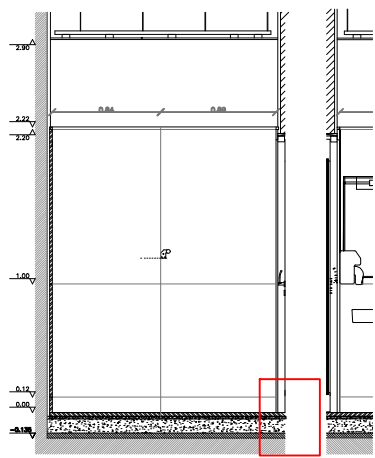
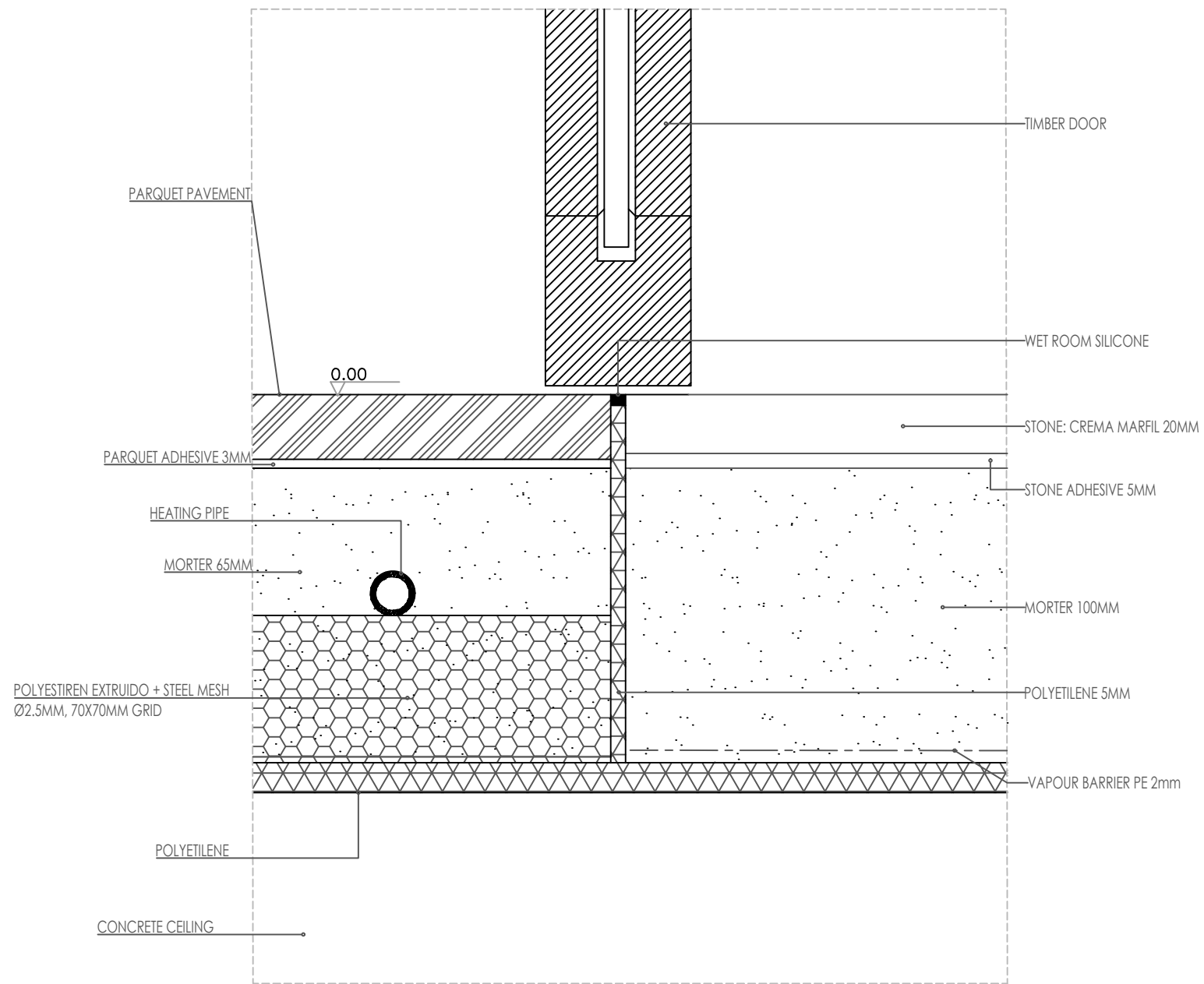
PROJECT: Can Marquès	DATE: 01/01/18	6.19
SUBJECT: Bathroom Wall Corner	SCALE: 1:5	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



