

COMPANY PROFILE



P.O.BOX 40048 Riyadh 11499

Saudi Arabia

Tel: (+966) 11 412 4052

Fax: (+966) 11 412 0803

Mobile: (+966) 506860950

Website: www.electricalways.com

E-mail: adnan@electricalways.com / sales1@electricalways.com

ELECTRICAL WAYS

شركة مصنع طرق الكهرباء

لتصنيع حوامل الكابلات المعدنية ومستلزماتها

Electrical Ways Factory Co.

Manufacturer of all type of Cable Tray and Support System

- CABLE TRAY
- CABLE LADDER
- CABLE TRUNKING
- CHANNEL
- SUPPORT & SOLUTION SYSTEM
- CABLE CLEATS



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 - 2 Product Range
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- 

INTRODUCTION

Electrical Ways is dedicated to manufacture and distribute all types of cable trays system; the company's

success over the past years can be traced to providing high quality cable trays that matches your needs, with

the timeliest manner and within budget, not to mention the ongoing comprehensive quality control program

that provides a 100% customer satisfaction. **Electrical Ways** principal officers see each contract as an

agreement not between a business and its customers, but between partners that wish to create a close and

mutually beneficial long-term relationship. This will help provide greater long-term profit through referrals and

repeat business. Our sales agent and factory personnel endure that technical and the engineering experience

to help you select and design the cable tray system that meets your specific requirements.

Product Range

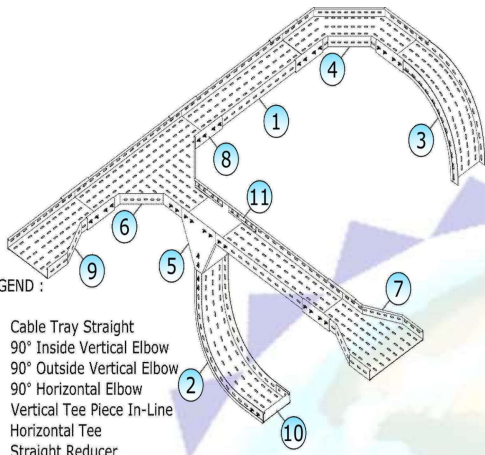
- Cable Tray System
- Cable Ladder System
- Cable Trunking System
- Cable Support Accessories
- Metal Framing System
- Cable Cleat



Materials

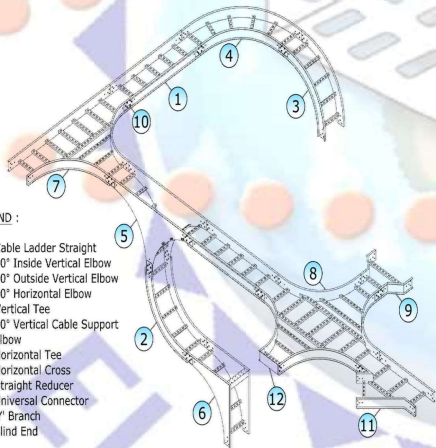
- Hot Dip Galvanize (HDGAF)
- Pre-Galvanized (GI)
- Aluminium
- Stainless Steel (304, 316)

Product Range



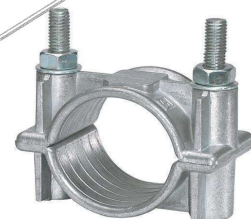
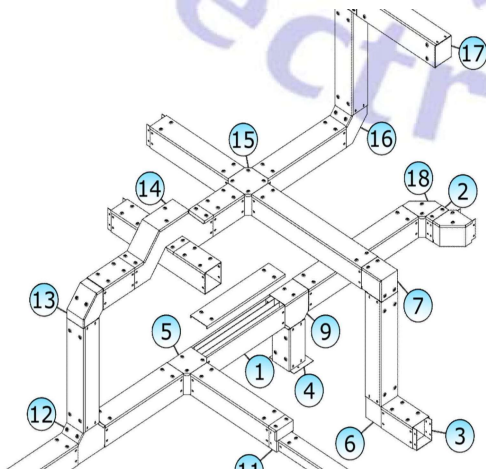
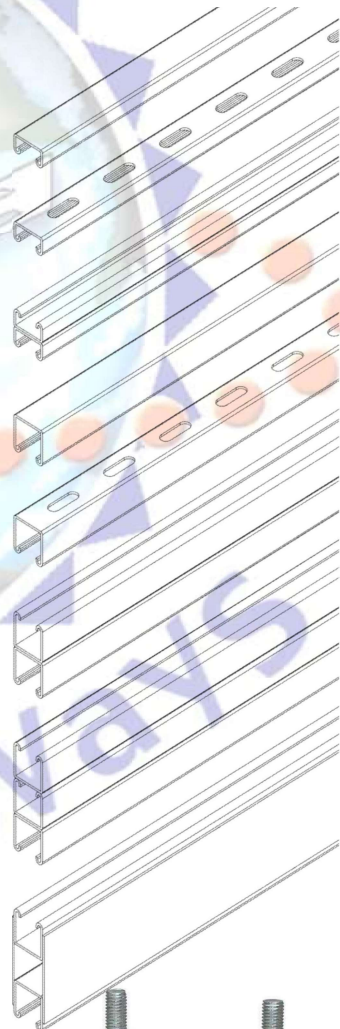
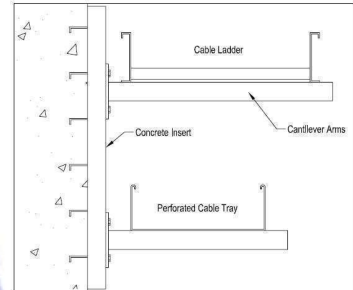
LEGEND :

1. Cable Tray Straight
2. 90° Inside Vertical Elbow
3. 90° Outside Vertical Elbow
4. 90° Horizontal Elbow
5. Vertical Tee Piece In-Line
6. Horizontal Tee
7. Straight Reducer
8. Wrapover Joint Piece
9. Left Hand Reducer
10. Blind End
11. Straight Joint Piece



LEGEND :

1. Cable Ladder Straight
2. 90° Inside Vertical Elbow
3. 90° Outside Vertical Elbow
4. 90° Horizontal Elbow
5. Vertical Tee
6. 90° Vertical Cable Support Elbow
7. Horizontal Tee
8. Horizontal Cross
9. Straight Reducer
10. Universal Connector
11. "Y" Branch
12. Blind End



Gov. Certificates

- 1 Commercial Registration
 - 2 Chamber of Commerce Subscription
 - 3 Industrial License
 - 4 Investment License
 - 5 Commercial Activity License
 - 6 Saudization Certificate
 - 7 Zakat Certificate
 - 8 VAT Registration Certificate
- 
- A central graphic featuring a globe with a white building on top, surrounded by a purple sunburst and orange dots. A watermark 'Electrical Ways' is visible across the bottom of the globe.

شركة مصنع طرق الكهرباء شركة شخص واحد



السجل التجاري: 1010267178

رمزك التجاري QR Code

من خلاله يمكنك التحقق المباشر من المعلومات:

- رخصة البلدية
- السجل التجاري
- برنامج نطاقات
- شهادة السعودة
- الغرفة التجارية
- شهادة الزكاة



وزارة التجارة
Ministry of Commerce

الرقم: ١٠١٠٢٦٧١٧٨
التاريخ: ١٤٣٠/٠٥/٠٩ هـ

رؤية 30
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

شهادة تسجيل الشركة

الرقم الموحد للمنشأة: ٧٠٠١٦٥٠٣٥٢
الاسم التجاري للشركة: شركة مصنع طرق الكهرباء شركة شخص واحد
نوعها: محدودة أجنبية
مدة الشركة: ٥ سنة
مركزها الرئيسي: الرياض
ص ب: ٤٠٠٤٨
النشاط: للإطلاع على بيانات الأنشطة الرجاء مسح الرمز التجاري
رأس المال: ١٠٠٠٠٠ ريال سعودي
المديرون: ١ عدنان سعد علي الهريايوي

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سلطات المدير/المديرون: حسب ما نص عليه عقد الشركة

يشهد مكتب السجل التجاري بمدينة: الرياض
وتنتهي صلاحية الشهادة في: ١٤٤٦/٠٢/٠٥ هـ بموجب الإيصال رقم: ٨٢٢٨٦٢٦١ وتاريخ: ١٤٤٢/١٢/٢٩ هـ

مدير السجل التجاري للشركات: عبد المحسن بن إبراهيم الحماد

التوقيع:



To Verify the information of this certificate visit <http://v.mci.gov.sa> على صحة هذه الشهادة بالدخول على
يمكنك التحقق من صحة هذه الشهادة بالدخول على



السادة/ شركة مصنع طرق الكهرباء، شركة شخص واحد
نهنتكم بدخول عالم الأعمال التجارية وإصدار سجلكم التجاري، ونتطلع أن يساهم هذا السجل
في تحقيق تطلعاتكم، وأن يكتب الله لكم التوفيق والنجاح في عملكم التجاري وأن تكون
شريكاً في تعزيز اقتصاد المملكة العربية السعودية.
يسرنا إبلاغكم بأن رقم منشآتكم الموحد هو ٧٠٠١٦٥٠٣٥٢ وقد تم ربطه بالخدمات الحكومية التي
ستحتاجها مستقبلاً. وهي على النحو التالي:

الرقم:	رقم سجلكم التجاري للمنشأة	 <input checked="" type="checkbox"/>
١.١.٢٦٧١٧٨		وزارة التجارة Ministry of Commerce
٢٣٩١٦٥	رقم منشآتكم لدى وزارة الموارد البشرية والتنمية الاجتماعية	 <input checked="" type="checkbox"/>
١٢٢٦.٥١٣٢	تم تسجيل منشآتكم مجاناً لمدة سنة في خدمة واصل التجاري	 <input checked="" type="checkbox"/>
٣٠٠٩٦٦.٦٤٩	رقم منشآتكم لدى هيئة الزكاة والضريبة والجمارك	 <input checked="" type="checkbox"/>
تحت الإجراء	رقم منشآتكم لدى المؤسسة العامة للتأمينات الاجتماعية	 <input checked="" type="checkbox"/>
٢١٣٤٨٢	رقم منشآتكم لدى الغرفة التجارية.	 <input checked="" type="checkbox"/>
٤٠٠٢١٧١٩٤٦٩	رقم رخصة "بلدية" فورية (في حال اختياركم)	 <input checked="" type="checkbox"/>



يُتيح تطبيق "نوافذ منشآت" العديد من الخدمات الممكنة لك في عالم الأعمال و منها
الحصول على الإرشاد و الاستشارات ، تطبيق "نوافذ منشآت" بوابة دخولك إلى عالم
الأعمال، <https://www.monshaat.gov.sa/nawafth>

منشآت
monsha'at
الهيئة العامة للمنشآت الصغيرة والمتوسطة
Small Medium Enterprise General Authority



ويمكنك فتح حساب بنكي دون الحاجة إلى أي أختام لمنشأتك

كما جمعنا لك كافة الانظمة واللوائح بلغة بسيطة في دليل التاجر لتمارس عملك التجاري
بسهولة mc.gov.sa/trader/guide





شهادة اشتراك Membership Certificate

غرفة الرياض
Riyadh Chamber

Membership No. :

213482

213482

رقم العضوية الموحد :

Date of Issue:

20/10/2009

2009/10/20

تاريخ الصداق:

Membership Class :

Third

الثالثة

درجة العضوية :

Riyadh Chamber Certifies

تشهد الغرفة التجارية الصناعية بالرياض بأن

شركة مصنع طرق الكهرباء (شركة شخص
واحد)

Commercial Registration No.

1010267178

1010267178

مفيدة بالسجل التجاري / الترخيص رقم :

Certificate Expires on

09/08/2024

2024/08/09

يلاهي سريان هذه الشهادة في

الخدمات الإلكترونية
E-SERVICES

الخدمات الإلكترونية لغرفة الرياض - بوابة أعمال © E-Services Riyadh Chamber

920004565

- يلزم التحقق من الوثيقة عبر الرابط <https://mybusiness.chamber.sa> ، أو تطبيق (سند)
- للأجهزة المحمولة أو الرقم الموحد دون ادنى مسؤولية على الغرفة عن محتوى الوثيقة.
- تعد هذه الورقة من الوثائق الإلكترونية لغرفة الرياض، ويمنع تعديلها أول محاولة العبث بها
- وتصبح لاغية حال محاولة تعديلها وتعرض صاحبها للملاحقة القانونية.



رؤية
2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

ترخيص منشأة صناعية

استثمار وطني



١٤٤١-٠٧-٠١ تاريخ القرار ١٤٤١-٠٧-٠١ تاريخ الترخيص ٢٩١٩٧ رمز المنشأة
١٤٤٤-٠٧-٠١ تاريخ الانتهاء ٤١١١٠٢١٠٣٠٧٤ رقم القرار تعديل نوع القرار

+٩٦٦٥٠٠٨٩٦٣٦ هاتف شركة مصنع طرق الكورباء اسم المنشأة الصناعية
فاكس ١٠١٠٢٦٧١٧٨ السجل التجاري للمنشأة الصناعية
موقع المنشأة الصناعية شركة مصنع طرق الكورباء شركة مصنع طرق الكورباء مالك المنشأة
المنطقة ١٠١٠٢٦٧١٧٨ رقم السجل التجاري الرئيسي
الرياض المدينة صنع الحديد القاعدي والصلب / ٢٤١٠ النشاط الرئيسي

الطاقة الانتاجية ستة و ثلاثون فرداً عدد العمالة
طن ١٦٠٠٠ ثلاثة ملايين و مائة و خمسة و خمسون ألفاً و عشرون ريال و ستة و سبعون هائلة حجم الاستثمار

الوحدة	الطاقة الانتاجية	النشاط الصناعي	وصف المنتج	رمز المنتج
طن	١٦٠٠٠	صناعة الأثاثيب والمواسير والأشكال المجوفة من الحديد والصلب	حوامل ومجازي كابلات وملحقاتها	٧٣٢٩٠٦٠



وزير الصناعة والثروة المعدنية

بندر بن إبراهيم الخريف

الخريف



وزارة الاستثمار Ministry of Investment

ترخيص استثمار صناعي Industrial Investment License

الرقم الموحد (7001650352)
رقم المنشأة (675671)
رقم الترخيص (101034306123186)
تاريخ الإصدار 1443/06/25 هـ
1445/06/23 هـ
م 2024/01/05 م
199531



المركز الرئيسي

حالة الترخيص: تجديد

اسم الترخيص

شركة مصنع طرق الكهرباء

الكيان القانوني

شركة شخص واحد ذات مسؤولية محدودة

الموقع

عدد العمالة (25 فرد)

إجمالي التمويل (100,000) ريال سعودي

اسم صاحب/ أصحاب الترخيص

رقم المستثمر الجنسية

الحصة

اسم صاحب/ أصحاب الترخيص

رقم المستثمر الجنسية

الحصة

عنان سعد علي الهرباوي

721685 الأردن

100%

عنان سعد علي الهرباوي

عنان سعد علي الهرباوي

عنان سعد علي الهرباوي

ADNAN SAAD ALI ALHARBAWI

البنود الجمركي المنتج

الكمية

الوحدة

البنود الجمركي المنتج

الكمية

الوحدة

النشاط:

251111:صناعة الهياكل المعدنية وأجزائها

251112:صناعة الأعمدة وأجزائها ، يشمل (أعمدة وكابلات الإنارة وأعمدة إشارات المرور .. الخ)

251114:صناعة الهياكل الحديدية خفيفة الوزن

الترخيص الاستثماري يشمل تصحيح السجل التجاري رقم 1010267178 وتاريخ 9 / 5 / 1430 والخاس بالطلب رقم 15869 بمنحة تصحيح الأوضاع

اسم الفرع

نوع الفرع

المدينة

رقم الفرع

اسم الفرع

نوع الفرع

المدينة

رقم الفرع

ورشة طرق الكهرباء للمعادن

ورشة

الرياض

975936

تاريخ الطباعة 1444/09/13 هـ



يمكنك التحقق من صحة وملاحية الشهادة عبر زيارة الرابط
<https://investsaudi.sa/en/verify> على موقع وزارة الاستثمار.



بلدي
balady



رخصة نشاط تجاري Commercial Activity Licence

شركة مصنع طرق الكهرباء

License Expiry Date

تاريخ نهاية الترخيص

1445/03/04

License Number

رقم الرخصة الموحد

40021719469

Owner's Name

اسم المالك

شركة مصنع طرق الكهرباء شركة شخص واحد

Owner's ID

رقم هوية المالك

7001650352 - 1010267178

ISIC Classification

التصنيف الصناعي القياسي الدولي (نشاط ايزك)

البيع بالجملة للأسلاك والمفاتيح الكهربائية ومعدات التوصيل

Detailed Activity

النشاط التفصيلي

البيع بالجملة للأسلاك والمفاتيح الكهربائية ومعدات التوصيل الأخرى المستخدمة

Sub-Municipality

البلدية

بلدية الملز

Municipality

الأمانة

أمانة منطقة الرياض

Street

الشارع

الصفرات

District

الحي

الملز

Shop's Sign's Area

مساحة اللوحات الإعلانية

2 متر مربع ارشادي | 0 متر مربع اعلاني



موقع المحل

Shop's Total Area

مساحة المحل الإجمالية

55 متر مربع

للاطلاع على الأنشطة الإضافية وتفاصيل الرخصة يرجى مسح رمز الاستجابة السريع QR Code

Permit Expiry Date

تاريخ انتهاء التصريح

Permit Number

رقم التصريح

Permits

التصاريح



مركز الدعم الفني

940

Balady_cs



saudimomra



www.balady.gov.sa

شهادة سعودة

رقم الشهادة 170005-45989143

تاريخ الإصدار 2023-03-08

تاريخ الانتهاء 2023-08-26

تاريخ التجديد 2023-05-28

رقم المنشأة 1-382252

اسم المنشأة شركة مصنع طرق الكهرباء شركة شخص واحد

حالة الشهادة نشط

رقم السجل التجاري 1010267178

الرقم الوطني الموحد 7001650352



تشهد وزارة الموارد البشرية والتنمية الاجتماعية بأن المنشأة المذكورة أعلاه حققت نسب التوطين المطلوبة منها

وتم منحها هذه الشهادة حسب طلبها

الشهادة معتمدة من صاحب الصلاحية ولا تحتاج إلى توقيع أو ختم



TIN ٣٠٠٩٦٦٠٦٤٩ الرقم المميز
Certificate No. ١٠٢٠١٩٦٢٠٧ رقم الشهادة
Issue Date ١٤٤٤/١٠/٠٩ تاريخ الاصدار



هيئة الزكاة والضريبة والجمارك
Zakat, Tax and Customs Authority

المملكة العربية السعودية
Kingdom of Saudi Arabia

شهادة Certificate

The Zakat, Tax and Customs

Authority certifies that the Taxpayer

تشهد هيئة الزكاة والضريبة

والجمارك أن المكلف /

شركة مصنع طرق الكهرباء

Entity Unified No. /ID No.

