GN-5/2025

Implementation Guidelines on Mitigating the Risk of Gas Explosion in Telecommunications Manholes

Office of the Communications Authority

10 October 2025

FOREWORD

A number of gas explosion incidents occurred in utility manholes (including telecommunications manholes) in the past. Some of these incidents resulted in injuries and property damages. The Communications Authority ("CA") considers that there is a genuine need for the fixed network operators ("FNOs") to implement systematic and comprehensive mitigation measures to ensure safety of telecommunications manholes.

Licence Conditions

2. FNOs are licensed under their respective Unified Carrier Licences ("UCLs"), as the case may be, to provide fixed telecommunications services. They may install telecommunications cables, ducts and other telecommunications facilities such as manholes and joint boxes (hereinafter collectively referred to as "manholes") in unleased Government land including public streets to, inter alia, build their telecommunications networks and systems for the provision of telecommunications services. With respect to the installation of telecommunications facilities in unleased Government land, the FNOs have to comply with, among others, the relevant conditions set out in their UCLs.

3. Under General Condition 14 of their UCLs, FNOs are required to ensure that proper and adequate safety measures are in place to

safeguard life and property in connection with all their networks and associated installations, and they shall comply with the safety requirements which may be prescribed from time to time by the CA and any directions of the CA in relation to the safety matter. Moreover, all utility companies have a common law duty of care to both their employees and the general public. Under Special Condition 25 of their UCLs, FNOs shall comply with any guidelines or codes of practice which may be issued by the CA from time to time for the purpose of providing practical guidance to them in respect of the use of Government facilities as well as facilities on Government property and unleased Government land for the provision of services under their licences.

Preparation and Update of the Guidelines[1]

4. In September 2009, the former Office of the Telecommunications Authority (now the Office of the Communications Authority, hereinafter collectively referred to as "OFCA") set up a forum with FNOs, relevant government departments and utility undertakers[2] ("Joint Forum") with a view to identifying and agreeing on the additional mitigation measures and developing a work plan for implementing these mitigation measures to reduce gas explosions in telecommunications manholes. A number of such measures were reviewed by the Joint Forum. General consensus was reached on the additional mitigation measures to be undertaken by the telecommunications industry systematically.

1 The Guidelines were first issued on 30 June 2010 and subsequently revised on 28 May 2013, 29 July 2016 and 10 October 2025.

2 Companies and government departments participating in the Joint Forum are at Annex 1.

OFCA also appointed a consultant (the "Consultant") in March 2010 to study the following issues –

(a) Design of vented covers for telecommunications manholes;
(b) Procedures for field inspections to detect the existence of any flammable gas in telecommunications manholes; and
(c) Type of gas detectors to be used for the inspections.

5. This document has been developed and updated in consultation with the Joint Forum and the FNOs concerned respectively, taking into account the recommendations of the Consultant. FNOs with manholes installed in unleased Government land including public streets should observe the requirements set out in Part 1 (Manhole Inspections) and Part 2 (Implementation of Mitigation Measures) of this document.

6. Parties concerned will gain experience with the implementation of the mitigation measures in accordance with this document. In tandem, there will certainly be further market and technological developments. This document will be updated as and when necessary to ensure the effectiveness of the mitigation measures undertaken by FNOs through further discussion with the industry.

Enquiry

7. For any enquiry or further information regarding this document or the related issues, please contact –

Office of the Communications Authority

29/F., Wu Chung House,

213 Queen's Road East,

Wanchai, Hong Kong

(Attn.: Senior Telecommunications Engineer (Regulatory 12))

Telephone no.: 2961 6683

Fax no.: 2803 5112

E-mail: manholes@ofca.gov.hk

PART 1: MANHOLE INSPECTIONS

1.1 Regular inspection of telecommunications manholes will enable early identification of irregularities or accumulation of flammable gases therein and is therefore conducive to reducing the risk of manhole explosion. In this regard, FNOs are required to step up the inspections of their telecommunications manholes. FNOs' staff should be equipped with appropriate gas detectors in order that they may competently carry out the inspections.

Procedure for Gas Detection inside Manholes

1.2 Inspection of the manholes will require opening of the manhole covers. Taking into account the large number of telecommunications manholes in unleased Government land including public streets and possible impact on the pedestrian flow with all manhole covers being opened for inspection, FNOs will conduct sample checks on their manholes to identify the possible accumulation of any flammable gas inside the manholes. Details of the sampling checks including the locations to be checked and the sampling rates are set out in paragraphs 1.9 and 1.10 below. Inspection should be carried out by trained and experienced staff to ensure that they are conducted in a safe manner. FNOs are recommended to follow the inspection procedure as specified below when opening manhole covers –

(a) Ensure that there is no naked lighting or smoking in the vicinity

of the manhole;

(b) For manhole covers with vent holes, check if the vent holes are blocked. If they are blocked, clear the vent holes carefully to avoid generating sparks. For manhole covers without vent holes, follow Step (d);

(c) Carry out gas test with the gas detector held close to the manhole cover and record the reading of any flammable gas. If the reading is equal to or greater than the Lower Explosive Limit ("LEL")[3], report the finding immediately to the emergency service hotline (999) and the Hong Kong and China Gas Company Limited ("Towngas") emergency hotline (2880 6999). If the reading is lower than LEL, go to Step (d);

(d) Pour water around the edges of the manhole cover[4];

(e) Open cover partially and conduct gas test by inserting the probe of the gas detector into the manhole, and record any flammable gas reading. If the reading is zero, close the manhole cover or continue to carry out works inside the manhole. If the reading is equal to or greater than the LEL, report the finding immediately to the emergency service hotline (999) and Towngas emergency hotline (2880 6999). If the reading is above zero but lower than the LEL, go to Step (f);

(f) Ventilate the manhole for at least 5 minutes and conduct gas test again;

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[3] It is understood that some FNOs may call the emergency service hotline and Towngas emergency hotline when the reading exceeding a certain percentage of the LEL or a certain amount of specific flammable gas is recorded. FNOs may continue their existing practices out of safety consideration.

[4] Adopted by at least one public utility company in Hong Kong, this measure is to avoid generating sparks in opening the manhole cover.

(g) Record the flammable gas reading. If the reading is zero, close the manhole cover or continue to carry out works inside the manhole. If the reading is greater than zero, report the finding immediately to the emergency service hotline (999) and Towngas emergency hotline (2880 6999); and

(h) Complete the "Telecommunications Manhole Inspection Log" for recording purpose (and for future investigation if required). A sample form of the inspection log is at Annex 2. FNOs may use log sheet with a different format provided that it contains all the information specified in the sample form. To align the level of details of the information recorded by different FNOs, OFCA may require FNOs to revise the format of their records if there is such a need to do so.

1.3 In the case of a manhole with a depth of 2m or more, or the manhole chamber is separated from the cover by an access shaft, gas test should be conducted in both the upper and the lower parts of the manhole before proceeding with any work.

1.4 A flowchart illustrating the inspection procedure is at Annex 3 for easy reference. The Chinese version of the inspection procedure is at Annex 4. With experience gained from implementation, the inspection procedure may be reviewed and fine-tuned subject to further discussion with the industry.

1.5 FNOs should maintain a summary record of inspections

completed as specified at Annex 5. They should provide a soft copy of the record for review upon request by OFCA or the Fire Services Department.

Report on Detection of Flammable Gases or other Anomalies

1.6 As mentioned in paragraph 1.2(e) and (g) above, the FNOs concerned should report the findings to the emergency service hotline (999) and Towngas emergency hotline (2880 6999) if flammable gas is detected during their inspections. Moreover, the FNOs concerned should report to the emergency service hotline and/or other relevant government departments in case of other anomalies found e.g. smoke or traces of burnt materials. For each of such cases, the FNO concerned should submit a report to OFCA, as soon as practicable, providing but not limited to the following information on the incident –

(a) brief description of the incident;
(b) date and time of occurrence;
(c) location(s) and size(s) of the manhole(s) involved;
(d) type(s) of mitigation measure(s) implemented for the manhole(s), if any;
(e) cause of the incident, wherever identifiable; and
(f) remedial/preventive actions taken/will be taken by the FNO.

Upon receipt of the said report, OFCA will circulate the relevant information to the other FNOs which may, as necessary, conduct

inspections of their telecommunications facilities (if any) in the vicinity of the incident to check whether the facilities are affected. They should report to OFCA in the event that anomalies are found during their inspections.

Use of Gas Detectors

1.7 The gas detectors which meet the following functional requirements should be used to detect any flammable gases during inspections –

(a) Fast response time (not greater than 20 seconds);
(b) Measuring range – 0 to 100% LEL;
(c) Long running time – batteries not less than 12 hours charge;
(d) Audio and visual alarm;
(e) Lightweight (not greater than 0.5kg);
(f) Compact – able to fit in pocket or clip to clothing/ harness;
(g) Weatherproof – suitable for use in humid conditions up to 95% relative humidity;
(h) Spark-proof;
(i) Robust, able to withstand manual handling in a busy pedestrian environment; and
(j) Automatic data logging and facility enabling download to a personal computer via universal service bus (USB) or by wireless means (an optional item).

1.8 The gas detectors shall be able to detect the following flammable gases which are most commonly found in utility manholes –

(a) Carbon Monoxide (CO);
(b) Hydrogen Sulphide (H_2S); and
(c) Methane (CH_4).

Manhole Inspection Plan

1.9 The Joint Forum has identified a list of public streets (as set out at Annex 6, hereinafter referred to as the "Busy Streets") with high pedestrian traffic where any manhole explosion will likely lead to serious ramifications. According to this risk assessment approach, priorities should be given to the inspections of manholes in the Busy Streets (in particular those manholes which have not been opened for a long time and without any one of the three mitigation measures, i.e. vented manhole covers, duct sealing and concrete surrounding of ducts mentioned in paragraph 2.13 below) implemented. For manholes located in the Busy Streets, FNOs should conduct inspections at a sampling rate of at least 20% of these manholes in every 12 months starting from 1 August 2016.

1.10 The Joint Forum agreed that a lower frequency of inspections and sampling rate could be adopted for manholes located in the unleased Government land other than the Busy Streets (hereinafter referred to as "Other Places"). FNOs should conduct inspections of at least 5% of these manholes in every 24 months from 1 August 2016 onwards. Manholes

located inside country parks are not included in the regular inspection programme in view of the remoteness of their locations, and that the consequence of any gas explosion should be relatively less serious.

1.11 FNOs should provide OFCA, on a half yearly basis, with tentative schedules[5] showing the list of public streets/locations with manholes they plan to inspect in the coming six months. It is also the FNOs' responsibility to arrange and conduct inspections timely with the participation of OFCA (and other Government officers as appropriate) if such requests are raised.

[5] The inspection schedules are for advance information of the relevant government departments. FNOs may make adjustments as necessary according to their manpower deployment and work arrangements.

PART 2: IMPLEMENTATION OF MITIGATION MEASURES

2.1 According to the Highways Department's consultancy report entitled "Prevention of Gas Explosion in Utility Manhole" ("the Highways Report") issued in April 2008, ventilating manholes is one of the possible measures to mitigate the risk of gas explosion in utility manholes. This approach has been used extensively by North American utility companies which have experienced similar problems of manhole explosion.

2.2 In principle, the more and bigger the openings are in a manhole cover, the more effective they will be in the dispersal of gases. However, one should be mindful of the need to limit the number and size of the holes to avoid such practical nuisances as sticks and high-heeled shoes being caught, or loosening of paving blocks caused by having too many holes on a recessed manhole cover[6]. Given that vented manhole covers and gullies are already in use by other utilities and government departments, the retrofitting of holes in existing telecommunications manhole covers should be cost effective, and should not hinder FNOs' day-to-day operation or give rise to environmental concerns.

2.3 The following two sections provide the designs recommended by the Consultant for the introduction of vent holes on telecommunications manhole covers. They include the new designs and modifications of existing designs for the manhole covers commonly used in Hong Kong, namely –

[6] See paragraph 2.3 and footnote 7 for further details.

(a) Recessed covers[7];

(b) Concrete infill covers[8]; and

(c) Cast iron covers[9].

Design of New Manhole Covers

2.4 Figure 1 below illustrates the schematic layout of the design of new type of manhole covers which is applicable to both recessed covers and concrete infill covers. The manhole cover should consist of at least two metal compartments, each of which comprises two holes, i.e. the upper hole for manhole lifting key and the lower hole located at the base tray for ventilation. These two holes provide a passage for lighter-than-air gases to escape to the atmosphere. To minimize possibility of trash falling through, the width of the upper hole should be in the range of 15 mm to 20 mm. The size of the lower hole should be determined based on the requirement that the hole will remain unblocked even though dust and debris may enter through the upper hole. According to the Consultant's study report, a hole of 30 mm in diameter or equivalent area will allow dust and trash to pass directly through to the manhole chamber without blocking the vent hole.

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7 Recessed covers, sometimes referred to as 'inset covers', are used within paved area to 'mask' the presence of manholes, inspection chambers and access fittings.

8 Concrete infill covers are manufactured in galvanised steel and are factory filled with reinforced high strength concrete. These covers are suitable for use in footpaths, car parks, grass verges and areas with slow moving traffic.

9 Cast iron covers are usually used in carriageway and other vehicular access areas.

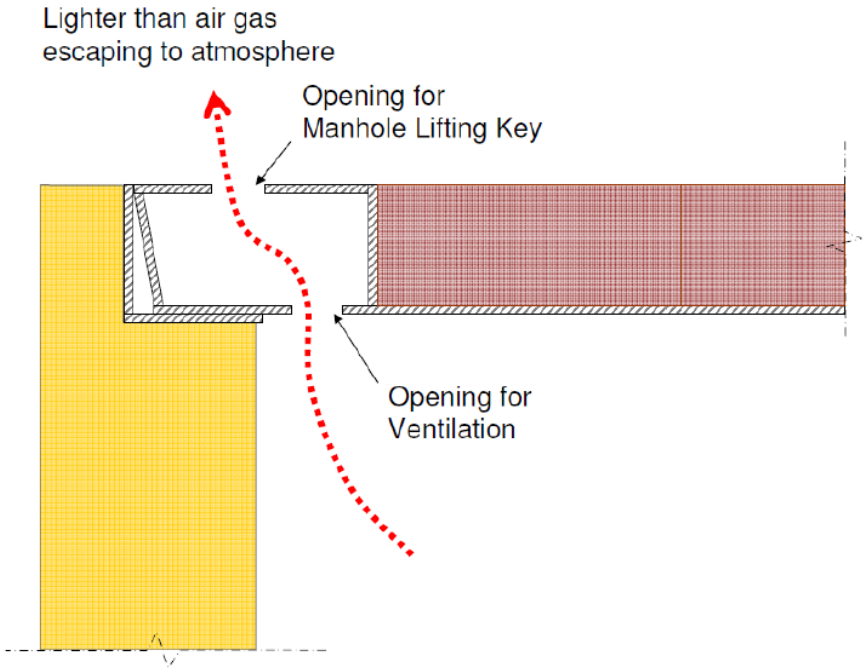


Figure 1: Schematic Layout of Vent Hole in the New Design for Concrete Infill Cover or Recessed Manhole Cover

2.5 Figure 2 below illustrates the schematic layout of the new design for cast iron covers. There should be one hole of 30 mm in diameter or equivalent in area provided to each triangular cover in addition to the keyhole. The precise location should be determined taking into account the pattern on the exterior surface and the location of the stiffeners on the underside of the cover.

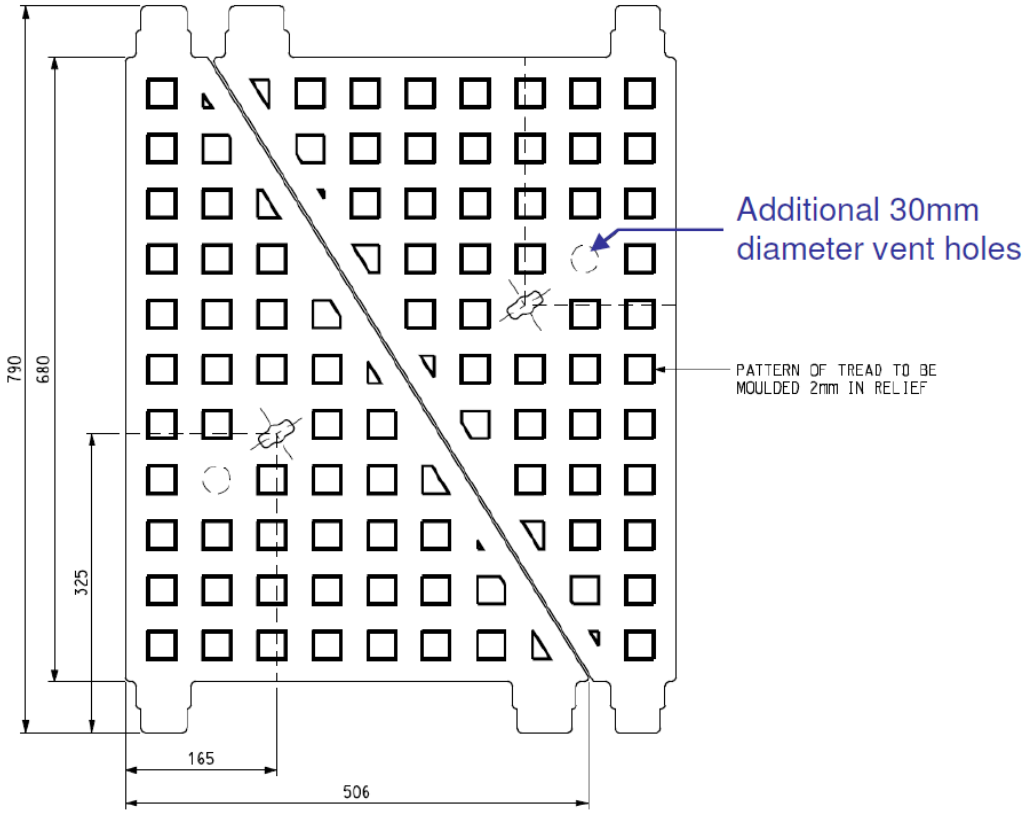


Figure 2: Schematic Layout of Vent Hole in the New Design for Cast Iron Manhole Cover

2.6 The reference drawings of the new designs of manhole covers are at Annex 7. FNOs should adopt the design for their new vented manhole covers unless they opt for other acceptable measures (i.e. duct sealing or concrete surrounding of ducts) as specified in paragraphs 2.13 to 2.16 below.