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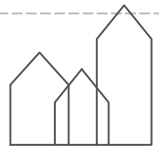
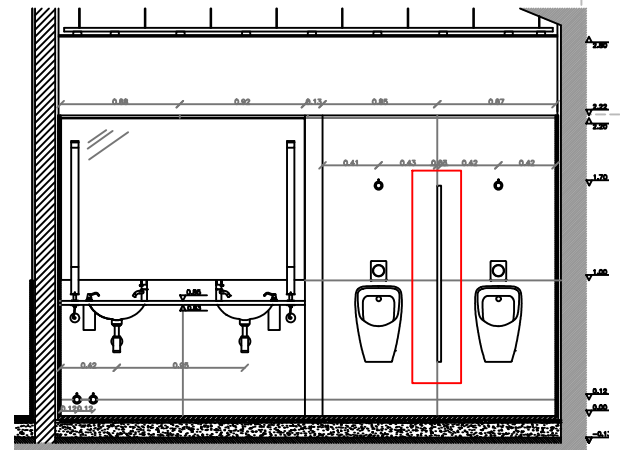
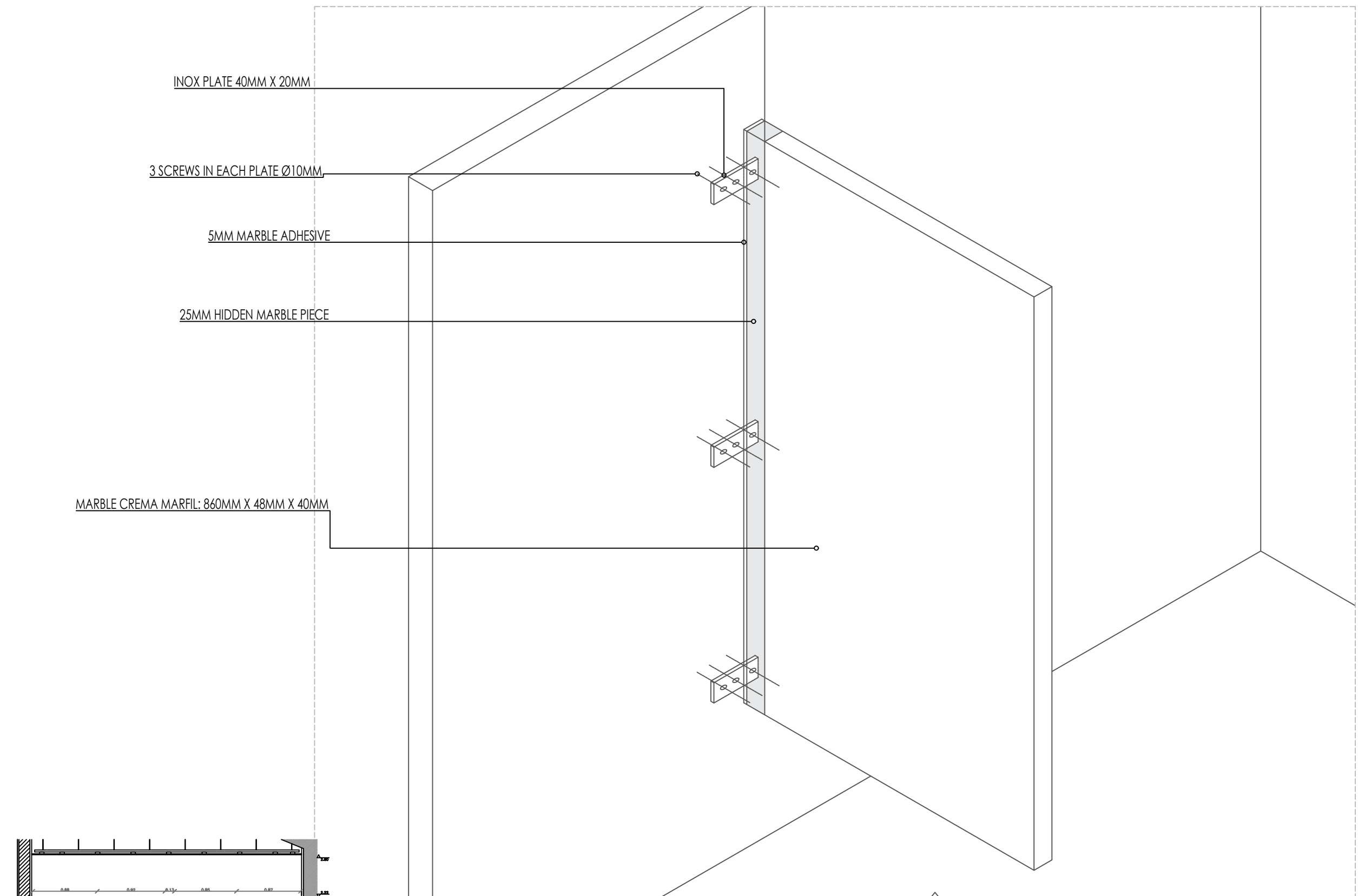
PROJECT: Can Marquès	DATE: 01/01/18	6.20
SUBJECT: Bathroom Wall Bottom	SCALE: 1:2	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