٧٠٠١٦٥٠٣٥٢

الرقم الموحد للمنشأة / رقم هوية

Commercial Registration/License /
Contract No

١٠١٠٢٦٧١٨

سجل تجاري / رخصة / عقد رقم

Has submitted his tax return for the period ending on 31/12/2022 AD, and he
was granted the certificate to complete all his transactions including the
payment of the final amount due on the contract.

The Certificate is valid until 21/10/1445 AH corresponding to 30/04/2024
AD

قدم إقراره عن الفترة المنتهية في ١٤٤٤/٠٦/٠٧ هـ ،
وقد منح هذه الشهادة لإنهاء جميع معاملاته بما في ذلك صرف
مستحققاته النهائية عن العقود.

يسري مفعول هذه الشهادة حتى تاريخ ١٤٤٥/١٠/٢١ هـ الموافق
٢٠٢٤/٠٤/٣٠ م

(The Twenty first of Shawwal one thousand four hundred forty-five Hijri) (الحادي والعشرون من شوال ألف و أربعمئة و خمسة و أربعون هجري)

لا يعتد بهذه الشهادة إلا بعد التحقق من موقع الهيئة الإلكتروني: www.zatca.gov.sa

This certificate is not valid until verified by the Authority's Website: www.zatca.gov.sa

zatca.gov.sa

19993

@zatca_sa



هذه الوثيقة مستخرجة من النظام الآلي ولا تحتاج إلى توقيع
ولا يعتد بهذه الشهادة إلا بعد التحقق من موقع الهيئة
www.zatca.gov.sa



TIN ٣٠٠٩٦٦٠٦٤٩ الرقم المميز
Certificate No. ١٠٢٠١٩٦٢٠٧ رقم الشهادة
Issue Date ١٤٤٤/١٠/٠٩ هـ تاريخ الاصدار



هيئة الزكاة والضريبة والجمارك
Zakat, Tax and Customs Authority

المملكة العربية السعودية
Kingdom of Saudi Arabia

قائمة فروع المكلف

List of Taxpayer Branches

المدينة City	إسم الفرع Branch Name	رقم سجل تجاري / رخصة / عقد CR/License/Contact Number
أخرى Riyadh	فرع شركة طرق الكهرباء للتجارة	١٠١٠١٨٥٨٩٤





TIN 3009660649 الرقم المميز
Certificate No. 100231078267937 رقم الشهادة
Certificate date 24/08/2017 تاريخ الشهادة

هيئة الزكاة والضريبة والجمارك
Zakat, Tax and Customs Authority

المملكة العربية السعودية
Kingdom of Saudi Arabia

شهادة تسجيل في ضريبة القيمة المضافة VAT Registration Certificate

تشهد هيئة الزكاة والضريبة والجمارك بأن المكلف أدناه مسجل في ضريبة القيمة المضافة بتاريخ ٢٠١٧/٠٨/٢٤ م
The Zakat, Tax and Customs Authority certifies that taxpayer below is VAT registered on 24/08/2017 AD

Taxpayer Name	شركة مصنع طرق الكهرباء	اسم المكلف
VAT Registration Number	300966064900003	رقم التسجيل الضريبي
Effective Registration Date	2018/01/01	تاريخ نفاذ التسجيل
Taxpayer Address	الرياض، الملز، الامير فهد بن ابراهيم ال سعود، 12629	عنوان المكلف
CR / License Contact / ID No	1010267178	رقم السجل التجاري / الرخصة / العقد / الهوية
Tax Period	ربع سنوي-Quarterly	الفترة الضريبية
First Filing due date	2018/04/30	تاريخ استحقاق أول إقرار ضريبي

ملاحظة: كمكلفين مسجلين في ضريبة القيمة المضافة، لا يجوز لكم تحصيل ضريبة القيمة المضافة من عملائكم قبل تاريخ نفاذ التسجيل في الضريبة. و في حال تبين غير ذلك ستقوم هيئة الزكاة والضريبة و الجمارك بتنفيذ الغرامات المستحقة

Note: As a VAT registered taxpayer, you are not allowed to collect VAT from your customers prior to the effective date of the tax registration. If otherwise approved, The ZAKAT, Tax and Customs Authority will impose the applicable penalties



zatca.gov.sa

19993

@zatca_sa



هذه الوثيقة مستخرجة من النظام الآلي ولا تحتاج إلى توقيع
و لا يعتد بهذه الشهادة إلا بعد التحقق من موقع الهيئة
www.zatca.gov.sa



TIN 3009660649 الرقم المميز
Certificate No. 100231078267937 رقم الشهادة
Certificate date 24/08/2017 تاريخ الشهادة



هيئة الزكاة والضريبة والجمارك
Zakat, Tax and Customs Authority

المملكة العربية السعودية
Kingdom of Saudi Arabia

قائمة فروع المكلف

List of Taxpayer Branches

المدينة City	اسم الفرع Branch Name	رقم سجل تجاري / رخصة / عقد CR / License / Contract Number
اخرى Riyadh	فرع شركة طرق الكهرباء للتجارة	1010185894



zatca.gov.sa

19993

@zatca_sa



هذه الوثيقة مستخرجة من النظام الآلي ولا تحتاج إلى توقيع
و لا يعتد بهذه الشهادة إلا بعد التحقق من موقع الهيئة
www.zatca.gov.sa



ISO CERTIFICATES

Electrical Ways



CERTIFICATE

BQC CERTIFICATION BODY CERTIFIES THAT THE ORGANIZATION

ELECTRICAL WAYS FACTORY

PO Box 40048, Riyadh 11499, Saudi Arabia

WITH SCOPE OF CERTIFICATION

Manufacturers and Suppliers of Electrical Trays, Ladders, Trunking and Related Electrical Supplies.

Has developed and implements a quality management system that fully meets the requirements of

ISO 9001:2015

(Re)Certification audit: 02/09/2022 1st surveillance audit: __/__/__ 2nd surveillance audit: __/__/__

The audit reports dates above are filled in annually after the successful completion of the surveillance audits and attest the continuous conformity of the certified organization to the above standard and the validation of the certificate for each designated period.

Certificate Number: **100CN22370WW3098**

Initial Certification	25/10/2022	Certification cycle start	25/10/2022
Issue	25/10/2022	Certification cycle expiry	24/10/2025

If the surveillance audits are not conducted annually, the certification of the Organization will be withdrawn and the certificate has to be returned, since it remains a property of BQC.

ACCREDITATION MARKS



THE INTERNATIONAL ACCREDITATION FORUM



MS Certification No. of Certificate 546
HELLENIC ACCREDITATION SYSTEM SA



CERTIFICATION DEPARTMENT

Niki Panopoulou



BQC P.C. | Certification Body | 54, Ag. Dimitriou Av., GR17341, Agios Dimitrios, Athens | T. +30 211 2213726



CERTIFICATE

BQC CERTIFICATION BODY CERTIFIES THAT THE ORGANIZATION

Electrical Ways Factory

PO Box 40048, Riyadh 11499,
Saudi Arabia.

WITH SCOPE OF CERTIFICATION

**Manufacturers and Suppliers of Electrical Trays, Ladders,
Trunking and Related Electrical Supplies.**

Has developed and implements an occupational health and safety manamegent system that fully meets the requirements of

ISO 45001:2018

Certification audit: 02/09/2022 1st surveillance audit: __/__/__ 2nd surveillance audit: __/__/__

The audi reports dates above are filled in annually after the successful completion of the surveillance audits and attest the continuous conformity of the certified organization to the above standard and the validation of the certificate for each designated period.

Certificate Number: **100CN155811806**

Initial Certification	31/10/2022	Certification cycle start	31/10/2022
Issue	31/10/2022	Certification cycle expiry	30/10/2025

If the surveillance audits are not conducted annually, the certification of the Organization will be withdrawn and the certificate has to be returned, since it remains a property of BQC.



CERTIFICATION
DEPARTMENT

Niki Panopoulou



BQC P.C. | Certification Body | 54, Ag. Dimitriou Av., GR17341, Agios Dimitrios, Athens | T. +30 211 2213726



APPROVALS

Electrical Ways

Transmittal # 21021020-000-T12T-01962-000
Saudi Electricity Co., (SEC) Central Operating Area
Qassim Central P.P.
King Abdul Aziz Road, Qassim, KSA.
Tel. No. 06-322 0407
Fax No. 06-322 0829

Date: 20-Feb- 2012

Attention : Eng. Yousef Mohammed AlSayed,
Project Manager, ymsayed@se.com.sa

CC : Mr. Muhammad Arif Sahi, marifsahi@hotmail.com
(Sr. Electrical Engineer, SEC)

Subject : Qassim III – Prequalification Document of Cable Ladders, Cable Trays and
Accessories from Electrical Ways (Electrical)

Reference : Reinforcement of Qassim Power Plant Project Extension-III
SEC Contract No. 21021020/00

Dear Sir,
Please find enclosed subject documents/Drawings, issued for Approval; detail is as
mentioned below:

Sl. #	Dwg #. / Doc #.	Rev.	Title	Discipline (*1)	Reason for Issue (*2)
1.	QAS3-00-E-MTM-ABC-064	A	Pre-Qualification of Ms/ Electrical Ways and Catalogue for Cable Ladders, Cable Trays and Accessories	E	IFA
2.	-	-	Attachment: SEC approval @ PP-10 of the same, ref: SEC/BEMCO/PP10/2839/L	-	-

*1) IFC – Civil; M – Mechanical; E – Electrical; I&C- Instrumentation& Control; V-Vendor ; G-General
*2) IFA – Issued for approval; IFI – Issued for information; IFC – Issued for construction; ASB – As built

Regards,



Hassan F. Bayrakdar
Sr. Project Manager
Encl: As Above
M. Iftikhar

BEMCO is Most Competitive, Best Performing & Highest Quality Co.

RECEIVED 20 FEB 2012

Limited Liability Co., Paid Capital (SR. 200, 000, 000)
C.R.: 4030019266 - P.O.Box 3143, Jeddah 21471 - K.S.A
☎ : +966 2 669 5851 / 667 0092 - Fax : +966 2 660 9432
E-mail: arabian@bemco-ipp.com



شركة ذات مسؤولية محدودة رأسمالها (٢٠٠,٠٠٠,٠٠٠) مدفوع بالكامل
م.ت ٤٠٢٠٠١٩٢٦٦ - ص.ب ٢١٤٣ جدة ٢١٤٧١ - المملكة العربية السعودية
☎ : +٩٦٦ ٢ ٦٦٠ ٩٤٣٢ - فاكس : +٩٦٦ ٢ ٦٦٧ ٠٠٩٢ / ٦٦٩ ٥٨٥١ : ☎
E-mail: arabian@bemco-ipp.com

Qassim III Site Document Control

From: Qassim III Site Document Control [qassim3-sitedc@qassimksa.com]
Sent: Monday, February 20, 2012 3:25 PM
To: 'Mohammad Arif Sahi'
Cc: 'Mohammad Younis Haider'; 'Mohammad Zakiuddin'; 'Yousuf Idris'; 'Document Control Assis'
Subject: Qassim Ex-III: BEMCo Transmittal # T12T-1962-00 Prequalification Document of Electrical Ways for Cable Ladders, Cable Trays & Accessories
Attachments: Qassim 3-Bemco Outgoing Transmittal - 21021020-00-T12T-01962-000 Prequalification Document of Electrical Ways for Cable Ladders, Cable Trays & Accessories.pdf; PreQualification Document.pdf

Dear Sir;

Please find attached subject Transmittal, Issued for Approval.

Attn. Mr. Yousuf Idris:

Please manage to handover one (1) set of attached transmittal to Mr. Muhammad Arif Sahi (Sr. Electrical Engineer, SEC)

Note: **Due to bigger size of Catalogue, are not attached herewith. An Original Book is being sent for submission to SEC/PP10.**

Regards,

Site Document Control Dept.
Qassim-III Extension Project

Zain No. 059397-1487

**Materials Sector
Purchasing Department
Vendors Affairs Division**



الشركة السعودية للكهرباء
Saudi Electricity Company

Date: 28/04/16
Vendor Name: **electrical ways factory**
Attention: **adnan herbawi**
E-mail 1: adnan@electricalways.com

SUBJECT: VENDOR'S REGISTRATION NOTIFICATION

Dear Sir,

We are pleased to inform that your commercial documents have been evaluated and your company is now registered with Saudi Electricity Company under Vendor No (2006312),

You must fill up the prequalification form / requirements whenever it is applicable, which is available on SEC website www.se.com.sa / procurement / MFRs' prequalification to deliver materials based on your activity in your Commercial Registration:

Applicable for Distribution Materials	Applicable for Generation Materials	Applicable for Industrial Security Materials	Applicable for Transportation Materials
Yes	-	-	-

To Login E-Bidding System: (Click Here)

Vendor ID: **2006312**

Password : **1212**

When you log on the system as a first time please change your password immediately through e-bidding link which available on SEC webpage.

Notice :

1. This approval should not be construed as commitment by SEC to purchase from you but when needed SEC will invite you to bid and will be evaluated based on the established policies & procedures.
2. If the Bid is considered as a LOW VALUE you must quote through the e-bidding system .However, if the bid is a HIGH VALUE you must submit the quotation in a closed envelope and submit to reception of purchasing sections in operating area's requested the materials'.

We would suggest that you maintain a continuous contact with Purchasing Sections in SEC operating areas. We thank you for your interest to deal with Saudi Electricity Company.

Best Regard,

Ibrahim Al-Ghamdi
Vendor Affairs and Support Division Manager
Headquarters - Grnatah Tower (A6) - Gth floor
Office +966 (11) 8079651
Riyadh- Saudi Arabia
pcsvsdv@se.com.sa

فرع المنطقة الشرقية

ص ب ٥١٩٠
الدمام ٣١٤٤٢
الشركة العربية السعوديةهاتف: +٩٦٦-٣-٨٥٧-٢٢٠٠٠٠
فكس: +٩٦٦-٣-٨٥٧-٢٠٢٠٠٠
sec@socco-east.comالشركة السعودية للكهرباء
Saudi Electricity Company

GENERATION PROJECTS DEPARTMENT-EAST & CENTRAL

Eastern Projects Implementation Division

Room # 2-213E, SEC-EOA Hqs., Dammam

Telephone: 858-6923, Fax: 858-5243

03.08.1429 (5-Aug-08)

30621090-000-L8T-00 810

ARABIAN BEMCO CONTRACTING CO. LTD.
QURAYYAH-II PROJECT OFFICE
AL-KHOBAR, SAUDI ARABIA

Fax # : 887-4931


Attention: MR. JOSEPH RICHARDS, Project Manager
Qurayyah-II ProjectSUBJECT : CONTRACT # 30621090
CONSTRUCTION OF QCCPP PROJECT
PREQUALIFICATION DOCUMENT OF ELECTRICAL WAYS FOR
CABLE SUPPORTS

Reference : 30621090-000-T8T-00821-000 dated July 16, 2008

Please find enclosed SEC comments on the document(s) in following:

Sl. #	BEMCO TRANSMITTAL #	DOCUMENT TITLE	REV.	DRAWING/DOCS. NUMBER
1.	30621090-000- T8T-00821-000	Electrical Ways Factory Prequalification Document for Cable Support	POA	30621090-000- 48Q-00692

Regards,


 HASSAN F. BAYRAKDAR, Project Manager
 Qurayyah Combined Cycle Power Plant Project
 Eastern Projects Implementation Division/GPD

EKS/MDP/MA

cc : Chrono
QPP OPE.

قرع المنطقة الشرقية

ص ب ٥١٩٠ هاتف: +٩٦٦-٣-٨٥٧٢٣٠٠
 الدعايم ٣١٤٢٢ فاكس: +٩٦٦-٣-٨٥٧٦٠٦٠
 المسلكة العربية السعودية sec@sccco-east.com



الشركة السعودية للكهرباء
 Saudi Electricity Company

30621090-000-L8T-00 *B/O*

DOCUMENT TITLE	: 1. Electrical Ways Factory Prequalification Document for Cable Support
DRAWING/DOCS NUMBER	: 1. 30621090-000-48Q-00692
REVISION	: POA
ACTION	: For immediate and necessary action

COMMENTS :

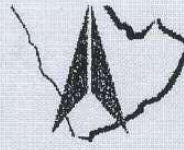
SEC have reviewed the above documents/drawings and have following comments.

1. Bemco to advise Electrical Ways to fill up the vendor survey check lists completely and submit these filled-out checklists to SEC.
2. Bemco/Electrical Ways to provide a compliance statement that manufacturer is fully compliance with SEC standard 01-TMSS-01 & 24-TMSS-01.
3. Certified test reports of type tests and routine tests performed as per relevant international standard to be submitted for SEC review and approval.
4. Factory visit shall be arranged for SEC Engineers to witness any type/routine tests being conducted on similar equipment which are to be supplied for any other customer.
5. Completely filled data schedule of SEC standard 24-TMSS-01 shall be submitted.

This is for Bemco attention and immediate action.

Eastern Region Branch
Internal Correspondence

فرع المنطقة الشرقية
مراسلات داخلية



نقل الكهرباء
National Grid SA

HV PROJECTS

Projects Department-East
Substation Projects Division

Room 2-200E, Phase-II, National Grid - SA Hqs, Dammam
Tel: 858 5171 | Fax: 858 6938

SUBMITTAL REVIEW REPLY FORM

LETTER No. : 13 -1312-303031
DATE : 21.01.2013 (09.03.1434h)
PROJECT TITLE : Qurayyat Open Cycle P/P Project Phase-II
PTS No. : -
CONTRACT No. : 31121092/00
BI. No. /JO No. :

- Project Manager ,GPD -COA & EOA
 Senior Transmission Engineer, PD-East/ L&TPD
 Division Manager ,PD-East/SFPD

Submittal Reference No. : Gen Sub 12-0027- 020510 dated 09-01-2013

Document Description : 132kV cable clamps (Cleat) for 132kV Power cable
Contractor Name : Arabian BEMCO Contracting

PD-East/SPD Response

- Acceptable
 Not Acceptable /Resubmit
 No Comments
 Acceptable except as noted
 Rejected as noted below
 See attached comments

The 132kV cable clamps (Cleat) for 132kV Power cable shall be non-ferrous , non-magnetic aluminum alloy finished surfaced with powder coated with inner rubber lining.