2.7 **FNOs should deploy over the entire territory of Hong Kong the newly designed covers for all their newly built manholes as well as existing manholes where covers are to be replaced under normal maintenance or upgrading works.** For the avoidance of doubt, a large manhole with multiple covers should be fitted with covers that

conform to the new design and with an adequate number of vent holes that commensurate with the area of the manhole.

Modification of Existing Manhole Covers

2.8 As a large number of manhole covers are being used throughout the territory, mitigation measures should be applied to the manholes before their existing covers are due for replacement. Although modification of the existing manhole may be less effective in ventilation as compared with the use of newly designed manhole covers, the Consultant recommended this as an expedient approach to avoid extensive replacement of manhole covers, especially for those in the busy streets.

2.9 Owing to limitations in the existing manhole covers, it may not be possible to make available holes of 30 mm in diameter or equivalent area as specified in the new type of manhole covers. However, an existing manhole cover should be retro-fitted with smaller vent holes in the range of 15 mm to 20 mm in diameter or equivalent area. When applying this mitigation measure to a larger manhole, the FNOs should ensure that all the covers of the manhole are provided with an adequate number of vent holes.

2.10 The following options are available for modifying the existing recessed covers and concrete infill covers –

Option (1A) is illustrated in Figure 3. It is applicable to recessed covers. The paving blocks on top of the recessed cover may first be removed to allow for holes of 20 mm in diameter or equivalent area to be drilled through the base plate and side wall of the keyhole opening. The bottom edge of the blocks would also need to be chamfered through saw cutting or chiselling to provide a clear route for the gases to escape from the manhole.

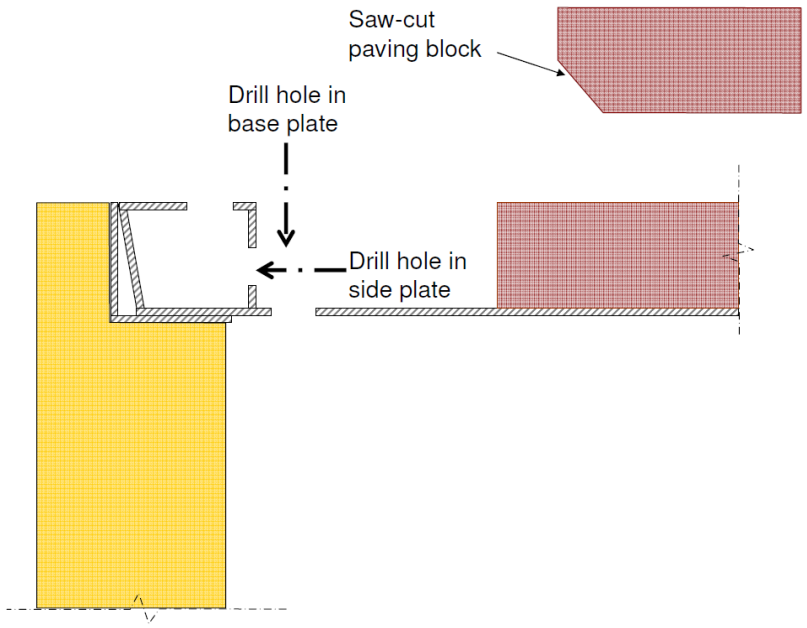


Figure 3: Modification of Existing Manhole Covers – Option (1A)

Option (1B) is illustrated in Figure 4. It is applicable to concrete infill covers. For these covers, it is practically difficult to remove the concrete infill and drill the hole. A hole of 15 mm in diameter or equivalent area may therefore be drilled through both the frame and the concrete from the keyhole opening.

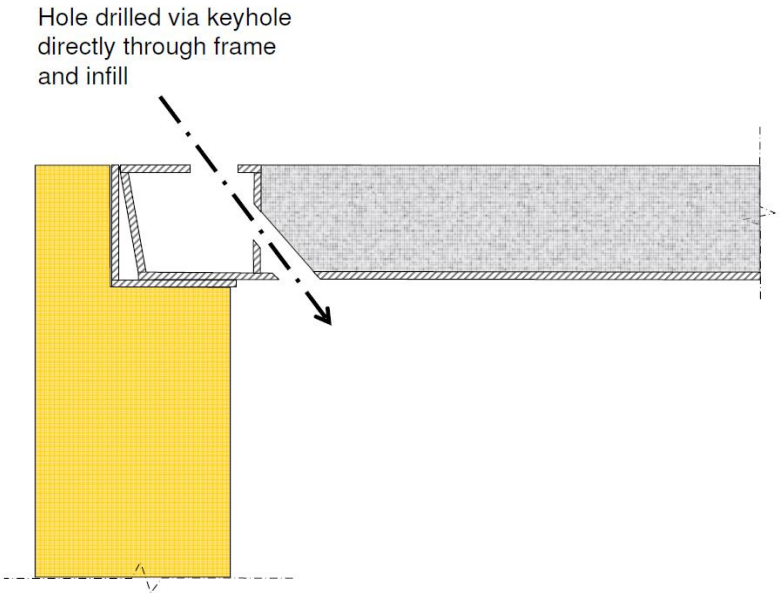


Figure 4: Modification of Existing Manhole Covers – Option (1B)

Option (2) is illustrated in Figure 5. It is similar to the newly designed manhole covers and is applicable to both recessed covers and concrete infill covers. If the keyhole compartment is large enough, a hole in the range of 15 mm to 20 mm in diameter or equivalent area may be drilled directly through the keyhole compartment to the manhole chamber.

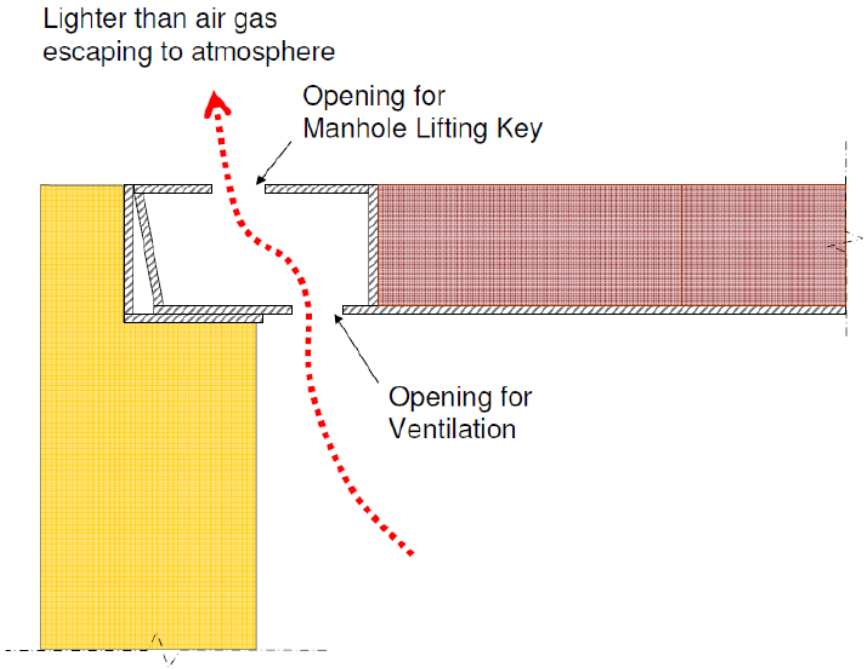


Figure 5: Modification of Existing Manhole Covers – Option (2)

Option (3) is illustrated in Figure 6. It is applicable to both recessed covers and concrete infill covers. Separate vent holes may be drilled directly down through the paving blocks or concrete and through the base plate. This option may be deployed where drilling of a hole through the keyhole is found to be impractical. Considering that the holes should be of small diameter and no larger than the keyhole openings so as not to give rise to any hazard to pedestrians, a larger number of holes should be provided to reduce the increased risk of blockage by debris. In general, four such holes of 15 mm in diameter or equivalent area should be provided symmetrically around the edges in each manhole cover.

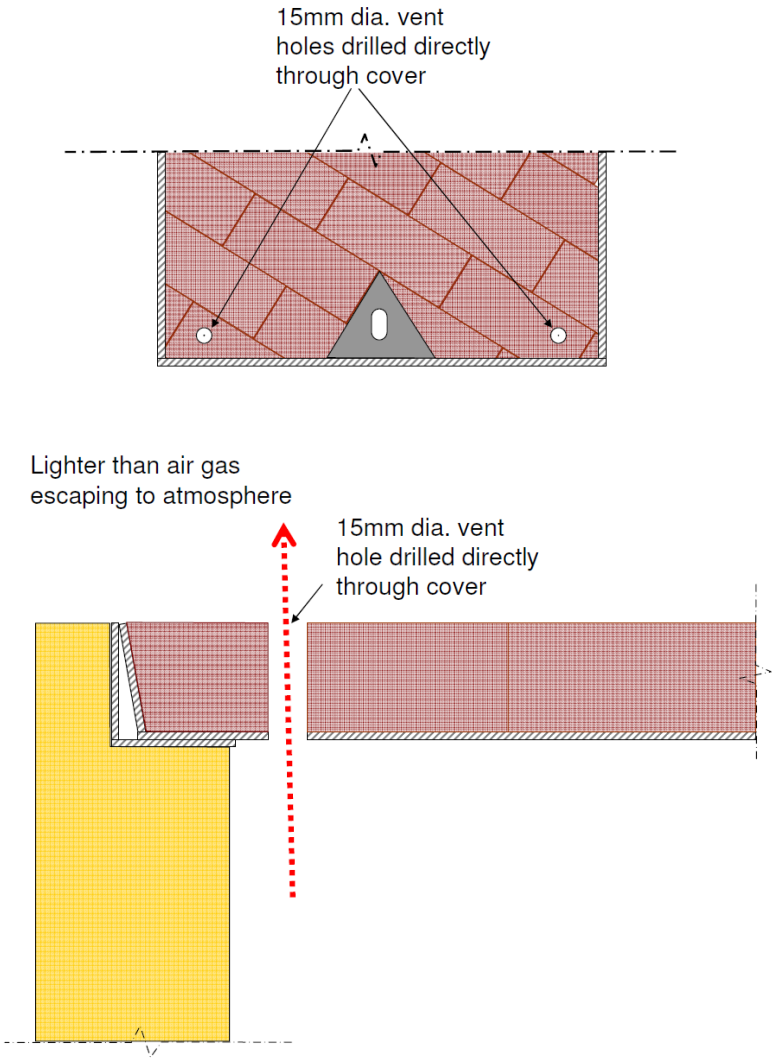


Figure 6: Modification of Existing Manhole Covers – Option (3)

2.11 Cast iron manhole covers are used for manholes located within the carriageway or other vehicular access areas. As the manhole keyholes are typically larger in size and continuous through the whole depth of the cover, this already provides a path for egress of the lighter-than-air gases. As such, additional vent holes for existing cast iron covers are not required.

2.12 The standard reference drawings incorporating the vent holes for retro-fitting existing covers mentioned above are at Annex 8. For easy

reference, the table below shows the requirements of the number and size of vent holes in each manhole cover –

Requirements	**Design of new type of manhole covers**	**Modification of existing manhole covers (except for cast iron covers)**
Number and size of vent holes in each manhole cover	Two holes of 30 mm in diameter or equivalent area	Two holes of 20 mm in diameter or equivalent area; or four holes of 15 mm in diameter or equivalent area

Alternative Mitigation Measures

2.13 As the causes of most of the previous gas explosion incidents could not be identified, the Joint Forum was of the view that it might not be possible to draw a conclusion about the most effective mitigation measure at this stage. As such, the Joint Forum suggested that some flexibility should be allowed so that FNOs may, according to their own consideration as well as the surrounding and condition of manholes, implement duct sealing or concrete surrounding of ducts as an alternative to the vented manhole covers. Both of these measures are specified in the national standards[10] of the Chinese Mainland.

[10] The Standard GB 50373 – 2006 entitled "Design Code for Communication Conduit and Passage Engineering" and GB 50374 – 2006 entitled "Code of Construction and Acceptance for Communication Conduit Engineering" promulgated on 11 December 2006 and implemented on 1 May 2007 refers.

2.14 Duct sealing is to seal up ducts leading into manholes to prevent flammable gases from entering and accumulating inside manholes. According to the Highways Report, duct sealing is another possible mitigation measure for use in utility manholes. To ensure effectiveness of the sealing, duct plugs or suitable sealing materials[11] should be employed for sealing of all ducts leading into the manhole including those occupied with telecommunications cables.

2.15 Concrete surrounding of ducts, on the other hand, is to surround the ducts with concrete to protect the ducts and to prevent flammable gases from entering the manholes. Any FNO adopting this measure should file a complete set of drawings related to such installations for record of OFCA. In addition, the FNOs should place appropriate caution tapes showing the types and owners of the facilities on the concrete surface for easy identification. FNOs may follow the following practice in their implementation –

(a) The caution tape is laid at 300 mm above the uppermost ducts of duct formation; and

(b) The following number of caution tape is laid for the whole length of duct according to the formation shown below –

- 1-way to 18-way ducts: one length of caution tape;
- 24-way to 48-way ducts: two lengths (in parallel) of caution tape;

[11] One of the following materials should be used for the duct sealing: resin pack 7A or compound 16A.

- 64-way to 80-way ducts: three lengths (in parallel) of caution tape; and
- 120-way ducts: four lengths (in parallel) of caution tape.

A sample drawing of the caution tape is at Annex 9.

2.16 For the avoidance of doubt, if an FNO does not intend to deploy vented covers in any manhole as required under paragraphs 2.4 to 2.12 above, it should ensure that all the ducts leading to that manhole should have been sealed and/or surrounded with concrete according to the same implementation schedule. The Joint Forum will review the effectiveness of the mitigation measures implemented and where necessary explore other suitable mitigation measures which may be applicable in Hong Kong.

Manhole Size

2.17 According to the Consultant who is also the author of the Highways Report, in calculating the interior volume of a manhole the FNOs may exclude the space occupied by facilities residing inside the manhole. That is, when determining whether mitigation measures should be applied according to the size of a manhole, their assessments may be based on the net interior volume instead of the gross interior volume of the manhole. This suggestion has been adopted by the Joint Forum. For manholes with net interior volumes equal to or greater than 0.5 m^3, the Joint Forum agreed that mitigation measures would be needed. For manholes located in the Busy Streets, having regard to the risk and

consequence of manhole explosion in these locations and having consulted the FNOs, mitigation measures should also be implemented irrespective of the size of the manholes.

Implementation Schedule for Existing Manholes

2.18 The Joint Forum including the FNOs agreed that priority should be given to the implementation of the mitigation measures for the manholes in the Busy Streets. All FNOs have completed the implementation of at least one of the three mitigation measures (i.e. vented manhole covers, duct sealing and concrete surrounding of ducts) mentioned in paragraph 2.13 above for all their existing manholes with net interior volumes equal to or greater than 0.5 m^3 in the Busy Streets by June 2012.[12] As for the remaining manholes with net interior volumes less than 0.5 m^3 in the Busy Streets, all FNOs had completed the implementation of at least one of the three mitigation measures (i.e. vented manhole covers, duct sealing and concrete surrounding of ducts) mentioned in paragraph 2.13 above by July 2020.

2.19 It should be emphasised that the safety of the telecommunications manholes, irrespective of their sizes, in the Other Places should not be neglected. FNOs are encouraged to implement at least one of the three mitigation measures (i.e. vented manhole covers, duct sealing and concrete surrounding of ducts) mentioned in paragraph 2.13 above for these manholes with a view to further reducing the risk of gas

[12] Excluding some 12 manholes due to site constraints.

explosion. FNOs are also advised to continue with their existing practices of inserting duct plugs to empty ducts.

2.20 OFCA (and other Government officers as appropriate) may request sample checks on the implementation progress of the mitigation measures by individual FNOs. FNOs shall arrange such checking to be conducted in a timely manner.