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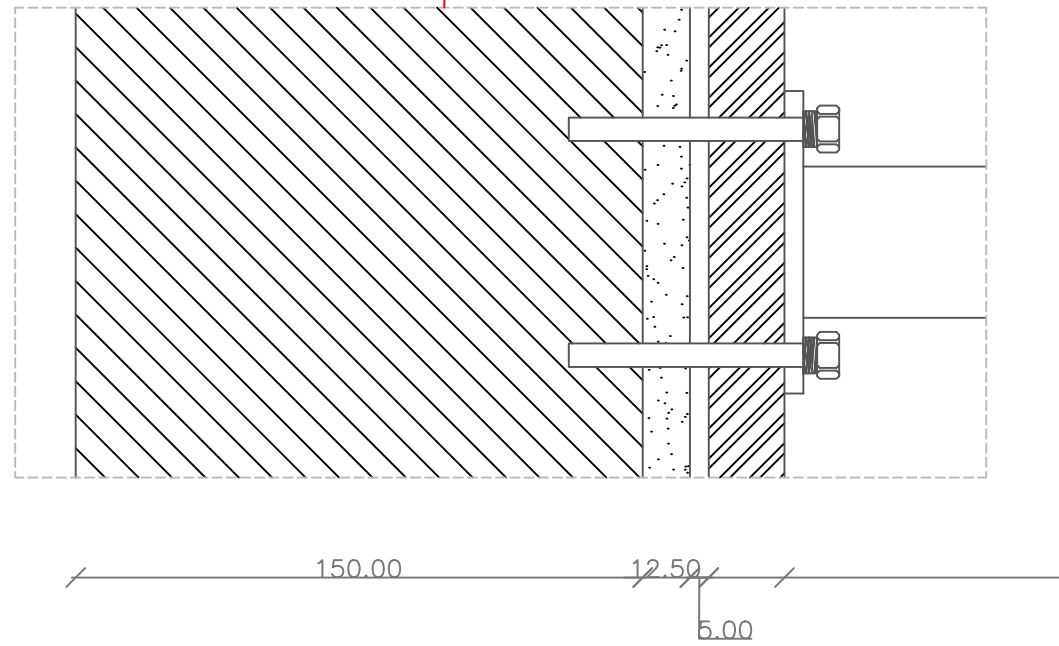
PROJECT: Can Marquès	DATE: 01/01/18	6.21
SUBJECT: Accessibility	SCALE: 1:2	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