Should you have any question ,please contact M.H.Aleem on extension 8-5369

MHL

Letter File # 5.2



MOHAMMED IFTEKHAR KHAN
Transmission Engineer Specilist
PD-E/Substation Projects Division



الشركة السعودية للكهرباء
Saudi Electricity Company

GENERATION PROJECTS EXECUTION DEPARTMENT- COA & EOA
Extension of Qurrayat Open Cycle Power Plant Project
Room # 2-206E, EOA-Hq, Dammam, Saudi Arabia
Telephone: +9663-858-5522, Fax: +9663-8585243
December 15, 2012

31121092-L12T-01105

ARABIAN BEMCO CONTRACTING CO. LTD
JEDDAH, SAUDI ARABIA
Fax # : 02-660-9432

Attention: MR. BASSAM KHALED
Project Manager

SUBJECT : EXTENSION OF QURRAYAT OPEN CYCLE PP PROJECT- CN: 31121092/00
MATERIAL SUBMITTAL FROM ELECTRICAL WAYS TRADING FOR CABLE CLAMP (CLEAT)
FOR HV, 132 KV CABLE

Reference: 31121092-T12T-01258-000

Please find enclosed SEC comments on the following:

ITEM	Arabian Bemco TRANSMITTAL	DOCUMENT TITLE	REV	DOC/DWG NUMBER
1	31121092-T12T-01258- 000	MATERIAL SUBMITTAL FROM ELECTRICAL WAYS TRADING FOR CABLE CLAMP (CLEAT) FOR HV,132 KV CABLE	POA	4MR-00632

Regards

FAWZI H. LABBAN, Project Manager
Generation Projects Execution Department (C&E)

KMD /EKS /MA /JJS /sda
cc:
SEC Site Manager
File



الشركة السعودية للكهرباء
Saudi Electricity Company

31121092-L12T-01105

DOCUMENTS TITLE : MATERIAL SUBMITTAL FROM ELECTRICAL WAYS TRADING FOR CABLE
CLAMP (CLEAT) FOR HV,132 KV CABLE

DOC/DWG NO. : 4MR-00632

REVISION : P0A

ACTION : 02 (Approved)

COMMENTS/NOTES

SEC has reviewed the above document and has no further comment.

Note:

BEMCO to note that if any discrepancy or deficiency found during construction, installation & testing/commissioning , BEMCO has to attend to fulfill the contract requirements.

This is for BEMCO's necessary action.

شركة المنطقة الشرقية

ص.ب ٥١٩٠
الدمام ٣١٤٢١
شركة المنطقة الشرقية

هاتف: +٩٦٦-٣-٨٥٧-٢٣١٠
فاكس: +٩٦٦ ٣-٨٥٧-٢٠٦٠
sec@soeco-east.com



الشركة السعودية للكهرباء
Saudi Electricity Company

GENERATION PROJECTS EXECUTION DEPARTMENT- COA & EOA

Room # 2-206E, EQA-Hq, Dammam, Saudi Arabia
Telephone: +9663-8586923, Fax: +9663-8585243

October 17, 2012

31121092-L12T-007٩٥

ARABIAN BEMCO CONTRACTING CO. LTD
JEDDAH, SAUDI ARABIA
Fax # : 02-660-9432

Attention: MR. BASSAM KHALED
Project Manager

SUBJECT : EXTENSION OF QURRAYAT OPEN CYCLE PP PROJECT- CN: 31121092/00
MATERIAL SUBMITTAL OF CABLE LADDER, CABLE TRAY AND ACCESSORIES
FROM ELECTRICAL WAYS

Reference: 31121092-T12T-00846-000

Please find enclosed SEC comments on the following:

ITEM	Arabian Bemco TRANSMITTAL	DOCUMENT TITLE	REV	DOC/DWG NUMBER
1	31121092-T12T-00846-000	MATERIAL SUBMITTAL OF CABLE LADDER CABLE TRAY AND ACCESSORIES FROM ELECTRICAL WAYS	POA	31121092-4MR-00604



FAWZI H. LABBAN, Project Manager
Generation Projects Execution Department (C&E)

KMD/BKS/MA/MNA/JJS

cc: SEC Site Manager – Extension of Qurayyat Open Cycle Power Plant
File

فرع المنطقة الشرقية

ص.ب. ٥١٩٠
الرياض ٢١٤٢٢
المملكة العربية السعودية

هاتف: +٩٦٦٦٣٨٥٧٢٣١٠
فاكس: +٩٦٦٦٣٨٥٧٢٠٦٠
seco@sceco-east.com



الشركة السعودية للكهرباء
Saudi Electricity Company

31121092-L12T-00

DOCUMENTS TITLE : MATERIAL SUBMITTAL OF CABLE LADDER CABLE TRAY AND ACCESSORIES FROM ELECTRICAL WAYS

DOC/DWG NO. : 31121092-4MR-00604

REVISION : P0A

ACTION : 03(Approved with comments)

COMMENTS/NOTES

SEC has reviewed the above document and has the following comments:

1. Data schedule shall be submitted for cable tray mentioning voltage level, tray depth, tray type and rung type as per clause 1.5 (D) of PTS SECO -10-024-0-TS 16114.
2. With reference to the attached letter for cable tray for PP-10 Riyadh Project, this approval does not relieve Bemco from its basic contractual obligation.

This is for BEMCO's necessary action.

فرع المنطقة الشرقية

ص.ب ٥١٩٠
الدمام ٢١٤٢٢
الشركة العربية للتيار الكهربائي

+٩٦٦-٣-٨٥٧-٥٥٢٢
+٩٦٦-٣-٨٥٧-٥٥٢٤
sec@sec.co.sa



الشركة السعودية للكهرباء
Saudi Electricity Company

GENERATION PROJECTS EXECUTION DEPARTMENT- COA & EOA
Extension of Qurrayat Open Cycle Power Plant Project
Room # 2-206E, EOA-Hq, Dammam, Saudi Arabia
Telephone: +9663-858-5522, Fax: +9663-8585243
January 26, 2013

31121092-L13T-00٧٦

ARABIAN BEMCO CONTRACTING CO. LTD
JEDDAH, SAUDI ARABIA
Fax # : 02-660-9432

Attention: **MR. BASSAM KHALED**
Project Manager

SUBJECT : EXTENSION OF QURRAYAT OPEN CYCLE PP PROJECT- CN: 31121092/00
MATERIAL SAMPLE SUBMITTAL FOR CABLE CLAMP (CLEAT) FOR HV 132KV CABLE FROM ELECTRICAL WAYS

Reference: 31121092-T12T-01421-000

Please find enclosed SEC comments on the following:

ITEM	Arabian Bemco TRANSMITTAL	DOCUMENT TITLE	REV	DOC/DWG NUMBER
1	31121092-T12T-01421-000	Material Sample Submittal for Cable Clamp (CLEAT) for HV 132KV Cable from Electrical Ways	POA	31121092-4MR-00643

Regards,

FAWZI H. LABBAN, Project Manager
Generation Projects Execution Department (C&E)

KMD/EKS/MA/JJS

cc:
SEC Site Manager
File



فروع المنطقة الشرقية

رقم الهاتف
الفاكس
البريد الإلكتروني

+96612-8064250
+96612-8064251
sec@secc.com.sa



الشركة السعودية للكهرباء
Saudi Electricity Company

31121092-L13T-00276

DOCUMENTS TITLE : Material Sample Submittal for Cable Clamp (CLEAT) for HV 132KV Cable
from Electrical Ways

DOC/DWG NO. : 31121092-4MR-00643

REVISION : C02

ACTION : 03-Approved with comments

COMMENTS/NOTES

Electrical Comments:

1. Insulating material of the cable clamp shall be tested in accordance with section 7.8 of ANSI/IEEE C37.23 - 1987. Further proof of successful testing shall be submitted by vendor/BEMCO as certified test results.

Substation Comments:

SEC substation has reviewed the above documents and has the following comments on attached letter. (Ref: PD-E/SPDletter # 13-1312-303031 dated 21-Jan-2013)

This is for BEMCO's necessary action.

ص.ب: 57
الرياض: 11411
المملكة العربية السعودية

منطقة أعمال الوسطى
هاتف: +966-1-403-2222
فكس: +966-1-405-0723
P.R.CEN@SCECO.COM



الشركة السعودية للكهرباء
Saudi Electricity Company

Our Ref.: SEC/BEMCO/PP10/2839/L

Date: 24-09-1430H (Sept. 14, 2009G)

Arabian BEMCO
PP-10 Project, Riyadh

Fax No. : 02-661 1161 / 01-246 3701

Attention : Engr. Bassem Haddad
Project Manager

Project : PP- 10 Project, Contract #10721026/00

Subject : Pre-Qualification Documents of Cable Ladders, Cable Trays and
Accessories from Electrical Ways- (Electrical)

Reference : 10721026-000-T 9 T-03586-000 Dated: 06-09-2009

Dwg. No. / Doc. No. : PP10-00-B-EMO-ABC-002 (Rev. A)

Title : Pre-Qualification Documents of Cable Ladders, Cable Trays
and Accessories from Electrical Ways - (Electrical)

Status : Approved

With reference to your submittal referred above on the subject matter, M/s Electrical Ways are approved for the supply of all types of cable ladders, cable trays and accessories for the project. This approval does not relieve BEMCO from its basic contractual obligations.

Regards

ENGR. KHALID Q. AL-HARBI
Acting Manager, Generation Projects – COA



Riyadh Power Plant (No. 10) Project	
Date:	Act. Info. P. No.
Executive VP	
Director (HA)	
Eng. Manager (BH)	
Proj. Manager (GH)	
Project Manager	
Site Superintendent (K/KA)	
ASIC Comm. Eng. (AAZ/AA)	
IO Eng. (AK/AS/AV/AF)	
ABC Eng. (AG/AF/FA)	
ABC Civil (VZ/VA/VA)	
Comm. Manager	
Construction Manager	
Process Const. Managers	
Automation (ST/TK/MA/AF)	
Coordinator (AS)	
Site Cln Director (FM)	
Material Expediter (AV/ST/MT)	
Quality (SU / Saleh) (TS)	
Security (BK)	
Others:	
Site Planning (NA)	
Document Control	

ATTEN: MR. RAMA

Central Operating Area
Internal Correspondence

منطقة أعمال الوسطى

مراسلات داخلية

SN/BEM/PP9C&D/12



الشركة السعودية للكهرباء
Saudi Electricity Company

dated 13-12-2006.

ENGINEERING & DESIGN DEPARTMENT
Engineering & Design - EHV Systems
Marrouj Building, Tower 'C', Riyadh
Tel: 4032222, Ext: 18645; Fax Ext: 18661

Ref. : 06-332-030335

Date : 11 December 2006 (G)



PP9 Extension & Reinforcement
(Block C&D) Project
Contract# 10421001/00

DIVISION MANAGER,

Generation Project Execution

Fax. : 01 4086307

Subject : 132kv Power Cable Aluminum

Your ref. : MY/2654 dated 10.12.2006

BEMCO ref. :BEM/SN-T(E/T)-PP9C&D/1068 dated 09.12.2006.

Greetings,

With reference to the above mentioned subject and to the submitted cable cleat sample, please be informed that the sample is approved with the following comment :

1. The casting finish should be more precise .
2. The hardware (specially washers) should fit the stud size .Spring washers should be added to the lower halve .
3. The stud length should suit the job site case .
4. Hexagonal nut of the same stud size should be fitted in the housing of the lower halve to fix it finally before mounting the upper halve .
5. Aluminum alloy contents should be submitted .

Regards,

(Signature)
12/12/2006

ABDULAZIZ H. ALWAYEL
Division Manager
E&DD/ E&DD-EHV System

SC

(Signature)
AW

RIYADH PP9 EXT. & REINF. (Block C & D) Project		
	Action	Info.
Project Mgr.		
Contract Mgr.		
Lead Civil		
Lead Elect.	✓	
Lead Mech.		
Lead I & C		
Sr. Civil / Site		
Sr. Elect. / Site		
Sr. Mech. / Site		
Sr. I & C		
Sr. T & E		
ALL		
SC HC		
Date :		

90/21/11
12/12/06

Our Ref. : SN/BEM/PP-9 C&D/1283
 Dated : 22-11-1427H (13-12-2006G)

The Project Manger
 Arabian BEMCO Contracting Co.
 Riyadh
 Kingdom of Saudi Arabia

Fax : (01) 246 3701

Attention : **Mr. Hamad Abdallah**
 Project Manager



Ref. : 1) Letter # 06-332-030335 dated 11-12-2006
 from SEC-COA Transmission Engineering & Design Department
 2) BEM/SN-T(E/T)-PP9 C&D/1068 dated: 09-12-2006

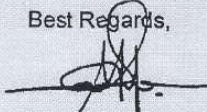
Subject : PP-9 Extension & Reinforcement (Block C&D) Project, Contract # 10421001/00
132kV Power Cable Aluminum

This has reference to BEMCO's above cited letter (Ref. 2) on the subject matter.

SEC-COA Engineering and Design Department have reviewed the above cited submittal and their comments on the same are enclosed herewith as (Ref. 1). The sample submitted is stand approved with comments as mentioned therein.

BEMCO is advised to adhere to the comments.

Best Regards,



Engr. Muhammad Rafique Moghal
 Team Leader
 RM/WL

Encl.: (01) Sheet(s)

Cc:

- Engr. Saad S. Al-Mutairi – Division Manager, Projects Execution-COA

DISTRIBUTION TO	ACTION	INFO.
Project Manager		✓
DY. Project Engineer		✓
Construction Manager		
Document Control Jedd		✓
Document Control Site		✓
Others <i>MR. Kama</i>	✓	✓

الرقم - ٤٩١/ج ت م / ٢٠١٦
التاريخ - ١٤٣٧/٠٤/٠١
الموافق - ٢٠١٦/٠١/١١

استشارى إدارة المشاريع
بجامعة تبوك

الموقر
المهترمين
المهترم

صوره مع التحية لسعادة مساعد وكيل الجامعة لمشروع الدكتور / صالح بن غضر العنوي
الساده / مؤسسة العتاق للمقاولات
عناية المهندس / مدير مشروع
السلام عليكم ورحمة الله وبركاته

إنشاء كلية إدارة الأعمال

الموضوع :-

المستندات المطلوب تقديمها مع طلبات اعتماد المواد

إشارة إلى الموضوع أعلاه والى التقديمات الكهربائية المقدمة منكم بتاريخ ٢٠١٦/١/١٠م وطبقا لما هو متبع بباقي المشاريع وكذلك ما تم ابلاغكم به سابقا عليكم ارفاق المستندات الآتية مع كل تقديم :-

- ١- صورته من المواصفات.
- ٢- صورته من جداول الكميات.
- ٣- جدول مقارنة بين الموردين.
- ٤- مقارنة مع المواصفات مختومة وموقعه من كل مورد .
- ٥- أرفاق العينات لكامل المواد المقدمة بطلب الاعتماد.

وبناء على ما تقدم نعيد اليكم جميع التقديمات لاستكمال المستندات المطلوبة.