10 October 2025

Office of the Communications Authority

Annex 1

Companies and Government Departments

Participating in the Joint Forum

Government Departments

- Office of the Communications Authority
- Highways Department
- Electrical and Mechanical Services Department
- Fire Services Department
- Drainage Services Department

FNOs

- Hong Kong Cable Television Limited
- Hong Kong Broadband Network Limited
- Hutchison Global Communications Limited
- New World Telecommunications Limited
- PCCW-HKT Telephone Limited and Hong Kong Telecommunications (HKT) Limited
- Towngas Telecommunications Fixed Network Limited
- TraxComm Limited
- Wharf T&T Limited

Other Utility Companies

- CLP Power Hong Kong Limited
- The Hong Kong and China Gas Company Limited
- The Hongkong Electric Company Limited

Annex 2

Telecommunications Manhole Inspection Log

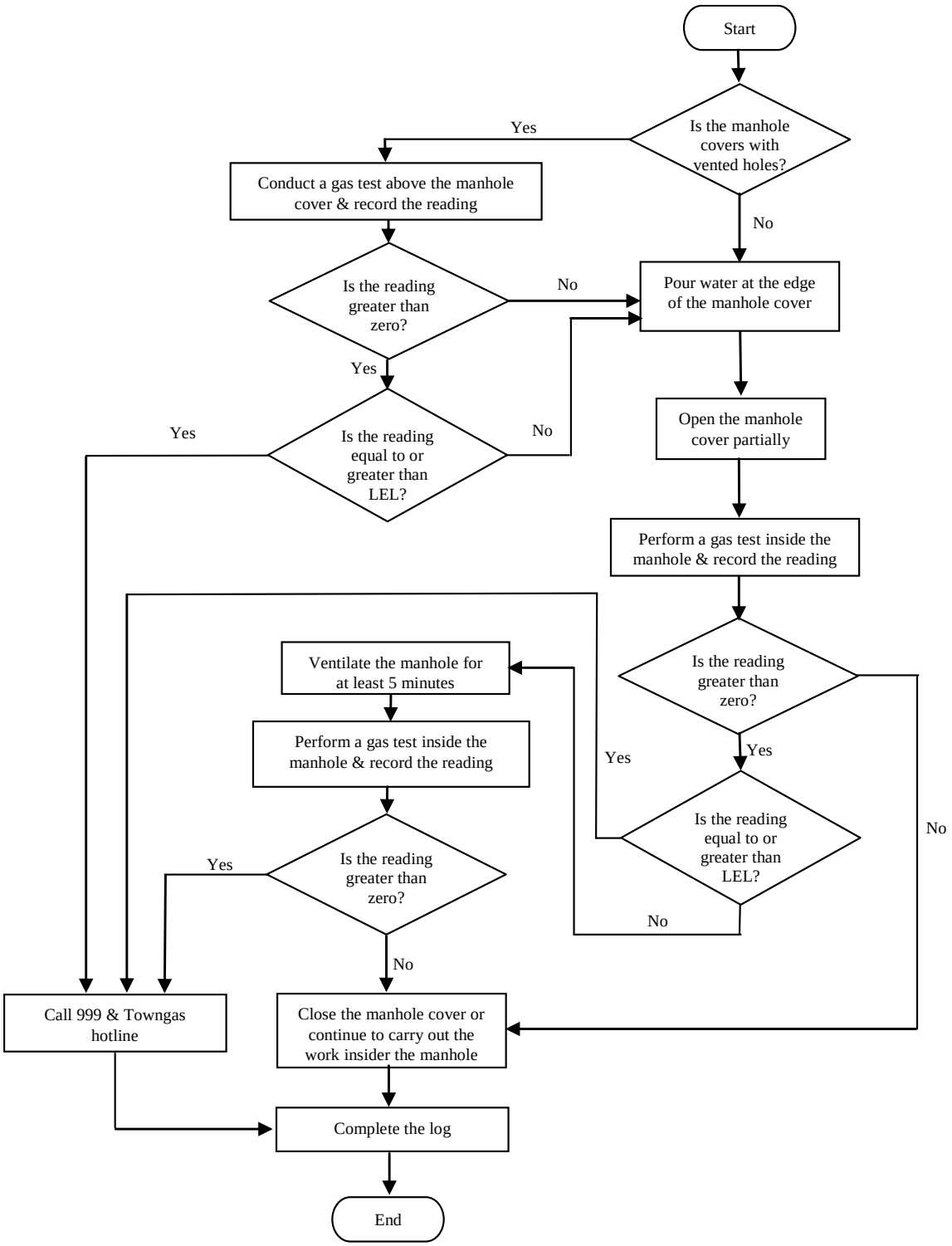
Telecommunications Manhole Inspection Log
電訊沙井檢查記錄

Telecommunications Manhole Inspection Log 電訊沙井檢查記錄	
Basic Information 基本資料	
Date 日期:	District 地區: Street Name 街名:
Time 時間:	Manhole No. 沙井號碼:
Name of Fixed Network Operator 固定網絡營辦商名稱:	
Name of Inspection Staff 員工姓名:	
Gas Test Result 氣體測試結果	
1st Gas Test (Above Manhole Cover, for manhole cover with vent holes only) *第一次氣體測試 (沙井蓋面，只適用於有氣孔之沙井蓋)*	
Flammable Gas Reading 易燃氣體讀數	
□ 0	□< LEL 低於爆炸下限 □≥ LEL 相等或高於爆炸下限
□ Not Applicable 不適用	
2nd Gas Test (Inside Manhole) *第二次氣體測試 (沙井內)*	
Flammable Gas Reading 易燃氣體讀數	
□ 0	□< LEL 低於爆炸下限 □≥ LEL 相等或高於爆炸下限
3rd Gas Test (Inside Manhole, for flammable gas reading < LEL in 2nd gas test) *第三次氣體測試 (沙井內，適用於第二次氣體測試之易燃氣體讀數低於爆炸下限)*	
Flammable Gas Reading 易燃氣體讀數	
□ 0	□< LEL 低於爆炸下限 □≥ LEL 相等或高於爆炸下限
Signature 簽署:	

Annex 3

Flowchart of the Telecommunications Manhole Inspection Procedure

Flowchart of the Telecommunications Manhole Inspection Procedure



Annex 4

Chinese Version of the Telecommunications Manhole Inspection Procedure

電訊沙井檢查步驟

(a) 確保沙井附近沒有火種及執行禁煙措施；

(b) 如沙井蓋有氣孔，檢查氣孔是否受堵塞，並小心清理受堵塞之氣孔，以免產生火花。如沙井蓋沒有氣孔，執行步驟(d)；

(c) 於沙井蓋面以氣體探測器進行氣體測試，並記錄易燃氣體的讀數。如測試結果顯示易燃氣體的濃度相等於或超過爆炸下限[1]，當場致電緊急服務熱線(999)及煤氣公司緊急熱線(2880 6999)報告測試結果。如測試結果顯示易燃氣體的濃度不高於爆炸下限，執行步驟(d)；

(d) 於沙井蓋邊緣注水；

(e) 局部打開沙井蓋以避免產生火花，將氣體探測器探測端放入沙井內進行氣體測試，並記錄易燃氣體的讀數。如易燃氣體的讀數為零，可放回沙井蓋或安排員工於沙井內進行工作。如測試結果顯示易燃氣體的濃度相等於或超過爆炸下限，當場致電緊急服務熱線(999)及煤氣公司緊急熱線(2880 6999)報告測試結果。如測試結果顯示易燃氣體的濃度不高於爆炸下限，執行步驟(f)；

---

1 據了解，部分固定網絡營辦商會在易燃氣體濃度讀數超過爆炸下限的某個百分比或易燃氣體含量超過特定數值時，致電緊急服務熱線(999)及煤氣公司緊急熱線(2880 6999)報告事件。固定網絡營辦商可基於安全考慮繼續按照其現行的做法報告緊急事故。

(f) 為沙井安排通風至少 5 分鐘，然後再將氣體探測器探測端放入沙井內進行氣體測試；

(g) 記錄易燃氣體的讀數，如易燃氣體的讀數為零，可放回沙井蓋或安排員工於沙井內進行工作。 如測試結果顯示易燃氣體的讀數高於零，當場致電緊急服務熱線(999)及煤氣公司緊急熱線(2880 6999)報告測試結果；

(h) 填寫「電訊沙井檢查記錄」。檢查記錄可參照附件 2 提供的表格樣本。固定網絡營辦商亦可採用其本身格式，但檢查記錄必須包含表格樣本內的資料。如有需要，通訊事務管理局辦公室或會要求營辦商修改其記錄格式，以劃一不同營辦商所提供的資料細節。

Annex 5

Summary of Telecommunications Manhole Inspections

Summary of Telecommunications Manhole Inspections
電訊沙井檢查摘要

Date of Inspection 檢查日期	District 地區	Street/Location 街道/位置	Manhole Number 沙井編號	Located in Busy Street set out in Annex 6? 是否位於附件 6 的繁忙街道?	Is It a Newly Built Manhole? 是否新建沙井?	The Highest Flammable Gas Reading Recorded 最高易燃氣體濃度	Action Taken and Follow-up Action 已採取措施及跟進措施

Annex 6

List of Public Streets of High Pedestrian Traffic

1. Hong Kong Island

Hong Kong Island	Districts	Streets
Central & Western	Sai Wan	Belcher's Street
	Sai Ying Pun	Des Voeux Road West
		Queen's Road West
	Sheung Wan	Wing Lok Street
		Bonham Strand
		Bonham Strand West
		Wing Kut Street
		Morrison Street
		Jervois Street
	Central	Pedder Street
		Des Voeux Road Central
		Queen's Road Central
		Stanley Street
		Wellington Street
		Lan Kwai Fong
		D'Aguilar Street
		Chater Road
Eastern	North Point	Electric Road
		Tong Shui Road
		King's Road
		Chun Yeung Street
		King's Road
	Quarry Bay	Tong Chong Street
		Taikoo Shing Road
	Shau Kei Wan	Shau Kei Wan Road
		Shau Kei Wan Main Street East
		Mong Lung Street

Hong Kong Island	Districts	Streets
		Kam Wa Street
Southern	Stanley	Stanley Main Street
		Stanley New Street
	Aberdeen	Nam Ning Street
		Old Main Street, Aberdeen
		Aberdeen Main Road
		Tung Sing Road
		Sai On Street
Wan Chai	Wan Chai	Hennessy Road
		Wan Chai Road
		O'brien Road
		Tin Lok Lane
		Marsh Road
		Bowrington Road
		Queen's Road East
		Johnston Road
		Harbour Road
Causeway Bay	Causeway Bay	Russell Street
		Percival Street
		Yee Wo Street
		Paterson Street
		Sugar Street
		Jardine's Bazaar
		Jardine's Crescent
		Lee Garden Road
		Kai Chiu Road
		Pak Sha Road
		Lan Fong Road
		Great George Street
		East Point Road
		Sharp Street East

Hong Kong Island	Districts	Streets
		Tang Lung Street
		Causeway Bay Road
		Matheson Street
		Irving Street

2. Kowloon

Kowloon	Districts	Streets
Kowloon City	Kowloon City	Nga Tsin Wai Road
		Prince Edward Road West
	To Kwa Wan	Lok Shan Road
Kowloon Bay	Kowloon Bay	Ngau Tau Kok Road
		Jordan Valley North Road
Kwun Tong	Kwun Tong	Kwun Tong Road
		Yue Man Square
		Fu Yan Street
		Shui Wo Street
		Mut Wah Street
		Hoi Yuen Road
		Chong Yip Street
		How Ming Street
		Tung Yan Street
Sham Shui Po	Sham Shui Po	Yen Chow Street
		Kweilin Street
		Pei Ho Street
		Nam Cheong Street
		Apliu Street
		Fuk Wa Street
		Fuk Wing Street
		Yu Chau Street

Kowloon	Districts	Streets
		Cheung Sha Wan Road
		Un Chau Street
Cheung Sha Wan	Cheung Sha Wan	Cheung Sha Wan Road near Lai Chi Kok MTR Station
		Cheung Sha Wan Road
Wong Tai Sin	Wong Tai Sin	Ching Tak Street
		Sheung Fung Street
		Wan Fung Street
	San Po Kong	Tai Shing Street
		Tseuk Luk Street
		Tai Yau Street
		Shung Ling Street
Yau Tsim Mong	Mongkok	Nathan Road
		Sai Yeung Choi Street South
		Tung Choi Street
		Fa Yuen Street
		Sai Yee Street
		Portland Street
		Shanghai Street
		Mong Kok Road
		Argyle Street
		Fife Street
		Nelson Street
		Shantung Street
		Soy Street
		Bute Street
		Prince Edward Road West
		Flower Market Road
	Yau Ma Tei	Dundas Street
		Temple Street

Kowloon	Districts	Streets
		Bowring Street
		Nathan Road
		Jordan Road
		Shanghai Street
	Tsim Sha Tsui	Kimberley Road
		Granville Road
		Cameron Road
		Peking Road
		Haiphong Road
		Nathan Road
		Canton Road
		Mody Road

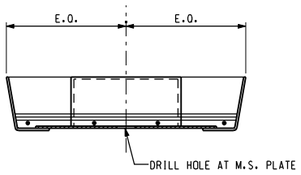
3. New Territories

New Territories	Districts	Streets
Kwai Tsing	Kwai Chung	Hing Ning Road
		Kwai Hing Road
		Tai Lin Pai Road
		Tai Wo Hau Road
North District	Fanling	Luen Hing Street
		Luen Cheong Street
		Pak Wo Road
	Sheung Shui	Lung Sum Avenue
		Lung Wan Street
		San Fat Street
		San Fung Avenue
		San Hong Street
Sai Kung	Tseung Kwan O	Tong Tak Street
	Hang Hau	Po Ning Road
		Pui Shing Road

New Territories	Districts	Streets
	Sai Kung	Fuk Man Road
		Man Nin Street
		Sai Kung Hoi Pong Street
		Po Tung Road
Sha Tin	Sha Tin	Sha Tin Centre Street
		Ngan Shing Street
		Sha Kok Street
		Ngau Pei Sha Street
Tai Po	Tai Po	Kwong Fuk Road
		On Po Road
		Po Heung Street
		On Cheung Road
Tsuen Wan	Tsuen Wan	Sha Tsui Road
		Yeung Uk Road
		Tai Ho Road
		Tsuen Wan Market Street
		Hoi Pa Street
		Chuen Lung Street
		Chung On Street
Tuen Mun	Tuen Mun	Tin King Road
Yuen Long	Yuen Long	Yuen Long On Ning Road
		Kau Yuk Road
		Tai Tong Road
		Hop Yick Road
		Yuen Long New Street
		Castle Peak Road - Yuen Long

Annex 7

New Designs of Manhole Covers



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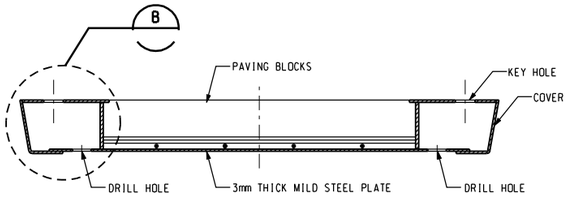

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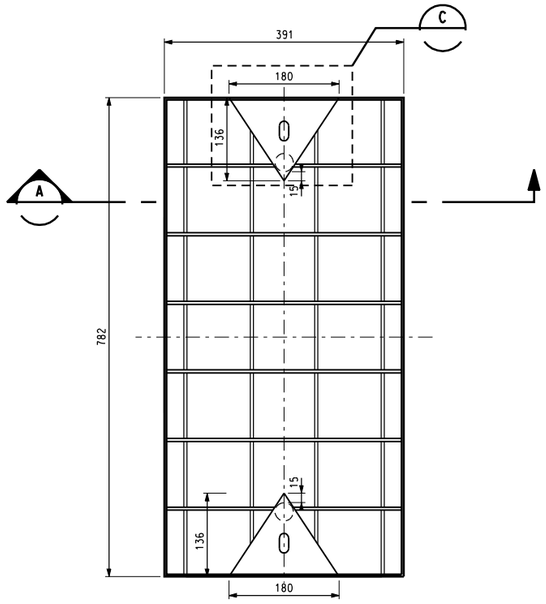
SCALE 1:5



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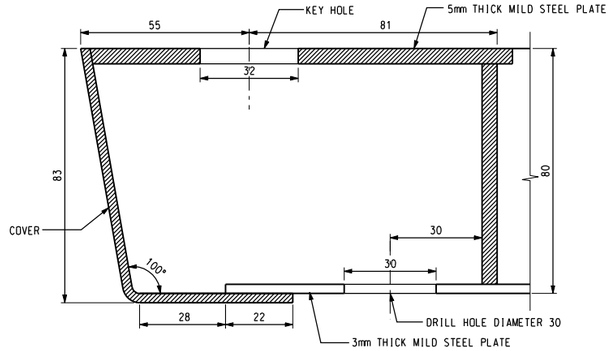

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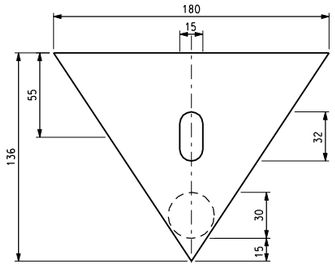


DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

Mott MacDonald
7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

OFTA

Project

STUDY ON VENTILATED MANHOLE COVER

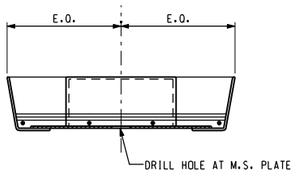
Title

CABLE CHAMBER RECESSED COVER SIZE 391mm x 782mm

Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1	Status	Rev
AS SHOWN	PRE	P1

Drawing Number
272845/VMC/001



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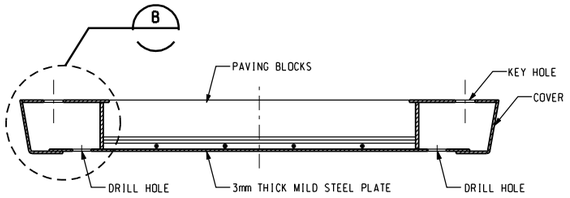

SIDE VIEW
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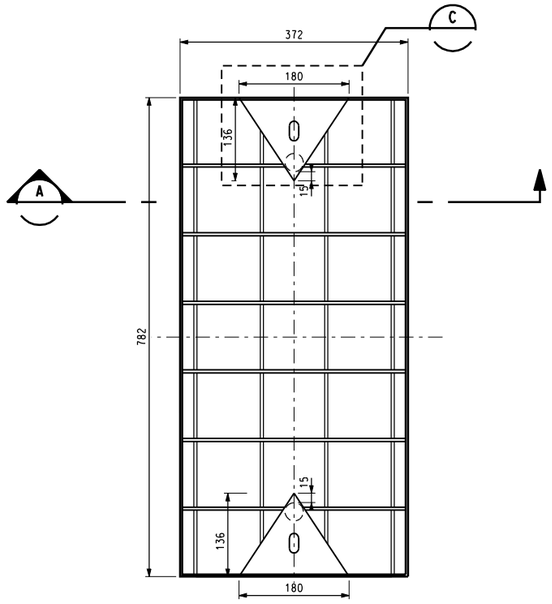

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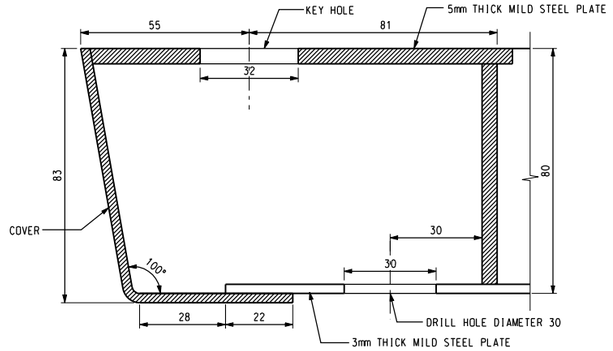
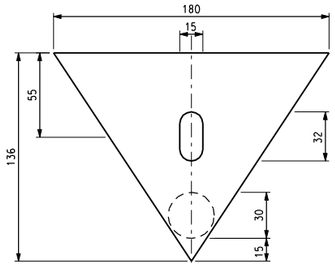


DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

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7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

OFTA

Project

STUDY ON VENTILATED MANHOLE COVER

Title

CABLE CHAMBER RECESSED COVER SIZE 372mm x 782mm

Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1	Status	Rev
AS SHOWN	PRE	P1

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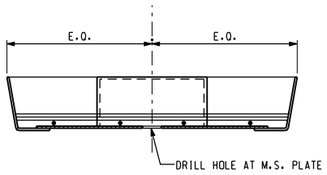
272845/VMC/002



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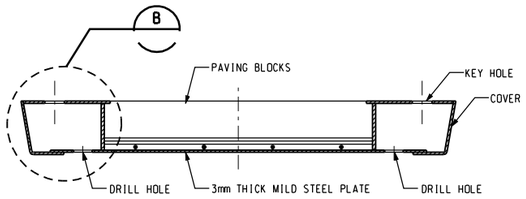
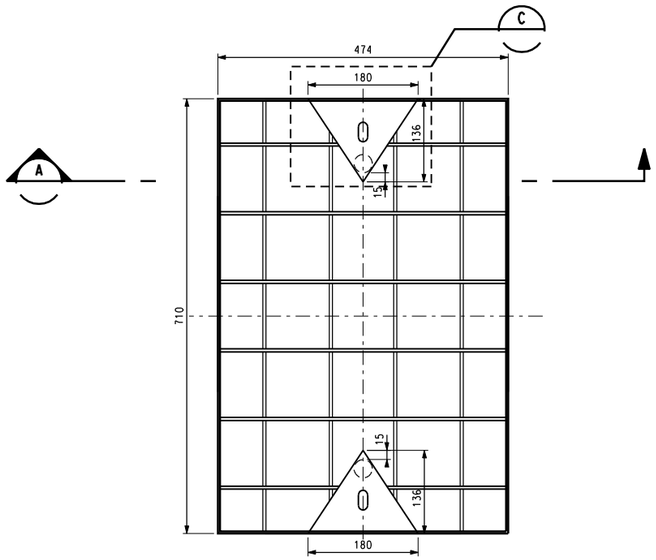


SIDE VIEW
SCALE 1:5



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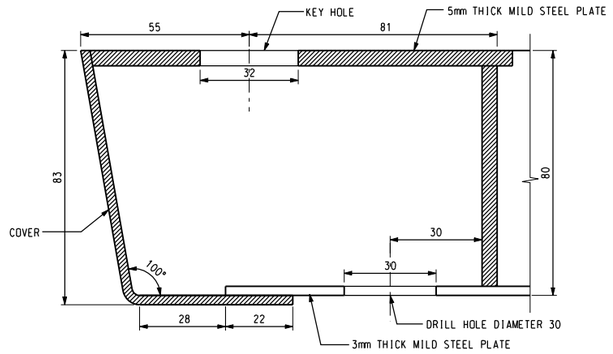
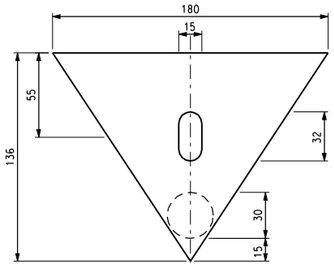


DETAIL B
SCALE 1:1

FOR 87mm DEEP COVER, SEE DETAIL D



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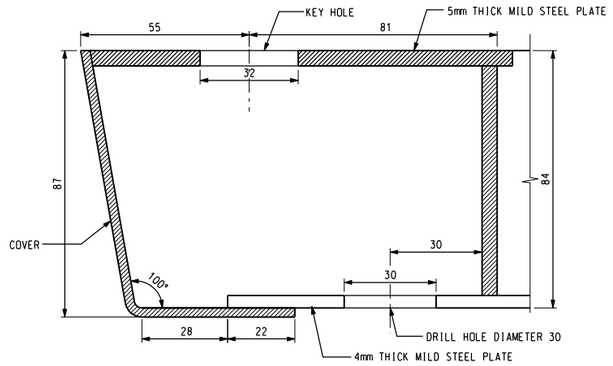

DETAIL D
SCALE 1:1

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

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Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

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Project

STUDY ON VENTILATED MANHOLE COVER

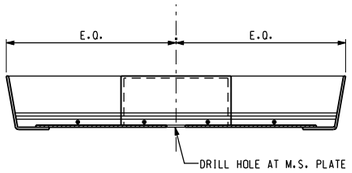
Title

CABLE CHAMBER RECESSED COVER SIZE 474mm x 710mm

Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1: AS SHOWN
Status: PRE
Rev: P1

Drawing Number: 272845/VMC/003



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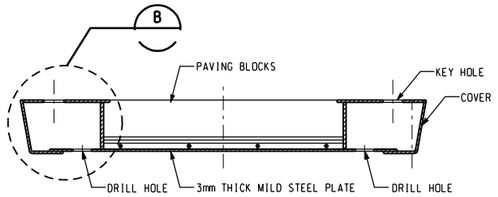

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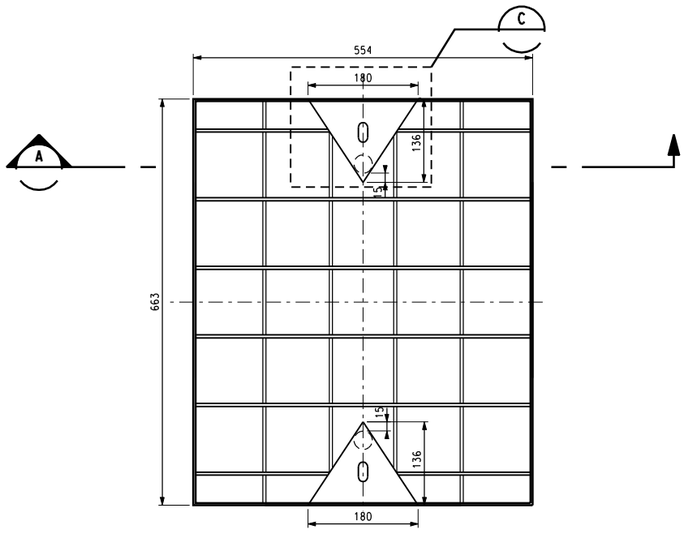

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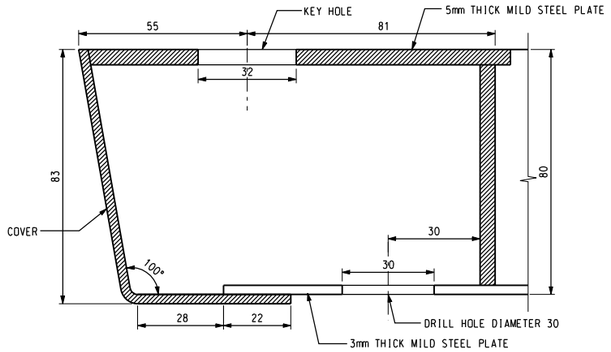

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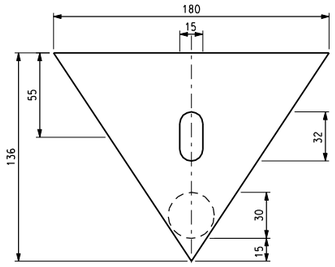

DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

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Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

OFTA

Project

STUDY ON VENTILATED MANHOLE COVER

Title

CABLE CHAMBER RECESSED COVER SIZE 554mm x 663mm

Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

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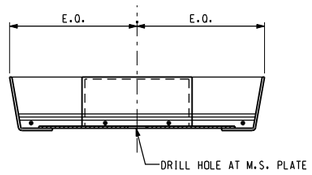
Status: PRE
Rev: P1

Drawing Number: 272845/VMC/004



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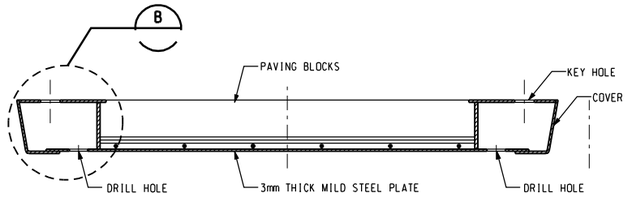

SIDE VIEW
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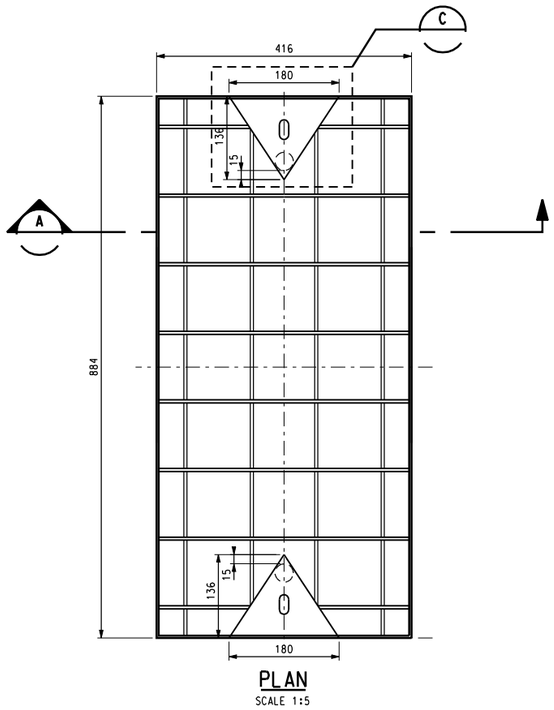

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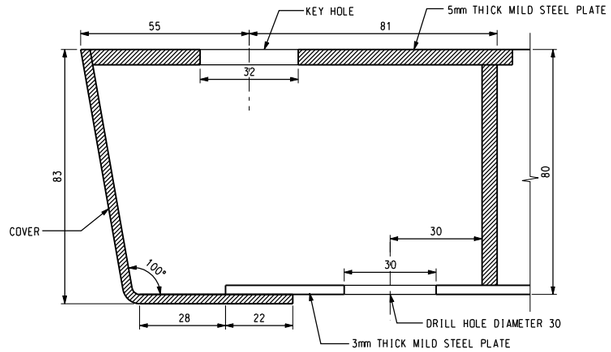

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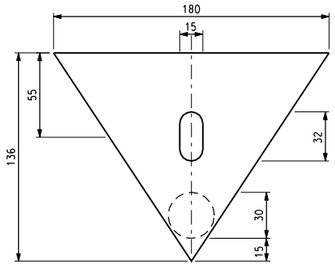

DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

Mott MacDonald
7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

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OFTA

Project

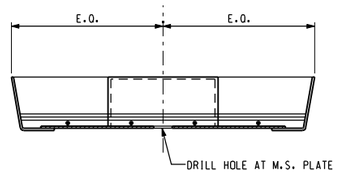
STUDY ON VENTILATED MANHOLE COVER

Title

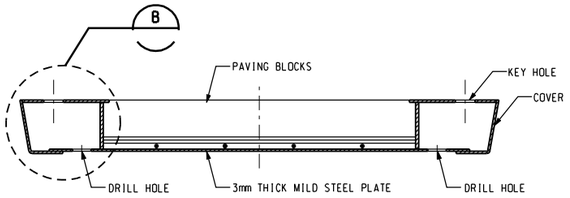
CABLE CHAMBER RECESSED COVER SIZE 416mm x 884mm

Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	
Scale at A1 AS SHOWN		Status PRE		Rev P1	

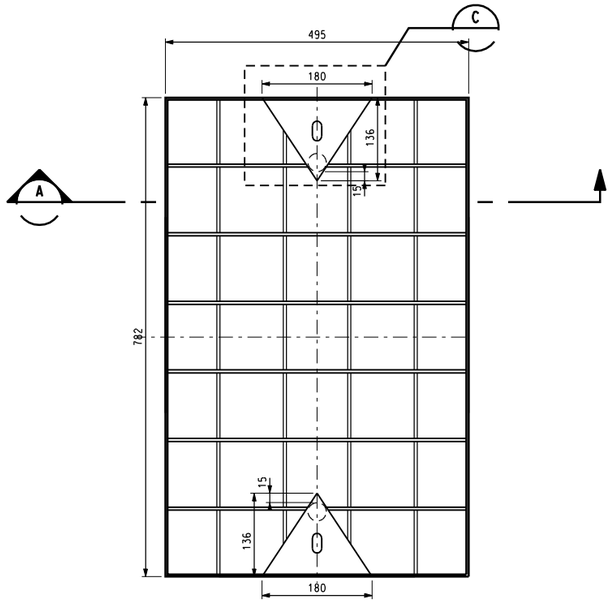
Drawing Number 272845/VMC/005



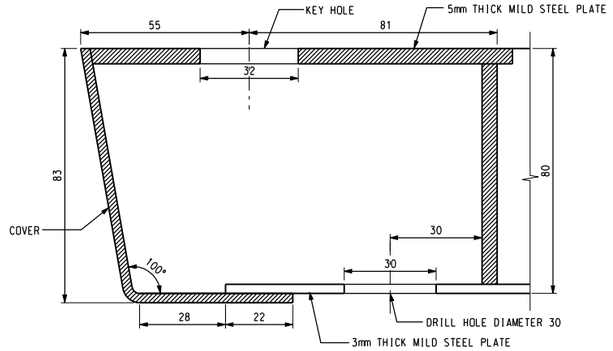
SECTION A
SCALE 1:5



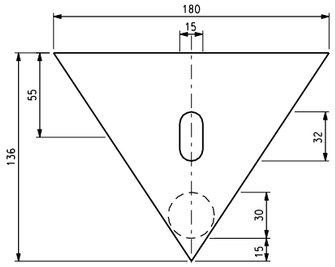
SIDE VIEW
SCALE 1:5



PLAN
SCALE 1:5



DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

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7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

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Project

STUDY ON VENTILATED MANHOLE COVER

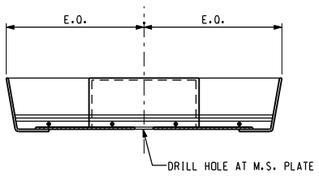
Title

CABLE CHAMBER RECESSED COVER SIZE 495mm x 782mm

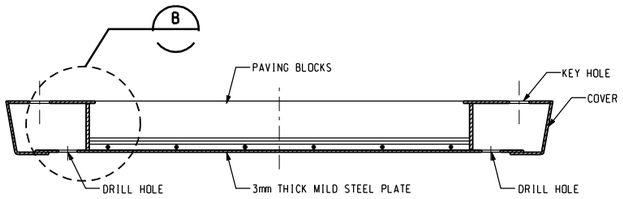
Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1	Status	Rev
AS SHOWN	PRE	P1