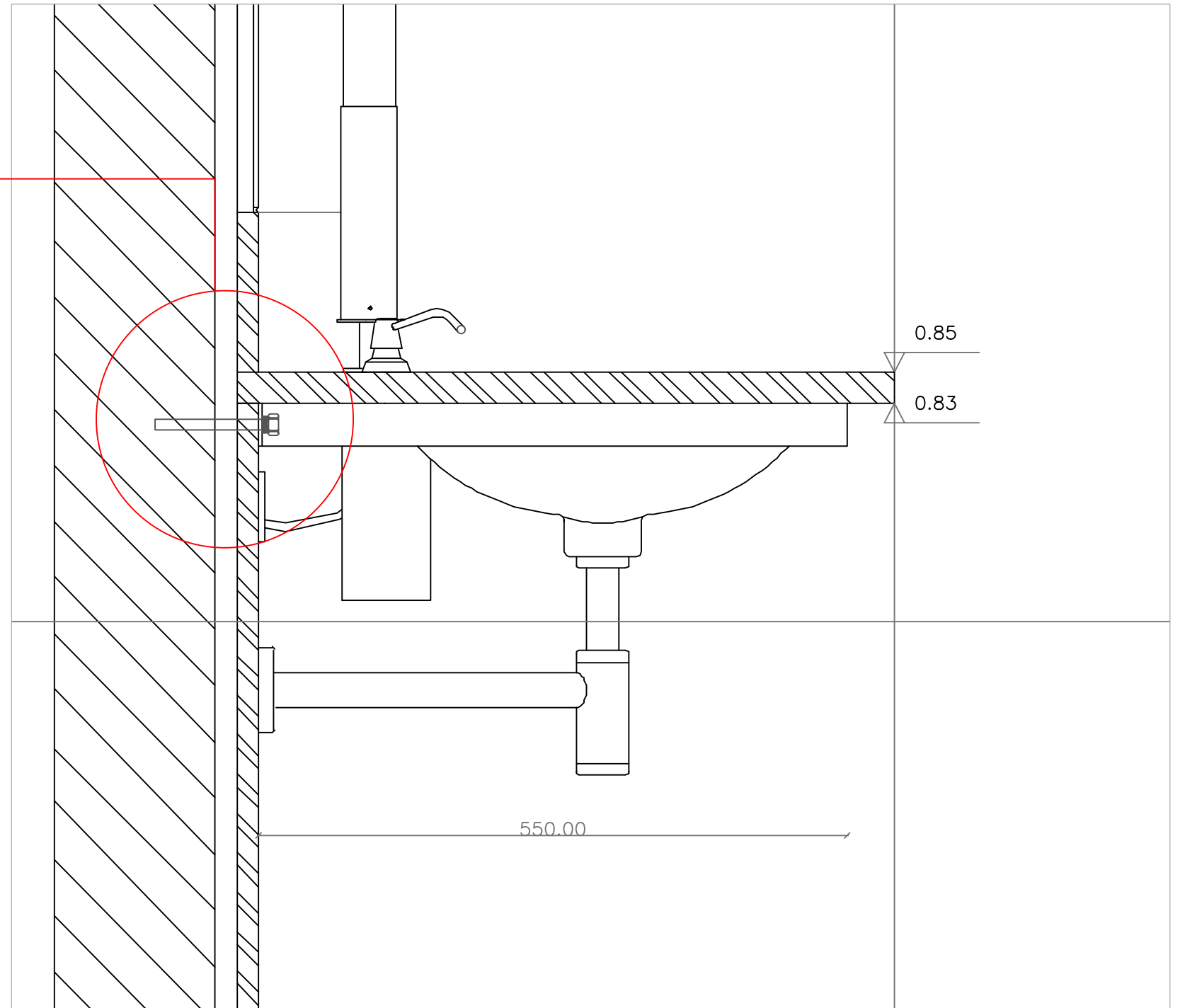
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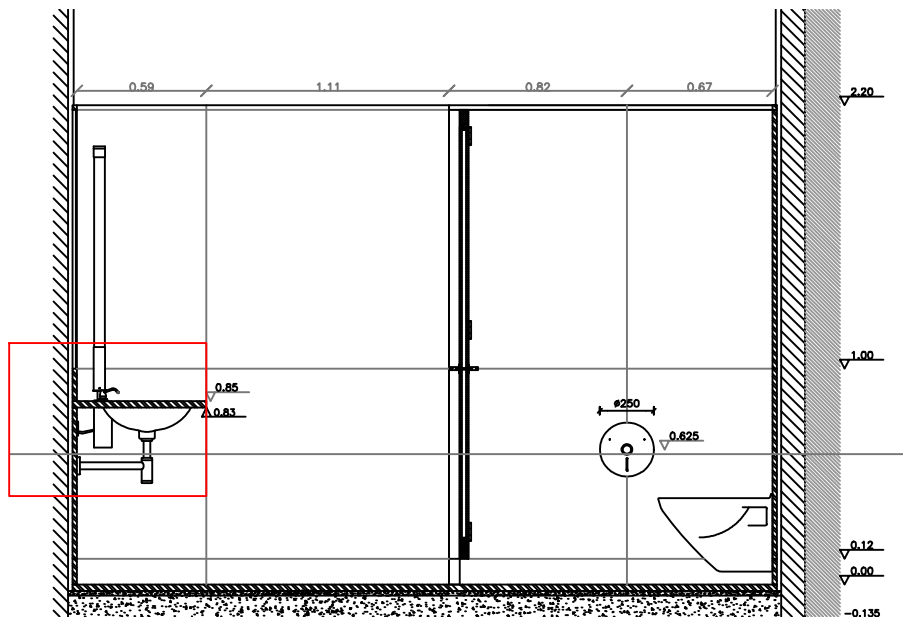
PROJECT: Can Marquès	DATE: 01/01/18	6.22
SUBJECT: Bathroom Partition	SCALE: N/S	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	



1:2 TOP VIEW



1:5 SECTION



-  BRICK
-  TIMBER
-  MORTAR
-  STONE
-  CONCRETE



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PROJECT: Can Marquès	DATE: 01/01/18	6.23
SUBJECT: Marble Top Holding	SCALE: As indicated	
DRAWN BY: Sandra Martín Solà	CLASS: AH 73	