عناية المهندس عادل
١٣ ضالـه / صوان
وتقبلوا تحياتي

مدير استشارى إدارة المشاريع

م / أحمد سيد حسن

باسم هذا الخطاب يتم مراجعة المهندس
أحمد هـ + م. م. من زكي (أدري)
بمجرد الموضوع لهذه الاعمال ذات
عد أن يتم لاحقاً التقديم حسب الشروط المبينة

م. زيد


أستشارى إدارة المشاريع
بجامعة تبوك



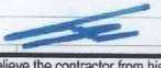



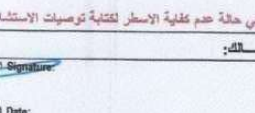
مشروع كلية ادارة الأعمال

الموضوع : - ملاحظات اعتماد مورد لحوامل الكابلات

- 1- جميع المقاسات المورد تكون Hot Dipped Galvanized – Heavy Duty سماكه 2mm
- 2- جميع المقاسات لابد ان تكون outside return flange بأرتفاع لا يقل عن 7.5mm للمقاسات الصغيره حتى 30 سم و 100mm للمقاسات التى اكبر من 30 سم
- 3- جميع الأكسسوارات من نفس المورد ولا يسمح بالتصنيع أو اللحام بالموقع
- 4- يتم توريد وتركيب expansion type fitting عند مرور حوامل الكابلات بفواصل التمدد الأنشائيه
- 5- يتم تركيب الوصلات النحاسيه الخاصه بالتأريض بين الأجزاء
- 6- يتم دراسة نظام التعليق طبقا لأحمال الكابلات ويتم تقديم الحسابات مع المخططات التنفيذيه
- 7- للأستشارى للأعتماد مع مراعاة المسافات بين الكابلات
يتم استخدام الغطاء الخاص بحوامل الكابلات فى الأماكن التى يجب التغطية فيها طبقا للمواصفات والكود
- 8- يتم التنفيذ طبقا للمخططات التنفيذيه المعتمده

مهندس الكهرباء


م / حسن عطاالله

CONTRACTOR 		OWNER 		CONSULTANT 	
PROJECT NAME: إسم المشروع: كلية إدارة الأعمال		PROJECT No.: A6		رقم المشروع: A6	
LOCATION: main building				الموقع: جامعة تبوك	
BUILDING NAME: main building				إسم المبنى: المبنى الرئيسي	
MATERIAL EQUIPMENT SUBMITAL تقديم مواد تجهيزات					
New Submittal <input type="checkbox"/> تقديم جديد		Submittal No.:		Previous Submittal # رقم التقديم السابق:	
Resubmittal <input checked="" type="checkbox"/> إعادة تقديم		Submittal Date: ٢٠١٦/١/١٤		Previous Submittal Date: ٢٠١٦/١/١٠	
PURPOSE OF SUBMITTAL الغرض من التقديم <input type="checkbox"/>		For Information <input type="checkbox"/> معلومات		For Comments <input type="checkbox"/> ملاحظات	
		For Approval <input checked="" type="checkbox"/> اعتماد			
DISCIPLINE التخصص الهندسي		ARCHITECTURE <input type="checkbox"/> معماري		STRUCTURAL <input type="checkbox"/> انشائي	
PLUMBING <input type="checkbox"/> صحي		ELECTRICAL <input checked="" type="checkbox"/> كهرباء		HVAC <input type="checkbox"/> تكييف	
		COMMUNICATIONS & INFORMATION <input type="checkbox"/> اتصالات ومعلومات		OTHER SPECIALITY: PLEASE SPECIFY <input type="checkbox"/> تخصص هندسي آخر: برجاء تحديد التخصص	
ATTACHMENTS المرفقات		CATALOGUE <input checked="" type="checkbox"/> كتليب معلومات		DRAWING <input type="checkbox"/> مخططات	
		CERTIFICATE <input type="checkbox"/> شهادة اعتماد		SAMPLE <input type="checkbox"/> عينة	
		TECH. DATA <input type="checkbox"/> توصيفات تقنية		CALCULATIONS <input type="checkbox"/> حسابات	
MATERIAL/EQUIPMENT جدول مواد/أجهزة		Note: Please use the attachment in case items are more than the provided space. يرجى إرفاق جدول إضافي في حالة زيادة عدد بنود المواد المقدمة عن المساحة المتاحة بالجدول.			
No. of Attachments: عدد المرفقات:					
Sr. No. / مسلسل	Name, No. and description / اسم ورقم وصف التفصيلية	Rev. No.	Origin / بلد المنشأ	Manufacturer / Supplier / مصنع المورد	Standard / المقبول المرجعي
1-	حوامل الكابلات الكهربائية (cable tray) بند ٤.١٦		سعودي	مصنع طرق الكهرباء	B
2-	حوامل الكابلات الكهربائية (cable tray) بند ٤.١٦		سعودي	مصنع ميلاف السعودية	
3-	حوامل الكابلات الكهربائية (cable tray) بند ٤.١٦		سعودي	لصناديق الكمبيوتر ومجاري الكابلات	B
4-				مصنع عصام قباني	
Contractor's Remarks / إقرار المقاول		We clarify that above Submittal is strictly adhered with contract specifications except otherwise as stated below: يتمهد المقاول بأن التقديم ملتزم التزاما تاما بمواصفات العقد كما يذكر لا خلا			
Exceptions / استثناءات					
CONTRACTOR PROJECT MANAGER NAME: / مدير المشروع / المقاول: م. أمجد الحاج علي		Signature / التوقيع: 			
		Date: ٢٠١٦/١/١٤			
Consultant's Recommendations / توصيات الاستشاري		Approval of the above materials does not relieve the contractor from his contractual obligations. اعتماد المخططات لا يفي المقاول من التزاماته التعاقدية			
<p>بمعد كل من مصنع عصام قباني ومصنع طرق الكهرباء لتوريد حوامل الكابلات على انه يتم التوريد منه مورد واحد فقط ويتم الالتزام بالمواصفات الواردة بالخطاب طرفه</p> <p> ١٧ ٢٠١٦</p>					
Note: under Consultant's Comments, in case of insufficient lines to write comments, separate attachments can be added indications to the attachments shall be mentioned in this form.					
ملاحظة: في حالة عدم كفاية الاسطر لكتابة توصيات الاستشاري يمكن إضافة ملحقات بصحفات منفصلة. ويتم الإشارة لتلك الملحقات بهذا النموذج					
CONSULTANT REPRESENTATIVE / ممثل الاستشاري		OWNER REPRESENTATIVE / ممثل الا مستشاري		ممثل المالك / التوقيع:	
Name: 		Name: 		Name: 	
Position: ١٧		Position: ١٧		Position: ١٧	
Date: ١٧		Date: ١٧		Date: ١٧	
Approval Status / التقييم الفني		A Approved / يعتمد		C Approved As Noted / Resubmittal is required	
		B Approved As Noted / Resubmittal is not required		D Disapproved / مرفوض	
		E No Action / لم يتخذ إجراء		F Returned for Incompletion of Information / يعاد لعدم اكتمال المعلومات	
REF. IN: / واردة:		Signature: / التوقيع:		REF. OUT: / صادر:	
Date: / التاريخ:		Date: / التاريخ:		Date: / التاريخ:	

ELECTRICAL WAYS FACTORY CO.



Manufacturing all type of Cable Tray, & Support System
MATERIAL SUBMITTAL FORM



شركة مصنع طرق الكهرباء

تصنيع جميع أنواع حوامل الكابلات ومستلزماتها
Nesma Trading Co. Ltd.

Submittal No. NT-AG-MS-ELEC-05 REV-00		Submittal Date: 06 April 2017		Project Title/Ref. No: CONSTRUCTION & Maintenance of 39K Warehouse RIYADH - SULAY	
Submitted by: Nesma Trading co ltd -Building Division (BLD)				Manufacturer/Supplier: Electrical Ways Factory Co.	
Product: "Cables Tray & Ladders"					
Specification Ref:		Drawing No. Ref:		BOQ/Item No. Ref:	
Attachment	<input checked="" type="checkbox"/> Technical Brochures		<input type="checkbox"/> product tests		<input type="checkbox"/> certificates
	<input checked="" type="checkbox"/> AVI COMPANY Profile		<input type="checkbox"/> Drawings		<input type="checkbox"/> Reference
Other (specify):					
Is the above material fully complying with contract specification? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO. If NO, explain your reason justifying your deviation to contract specification. (subject to Client/ Consultant review and approval)					
Prepared/ Reviewed by:	Name: Ghassan Agha		Title: Project Manager		Sign:
Approved by:	Name:		Title:		Sign:
Pls. Indicate required date of delivery for site use: → Date					
ENGINEER'S APPROVAL CODE					
<input type="checkbox"/> [A] Approved & Proceed			<input type="checkbox"/> [D] Do not proceed, more documents required as noted, resubmit		
<input type="checkbox"/> [B] Proceed, change as noted and resubmit			<input type="checkbox"/> [E] For Information Only		
<input type="checkbox"/> [C] Do not proceed, change as noted and resubmit			<input type="checkbox"/> [F] Rejected		
ENGINEER'S NOTES					
<p>Submittal No. NT-AG-MS-ELEC-05, dated 06 /04/2017 Cable Trays Manufacturer by M/S Electrical Ways are approved Code "B", subject to the followings.</p> <ol style="list-style-type: none"> Cable tray must be heavy duty type EA "outside return flange" Cable tray must be hot dipped galvanized steel. 					
CLIENT/CONSULTANT ENGINEER		CONSULTANT /CLIENT PROJECT MANAGER		APPROVAL CODE	
Name AHmed Aazab		Date 8 May 2017			
Sign		Date			
This Item not in critical Path					
RECEIVER:					
STAMP		SIGNATURE		DATE	

	Client: 	Contractor: 
--	--	--

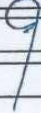
Project: 2X2 MVA SUBSTATION-TRANSPORT ACCOMMODATION & YARD (PO#4501274403&4501274393)

Material Submittal	Doc. No.	EBEM-TA&Y-MAT-EL-003
	Rev.	

To:	Almarai	Date:	10-Apr-2017
Attention:	Engr.Danish	Reqd. By:	Engr.Roger
CC:	Engr. Soman Pradeep		
From:	EBEM		

Material Detail		List of Enclosure (Tick the Related Box)
Item Description	HDG Cable Tray and Accessories	<input type="checkbox"/> Vendor's Technical Literature <input type="checkbox"/> Compliance Statement <input type="checkbox"/> Previous Test Results <input type="checkbox"/> Copy of the Related Specs. <input checked="" type="checkbox"/> Samples with Sample Tag <input type="checkbox"/> List of Previous Projects Done <input type="checkbox"/> Others (Specify):
Specs. Reference		
BOQ Reference		
Drwg. Reference		
Material Specified		
Material Proposed		
Manufacturer / Supplier	Electrical Ways Factory Co. , KSA	
Remarks		

Contractor Statement: We certify that the material submitted herewith has been reviewed in details and is in compliance with the contract drawings and specifications except as otherwise stated here above.

Contractor Sign: 	Date: 10-Apr-2017
Received Sign:	Date: 10-Apr-2017
	Ref.No

AL MARAI Engineer's Comments:

Approved / 10/4/2017



- Code A - Approved
- Code B - Approved As Noted
- Code C - Not Approved, Resubmit
- Code D - Disapproved
- Code E - Information Record

Sign:	Date:
Contractor Received Sign:	Date:

Corrections or comments made relative to submittals during this review do not relieve the contractor from compliance with the contract requirement and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents.

PROJECT : WAREHOUSING FACILITY EXPANSION PROJECT	Request No. : YMES-MAR-007
OWNER : ALMARAI COMPANY	Date : April 07, 2008

TO : ALMARAI PROJECTS OFFICE
 ATTENTION : Manuel De Veyra
 CC : Mohammad Shamkhani
 FROM : YOUSSEF MARROUN CONT. EST.
 SUBJECT : MATERIAL SUBMITTAL

Dear Sir,

We hereby submit the following for your review and approval:

ITEM	DESCRIPTION	REMARKS
1	ELECTRICAL WAYS Cable trays system	1 set
<i>Comment below</i>		

MANUFACTURE:

SAMPLE:

LOCATION: ALMARAI BOTTLE & OUTBOUND STORAGE

REF. DRAWING/SPECS:

APPROVED	
<i>[Signature]</i>	DATE

REVIEW COMMENTS	APPROVED	RESUBMIT	DISAPPROVED
<i>All trays to be HDG and external trays required protection of cover.</i>	✓		

Submitted by:

Signature: *[Signature]*
 Name: Arthur Y. Sarmiento
 Date: 07 April 2008

Received/Checked by:

Signature: *[Signature]*
 Name: _____
 Date: 14/4/08



SAMAMA FACTORY FOR PRECAST PRODUCTION

AL MUTAWA TOWER - RIYADH

TRANSMITTAL OF DRAWINGS & MATERIALS FOR APPROVAL



SAUDI CONSOLIDATED ENGINEERING COMPANY

DRAWING	NEW	X	DATE SUBMITTED	SHEET NO.	SUBMITTAL REF. NO.
DESIGN	RESUBMITTAL		21/12/2005		ELE-M-010
MATERIAL/EQUIP	X	SUBSTITUTION			
SAMPLE		SCHEDULE			

ITEM NO.	DESCRIPTION	SPECS. REF. NO.	DRAWING REF. NO.	NO. OF COPIES	ACTION CODE
CABLE MANAGEMENT SYSTEM					
1	CABLE TRAY WITH FITTINGS	Approved as Noted.	Section #16	1 - Orig 1 - Copy (13 pages)	1 & 2 - (B)
2	CABLE LADDER WITH FITTINGS				
3	CABLE TRUNKING				
SUPPLIERS :					
1	ELECTRICAL WAYS - ATTACHED SAMPLE & CATALOGUE			1 - Orig	
2	AL- AMAL CO - ATTACHED SAMPLE			1 - Copy	
3	AL - MISBAH FABRICATOR - ATTACHED CATALOGUE			1 - Orig	
				1 - Copy	(9 pages)

CONTRACTOR'S REMARKS: _____

SAMAMA ENGINEER: Eng. ADNAN RIZK

 Project Manager

APPROVING ENGINEER'S REMARKS :
 * Follow comments on attached comment sheet (1 page) and submittal copies.

CIVIL	
STRUCTURAL	
ARCHITECTURAL	
ELECTRICAL	(Signature) 21/12/05
PLUMBING	
HVAC	
OTHERS	

ELECTRICAL ENGINEER: 21/12/05
 KHAMAL AHMED

PROJECT MANAGER: KHAMAL AHMED

MECHANICAL ENGINEER: KHAMAL AHMED

KAMAL AHMED JIHAD MOHTADI OMAR AL-KARIB

A - APPROVED AS SUBMITTED C - REVISE AND RESUBMIT

B - APPROVED AS NOTED (RESUBMISSION NOT REQUIRED) D - DISAPPROVED (SEE ATTACHED)

Done
 21/12/05

Kingdom of Saudi Arabia
Ministry of Higher Education
Dammam University

المملكة العربية السعودية
وزارة التعليم العالي
جامعة الدمام
() الرمز

الرقم: ٦٤٥/١/١٥ التاريخ: ١٤/٤/١٤٣١هـ المرفقات: ١

المترمين
المحترم

السادة / مكتب زهير فايز ومشاركوه
عناية المهندس / طارق محمد توفيق

السلام عليكم ورحمة الله وبركاته

المشروع: مشروع إنشاء مبنى الأنشطة الطلابية ومطعم الطلاب.
الموضوع: اعتماد موردين لحوامل الكابلات.

إشارة إلى خطابكم رقم J08-130000/B12/120 وتاريخ ١٤٣١/٠٤/٠٢هـ بشأن الموضوع أعلاه .

نحيطكم أنه لا مانع لدينا من اعتماد مؤسسة طرق الكهرباء وشركة فاس الجزيرة كموردين لحوامل الكابلات في مشروع مركز الأنشطة الطلابية ومطعم الطلاب بناءً على توصياتكم مع الالتزام بمواصفات المشروع وأن تكون المواد الموردة من الصلب المجلفن .

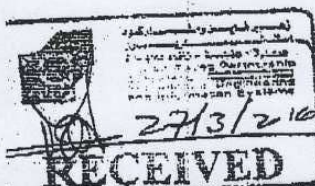
وتقبلوا خالص تحياتي ...

المشرف العام على إدارة المدينة الجامعية

د. منصور بن ناصر الجديد

From : P.M.			
To	Action	Info	Rec.
ARC			
CIVIL			
ME			
EL	✓	✓	8

(صورة) الدكتور / مصطفى كمال للمتابعة





KING ABDULAZIZ UNIVERSITY
UNIVERSITY MAIN CAMPUS PROJECT
CONSTRUCTION SUPERVISION CONTRACT
FLUOR ARABIA LTD.

CERTIFICATE OF COMPLIANCE
MATERIAL TRANSMITTAL FORM - TSF-03

Title: CUP-2 Building Civil Works / Electro Mechanical Works

Contract No. 8400
Contractor: SEB-IPP JV Arabien Bemco Contracting Co.

We understand that approval of the material(s) submitted herein is only intended to determine general conformance with the intent of the project contract documents. By submitting these materials for approval, we confirm we have performed all necessary on-site dimensional and building utility requirement coordination, and if approval is granted, will further coordinate the information contained within with all other concerned contractors employed by the University.

[Signature]
Name & Signature of Contractor

MATERIAL SOURCE CODES: (S) Saudi Arabia (G) Gulf Cooperative Council (F) Imported

Transmittal Date: 24/09/2008

Transmittal No. E-012
Subject: CABLE TRAYS / LADDER & FITTINGS

Item	Specs	Prod.	Rev.	Description	Subs. Req.	Source	Action	Comments
01	DIVISION 16		A	CABLE TRAYS & LADDER		S	C	1) PE. Submittal Samples (see this is a material submittal) 2) MWF guarantee against corrosion 3) List of Products where the same products were used.
				Supplier & Manufacturer: ELECTRICAL WAYS TRAD P.O.Box 40048, RIYADH 11498, K.S.A				

The above approval does not relieve the Contractor of any contract obligations, whether for coordination, compliance, or quality with the contract terms and conditions of the contract.




[Signature]
FAL Project Manager
Date: 10/09/08

10/09/08
(C) Revise and Resubmit

ACTION CODES:
(A) Approved
(B) Approved As Noted, Resubmittal Not Required
(C) Revise and Resubmit
(D) Not Approved

Contractor Receipt: *[Signature]*
Date: 18/10/08

2/5

Owner :  وزارة التعليم العالي Riyadh Ministry of Higher Education in Riyadh		Consultant :  المهندس مهندسون استشاريون د/ عبد العزيز بن تركي العتيبي Otaishan Consulting Engineers Dr. Abhal Aziz T. Alotaishan		Contractor :  شركة الترابيس التجارية والصناعية مستشارك Saudi Al-Terais Trading, Industrial & Contracting Co. Riyadh, Saudi Arabia	
Project : Construction of Science College In ARAR مشروع إنشاء مبنى كلية العلوم في عرعر					
Materials Submittal - Approval Request طلب إعتماد تقديم مواد					
Day / Month / Year					
Submittal date رقم تقديم	Transmitted No. رقم الترخيص	Submittal Code	C-Civil <input type="checkbox"/> مائي <input type="checkbox"/> A-Arch <input type="checkbox"/> معماري <input type="checkbox"/> E-Elect <input type="checkbox"/> كهربائي <input type="checkbox"/> G-General <input type="checkbox"/> عام	Re-submittal <input type="checkbox"/>	New Submittal <input type="checkbox"/>
Item No. رقم	Item البنية	Unit الوحدة	Estimated Quantity التقدير الكمية	Contract Documents رقم المخطط Spec. No رقم المواصفات	Manufacturer / Supplier مصنع
3	ELECTRICAL WAYS FACTORY	حجرية	2,16	101/01	عربي الكورام للتجارة و التصنيع الصناعي
	CABLE TRAY (HEAVY DUTY TRAY) page(30)		3,16	101/01	
	cable tray fitting page(47,48,49,80,81,82,83,84)		4,96		
	Cable tray Accessories page(85,88,87)		5,16		
		(7,89,18,16)			
Attachments ملحقات المرفقات	Sample Catalogue عينة كتالوج	Calculation حسابات	Others اخرى	Contractor Signature توقيع المالك	
Contractor Remarks :					
Note :					
Consultant Comments					
Consultant Action & Comments					
Owner Rep Approvals					
NAME :			SIGNATURE :		
NAME :			SIGNATURE :		
DATE : / /			DATE : / /		
DATE : / /			DATE : / /		

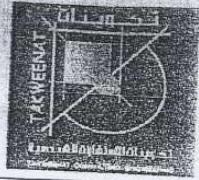

Returned Without Action

Revise and Resubmit

Approved as submitted

Approved as noted

Disapproved

Consultant: 	Project: KING ABDUL AZIZ LIBRARY	Contractor: 
--	--	--

DOCUMENT SUBMITTAL

Ref. No. : S B C 0 0 0 7 6	Date : 2 7 1 0 0 8	New Submittal Resubmittal
<input type="checkbox"/> Architectural <input type="checkbox"/> Structural	<input checked="" type="checkbox"/> Electrical <input type="checkbox"/> Mechanical	<input type="checkbox"/> Civil <input type="checkbox"/> Interior Design <input type="checkbox"/> Others
Please find enclosed the following documents:		Specs. No. _____ Drwg. No. _____

No.	Document No.	Description / Title	Code
1		ORDER FOR CABLE TRAY	B

Submitted For:

1. For Approval
2. For Information
3. For Further Action
4. For Your File

The submittal documents are in strict conformity with the design drawings and the specification. Minor deviations are indicated in the submitted documents. All aspects of associated works have been considered and coordinated.