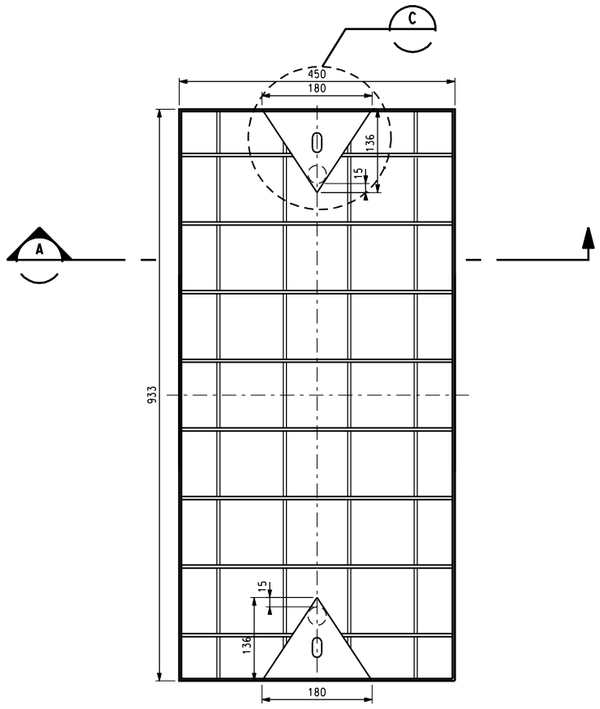
Drawing Number
272845/VMC/006



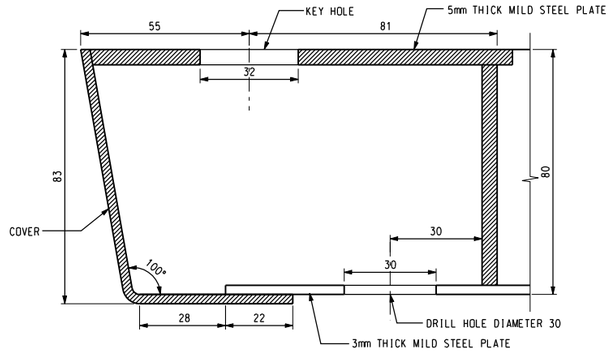
SECTION A
SCALE 1:5



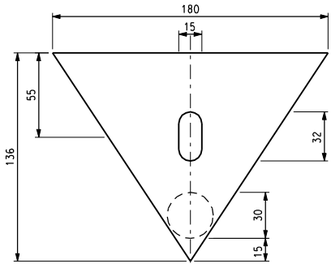
SIDE VIEW
SCALE 1:5



PLAN
SCALE 1:5



DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

Mott MacDonald
7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

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Project

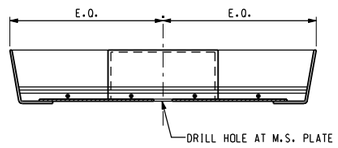
STUDY ON VENTILATED MANHOLE COVER

Title

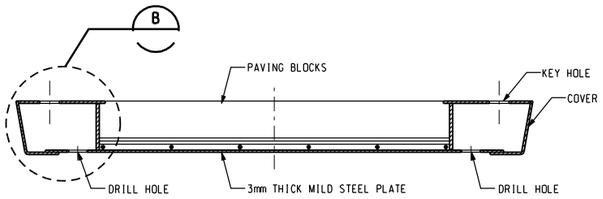
CABLE CHAMBER RECESSED COVER SIZE 450mm x 933mm

Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	
Scale at A1 AS SHOWN		Status PRE		Rev P1	

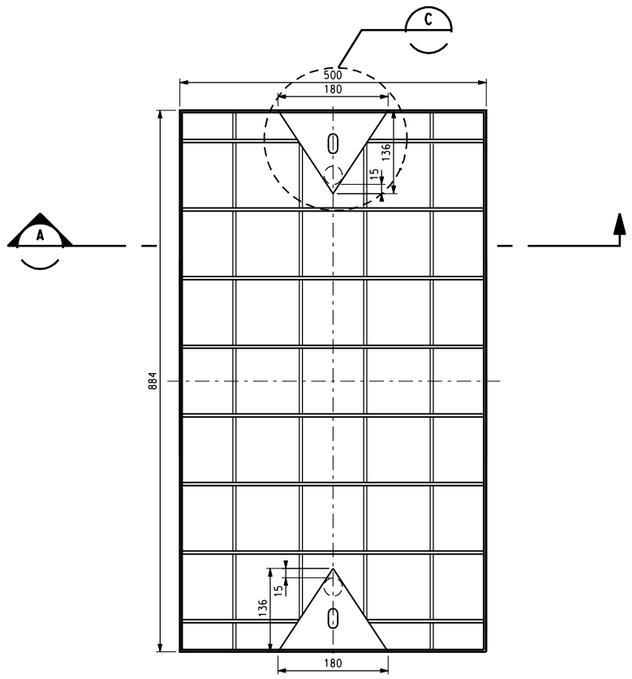
Drawing Number 272845/VMC/007



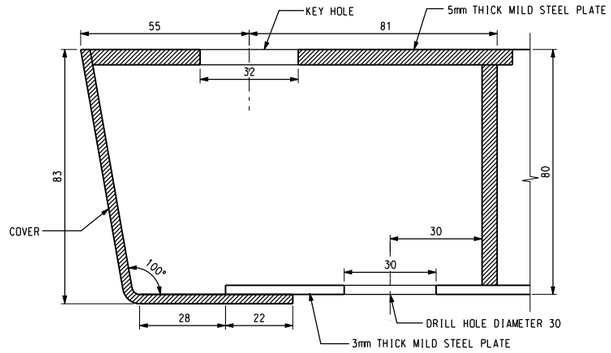
SECTION A
SCALE 1:5



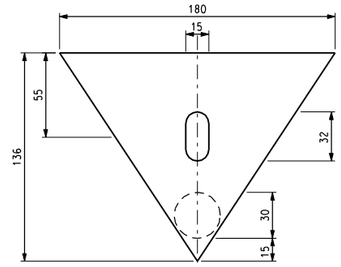
SIDE VIEW
SCALE 1:5



PLAN
SCALE 1:5



DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

Mott MacDonald
7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

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Project

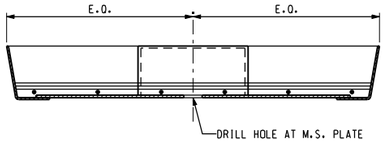
STUDY ON VENTILATED MANHOLE COVER

Title

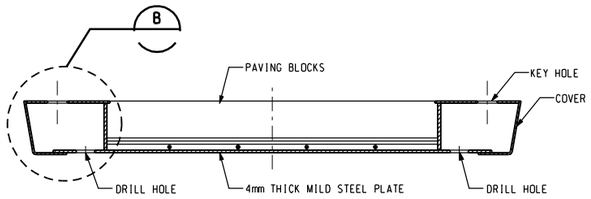
CABLE CHAMBER RECESSED COVER
SIZE 500mm x 884mm

Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	
Scale at A1	AS SHOWN	Status	PRE	Rev	P1

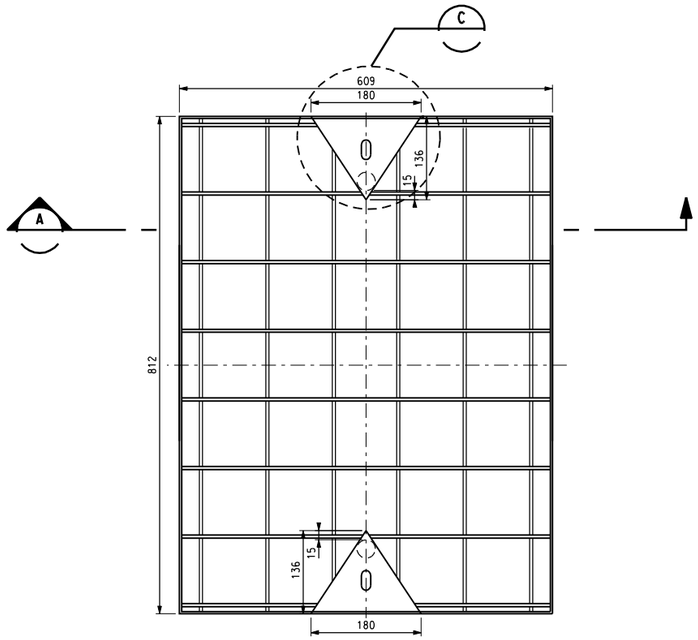
Drawing Number
272845/VMC/008



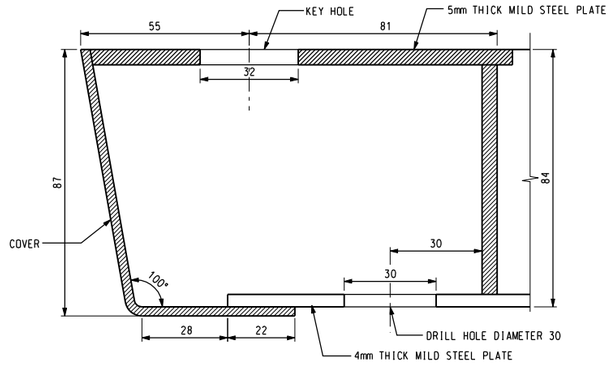
SECTION A
SCALE 1:5



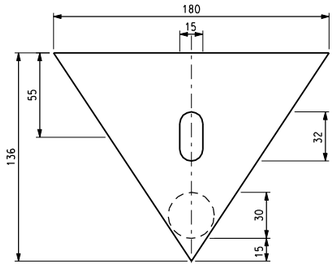
SIDE VIEW
SCALE 1:5



PLAN
SCALE 1:5



DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

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7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

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Project

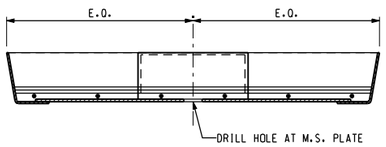
STUDY ON VENTILATED MANHOLE COVER

Title

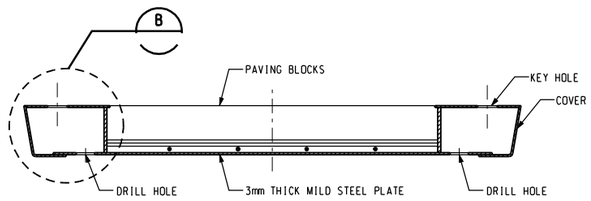
CABLE CHAMBER RECESSED COVER (WITH 2 KEY HOLES)
SIZE 609mm x 812mm

Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	
Scale at A1	AS SHOWN	Status	PRE	Rev	P1

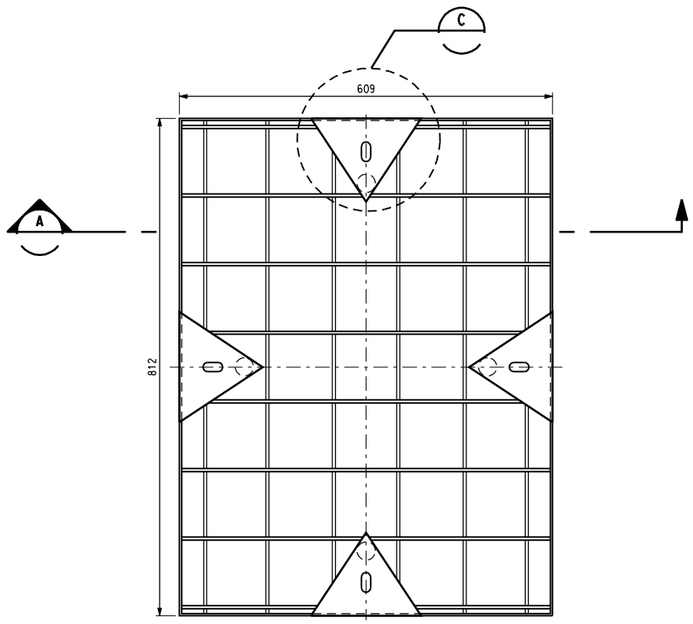
Drawing Number
272845/VMC/009



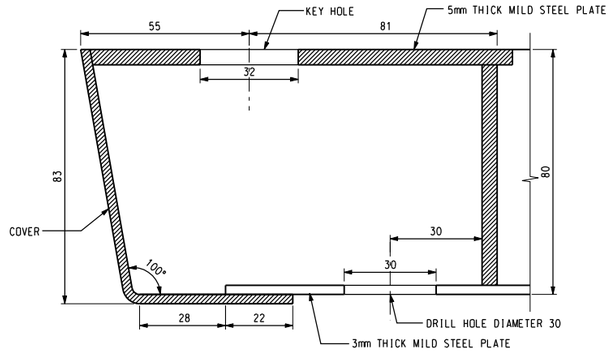
SECTION A
SCALE 1:5



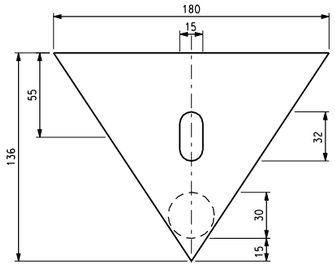
SIDE VIEW
SCALE 1:5



PLAN
SCALE 1:5



DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

Mott MacDonald
7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

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Project

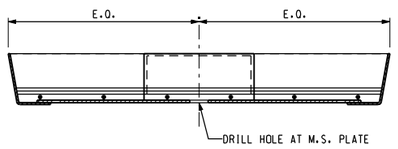
STUDY ON VENTILATED MANHOLE COVER

Title

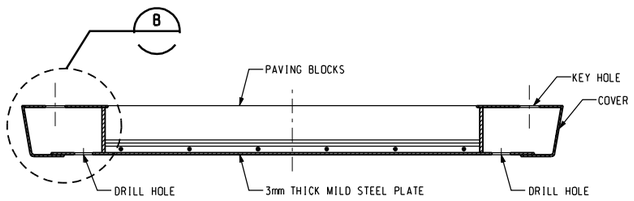
CABLE CHAMBER RECESSED COVER (WITH 4 KEY HOLES)
SIZE 609mm x 812mm

Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	
Scale at A1	AS SHOWN	Status	PRE	Rev	P1

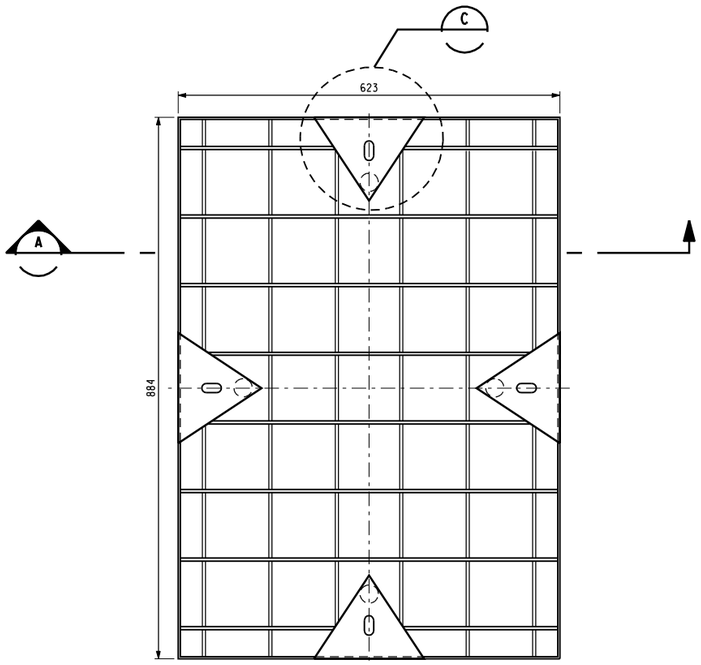
Drawing Number
272845/VMC/010



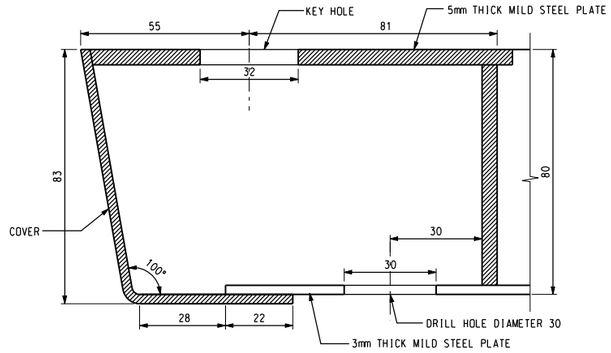
SECTION A
SCALE 1:5



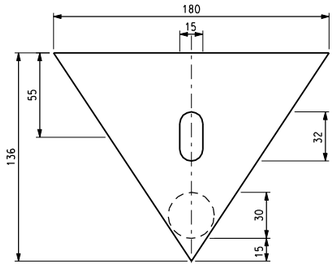
SIDE VIEW
SCALE 1:5



PLAN
SCALE 1:5



DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

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7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