Project Manager : ROSVELT P. BOLICANO

Received by: _____

Name: _____ Date: _____ Signature: _____

Remarks / Comments:

According to specifications Type (EA) outside return Plange is approved. The final approval at delivery on site for the cable tray units, supports and fittings. The earthing is essential for protection against any leakage current and any surge voltages.

Status

A Approved C Approved as noted, resubmit N No Action

B Approved as noted D Disapproved

Date: 20/11/09 Name & Signature of Engineer: _____ Project Manager: _____

2008

RECEIVED

20/11/09

S. P. B.

جدول تقديم العينات للاعتماد

(بند كهرباء)

التاريخ : ٢٠٠٨/١٢/١٧
 فاكس : ٢٧٢٣٧٩١٢
 فاكس : ٢٨٤٨٨٨٢٢
 عدد العينات : مائة واحدة



وزارة التعليم العالي
 Ministry of Higher Education

المشروع : موقع عام وكلية المجتمع بقرى الباطن
 زم : مؤسسة عبد الله بن محمد آل بوطين
 زم : مكتب احمد الموسى للاقتنارات الهندسية
 رقم المقدمة : حوامل كيبلاط (CABLE TRAYS)

المنطقة : الشرقية
 تليفون : ٢٧٢٣٧٩١٢
 تليفون : ٢٨٤٨٨٨٤٤

رقم العينة	نوع العينة	طرق الكهرباء للتجارة	ELECTRICAL WAYS	صناعة سعودية	حوامل كيبلاط ١٠٠م و٢٠٠م و٣٠٠م	16-4 لا يوجد

التاريخ : ٢٠٠٨/١٢/١٧
 المقدم : م/التعليم العالي
 المصمم : م/المصمم
 المهندس : م/الهندسة
 المهندس : م/الكهرباء
 المهندس : م/المقاول



الاسم : م/الاسم
 العنوان : م/العنوان
 رقم الهاتف : م/الرقم
 ملاحظات : ملاحظات
 ملاحظات : ملاحظات
 ملاحظات : ملاحظات



مجموعة عبدالله بن محمد أبابطين

Abdullah Bin Mohammad Ababtain Group

GENERAL MANAGEMENT

الإدارة العامة

C.R. 2051026114

س.ت ٢٠٥١٠٢٦١١٤

C.C. 80792

رقم العضوية ٨٠٧٩٢

التاريخ: ١٤/١٩ ١٤٢٥هـ

الموافق: ١٤/١٧ ١٤٢٥هـ

الرقم:

المحترمين.

السادة/ مكتب أحمد موسى للاستشارات الهندسية

المحترم.

عناية المكرم / م. صلاح الصياد (مدير المشروع)

المحترم

عناية المكرم / م. ماجد بده (استشاري أعمال الكهرباء)

السلام عليكم ورحمة الله وبركاته...

الموضوع: عينات حوامل كوابل

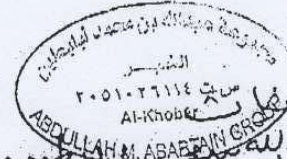
نرفق لسيادتكم ثلاث نسخ كتالوجات مع سابقة الأعمال لحوامل الكيبلات (مصنع طرق الكهرباء) مع عينة من هذه الحوامل.

يرجى تدقيقها واعتمادها.

وتفضلوا بقبول فائق الاحترام والتقدير

مدير المشروع
م. محمد غيث ياسين

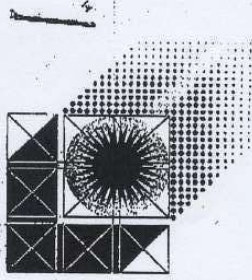
م. علي محمد النقس



م. علي محمد النقس
م. علي محمد النقس
م. علي محمد النقس

م. علي محمد النقس
م. علي محمد النقس
م. علي محمد النقس

المركز الرئيسي: ص.ب ١٧٨٤ الخبر ٣١٩٥٢ - المملكة العربية السعودية - هاتف ٨٨٧٤٠٠٠ - فاكس ٨٨٧٤٢٦٢
الفروع: الرياض - الدمام - الأحساء - حفر الباطن - حوطة سدير - الجوف
Head Office : P.O.Box 1784, Al-Khobar 31952 - Kingdom of Saudi Arabia - Tel.: 03 8874000 - Fax: 03 8874262
Branches : Riyadh - Dammam - Al Hasa - Hafr El Batin - Hotat Sudair - Al Jouf
E-mail : abduallahababtain@yahoo.com



شركة زهير فايز
ومشاركوه للإستشارات
عمارة - هندسة - نظم معلومات
شركة مهنية رقم ٣٢٣ / ١٣ / ٨٦
Zuhair Fays Partnership
Consultants
Architecture, Engineering
And Information Systems
Registration No. 323/13/86

الرقم J08-13000/B12/269
التاريخ ١٤٣١/٤/١١ هـ
الموافق ٢٠١٠/٣/٢٧ م

المشروع : مبنى مركز الأنشطة الطلابية و مطعم الطلاب
الموضوع : اعتماد مؤسسة طرق الكهرباء وشركة مصنع فاس الجزيرة
(موردين لحوامل الكابلات)

السادة / شركة الزهراني للمقاولات
لعناية المهندس / بلال اسماعيل (مدير المشروع)
المحترمين ،،
المحترم ،،
السلام عليكم و رحمة الله و بركاته

إشارة إلي عقد المشروع . و الي التقديم

- ١- رقم Elec-M-19 بتاريخ ٢٠١٠/٣/١٣ م بخصوص شركة Electrical Ways Factory
٢- رقم Elec-M-16 بتاريخ ٢٠١٠/٣/١٣ م بخصوص شركة Fas Aljazeera United Factory
لتوريد حوامل الكابلات .
نفيدكم بموافقة الجامعة بالخطاب الجامعة بالخطاب رقم ٦٤٥/١/١٥ بتاريخ ١٤٣١/٤/٧ هـ باعتماد كل من
Electrical Ways Factory /١
Fas Aljazeera United Factory /٢
كموردين لتصنيع وتوريد حوامل الكابلات مع الالتزام بمواصفات المشروع . وان تكون المواد المورده
من الصلب المجلفن .
ولكم تحياتنا ،،،

شركة زهير فايز و مشاركوه
مهندس / طارق محمد توفيق
مدير المشروع



CONSULTANTS: Zuhair Fayez Partnership Consultants Architecture, Engineering and Information Systems	PROJECT & CLIENT: New Head Quarter For Royal Commission for Jubail and Yanbu, Riyadh	CONTRACTOR: Al Mashrik Co. (J.V.) Jubail - Al Towalib Partnership Riyadh
--	---	--

SUBMITTAL FORM (MATERIAL)



FROM: CONTRACTOR AL MASHRIK CO. (J.V.) P.O. Box 6108 Riyadh 11442 Kingdom of Saudi Arabia	TO: CONSULTANTS: ZUHAIR FAYEZ PARTNERSHIP CONSULTANTS P.O. Box 9486 Riyadh 11413 Kingdom of Saudi Arabia
---	--

CONTRACT NAME: ROYAL COMMISSION HEADQUARTERS BUILDING	SUBMITTAL NO.: RCHQ-MSE-023 EP (Rev. 0)
--	--

MATERIAL DESCRIPTION <p align="center">CABLE TRUNKING</p>	COPIES SUBMITTED		
	Original Copies	Photocopy	Other Supporting Documents
	1	2	

Specification Reference:	BOQ Reference:	Drawing No.:
Manufacturer's Name & Address: ELECTRICAL WAYS TRADING & FABRICATORS P.O. BOX - 40048, RIYADH - 11499. TEL: 01/4124052, FAX: 01/4120803.	Origin of Manufacture: KSA	Supplier / Local Agent Name & Address: ELECTRICAL WAYS TRADING & FABRICATORS P.O. BOX - 40048, RIYADH - 11499. TEL: 01/4124052, FAX: 01/4120803.

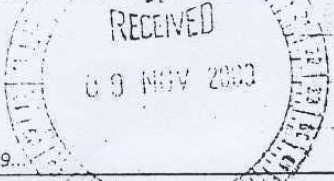
INFORMATION SUBMITTED / ATTACHED:

<input checked="" type="checkbox"/> Technical Brochure	<input type="checkbox"/> Shop Drawings	<input type="checkbox"/> Spare Parts	<input type="checkbox"/> Others (Please specify)
<input checked="" type="checkbox"/> Certificate	<input checked="" type="checkbox"/> Samples (1PIECE)	<input type="checkbox"/> Warranty	
<input checked="" type="checkbox"/> Manufacturer's Data and Specs.	<input type="checkbox"/> Details of permanent manpower		

Activity ID and scheduled Early Date of Submittal from Schedule of Submittals: ID: Date:	Activity ID and Early Start Date of related / Successor Activity from Construction Schedule: ID: Date:
---	---

CONTRACTOR'S STATEMENT: It is certified that the above submittal has been prepared, checked and verified to conform to the requirements of the Contract Documents and applicable codes and standards.

Contractor's Representative: *[Signature]* Date: ...3-Nov-2009...



CONSULTANT'S REVIEW COMMENTS:

- Compliance statement sheets shall be provided. Technical compliance sheet shall be as per project specification 16110 2.02C Metal Trunking wireways and 16110 2.02E Under Floor Trunking.
- Sample provided shall be identified the usage of application.
- Resubmit sample according to specification and project requirement. For under floor trunking submit 3 compartments 90 bends and other fittings.

This approval is for general performance with design conforming to contract documents. The contractor remains responsible for coordinating the works of various trades, for details and accuracy, for conforming and correlating all quantities and dimensions, for selecting fabricating process, for the techniques of assembly, and for performing his work in a safe manner.

- A - Approved as submitted
- B - Approved as Noted
- C - Revise & Resubmit
- D - Rejected

Reviewed By: *[Signature]* Date: 09/11/09

Review Endorsed By:

Architect:	Elect. Engineer	Mech'l Engineer	Structural Engineer	Civil Engineer
Signature & Date:	Signature & Date:	Signature & Date:	Signature & Date:	Signature & Date:
	<i>[Signature]</i>			

Project Manager

Signature: *[Signature]*
Date: 09/11/09

- Submittal in site office
- Received only cover sheet on 10/11/09
de sanding

CONTRACTOR'S SUBMISSION

CONSULTANT'S REVIEW

ZUHAIR FAYEZ PARTNERSHIP
To E. JHM
13/10



9



شركة محمد العنبي السويديم
للتجارة و المقاولات

SUBMITTAL FORM

طلب اصدار مدار

SUBJECT: Cable tray(Electric way factory)

Specs. Code & Ref. Div.16	B.O.Q. Code Ref.	Document No.	Submittal No. ELEC/MTR/007-A
			Date Received: 13/10/2008
			Date Returned:

Sub-contractor:
Name: _____ Address: _____
Address: _____ Phone: _____ Telex: _____

Manufacturer		Supplier/Agent	
Name: Electric ways	Address: RIYADH	Name: _____	Address: _____
Phone: 01-4124052	Fax: 01-4120503	Phone: _____	Fax: _____
Telex: _____		Telex: _____	

Information submitted and attached:

Certificates	<input checked="" type="checkbox"/>	Operation & Maintenance Manual	<input type="checkbox"/>
Technical Brochure	<input checked="" type="checkbox"/>	Spare Parts List	<input type="checkbox"/>
Manufacturer's Data & Specs.	<input checked="" type="checkbox"/>	As Built Drawings	<input type="checkbox"/>
Shop Drawings	<input type="checkbox"/>	Warranty	<input type="checkbox"/>
Samples	<input checked="" type="checkbox"/>	Others (specify)	<input type="checkbox"/>

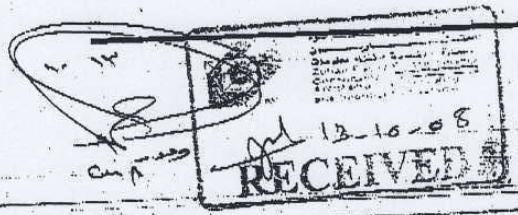
Contractor's Comments: See Attachment

Note: This review does not relieve the contractor of his responsibilities under the terms of the contract nor authorize additional compensation.

(Contractor's) Signature: ENGR. AHMED SHOUJAN
Date: 13/10/2008

Consultant's Comments: See attached one page of comments. See Attachment

Status:	Discipline	Sign & Date	Resident Engineer
Approved <input checked="" type="checkbox"/>	<input type="checkbox"/> Arch		Sign: _____
Approved as noted <input checked="" type="checkbox"/>	<input type="checkbox"/> Civil		Date: _____
Revise and submit <input type="checkbox"/>	<input type="checkbox"/> Mech		
Rejected <input type="checkbox"/>	<input checked="" type="checkbox"/> Elect	ENGR. AHMED SHOUJAN 25/10/08	26/10
	<input type="checkbox"/> HVAC		
	<input type="checkbox"/> LS		



DATE: 13/10/08

Material submittals for cable trays.

Supplier # 01-

ELECTRIC WAYS

ELEC/MTR/007-A.

Supplier # 02-

AL-AMAL CO.

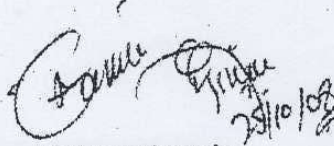
ELEC/MTR/008-A.

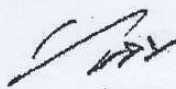
PROJECT: King Faisal University Dammam-KFU

SUBJECT: APPROVAL FOR CABLE TRAYS/LADDERS AND TRUNCKING.

1- As above submitted material catalogues and samples, the approval will be depends on the following.

- Contractor shall submit manufacturer hot dip galvanizing proof test certificate report.
 - Contractor will get materials inspection approval at site on supplier delivery form as per approved specification before installation or unloading.
- 2- Cable trays/ladders/trucking and related all complete installation accessories like-reducers, tees, branches, channel holding clumps, bends, covers (lock type solid and ventilated for all), shall be heavy duty perforated type hot dip galvanized after fabrication as per ASTM-A123, NEMA VEI, and as per contract specifications.
 - 3- All materials thickness shall not be less than 2.0mm including mounting channel also.
 - 4- Threaded rod shall not be less than 10mm.
 - 5- Dimension of cable trays/ladder/trunck and installation details shall be according to the approved drawings.
 - 6- Cable trays/ladder/trunck shall be supported according to the mounting types, rigidly strong enough to withstand the cable load as per contract requirement.
 - 7- As attached submitted catalogues the types of the cable tray (EA), ladder (EC), and cable trunking (1TR ~ 3TR), are **APPROVED of ELECTRICAL WAYS** for the electrical installation cable arrangement systems.
 - 8- Cable ladder space of the rungs shall not be more than 200mm.
 - 9- All materials shall be as per submitted catalogues.
 - 10- Samples for cable ladder and for cable trunking shall be submitted for evaluation.


Engr. Iftikhar Hussain
Elect. Consultant-ZFP.


26/10



AL-FANAR CABLE FACTORY.



Consultant:  Zuhair Fayed Partnership ZFP Riyadh, Kingdom of Saudi Arabia	Client:  Al-Fanar Electrical Systems AES Riyadh, Kingdom of Saudi Arabia	Project Manager:  Al-Fanar Projects Development APD Riyadh, Kingdom of Saudi Arabia	contractor:  Al-Fanar Industrial building Electromechanical IBEM Riyadh, Kingdom of Saudi Arabia
---	--	---	--

ELECTRICAL - SUBMITTAL FORM

SUBJECT: Submittal for cable tray

Specs. Code & Ref.	B.O.Q. Code Ref. Item C	Drawing No. E - 15 & E-26	Submittal No. <u>1 / A</u>
			Date Received: _____
			Date Returned: _____

contractor
Name: Al-fanar (IBEM) **Address:** Riyadh, Kingdom of Saudi Arabia
Address: P.O box 301 , Riyadh 11411 **Phone:** 01-2755999#4613 **Telex:** 01-2758531

Manufacturer	Supplier/Agent
Name: <u>Electrical Wayes</u>	Name: <u>Adnan Herbawy</u>
Address: <u>El Meagel - Riyadh</u>	Address: <u>El Meagel - Riyadh</u>
Phone: <u>01-4124652</u>	Phone: <u>0506860950</u>
Fax: <u>01-4120803</u> Telex: _____	Fax: _____ Telex: _____

Information submitted and attached:

- | | |
|--|---|
| Certificates <input type="checkbox"/> | Operation & Maintenance Manual <input type="checkbox"/> |
| Technical Brochure <input type="checkbox"/> | Spare Parts List <input type="checkbox"/> |
| Manufacturer's Data & Specs. <input checked="" type="checkbox"/> | As Built Drawings <input type="checkbox"/> |
| Shop Drawings <input type="checkbox"/> | Warranty <input type="checkbox"/> |
| Samples <input type="checkbox"/> | Others (specify) <input type="checkbox"/> |

Contractor's Comments:

See Attachment

Note: This review does not relieve the contractor (Contractor)
of his responsibilities under the terms of the Signature: _____
Contract nor authorize additional compensation. Date: _____







Consultant's Comments:

Provide samples for final approvals.

See Attachment

Status:	Discipline	Sign & Date	Resident Engineer
Approved 1 <input type="checkbox"/>	<input type="checkbox"/> Arch		Sign: <u>[Signature]</u> Date: <u>5/01/08</u>
Approved as noted 2 <input checked="" type="checkbox"/>	<input type="checkbox"/> Civil		
Revise and submit 3 <input type="checkbox"/>	<input type="checkbox"/> Mech	<u>[Signature]</u>	
Rejected 4 <input type="checkbox"/>	<input type="checkbox"/> Elect		
	<input type="checkbox"/> HVAC		
	<input type="checkbox"/> LS		

Received -
[Signature]
5.1.08

Consultant:  Zuhair Fayed Partnership ZFP Riyadh, Kingdom of Saudi Arabia	Client:  Al-Fanar Ceramic Factory Riyadh, Kingdom of Saudi Arabia	Project Manager:  Al-Fanar Projects Development APD Riyadh, Kingdom of Saudi Arabia	contractor:  Al-Fanar Industrial building Electromechanical IBEM Riyadh, Kingdom of Saudi Arabia
---	--	---	--

ELECTRICAL – SUBMITTAL FORM

SUBJECT: Submittal for cable Tray and Accessories

Specs. Code & Ref.	B.O.Q. Code Ref.	Drawing No.	Submittal No.	El-37-E-009
	ITEM 8	CF-E2-111 : CF-E2-113	Date Received:	
			Date Returned:	

contractor
 Name: Al-fanar (IBEM) Address: Riyadh, Kingdom of Saudi Arabia
 Address: P.O box 301 , Riyadh 11411 Phone: 01-2755999#4613 Telex 01-2758531

Manufacturer	Supplier/Agent
Name: <u>Electrical way</u>	Name: <u>Adnan Herbawi</u>
Address: <u>Head office - Riyadh</u>	Address: <u>Head office esteem street - Riyadh</u>
Phone: _____	Phone: <u>01-4124052</u>
Fax: _____ Telex: _____	Fax: <u>01-4120803</u> Telex: _____

- Information submitted and attached:
- | | |
|--|---|
| Certificates <input type="checkbox"/> | Operation & Maintenance Manual <input type="checkbox"/> |
| Technical Brochure <input checked="" type="checkbox"/> | Spare Parts List <input type="checkbox"/> |
| Manufacturer's Data & Specs. <input checked="" type="checkbox"/> | As Built Drawings <input type="checkbox"/> |
| Shop Drawings <input type="checkbox"/> | Warranty <input type="checkbox"/> |
| Samples <input type="checkbox"/> | Others (specify) <input type="checkbox"/> |

Contractor's Comments: using cable tray for carrying cables indoor outdoor
 See Attachment

Note: This review does not relieve the contractor (Contractor) of his responsibilities under the terms of the Contract nor authorize additional compensation.
 Signature: _____ Date: 29/03/2008



Consultant's Comments: Material Thickness is 1.5MM Flange height is 50MM, EY-TYPE Galvanized after fabrication H
 See Attachment

Handwritten note: Handwritten note: Galvanized after fabrication H

Status:	Discipline	Sign & Date	Resident Engineer
Approved 1 <input type="checkbox"/>	<input type="checkbox"/> Arch		Sign: <u>ADP</u> Date: <u>2/4/08</u>
Approved as noted 2 <input checked="" type="checkbox"/>	<input type="checkbox"/> Civil		
Revise and submit 3 <input type="checkbox"/>	<input type="checkbox"/> Mech		
Rejected 4 <input type="checkbox"/>	<input checked="" type="checkbox"/> Elect	<u>ADP 02-04-08</u>	
	<input type="checkbox"/> HVAC		
	<input type="checkbox"/> LS		

26 JAN 2012

RECEIVED
01 FEB 2012
CCE-ITCC

BAYADAH INVESTMENT COMPANY TCC - CLIENT OFFICE 01 FEB 2012	HANMI INTERNATIONAL (KSA) LTD HP	MOHAMMED HAIR ABU AL-VAZ PARZEN ENGINEERING PARTNERSHIP المهندس محمد هار أبو الواض شركه مهندسين RECEIVED
ITCC PHASE 1 - BUILDINGS (03) - HOTEL CONVENTION CENTER (PB)		
MATERIAL SUBMITTAL FORM (MTS)		

SUBJECT: CABLE TRAY TRUNKING AND ACCESSORIES

WORK AREA: **HC.1** DISCIPLINE: **ELECTRICAL** SUBMITTAL NO.: **MTS - HC.1 - E - 005 G (Rev-00)**

Specs. Code & Ref.	B.O.Q. Code Ref. Bill # 1	Drawing No.	<input checked="" type="checkbox"/> New sub <input type="checkbox"/> Re-submitted	1 st Submittal Date: <u>25-Jan-2012</u> Previous Sub Date: _____ Present Sub Date: <u>25-Jan-2012</u>
Submittal scheduled date: _____				PR. ACTION
Sub-contractor Name: _____				
Address: _____		Address: _____		
Phone: _____		Phone: _____		Telex: _____

Manufacturer Name: ELECTRICAL WAYS TRADING <i>OR Manufacturer</i> Address: P.O. BOX 40048, RIYADH 11499, KSA Phone: 01-4124052 Fax: 01-4120803	Supplier/Agent Name: ELECTRICAL WAYS TRADING Address: P.O. BOX 40048, RIYADH 11499, KSA Phone: 01-4124052 Fax: 01-4120803 Telex: _____
---	---

Information submitted and attached:

<input checked="" type="checkbox"/> Certificates <input checked="" type="checkbox"/> Technical Brochure <input checked="" type="checkbox"/> Manufacturer's Data & Specs. <input type="checkbox"/> Shop Drawings <input type="checkbox"/> Samples	<input type="checkbox"/> Operation & Maintenance Manual <input type="checkbox"/> Spare Parts List <input type="checkbox"/> As Built Drawings <input type="checkbox"/> Warranty <input type="checkbox"/> Others
--	--

CCE ITCC SITE
Contracting & Construction Enterprises Ltd.

Contractor's Comments: This is Submitted As An Alternative Incase Delivery Time Of The Approved Supplier (Al-Arma) Is Too Long. See Attachment

Note: This review does not relieve the contractor of his responsibilities under the terms of the contract nor authorize additional compensation.

Signature: *[Signature]* Date: 25-Jan-2012
Engr. Georges Nasr (Projects Director)

Cost Impact: Yes No

Consultant's Comments: *Alternative Supplier/manufacturer approved in case of Approved supplier fails to delivery of material in time.* See Attachment

Client's Comments: *Electrical ways trademark with their logo shall be engrave on cable raceway. (cable tray & fittings).*

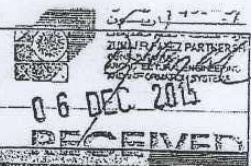
Status: A Approved B Approved as noted C Revise and submit. D Rejected E No Action

Sign & Date	Consultant	Client
<input type="checkbox"/> Arch <input type="checkbox"/> Civil <input type="checkbox"/> Structural <input type="checkbox"/> Plumbing <input checked="" type="checkbox"/> Electrical <input type="checkbox"/> HVAC <input type="checkbox"/> IS/IT	Sign: <u><i>[Signature]</i></u> Date: <u>31-01-12</u>	Sign: <u><i>[Signature]</i></u> Date: _____

Cc: Project Manager (MN02) Received

29 JAN 2012

KING ABDULLAH FINANCIAL DISTRICT



MATERIAL SUBMITTAL FORM

Contract No: C15B1	Work Package: C15B1
Title: Wiring Devices (Floor Box)	Submittal No: I/MTS-DC2-EL-048 A Rev. 00
To: ZUHAI FAYEZ PARTNERSHIP	Submittal Package: DOCUMENTS
From: CONTRACTING & CONSTRUCTION ENT. LTD	Date: 05-DEC-2015
Attn.: ENGR. Ashraf Saree	No. of Copies: 04
Submitted for: <input checked="" type="checkbox"/> Approval <input type="checkbox"/> Information <input type="checkbox"/> Coordination	

MATERIAL DESCRIPTION

Material Status: Specified Alternative Drawing Ref.: Electrical Drawings
 Discipline: ELECTRICAL Specification: 16050-2.4
 Parcel No.: 6.40 & 6.41 Building: DATA CENTER 1 & 2 BOQ Ref. No.: BILL # 01, DIV. 16
 Enclosures: Production Verification Catalogue Sample Comparison Sheet List of Suppliers Other:

MANUFACTURER/SUPPLIER

Company: Electrical Ways Factory Local Agent: Electrical Ways Factory
 Address: KSA Address: KSA

DELIVERY

Country of Origin: KSA Availability: Locally Available Imported

Delivery Program- Latest Date of Order : KAFD SITE
 Ex-Work Total Duration : Estimated Date for Arrival on Site

We certify that the above submitted items have been reviewed in detail and are correct and in strict conformity with the contract drawings and specifications except otherwise stated; also that the material sources indicated above have been reviewed and that they will supply the submitted items in full conformity with timely delivery

For the Contractor-
 Name: ENGR. GEORGES NASR Signature: Date: 05 DEC 2015 Contractor Stamp

ENGINEER'S COMMENTS

REFER IN THE ATTACHED SHEET.

Name: E. P. LOGDONIO Signature: Date: 6/12/15

ACTION CODE

A Approved B Approved As Noted C Revise - Resubmit
 Rejected - Resubmit E Receipt Acknowledged

Engineer Stamp

PM/CM REVIEW

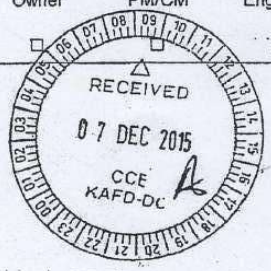
Name: Signature: Date:

OWNER'S COMMENTS (Optional)

Name: Signature: Date:

Approval shall not relieve the Contractor of its obligations and liabilities under the Contract or constitute authorization of any change to Contract Documents, and therefore, shall not imply any recognition whatsoever of additional time or cost to the Contract.

Distribution				To Contractor	
Owner	PM/CM	Engineer	Contractor	Received For:	Stamp & Signature
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Date: / / 20	



Document No: PP-DC-09-FM Rev.1

ATTACHED TO 3095
 CCE LETTER #

KING ABDULLAH FINANCIAL DISTRICT

REQUEST FOR ALTERNATIVE OR SUBSTITUTION (RAM)															
Contract No: C15B1	Work Package No: C15B1														
To: ZUHAIR FAYEZ PARTNERSHIP	Attn: ENGR. Ashraf Saree	Contractor: CCE													
RAM No: 12	Rev: 00	Date: 05-DEC-2015													
<p>This Submittal will not be reviewed unless the Contractor complies with the minimum submittal requirements of Comparison sheets, product data, cost comparison etc.</p> <p>PROPOSED ALTERNATIVE OR SUBSTITUTION:</p> <p> <input checked="" type="checkbox"/> PRODUCT <input type="checkbox"/> METHOD OF FABRICATION <input type="checkbox"/> METHOD OF INSTALLATION </p> <p>SPECIFIED PRODUCT..... Marshal - Tufflex.....</p> <p>PROPOSED PRODUCT..... Electrical Ways</p> <p>SPEC. SECTION No ... 16050..... PAGE No ... BILL 1..... ARTICLE NO..... DIV. 16B.....</p> <p>SPECIFIED MANUFACTURER ... Marshal Tufflex Ltd.....</p> <p>PARTNERSHIP.....</p> <p>PROPOSED MANUFACTURER Electrical Ways Factory Co.</p> <p>BRIEF PRODUCT DESCRIPTION..... Floor Box for Power & Data Outlet.....</p> <p>REASON FOR PROPOSED ALTERNATIVE OR SUBSTITUTION</p> <p>..... Availability / Compatibility.....</p> <p>COST AND TIME SAVINGS</p> <table style="width:100%; border: none;"> <tr> <td style="width: 15%;">COST</td> <td style="width: 10%;">NO</td> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 10%;">YES</td> <td style="width: 10%;"><input type="checkbox"/></td> <td style="width: 45%;">AMOUNT (SAR) (DEDUCTION).....</td> </tr> <tr> <td>TIME</td> <td>NO</td> <td><input checked="" type="checkbox"/></td> <td>YES</td> <td><input type="checkbox"/></td> <td>DAYS</td> </tr> </table>				COST	NO	<input checked="" type="checkbox"/>	YES	<input type="checkbox"/>	AMOUNT (SAR) (DEDUCTION).....	TIME	NO	<input checked="" type="checkbox"/>	YES	<input type="checkbox"/>	DAYS
COST	NO	<input checked="" type="checkbox"/>	YES	<input type="checkbox"/>	AMOUNT (SAR) (DEDUCTION).....										
TIME	NO	<input checked="" type="checkbox"/>	YES	<input type="checkbox"/>	DAYS										
<p>THE CONTRACTOR CERTIFIES AND UNDERTAKES THAT:</p> <ul style="list-style-type: none"> ❖ Same warranty maintenance service and replacement parts will be furnished for proposed alternative as for specified product. ❖ Cost data as stated above is complete. Claims for additional costs or time related to accepted alternative or substitution which may subsequently become apparent are to be waived. Other costs to other disciplines and/or contractors shall be borne by the Contractor. ❖ Proposed alternative or substitution does not affect dimensions and functional clearances. ❖ The cost for all changes to design, including architectural or engineering design, detailing, and construction cost including authorities approvals, caused by the requested alternative or substitution shall be fully the responsibility of the contractor at no cost to the employer. ❖ THE CONTRACTOR FURTHER ACKNOWLEDGES THAT APPROVAL FOR ALTERNATIVE/SUBSTITUTION DOES NOT WAIVE HIS OBLIGATIONS TO THE EMPLOYER AS PER THE CONDITIONS OF CONTRACT 															
CONTRACTOR'S REP		DATE/TIME <u>05 DEC 15</u>													
RECEIVED BY CONSULTANT		DATE/TIME													
<p>REVIEW AND ACTION BY THE CONSULTANT & PM/CM</p> <p> <input type="checkbox"/> Approved <input type="checkbox"/> Not Approved <input checked="" type="checkbox"/> Approved as Noted <input type="checkbox"/> Incomplete Data/Resubmit </p> <p>CONSULTANT'S COMMENTS:</p> <p style="font-size: 1.2em; font-weight: bold;">PROPOSED ALTERNATIVE IS ACCEPTABLE PROVIDED THAT THE ATTACHED COMMENTS WILL BE COMPLIED.</p> <p>Resident Engineer</p> <p>DATE/TIME.....</p> <p>PM/CM'S COMMENTS:</p> <p>PM/CM.....</p> <p>DATE/TIME.....</p> <p>NOTE: THIS APPROVAL DOES NOT ENTAIL ANY ADDITIONAL COST OR TIME</p>															

ATTACHED TO 3095
CCE LETTER #

KING ABDULLAH FINANCIAL DISTRICT

SAMPLE TAG	
Contract No: C15B1	Work Package No: C15B1
Contractor: CCE	Engineer: Ashraf Saree
Date: 05-Dec-2015	

Material Submittal No. : MTS-DC2-EL-048 A	Rev. 00	Approval Code:	SAMPLE NO. MTS-DC2-EL-048 A REV.00
Title: Wiring Devices (Floor Box)			
SAMPLE DESCRIPTION Wiring Devices (Floor Box)			
SPECIFICATION REFERENCE :			
CONTRACTOR'S SIGNATURE			

APPROVED
 APPROVED AS NOTED
 NOT APPROVED

SUPERVISION ENGINEER	(Date)	PM / CM	(Date)
<i>[Signature]</i>	6/12/15		

Document No: PP-CC-12-FM Rev.1

ATTACHED TO
CCE LETTER # 3095

KING ABDULLAH FINANCIAL DISTRICT

DOCUMENT-REVIEW FORM	
Contract No: B.24	Work Package No: C15B1

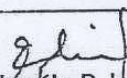
Submittal Ref. No: MTS-DC2-EL-048A	Rev. No.: 00	DR No.: 48A
Submittal Date: 05 December, 2015		DR Date: 06 December, 2015
Submittal Title: Wiring Devices (Floor Box)		

Review/Comments:

1. Since this is an alternative submittal, compliance statement shall be provided.
2. Floor box shall be with compartment to separate power cables into communication cables.
3. Floor box in areas using trunking as raceways shall be with opening and fixing that will match to the trunking connection.
4. Submitted floor box sample is applicable for used in areas with tile and carpet finish which is not more than 10mm in thickness. Not applicable for granite floor which is more than 10mm thickness.
5. Face plate shall be provided with proper opening that will fit totally with the wiring devices and shall be with rigid fixing accessories to hold the device.
6. Shall be provided with installation drawing for the installation in raise floor and in area without raise floor which is directly installed on screed.

Result of Review:

Proposed alternative manufacturer is acceptable provided that the above comments shall be complied.

Signature:  Edgardo P. Logdonio Senior Electrical Engr. / ZFP	Date: 06 December, 2015
--	-------------------------

Document No: PP-CC-17-FM Rev.1

**ATTACHED TO 3095
GCE LETTER #**



KING ABDULLAH FINANCIAL DISTRICT

MATERIAL SUBMITTAL FORM

Contract No.: 113B22	Work Package: C15B1
Title: Cable Tray, Ladder, Trunking & Channel	Submittal No: MTS-DC2-EL-045 A Rev.: 02
To: Zuhair Fayez Partnership	Submittal Package: Documents + Sample
From: Contracting & Construction Ent. Ltd.	Date: 16-May-15 No. of Copies: 3 Sets
Attn.: Engr. Ashraf Saree	Submitted for: <input checked="" type="checkbox"/> Approval <input type="checkbox"/> Information <input type="checkbox"/> Coordination

MATERIAL DESCRIPTION

Material Status: Specified Alternative Drawing Ref.: **E-200, E-400, E-500 & E-600 Series**
 Discipline: **Electrical** Specification: **16050**
 Parcel No.: **6.40 & 6.41** Building: **DC 1 & 2** BOQ Ref. No.: **Bill No. 01, Div. 16**
 Enclosures: Production Verification Catalogue Sample Comparison Sheet List of Suppliers Other:

MANUFACTURER / SUPPLIER

Company Name: **Electrical Ways Factory** Local Agent: **Electrical Ways Factory**
 Address: **P.O. Box 40048 Riyadh 11499, KSA**
Tel: 4124052 / Fax: 4120803

DELIVERY

Country of Origin: **KSA** Availability: Locally Available Imported
 Delivery Program-
 Ex-Work Total Duration : Latest Date of Order :
 Date Material Required on Site : Estimated Date for Arrival on Site :

Kindly find attached 3 sets of Technical Data Sheets + Sample from of (MTS-DC2-EL-045 A (Rev. 02) Cable Tray, Ladder, Trunking & Channel submitted by SBM, (M) M/s. Electrical Ways Factory, (S) E/W.s. Electrical Ways Factory for your reference, record, kind review and approval.