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Project

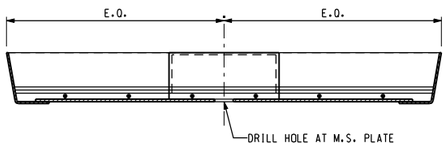
STUDY ON VENTILATED MANHOLE COVER

Title

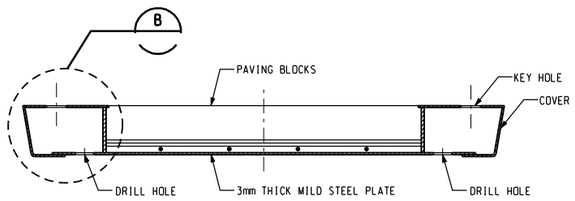
CABLE CHAMBER RECESSED COVER (WITH 4 KEY HOLES)
SIZE 623mm x 884mm

Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	
Scale at A1	AS SHOWN	Status	PRE	Rev	P1

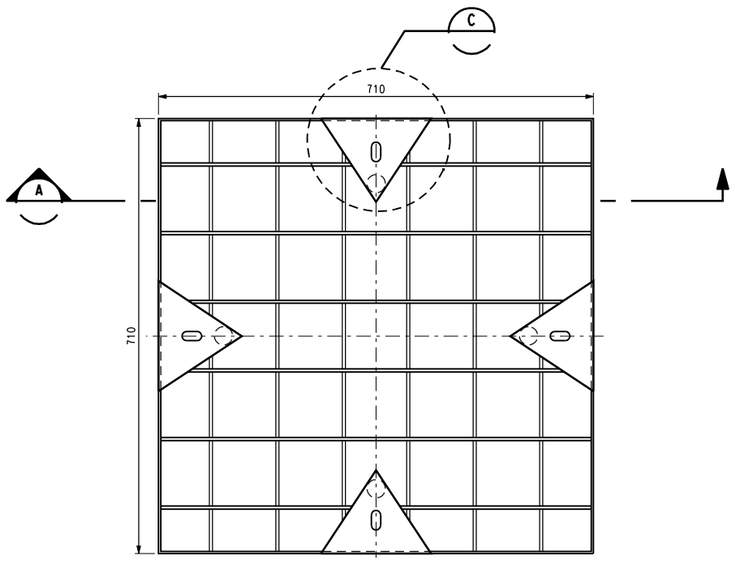
Drawing Number
272845/VMC/011



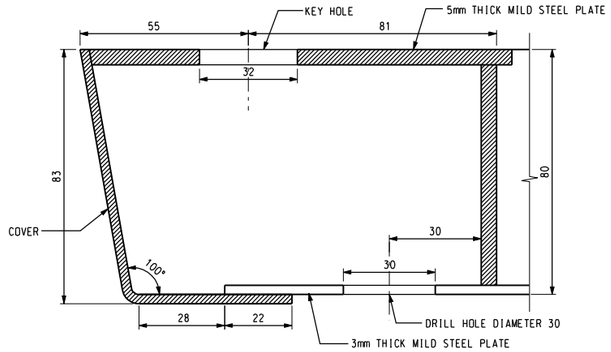
SECTION A
SCALE 1:5



SIDE VIEW
SCALE 1:5

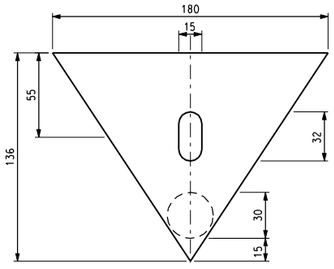


PLAN
SCALE 1:5

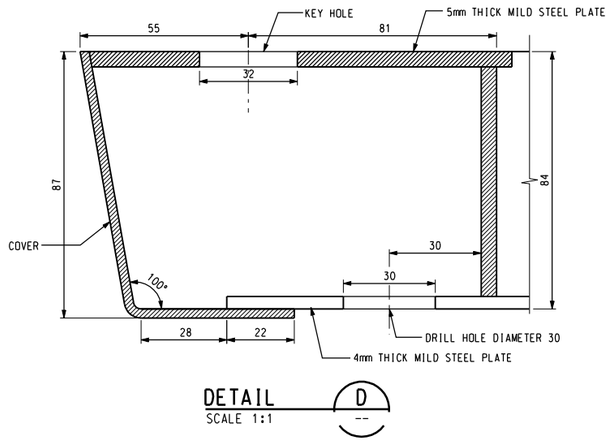


DETAIL B
SCALE 1:1

FOR 87mm DEEP COVER, SEE DETAIL D



DETAIL C
SCALE 1:2



DETAIL D
SCALE 1:1

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

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7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

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Project

STUDY ON VENTILATED MANHOLE COVER

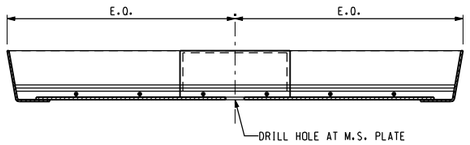
Title

CABLE CHAMBER RECESSED COVER (WITH 4 KEY HOLES)
SIZE 710mm x 710mm

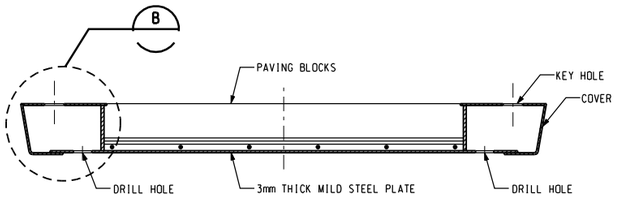
Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1: AS SHOWN
Status: PRE
Rev: P1

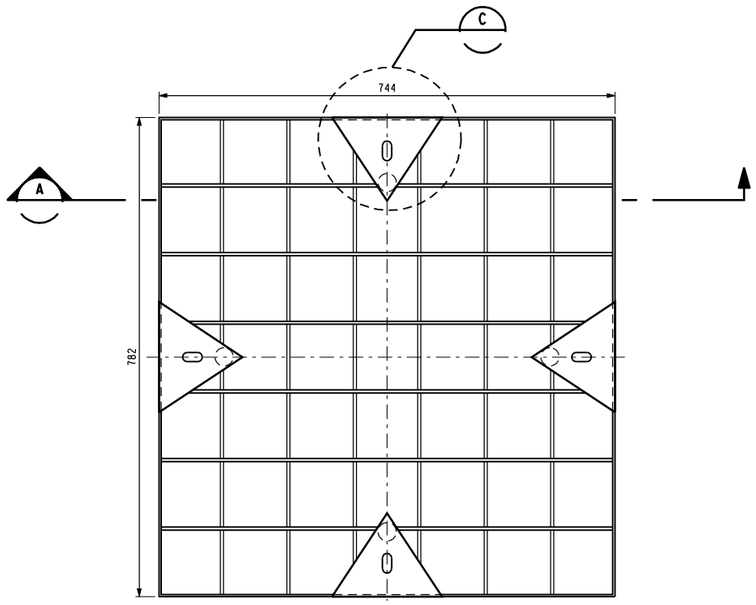
Drawing Number: 272845/VMC/012



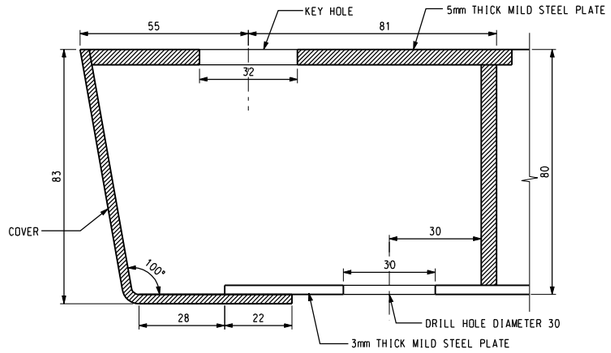
SECTION A
SCALE 1:5



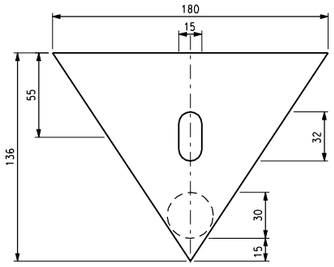
SIDE VIEW
SCALE 1:5



PLAN
SCALE 1:5



DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

Mott MacDonald
7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

OFTA

Project

STUDY ON VENTILATED MANHOLE COVER

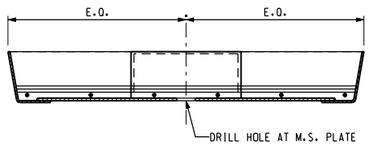
Title

CABLE CHAMBER RECESSED COVER (WITH 4 KEY HOLES)
SIZE 744mm x 782mm

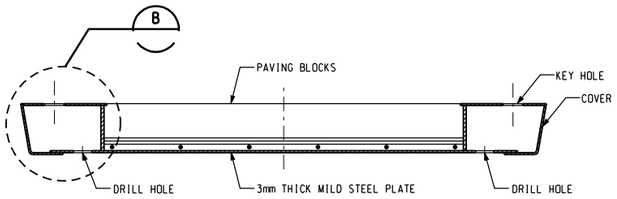
Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1: AS SHOWN
Status: PRE
Rev: P1

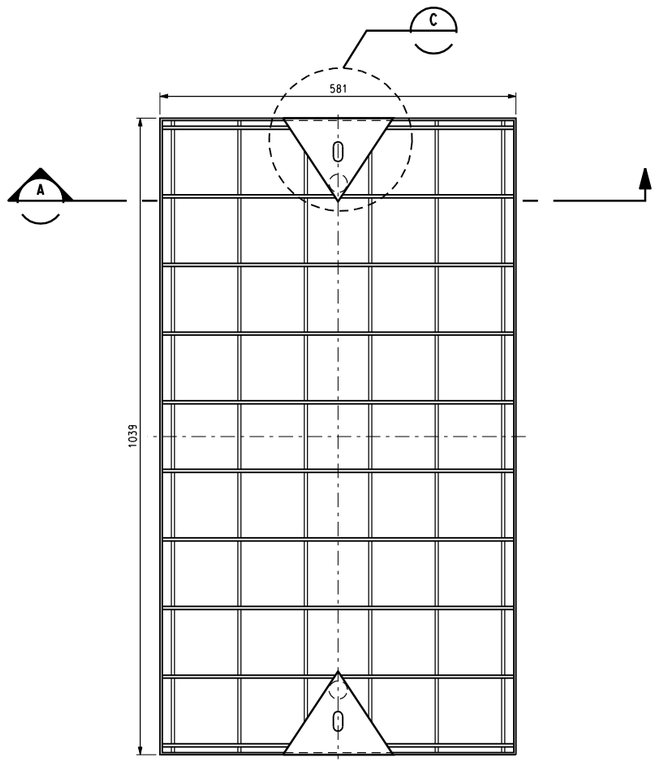
Drawing Number: 272845/VMC/013



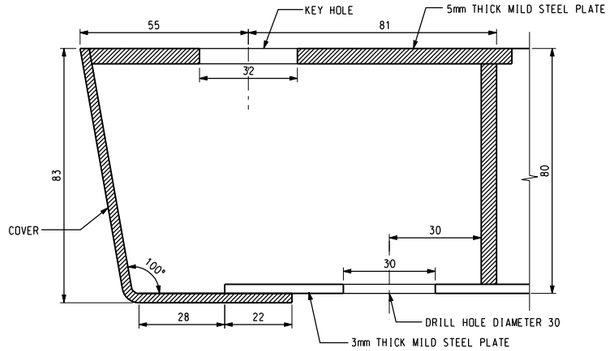
SECTION A
SCALE 1:5



SIDE VIEW
SCALE 1:5

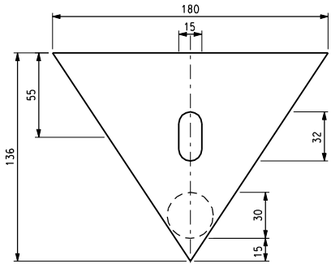


PLAN
SCALE 1:5

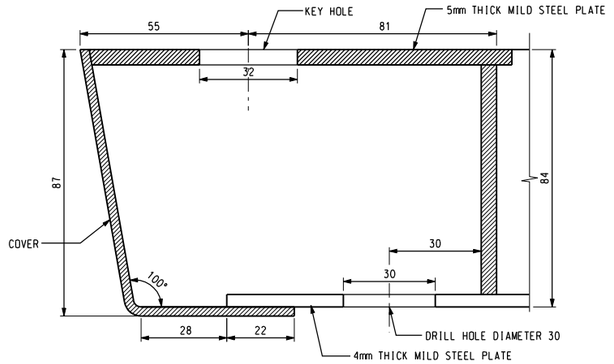


DETAIL B
SCALE 1:1

FOR 87mm DEEP COVER, SEE DETAIL D



DETAIL C
SCALE 1:2



DETAIL D
SCALE 1:1

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

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7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

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Project

STUDY ON VENTILATED MANHOLE COVER

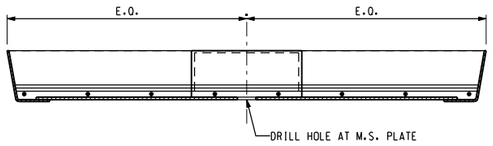
Title

CABLE CHAMBER RECESSED COVER SIZE 581mm x 1039mm

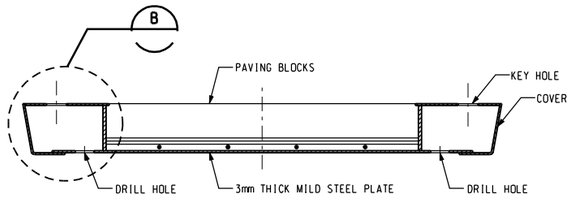
Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1: AS SHOWN | Status: PRE | Rev: P1

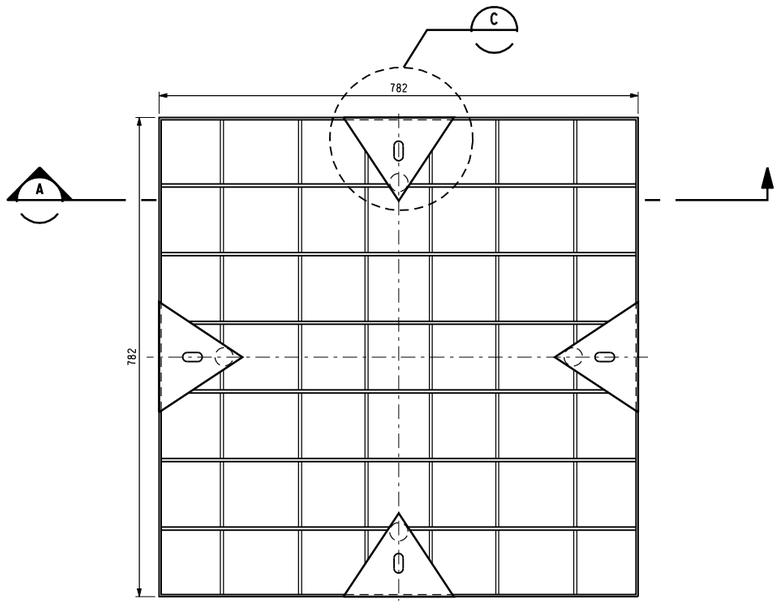
Drawing Number: 272845/VMC/014



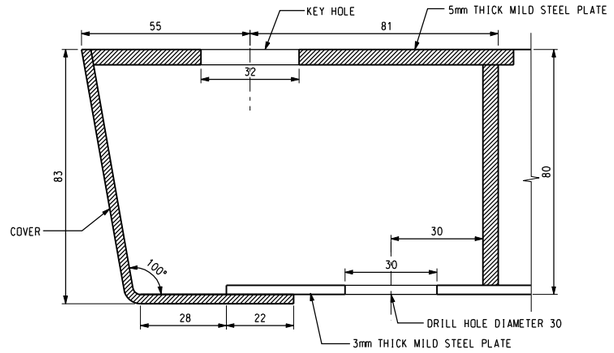
SECTION A
SCALE 1:5



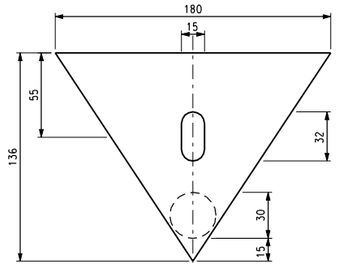
SIDE VIEW
SCALE 1:5



PLAN
SCALE 1:5



DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

Mott MacDonald
7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

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Project

STUDY ON VENTILATED MANHOLE COVER

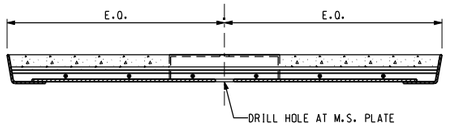
Title

CABLE CHAMBER RECESSED COVER (WITH 4 KEY HOLES)
SIZE 782mm x 782mm

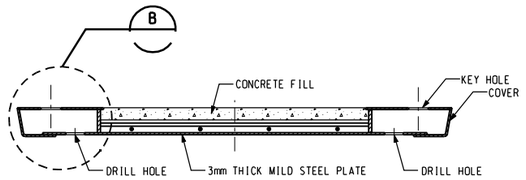
Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1: AS SHOWN
Status: PRE
Rev: P1