We certify that the above submitted items have been reviewed in detail and are correct and in strict conformity with the contract drawings and specifications except otherwise stated; also that the material sources indicated above have been reviewed and that they will supply the submitted items in full conformity with timely delivery

For the Contractor-
 Name: **Engr. Georges Nasr** Signature: Date: **16-May-15**
 Projects Director

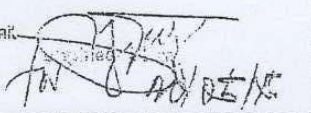


ENGINEER'S COMMENTS

DOCUMENT IS ACCEPTABLE, REFER TO THE ATTACHED SHEET FOR

Name: **E.P. LOGDONIC** Signature: Date: **20/5/15**

ACTION CODE
 A Approved B Approved As Noted C Revis - Resubmit
 Rejected - Resubmit E Receipt Acknowledged



OWNER'S REVIEW

Name: _____ Signature: _____ Date: _____

OWNER'S COMMENTS (Optional)

Name: _____ Signature: _____ Date: _____

Approval shall not relieve the Contractor of its obligations and liabilities under the Contract or constitute authorization of any change to Contract Documents, and therefore, shall not imply any recognition whatsoever of additional time or cost to the Contract.

Distribution				To Contractor:
Owner:	PM/CM:	Engineer:	Contractor:	Received For:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Date: 1/12/

KING ABDULLAH FINANCIAL DISTRICT

30 JAN 2016
RECEIVED

MATERIAL SUBMITTAL FORM

Contract No: C15B1	Work Package: C15B1
Title: Wiring Devices (Floor Box)	Submittal No: MTS-DC2-EL-048-A Rev.: 01
To: ZUHAIR FAYEZ PARTNERSHIP	Submittal Package: DOCUMENTS
From: CONTRACTING & CONSTRUCTION ENT. LTD	Date: 20-JAN-2016 No. of Copies: 04
Attn.: ENGR. Ashraf Saree	Submitted for: <input checked="" type="checkbox"/> Approval <input type="checkbox"/> Information <input type="checkbox"/> Coordination

1. MATERIAL DESCRIPTION

Material Status: Specified Alternative Drawing Ref.: Electrical Drawings
 Discipline: ELECTRICAL Specification: 16050-2.4
 Parcel No.: 6.40 & 6.41 Building: DATA CENTER 1 & 2 BOQ Ref. No.: BILL # 01, DIV. 16
 Enclosures: Production Verification Catalogue Sample Comparison Sheet List of Suppliers Other:

2. MANUFACTURER / SUPPLIER

Company: Electrical Ways Factory Local Agent: Electrical Ways Factory
 Address: KSA Address: KSA

3. DELIVERY

Country of Origin: KSA Availability: Locally Available Imported
 Delivery Program- Ex Work Total Duration : Latest Date of Order :
 Date Material Required on Site : Estimated Date for Arrival on Site :
 KAFD SITE
 Contracting & Construction Enterprises Ltd.

We certify that the above submitted items have been reviewed in detail and are correct and in strict conformity with the contract drawings and specifications except otherwise stated; also that the material sources indicated above have been reviewed and that they will supply the submitted items in full conformity with timely delivery

For the Contractor-
 Name: ENGR. GEORGES NASR
 PROJECT DIRECTOR Signature: _____ Date: 20 JAN 2016

ENGINEER'S COMMENTS

REFER IN THE ATTACHED SHEET.

Name: E. P. LOGDONIO Signature: _____ Date: 31/01/16

ACTION CODE

A Approved B Approved As Noted C Revise - Resubmit
 D Rejected - Resubmit E Receipt Acknowledged

BY ADDITIONAL REVIEW

Name: _____ Signature: _____ Date: _____

OWNER'S DOCUMENTS/REVISIONS

Name: _____ Signature: _____ Date: _____

Approval shall not relieve the Contractor of its obligations and liabilities under the Contract or constitute authorization of any change to Contract Documents, and therefore, shall not imply any recognition whatsoever of additional time or cost to the Contract.

Distribution				To Contractor
Owner	PM/CM	Engineer	Contractor	Received For:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Date: / / 20

31 JAN 2016
CCL

KING ABDULLAH FINANCIAL DISTRICT

REQUEST FOR ALTERNATIVE OR SUBSTITUTION (RAM)

Contract No: C15B1 Work Package No: C15B1
To: ZUHAIR FAYEZ PARTNERSHIP Attn: ENGR. Ashraf Saree Contractor: CCE
RAM No: 12 Rev: 01 Date: 20-JAN-2016

This Submittal will not be reviewed unless the Contractor complies with the minimum submittal requirements of Comparison sheets, product data, cost comparison etc.

PROPOSED ALTERNATIVE OR SUBSTITUTION:
 PRODUCT METHOD OF FABRICATION METHOD OF INSTALLATION
SPECIFIED PRODUCT..... Marshal - Tufflex.....
PROPOSED PRODUCT..... Electrical Ways.....
SPEC. SECTION No. 16050..... PAGE No. BILL 1..... ARTICLE NO. DIV. 16B.....
SPECIFIED MANUFACTURER Marshal Tufflex Ltd.....
& PARTNERSHIP.....
PROPOSED MANUFACTURER Electrical Ways Factory Co.....
BRIEF PRODUCT DESCRIPTION..... Floor Box for Power & Data Outlet.....
REASON FOR PROPOSED ALTERNATIVE OR SUBSTITUTION
..... Availability / Compatibility.....

COST AND TIME SAVINGS
COST NO YES AMOUNT (SAR) (DEDUCTION).....
TIME NO YES DAYS.....

- THE CONTRACTOR CERTIFIES AND UNDERTAKES THAT:**
- ❖ Same warranty maintenance service and replacement parts will be furnished for proposed alternative as for specified product.
 - ❖ Cost data as stated above is complete. Claims for additional costs or time related to accepted alternative or substitution which may subsequently become apparent are to be waived. Other costs to other disciplines and/or contractors shall be borne by the Contractor.
 - ❖ Proposed alternative or substitution does not affect dimensions and functional clearances.
 - ❖ The cost for all changes to design, including architectural or engineering design, detailing, and construction cost including authorities approvals, caused by the requested alternative or substitution shall be fully the responsibility of the contractor at no cost to the employer.
 - ❖ THE CONTRACTOR FURTHER ACKNOWLEDGES THAT APPROVAL FOR ALTERNATIVE/SUBSTITUTION DOES NOT WAIVE HIS OBLIGATIONS TO THE EMPLOYER AS PER THE CONDITIONS OF CONTRACT

CONTRACTOR'S REP  DATE/TIME 20 Jan 16
RECEIVED BY CONSULTANT DATE/TIME

REVIEW AND ACTION BY THE CONSULTANT & PM/CM
 Approved Not Approved Approved as Noted Incomplete Data/Resubmit

CONSULTANT'S COMMENTS:
PROPOSED ALTERNATIVE IS ACCEPTABLE PROVIDED THAT THE ATTACHED COMMENTS WILL BE COMPLIED.

Resident Engineer  DATE/TIME.....
PM/CM'S COMMENTS
PM/CM..... DATE/TIME.....

NOTE: THIS APPROVAL DOES NOT ENTAIL ANY ADDITIONAL COST OR TIME

KING ABDULLAH FINANCIAL DISTRICT

DOCUMENT REVIEW FORM

Contract No: B 24

Work Package No: C15B1

Submittal Ref. No: MTS-DC2-EL-048-A

Rev. No.: 01

DR No.: 48-A

Submittal Date: 20 January, 2016

DR Date: 31 January, 2016

Submittal Title: Wiring Devices (Floor Box)


Review/Comments:

1. Since this is an alternative submittal, compliance statement shall be provided.
2. Fixing of hinged cover to the enclosure box is not rigid.
3. Floor box in areas using trunking as raceways shall be with opening and fixing that will match to the trunking connection.
4. Submitted floor box sample is applicable for used in areas with tile and carpet finish which is not more than 10mm in thickness. Not applicable for tile and granite floors which is more than 10mm thickness.
5. Face plate shall be provided with proper opening that will fit totally with the wiring devices and shall be with rigid fixing accessories to hold the device.
6. Shall be provided with installation drawing for the installation in raise floor and in area without raise floor which is directly installed on screed.




Result of Review:

Proposed alternative manufacturer is acceptable provided that the above comments shall be complied. No acceptance of the delivery if the above comments will not complied.

Signature:


 Edgardo P. Logdonio
 Senior Electrical Engr. / ZFP

Date: 31 January, 2016

		
CLIENT	DESIGNER	Juffali A/c, Mech. & Elec. Co. (JAMED)
		MEP CONTRACTOR

MAAD TOWERS PROJECT - MAKKAH

MATERIAL SUBMITTAL

<input checked="" type="checkbox"/> NEW SUBMITTAL	SUBMITTAL NO: EE-M-09A	PREVIOUS SUBMITTAL NO. :
<input type="checkbox"/> RE - SUBMITTAL	SUBMITTAL DATE: 08-DEC-2015	PREVIOUS SUBMITTAL DATE:
PURPOSE OF SUBMITTAL	<input type="checkbox"/> FOR INFORMATION	<input type="checkbox"/> FOR COMMENTS
	<input checked="" type="checkbox"/> FOR APPROVAL	

DISCIPLINE **ELECTRICAL** HVAC PLUMBING ELECTRICAL OTHER

ATTACHMENT CATALOGUE DRAWING CERTIFICATE SAMPLE TECH. DATA CALCULATIONS OTHER

MATERIAL / EQUIPMENT NOTE : PLEASE USE THE ATTACHMENT IN CASE ITEMS ARE MORE THAN THE PROVIDED SPACE

Item	Material Description	Manufacturer / Supplier	Approval status
1	CABLE TRAYS	ELECTRICAL WAYS	

Remarks:	MEP CONTRACTOR	
	NAME: George El Khoury	NAME: Moujir Al Najami
	POSITION: Electrical Project Manager	POSITION: Construction Manager
	SIGNATURE: 	SIGNATURE: 


Designer's Recommendation:
REFER TO ENCLOSED COMMENTS ON RELATED MATERIAL SUBMITTED

Client's Recommendation:


APPROVAL STATUS:

(A) APPROVED AS SUBMITTED (B) APPROVED WITH COMMENTS

(C) REVISE AND RESUBMIT (D) DISAPPROVED, SEE COMMENTS

DESIGNER (CONSULT)		CLIENT REPRESENTATIVE			
NAME: SALAM ABOU NADER		NAME:			
POSITION: HEAD OF MEP DEPT		POSITION:			
SIGNATURES: 		SIGNATURES:			
DATE: DECEMBER 23, 2015		DATE:			

- The submitted certifications are related to the Quality Management, Environment, Occupancy Health & Safety Management, while the essential is the certificates of an International third party regarding the compliance with IEC or UL or BS standards.
- Accessories are to be of the same material of and to be marked up in catalog
- Bolts and Screws are to be Cadmium plated or electrolytically galvanized
- Load bearing Calculations for different cable trays supporting configurations shall be submitted.
- Proper accessories are to be provided to ensure that the deflection between supports is not exceeding 1/350 under full loading capacity.

MEP CONSULTANT			
 CONSULT <i>Consultancy & Engineering Services</i>			
PROJECT REFERENCE	REVIEWER	DATE	
---	---	---	
CODE A- APPROVED	<input type="checkbox"/>	CODE D- REJECTED	<input type="checkbox"/>
CODE B- APPROVED AS NOTED	<input checked="" type="checkbox"/>	CODE E- REVIEW NOT REQUIRED	<input type="checkbox"/>
CODE C- REVISE AND RESUBMIT	<input type="checkbox"/>		
<small>REVIEW IS FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT AND CONTRACT DOCUMENT. THIS OFFICE ASSUMES NO RESPONSIBILITY FOR THE ACCURACY AND COMPLETENESS OF THE SUBMITTAL. THIS REVIEW DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ANY DEVIATION FROM THE CONTRACT DOCUMENTS. IF THIS SUBMITTAL DOES NOT CONFORM TO CONSULT CONSTRUCTION DOCUMENTS, SUBMIT A WRITTEN EXPLANATION OF THE VARIANCE.</small>			

National Medical Care Co.

رعاية صادقة

الشركة الوطنية للرعاية الطبية

شركة مساهمة رأس المال ٣٠١١٠٠٠٠٠٠٠٠ ريال

٢٠١٠/٣٤٨ م ش	رقم
١٤٣٢/٠٣/١٢ هـ	تاريخ
٢٠١١/٠٢/١٥ م	التوقيع



المحترم

المكرم م. هلال محمد احمد

مدير مشروع المستشفى الوطني بالرياض - شركة ظروف

صورة مع التحية لمدير المشروع - خطيب وعلمي (م. كاشف)
 صورة مع التحية إلى م. مجدي - خطيب وعلمي .

الموضوع: أمر توقيف اعمال التوريد من شركة الامل للوحات الكهربائية.

السلام عليكم ورحمة الله وبركاته :

بناء على التقصير المتراكم من المورد المعتمد لتصنيع وتوريد الحوامل الكهربائية (شركة الامل للوحات الكهربائية) والمعتمدة سابقاً لمشروع المستشفى الوطني بالرياض ، فإنه وحفاظاً على مصلحة العمل في المشروع وعدم استجابته بالشكل المطلوب لأعمال التوريد ونقص عدد كبير من الاكسسوارات اللازمة للبدء في اعمال التركيب مما تسبب في تعطيل أعمال الكهرباء وتمديد الكوابل الكهربائية .

لذا نفيديكم بامرنا المتضمن ما يلي :

أولاً : الغاء التعميد السابق لشركة الامل للوحات الكهربائية لاعمال تصنيع وتوريد الحوامل الكهربائية نهائياً للمشروع من تاريخه ، ولن يتم السماح لهم بالتوريد.

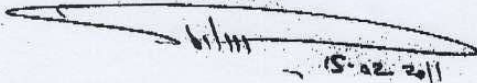
ثانياً : تعميم مصنع طرق الكهرباء لتصنيع حوامل الكابلات المعدنية ومستلزماتها من تاريخه والمرفق لكم ملف التاهيل الخاص بهم .

ثالثاً : ضرورة تزويدنا بنسخة من العقد لمقاول الباطن الجديد حسب ما ورد بالعقد في يوم اقصاه يوم الاربعاء ٢٠١١/٠٣/١٦ م .

لذا نامل منكم تنفيذ ذلك وتزويدنا حسبما ورد اعلاه .

وتقبلوا وافر التحية والتقدير ،،،

مدير إدارة المشاريع بالشركة



م. سليمان بن فهد الوهبي

cc / Elect. Dep.
with attach

ORC

PROJECT MANAGER (NATIONAL HOSPITAL)  المستشفى الوطني	CLIENT (NATIONAL HOSPITAL)  المستشفى الوطني	CONTRACTOR (CONSTRUCTION & PLANNING CO. LTD.)  شركة الإعمار و التنسيق المحدودة Construction & Planning Co. Ltd. (C&P)
--	---	--

SUBMITTAL INFORMATION SHEET

Submittal No.: <u>14</u>	Date of Submittal: <u>14-12-2015</u>
Manufacturer: <u>ELECTRICAL WAY</u>	Item Description: <u>Cable tray</u>
Supplier: <u>ELECTRICAL WAY</u>	Location: <u>All floors</u>
Specifications Details: <u>ALL YYPE OF CABLE TRY AND SUPPRT SYSTEM</u>	Building: <u>B1</u>
BOQ Detail: <u>1605</u>	Page No. <u>3</u> Item
	No.32-39

Brand Name: <u>ELEECTRICAL WAY</u>	Items Submitted:
Model No.: _____	<input type="checkbox"/> Certificates
Capacity: _____	<input type="checkbox"/> Specifications
Elect./Mech. Characteristic: _____	<input type="checkbox"/> Manufacture Data
General Information: _____	<input type="checkbox"/> Drawings
_____	<input type="checkbox"/> Inst. Procedure
_____	<input type="checkbox"/> Samples
_____	<input type="checkbox"/> Catalog Cuts

Engineer's Comments:
1-Sample required. 2- see attached comments
from one to 10

Approved
 Approved with conditions
 Disapproved



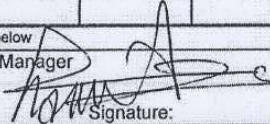
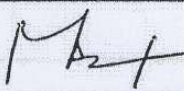

Mechanical _____
 Electrical 15/12/15
 Civil _____
 Architectural _____
 Engineer's Code _____

Contractor Signature: _____
 R.E. Signature: [Signature]
 Date: 14-12-2015
 Date: 15-12-15

(C&P) شركة الإعمار و التنسيق المحدودة
 Construction & Planning Co. Ltd.
 P.O. Box 1000, National
 Stamp: 14312015 2015 15 (245)

Stamp

 المستشفى الوطني

	OWNER King Fahd University of Petroleum & Minerals PROJECTS DEPARTMENT P.O. BOX: 5019 DHAHRAN - 31261 TEL : 860 4500 FAX 860 3788	PRP-04/FM04, REV: 0, 1/2010	CONTRACTOR  Manazel Construction Manazel Construction			
PROJECT No. 123		LOCATION: DHAHRAN				
PROJECT NAME: Bachelor Housing (Phase 2) / Masjid Al-Rabee / Dhahran Mosque Extension						
MATERIAL SUBMITTAL						
<input checked="" type="checkbox"/> New Submittal	Submittal No.	P-123-PE-119	Previous Submittal No.			
<input type="checkbox"/> Resubmittal	Submittal Date	Dec 23, 2013	Previous Submittal Date:			
PURPOSE OF SUBMITTAL <input type="checkbox"/> For information <input type="checkbox"/> For Comments <input checked="" type="checkbox"/> For Approval						
DISCIPLINE <input type="checkbox"/> CIVIL <input type="checkbox"/> ARCHITECTURAL <input type="checkbox"/> HVAC <input type="checkbox"/> PLUMBING/MECHANICAL <input checked="" type="checkbox"/> ELECTRICAL						
TYPE OF DRAWING <input type="checkbox"/> SHOP DRAWING <input type="checkbox"/> AS BUILT DRAWING <input type="checkbox"/> VENDOR DRAWING <input checked="" type="checkbox"/> Document submittal						
MATERIAL/EQUIPMENT Note: Please use the attachment in case items are more than the provided space						
Sr.No.	Name, No. and Description	Origin	Manufacturer/Supplier	Specification Reference	Standard	Approval Status
1	Cable tray and accessories with sample		Al Misbah Fabricator	Div 16 Sec 9		C
2	Cable tray and accessories with sample		Electrical ways factory	Div 16 Sec 9		B
3	Cable tray and accessories with sample		Isam Kabanni	Div 16 Sec 9		D
Contractor's Remarks: We clarify that above submittal is strictly adhered with contract specifications except otherwise as stated below						
Exceptions		Note:		Project Manager  Date: _____ Signature: _____		
Projects Department Comments			Approval of the above does not relieve the contractor from his contractual obligations			
* PROCEED THE CABLE TRAY OR CABLE TRAY SHALL BE THE SIZE OF OR ACCORDING TO THE SIZE OF CABLES AND WIRING * CABLE TRAY SHOULD BE HOT DIPPED GALVANIZED AN COVERED TO THE RAIN COVER AND BOUNDED TOGETHER TO THE GROUNDING SYSTEM			Office/Dep't Comments		Date In:	
			* MANAZEL مشروع التوسعة مسجد الراعي بامانة الملك فهد للبتترول والغاز 111667051/ت.س		Date Out:	
PROJECT SUPERVISOR			DIRECTOR GENERAL, PROJECTS			
Signature: 			Date: 28 (12) 2013		Signature: 	
APPROVAL STATUS			APPROVAL STATUS			
<input checked="" type="checkbox"/> [B] Approved as noted Resubmittal is not required			<input checked="" type="checkbox"/> [C] Approved as noted, Resubmittal is required <input checked="" type="checkbox"/> [D] Disapproved			
<input type="checkbox"/> [A] Approved			<input type="checkbox"/> [E] No Action			
REF. IN	Signature	Date	REF. OUT	Signature	Date	

* MINIMUM THICKNESS OF THE CABLE TRAYS SHALL BE 1.5MM FOR CABLE TRAY WITH UP TO 30CM AND 2MM FOR LARGE SIZE AND FLANGE SHOULD BE INSIDE RETURN.
 * FITTINGS DON'T MAKE ON SITE.
 * FOR SN # 1 : CABLE LADDER SHOULD BE INCLUDED IN THE SAMPLE AND EARTH CONTINUITY CONNECTION SHOULD BE MADE OF COPPER.
 * FOR SN # 2 : SAMPLE FOR ACCESSORIES SHOULD BE INCLUDED.