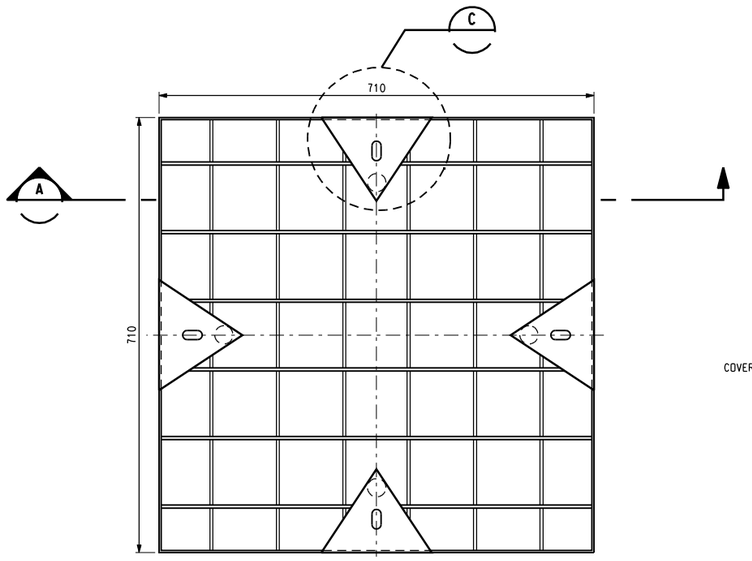
Drawing Number: 272845/VMC/015



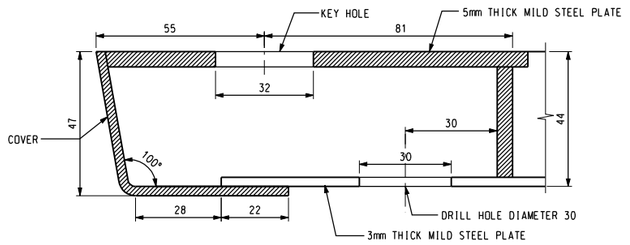
SECTION A
SCALE 1:5



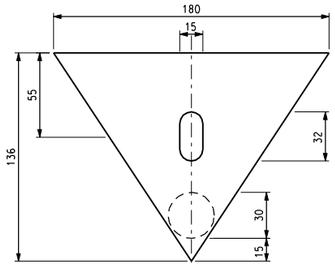
SIDE VIEW
SCALE 1:5



PLAN
SCALE 1:5



DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

Mott MacDonald
7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

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Project

STUDY ON VENTILATED MANHOLE COVER

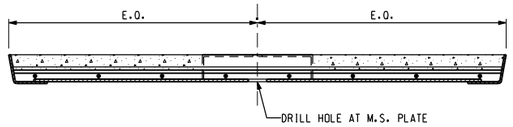
Title

CABLE CHAMBER CONCRETE COVER (WITH 4 KEY HOLES) SIZE 710mm x 710mm

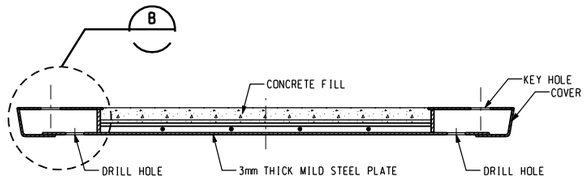
Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1: AS SHOWN | Status: PRE | Rev: P1

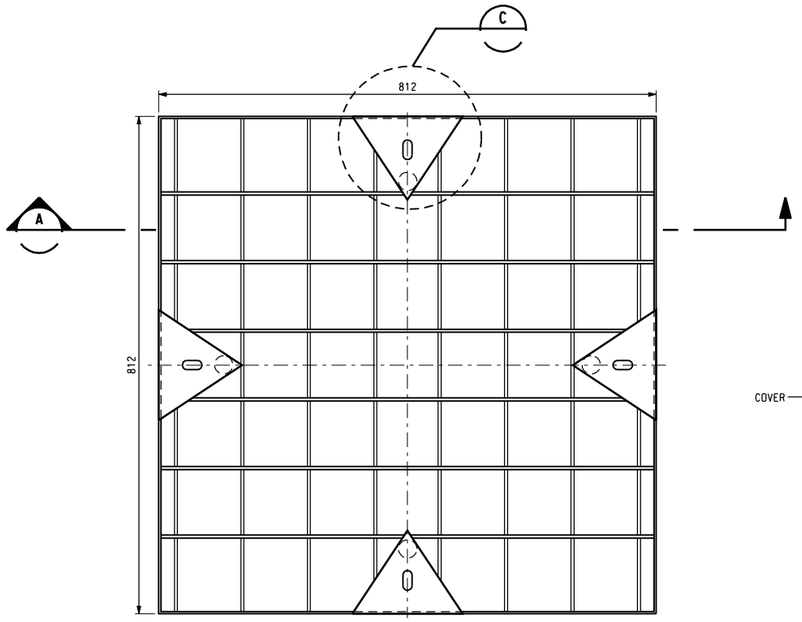
Drawing Number: 272845/VMC/016



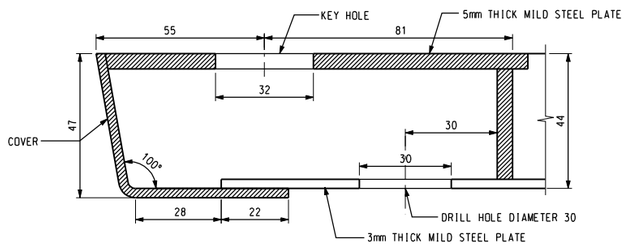
SECTION A
SCALE 1:5



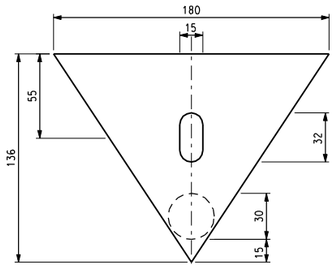
SIDE VIEW
SCALE 1:5



PLAN
SCALE 1:5



DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

Mott MacDonald
7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

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Project

STUDY ON VENTILATED MANHOLE COVER

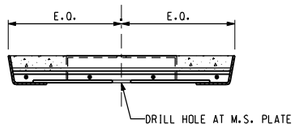
Title

CABLE CHAMBER CONCRETE COVER (WITH 4 KEY HOLES)
SIZE 812mm x 812mm

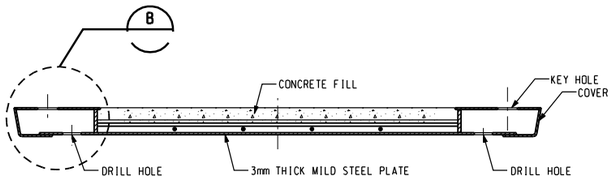
Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1	Status	Rev
AS SHOWN	PRE	P1

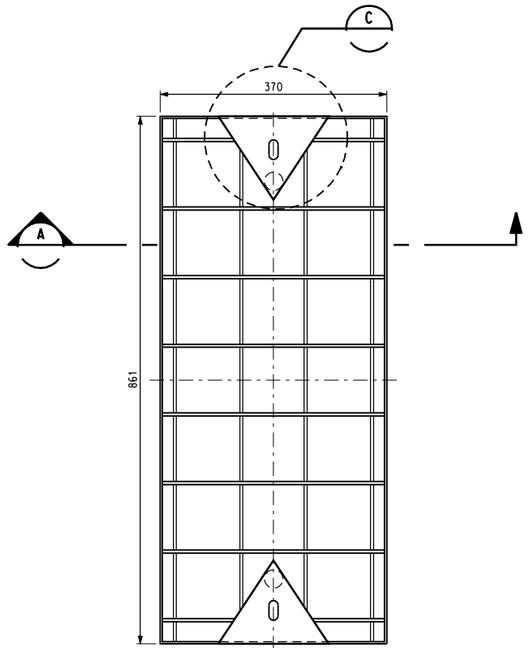
Drawing Number
272845/VMC/017



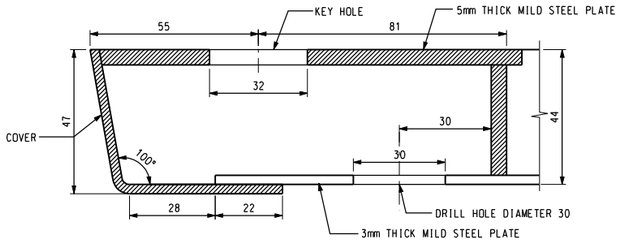
SECTION A
SCALE 1:5



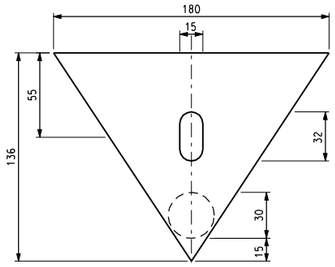
SIDE VIEW
SCALE 1:5



PLAN
SCALE 1:5



DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

Mott MacDonald
7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
t +852 2828 5757
f +852 2827 1823
w www.mottmac.com.hk

Client

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Project

STUDY ON VENTILATED MANHOLE COVER

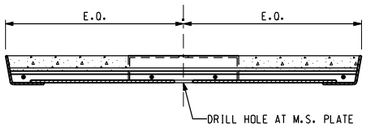
Title

CABLE CHAMBER CONCRETE COVER
SIZE 370mm x 861mm

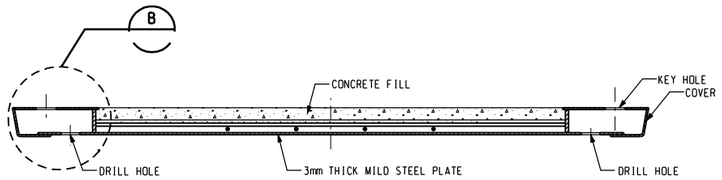
Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1: AS SHOWN
Status: PRE
Rev: P1

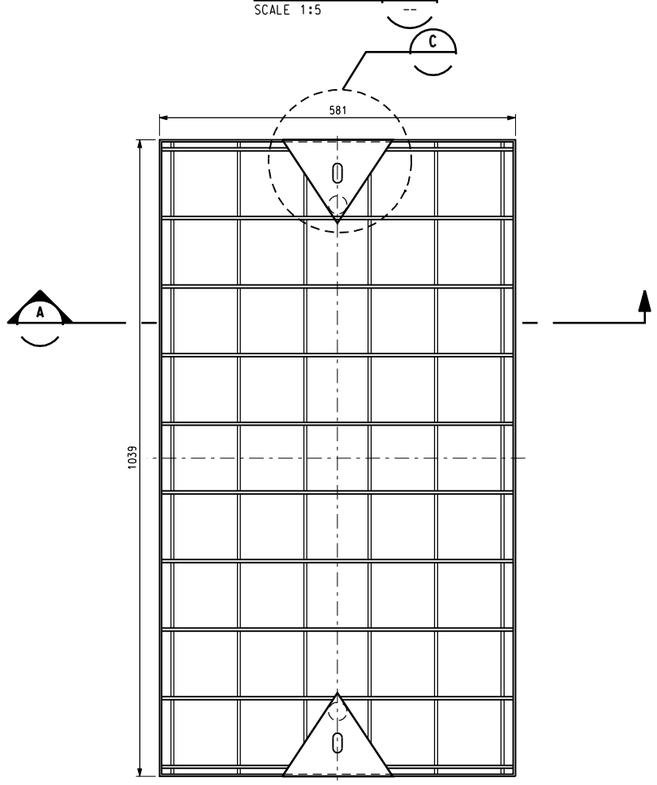
Drawing Number: 272845/VMC/018



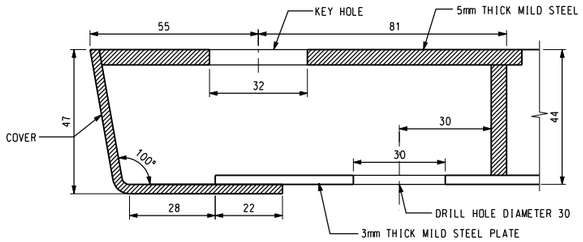
SECTION A
SCALE 1:5



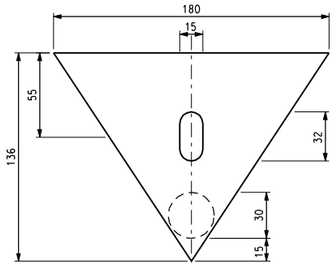
SIDE VIEW
SCALE 1:5



PLAN
SCALE 1:5



DETAIL B
SCALE 1:1



DETAIL C
SCALE 1:2

Notes

1. MILD STEEL SHOULD BE TO BS970:PART 1:1971(1994) STANDARD.
2. ALL SHARP EDGES SHOULD BE REMOVED.
3. FINISHES SHOULD BE HOT DIP GALVANIZED TO BS729:1971(1994).
4. ALL WELDING SPOTS IN CONTACT BETWEEN THE BEARING SURFACES OF THE FRAME AND COVER SHALL BE FINISHED SMOOTH.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	08APR10	CCH	FIRST ISSUE	PAH	HTC

Mott MacDonald
7/F West Wing Office Building
New World Centre, 20 Salisbury Road
Tsimshatsui, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

OFTA

Project

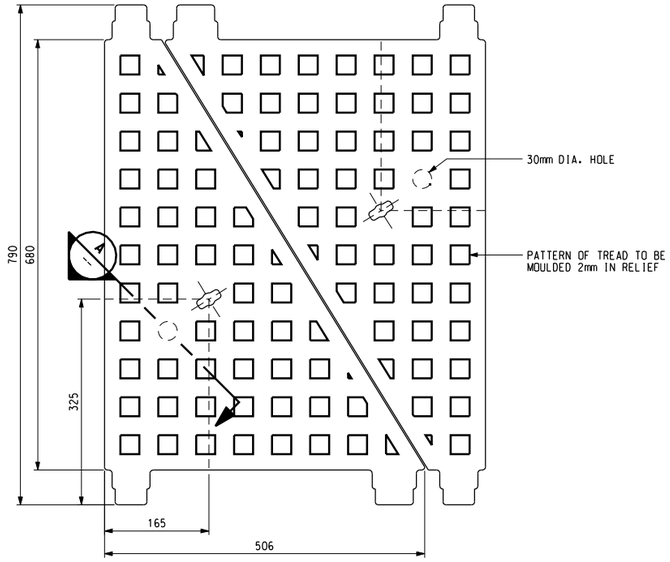
STUDY ON VENTILATED MANHOLE COVER

Title

CABLE CHAMBER CONCRETE COVER SIZE 581mm x 1039mm

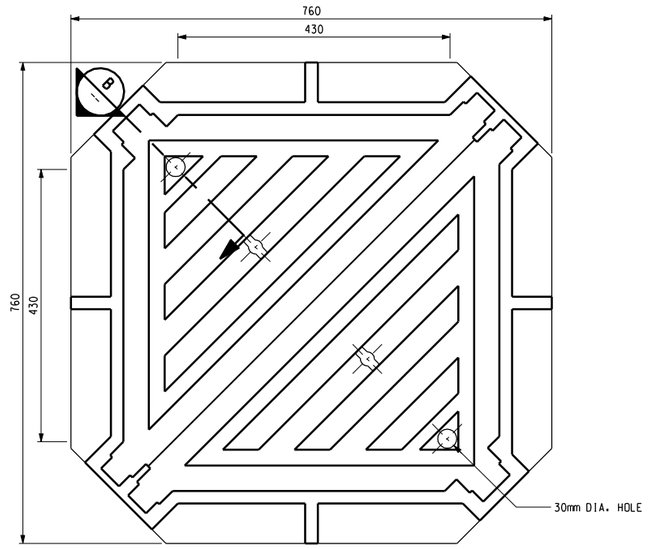
Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	
Scale at A1	AS SHOWN	Status	PRE	Rev	P1

Drawing Number
272845/VMC/019



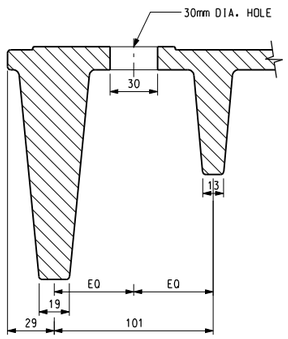
PLAN OF TYPE 1 CAST IRON COVER

SCALE 1:5



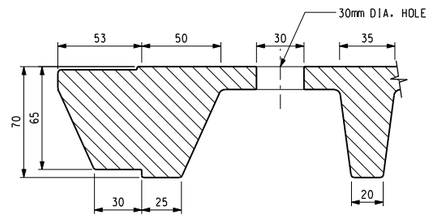
PLAN OF TYPE 2 CAST IRON COVER

SCALE 1:5



SECTION A

SCALE 1 : 2



SECTION B

SCALE 1 : 2

Notes

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd

Mott MacDonald

20/F Two Landmark East
100 How Ming Street
Kwun Tong, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

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Project

STUDY ON VENTILATED MANHOLE COVER

Title

PROPOSED
CAST IRON MANHOLE COVER

Designed	—		Eng check	—	
Drawn	CCH		Coordination	—	
Dwg check	—		Approved	—	

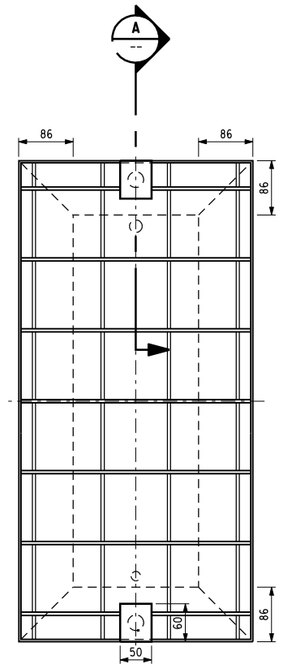
Scale at A1	Status	Rev
1:5@A1	PRE	P1

Drawing Number

272845/VMC/020

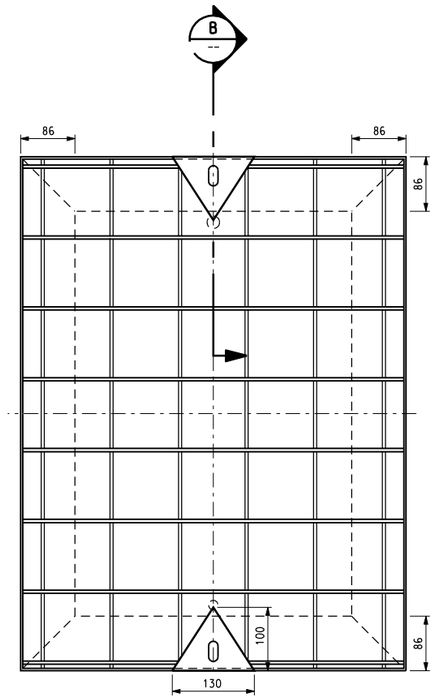
Annex 8

Modification of Existing Manhole Covers



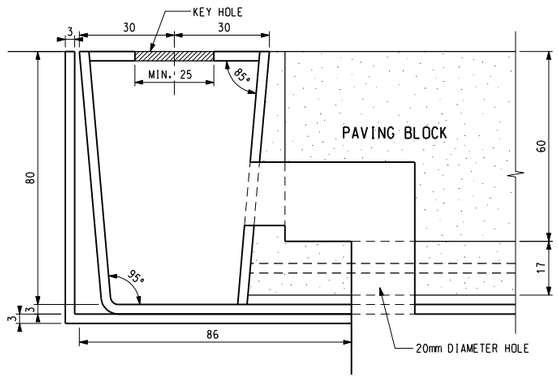
PLAN OF RECESSED MANHOLE COVER WITH VENT HOLE TYPE 1

SCALE 1:5



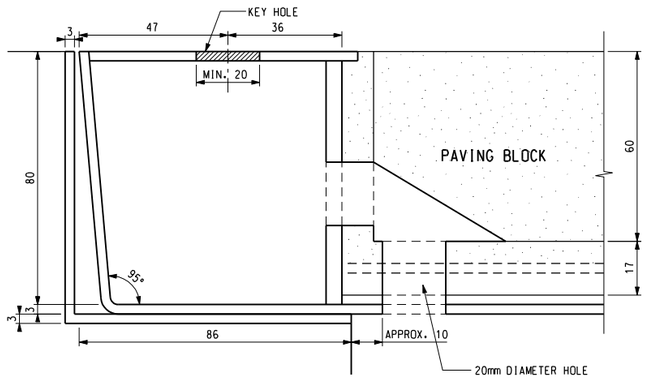
PLAN OF RECESSED MANHOLE COVER WITH VENT HOLE TYPE 1

SCALE 1:5



SECTION A

SCALE 1:1



SECTION B

SCALE 1:1

Notes

1. HOLES TO BE DRILLED DIRECTLY THROUGH KEY HOLE OPENING.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	03MAY10	JL	SECOND ISSUE	PAH	HTC
P1	21APR10	JL	FIRST ISSUE	PAH	HTC

Mott MacDonald

20/F Two Landmark East
100 How Ming Street
Kwun Tong, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

OFTA

Project

STUDY ON VENTILATED MANHOLE COVER

Title

MODIFICATION OF EXISTING RECESSED MANHOLE COVER - PAVING BLOCK INFILL

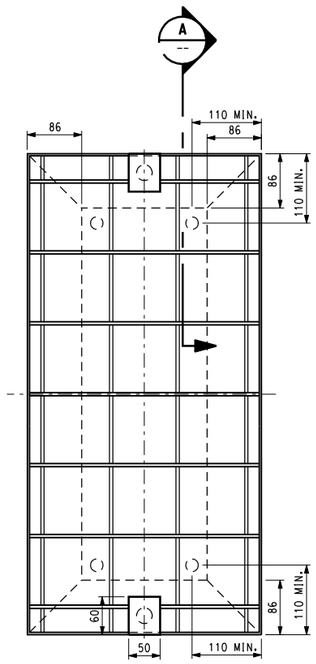
Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1: AS SHOWN

Status: PRE

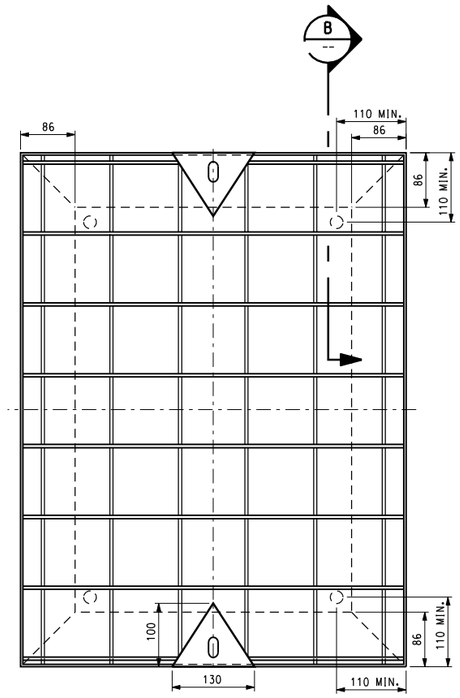
Rev: P1

Drawing Number: 272845/VMC/021



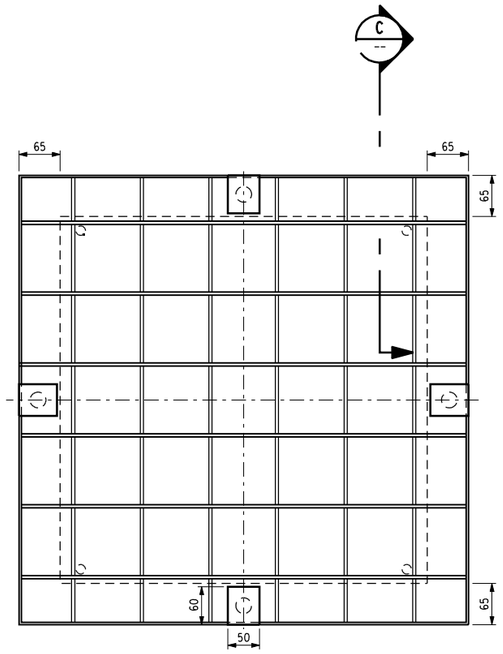
PLAN OF RECESSED MANHOLE COVER WITH VENT HOLE TYPE 2

SCALE 1:5



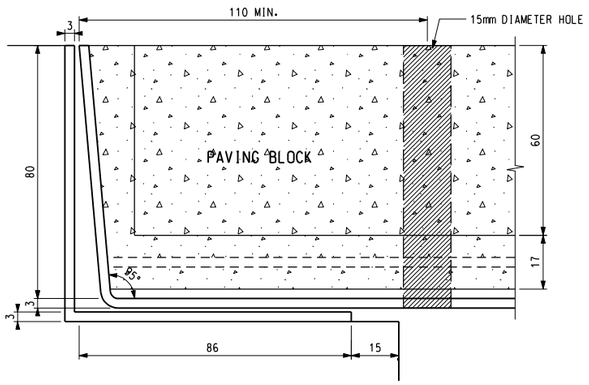
PLAN OF RECESSED MANHOLE COVER WITH VENT HOLE TYPE 2

SCALE 1:5



PLAN OF RECESSED MANHOLE COVER WITH VENT HOLE TYPE 2

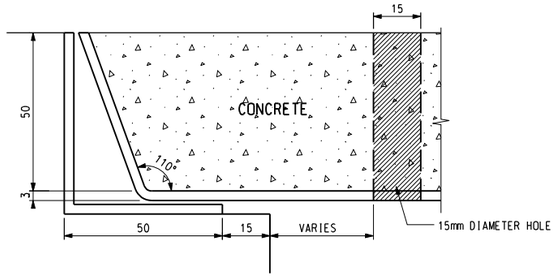
SCALE 1:5



SECTION A

SCALE 1:1

SECTION B SIMILAR



SECTION C

SCALE 1:1

Notes

1. HOLES LOCATION SHOULD BE AT LEAST 110mm FROM THE EDGE OF THE COVER AND IN THE MIDDLE OF THE PAVING BLOCK.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	04MAY10	JL	FIRST ISSUE	PAH	HTC
P1	21APR10	JL	FIRST ISSUE	PAH	HTC

Mott MacDonald

20/F Two Landmark East
100 How Ming Street
Kwun Tong, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

OFTA

Project

STUDY ON VENTILATED MANHOLE COVER

Title

MODIFICATION OF EXISTING RECESSED MANHOLE COVER - CONCRETE & PAVING BLOCK INFILL

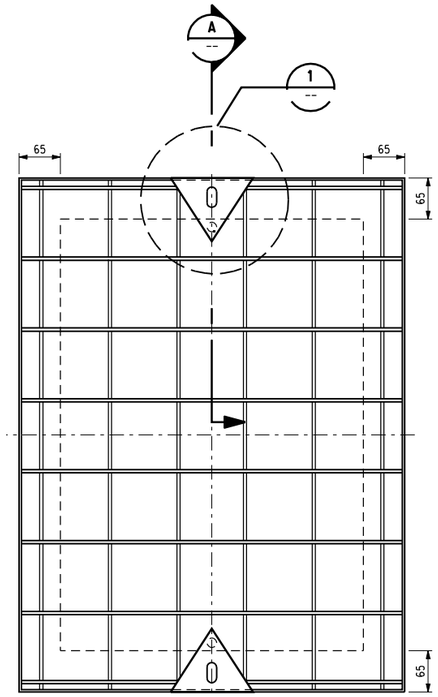
SHEET 1 OF 2

Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

Scale at A1	Status	Rev
AS SHOWN	PRE	P1

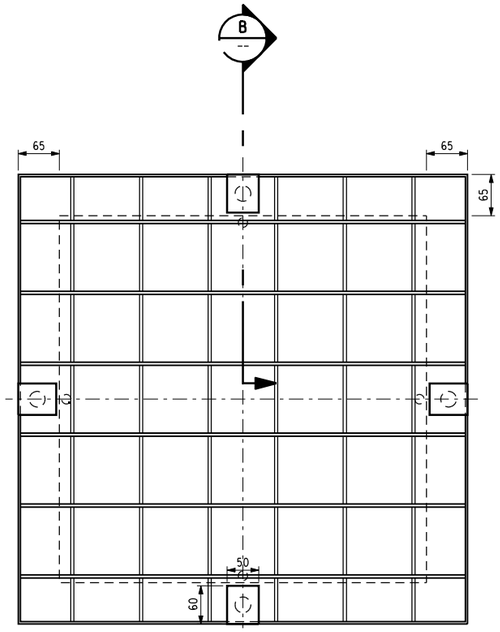
Drawing Number

272845/VMC/022



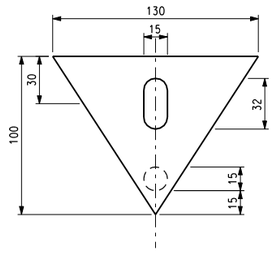
PLAN OF RECESSED MANHOLE COVER WITH VENT HOLE TYPE 3

SCALE 1:5



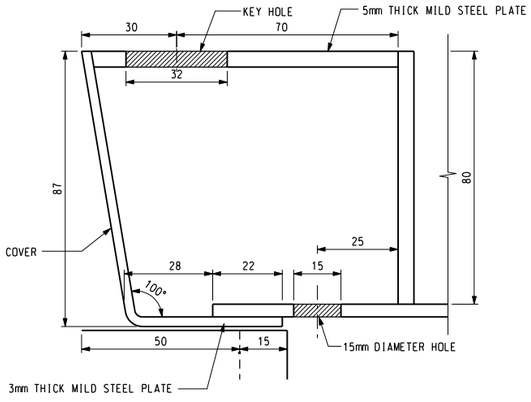
PLAN OF RECESSED MANHOLE COVER WITH VENT HOLE TYPE 3

SCALE 1:5



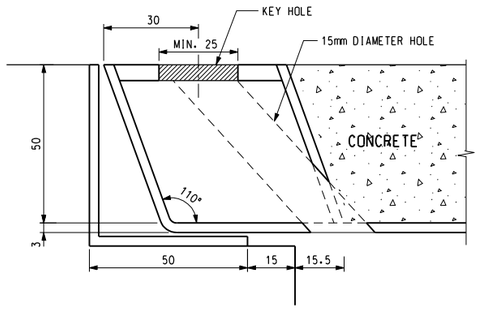
DETAIL 1

SCALE 1:2



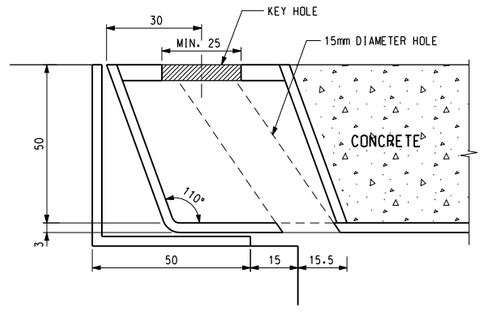
SECTION A

SCALE 1:1



SECTION B1

SCALE 1:1



SECTION B2

SCALE 1:1

Notes

1. HOLES IN BASEPLATE TO BE DRILLED FROM UNDERSIDE OF COVER.

Key to symbols

Reference drawings

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	04MAY10	PL	SECOND ISSUE	PAH	HTC
P1	21APR10	JL	FIRST ISSUE	PAH	HTC

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Kwun Tong, Kowloon
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STUDY ON VENTILATED MANHOLE COVER

Title

MODIFICATION OF EXISTING RECESSED MANHOLE COVER - CONCRETE & PAVING BLOCK INFILL

SHEET 2 OF 2

Designed	HL		Eng check	PAH	
Drawn	CCH		Coordination	HL	
Dwg check	HL		Approved	HTC	

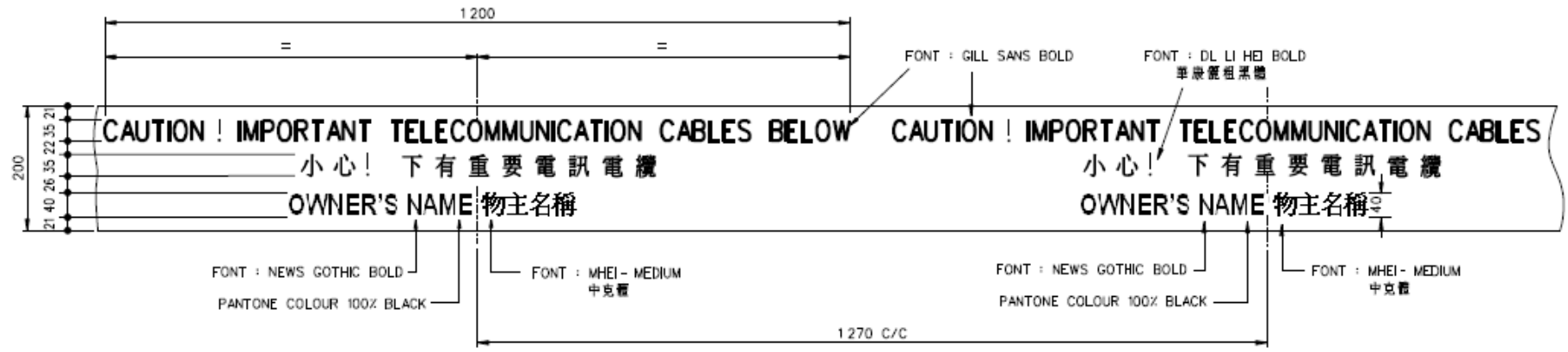
Scale at A1	Status	Rev
AS SHOWN	PRE	P1

Drawing Number

272845/VMC/023

Annex 9

Sample Drawing of Caution Tape



GENERAL SPECIFICATIONS

MATERIAL — FLEXIBLE POLYETHYLENE FILM (SLEEVE TYPE)
THICKNESS OF SHEET - 0.05 mm

COLOUR — 1. TAPE - BRIGHT YELLOW.
2. LETTER AND CHINESE CHARACTERS - RED, PRINTED ON ONE SIDE ONLY.
3. OWNER'S DENTITY IN BLACK.

TAPE SIZE — 200 mm WIDE x 250 m LONG, TO BE MOUNTED ON A HARDBOARD REEL WITH A CENTRE SPINDLE HOLE OF DIAMETER 40 mm.

FINISH — NATURAL

TOLERANCE — A GENERAL TOLERANCE ON ALL DIMENSIONS (EXCEPT MATERIAL) - ± 0.5 mm