QUALITY CERTIFICATE

Saudi Basic Industries Corporation (SABIC)
P.O.Box 5101 Riyadh 11422
Kingdom of Saudi Arabia

سبائك

شركة الحديد
شركة السعودية للصناعات الأساسية (سابك)
ص.ب 5101 الرياض 11422
المملكة العربية السعودية

Customer Name and Address

AL-RAJHI FACT. FOR STEEL INDUSTRIES
P.O.BOX 40707
JAYESH II
11511 RIYADH
TEL # 01-4985555

Shipping Address

AL-RAJHI FACT. FOR STEEL INDUSTRIES
P.O.BOX
AL Kharij Street, Exit 8
11511 AL Kharij
TEL # 01-4982227

Customer No.

R002374014

Sales Order/Item No.

18021411
113285280

Customer P.O. No.

MRW-COI-1974

Date of Issue

15/10/14

Delivery note No.

85875610

Product details
Thickness(mm) 1.50

HRC 1.50

Standard Width(mm) 285

JIS G3131: 1996 1219

Coating Spec.

Steel Grade SPHC

Product Length(mm)

Others

Material ID	Item ID	Pieces	Net Wt.(MT)	YS Minmm2	UTS Minmm2	EL%	QL (mm)MT	Bend Test	Hardness	ECV	Zinc Coat g/m2	Rat(Min)	Impact (J)
2114420280	1416950	570	11	285	382	46	U50	OK	-	-	-	-	-
2114420282	1416954	371	10.99	283	381	44	U50	OK	-	-	-	-	-

Item ID	C	Mn	S	P	SI	Al	N	Nb	V	TI	Ca	Cr	Co	Mo	Sr	NI	CEV	Temp	B
1416950	0.05	0.24	0.005	0.016	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-
1416954	0.05	0.22	0.005	0.021	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-

Chem. Composition %

Physical Properties

Impact Test Temperature C
Read Test is according to standard
Drop Weight Test
Hardness Unit

TEST CERTIFICATE AS PER EN10204/3.1B

شركة الحديد الأساسية



ISO 9001:2008
111297CC9-2012-AE-ANAB
System Certified ISO
14001:2004 EN6 Certification
No.11297CC9-2012-AE-ANAB

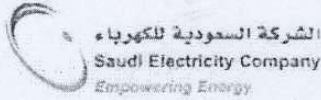


9801:2008
Quality Management System
Certified to ISO 5001:2008 by
Cert Reg No 44108 130526

This certificate is generated electronically, stamp and signature are not required

16/10/14

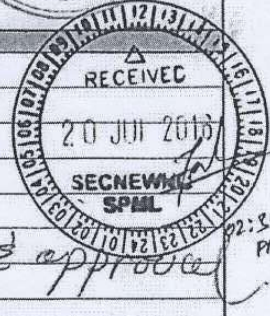
Omranianwiljac



SEC NEW HEADQUARTERS BUILDING
COMPLEX, RIYADH

498 MATERIAL SUBMITTAL

Ref. No. :	MS EL LV TW/PM 044 R0	Date :	1 8 0 6 2 0 1 6	<input checked="" type="checkbox"/> New Submittal <input type="checkbox"/> Resubmittal								
<input type="checkbox"/> Architectural <input type="checkbox"/> Structural	<input checked="" type="checkbox"/> Electrical <input type="checkbox"/> Mechanical	<input type="checkbox"/> Civil <input type="checkbox"/> Interior Design	<input type="checkbox"/> Furniture/Equipment <input type="checkbox"/> Others	Specs. No. 22-13-19 Drwg. No.								
Description*	Manufacturer	Supplier	No. of Catalogue/Sample	Code								
CABLE TRAY / CABLE LADDER / TRUNK	ELECTRICAL WAYS	ELECTRICAL WAYS	3 CATALOGUES 2 CD'S WITH ? SAMPLES	'B'								
* Description: (Manufacture, Model, Type, Size, Colour, etc.)												
<input checked="" type="checkbox"/> Catalogue <input type="checkbox"/> Drawing <input checked="" type="checkbox"/> Sample <input type="checkbox"/> Certificate <input type="checkbox"/> Calculation <input type="checkbox"/> Document												
Having checked this submittal, we certify that it conforms to the requirements of the Contract Documents in all respects, except as otherwise indicated herein (
Name & Signature :		Name & Signature :		Name & Signature :								
Design Manager		QA/QC Manager		Project Director								
Received by:												
Date		Name & Signature of Consultant										
Consultant's Comments												
REFER TO COMMENTS ON THE ATTACHED SHEET.												
* Provided us with sample for review & approval												
<table border="0"> <tr> <td>Status</td> <td>A Approved</td> <td>C Revise & Resubmit, Work shall not proceed</td> <td>N No Action</td> </tr> <tr> <td></td> <td><input checked="" type="radio"/> B Approved as noted</td> <td>D Rejected - Resubmit</td> <td></td> </tr> </table>					Status	A Approved	C Revise & Resubmit, Work shall not proceed	N No Action		<input checked="" type="radio"/> B Approved as noted	D Rejected - Resubmit	
Status	A Approved	C Revise & Resubmit, Work shall not proceed	N No Action									
	<input checked="" type="radio"/> B Approved as noted	D Rejected - Resubmit										
Consultant Site Office			Consultant Head Office									
Engineer:		Project Manager:										
28/06/16		28/06/16										
Date Name & Signature		Date Name & Signature										
Date Name & Signature		Date Name & Signature		Date Name & Signature								
19/07/2016		20/07/16		20/07/16								
Date Name & Signature		Date Name & Signature		Date Name & Signature								






Project: SEC NEW HEADQUARTERS PROJECT, RIYADH
Material Submittal: Cable Tray/ Cable Ladder/ Trunk
Manufacturer: Electrical Ways
Supplier: Electrical Ways
Submittal Ref. No.: MS-EL-LV-TW/PM-044-R0
Date sub.: 20-06-2016
Division: Electrical
Approval Code: 'B'

REVIEW COMMENTS:

1. Cable Trunk System size/dimensions shall have a minimum size of 100x100mm and a minimum height of 100mm for other widths; and Cable Tray/Cable Ladder shall have a minimum of 300 mm Width x 100 mm Height; all trays shall have approved cover/lid.
2. Two, Three, and four Compartmentalized of cable trunk is acceptable for use in multi-cable system installation for Low Current Systems where different system shall be separated; provide percent (%) fill calculation for review.
3. Materials shall be according to approved samples.
4. As per Project specifications only those cable trays and accessories will be acceptable which have thickness not less than:
 - a. 1.5 mm up to 305 mm width.
 - b. 2.0 mm above 305 mm and up to 900 mm width.
5. As per Project specifications only those cable ladders and accessories will be acceptable which have thickness not less than 2.0 mm.
6. Contractor shall assure that sizing of cable trays shall allow 30% spare capacity for future cables.
7. Cable cleats are subject to approved cable manufacturer recommendations.


O&A EE

CH2M.

Consultant 		Client 		Contractor 																													
PROJECT No. J/1420113		PROJECT NAME : WTP FOR 2nd. INDUSTRIAL CITY		LOCATION : DMN2																													
PROJECT NAME : MATERIAL / EQUIPMENT SUBMITTAL		Submittal No. Sub-E-027 Rev.0.		PAGE 01 of 01																													
Proj Ref. No. : J/1420113		Date : 13/12/2015		تقديم مواد / تجهيزات																													
DATE : 13/12/2015		<input type="checkbox"/> New Submittal		<input type="checkbox"/> Re-Submittal																													
PURPOSE OF SUBMITTAL : <input type="checkbox"/> For Information <input type="checkbox"/> For Comments <input checked="" type="checkbox"/> For Approval																																	
DISCIPLINE: <input type="checkbox"/> CIVIL <input type="checkbox"/> ARCHITECTURAL <input type="checkbox"/> STRUCTURAL <input type="checkbox"/> MECHANICAL <input type="checkbox"/> PLUMBING <input checked="" type="checkbox"/> ELECTRICAL <input type="checkbox"/> MEDICAL EQUIP.																																	
ENCLOSURES (مرفقات)																																	
DRAWINGS		<input type="checkbox"/> SAMPLE <input type="checkbox"/> SKETCH <input type="checkbox"/> CALCULATIONS <input type="checkbox"/> REFERENCES <input type="checkbox"/> REPORT <input type="checkbox"/> CLARIFICATIONS <input type="checkbox"/> OTHERS		مخططات																													
MATERIAL SUBMITTAL		<input type="checkbox"/> SKETCH <input checked="" type="checkbox"/> REFERENCES <input type="checkbox"/> REPORT <input type="checkbox"/> CLARIFICATIONS <input type="checkbox"/> OTHERS		مواد																													
CATALOGS		<input checked="" type="checkbox"/> REFERENCES <input type="checkbox"/> REPORT <input type="checkbox"/> CLARIFICATIONS <input type="checkbox"/> OTHERS		كتالوج																													
MFG. CERT.		<input checked="" type="checkbox"/> REFERENCES <input type="checkbox"/> REPORT <input type="checkbox"/> CLARIFICATIONS <input type="checkbox"/> OTHERS		شهادات																													
SPECIFICATIONS		<input checked="" type="checkbox"/> REFERENCES <input type="checkbox"/> REPORT <input type="checkbox"/> CLARIFICATIONS <input type="checkbox"/> OTHERS		مواصفات																													
<table border="1"> <thead> <tr> <th>رقم البند ITEM #</th> <th>DRWG. NO. SPECS. NO.</th> <th>رقم المخطط رقم المواصفة</th> <th>رقم المراجعة REV.</th> <th>الوصف DESCRIPTION</th> <th>عدد النسخ NO. OF COPIES</th> <th>رمز القرار ACT. CODE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>ATTACHED</td> <td></td> <td>0</td> <td>CABLE TRAYS & LADDERS, SUPPORTS CHANNEL WITH ACCESSORIES.</td> <td>2</td> <td style="text-align: center;">B</td> </tr> <tr> <td colspan="4"></td> <td>SUPPLIER & MANUFACTURER: ELECTRICAL WAYS TRAD., KSA</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>ATTACHED</td> <td></td> <td>0</td> <td>CERTIFICATES</td> <td>2</td> <td></td> </tr> </tbody> </table>						رقم البند ITEM #	DRWG. NO. SPECS. NO.	رقم المخطط رقم المواصفة	رقم المراجعة REV.	الوصف DESCRIPTION	عدد النسخ NO. OF COPIES	رمز القرار ACT. CODE	1	ATTACHED		0	CABLE TRAYS & LADDERS, SUPPORTS CHANNEL WITH ACCESSORIES.	2	B					SUPPLIER & MANUFACTURER: ELECTRICAL WAYS TRAD., KSA			2	ATTACHED		0	CERTIFICATES	2	
رقم البند ITEM #	DRWG. NO. SPECS. NO.	رقم المخطط رقم المواصفة	رقم المراجعة REV.	الوصف DESCRIPTION	عدد النسخ NO. OF COPIES	رمز القرار ACT. CODE																											
1	ATTACHED		0	CABLE TRAYS & LADDERS, SUPPORTS CHANNEL WITH ACCESSORIES.	2	B																											
				SUPPLIER & MANUFACTURER: ELECTRICAL WAYS TRAD., KSA																													
2	ATTACHED		0	CERTIFICATES	2																												
SPECIFICATION & BOQ:			LOCATION / USE:																														
SENDER (CONTRACTOR): Name: AL-KAWTHAR IND.CO. Signature & Date: 13-12-15		CO-ORDINATOR: Name: ENGR. HUSSEIN Signature & Date:		REVIEWED BY: Name: Signature & Date:																													
Consultant Review & Comments: "ELECTRICAL WAYS" ARE APPROVED FOR THE SUPPLY OF ALL TYPES OF CABLE TRAYS & LADDERS, SUPPORTS WITH ACCESSORIES. THIS APPROVAL DOES NOT RELIEVE KIC FROM ITS OBLIGATIONS.																																	
ACTION CODES: A) Approved (موافقة) B) Approved as noted (موافقة بملاحظات) C) Revise and resubmit (تعديل وإعادة التقديم) D) Rejected (مرفوض)																																	
Approval by (CH2M): * KIC TO NOTE THAT IF ANY DISCREPANCY OR DEFICIENCY FOUND DURING INSTALLATION CONTRACTOR WILL FULFILL CONTRACT REQUIREMENTS.																																	
CLIENT REP. APPROVAL "ممثل المالك" يعتمد من قبل			ختم الاعتماد																														
* CONTRACTOR SHALL PROVIDE MANUFACTURER'S HOT DIP GALVANIZING TEST CERTIFICATE REPORT.			* DIMENSIONS SHALL BE SUPPORTED ACCORDING TO MOUNTING TYPES RIGIDLY STRONG ENOUGH TO WITHSTAND CABLE LOADS.																														

* ALL MATERIALS SHALL BE AS PER SUBMITTED CATALOGUES & APPROVED DRAWINGS.

لجنة العينات

الإدارة العامة للمشروعات والصيانة

المشروع: (مشروع) /

التاريخ: ١٤٤١ / ٧ / ١٤ هـ

رقم: ٤٨٧٢ / ٥ / ١٠

اعتماد عينات

اسم المشروع: معهد التدريب المهني السليل

المادة المقدمة: حوامل للكابلات

اسم المورد/المصنع: مصنع طريق الكهرباء ومصنع نجوم الفريد

المكرمين / مكتب عنوان مهندسون واستشاريون

المحترمين

فاكس: ٤٦٥٨٧١٧

الرياض: ١١٦٩٢

ص.ب: ٨٩٥٥٢

بتاريخ ١٤٣١/٤/١٢ هـ

إشارة إلى خطابكم رقم (٢٣٣٦/ف/١٠)

بخصوص تقديمكم المواد أعلاه

تفيدكم بالتالي:


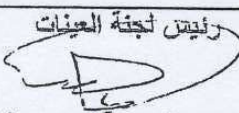

- ١- لا مانع من اعتماد حوامل الكابلات مبدئياً من كل من المصنعين المقدمين مع الالتزام بالتالي:
 - ١- تكون موديل (Return Flange Outside) من صفائح الصلب المجلفن المثقب وجميع مكونات النظام من مرابط وأكسسوارات وتفرعات وخلافه من نفس الشركة ومجلفنة على الساخن (H.D.G).
 - ٢- سمك المعدن لا يقل عن ٢ ملم، ويتم تثبيت الحوامل على مسافات منتظمة كل (١٥٠٠مم) والربط بينها بأسلاك تأريض.
 - ٣- استخدام (Curved) عند التفرعات، و (Reducer) عند تغير عرض المسار، و (Ladders) عند عمل التمديدات الرأسية مع تغطية المسار النازل والمسارات على سطح المبنى.
 - ٤- تثبيت الكابلات على مسار الحوامل بأحزمة تربيط كل ٢م، وقبل وبعد كل انحناء أو نزول أو تفرع، ويتم وضع (Blind End) في نهاية الخط، وعنونة الكابل بتوضيح مصدر تغذيته والحمل المغذي له على كل مسار.
 - ٥- الالتزام بالمواصفات وتعليمات المهندس المشرف، ويكون شعار المصنع محفور على الحوامل وتقديم عينات بذلك للاعتماد من كلا المصنعين، حيث لن يعتد بهذا الاعتماد ما لم يتم تقديم العينات.

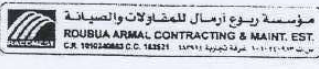


وتقبلوا تحياتي ،،،

٤٩

مساعد المدير العام للمشروعات والصيانة

عبد العزيز بن محمد العنقري

 استشاري مكتب عنوان مهندسون استشاريون		طلب اعتماد تقديم عينات Materials Submittal Approval Request	المالك المؤسسة العامة للتدريب التقني والمهني
المقاول شركة الدار الدولية للمقاولات والتنمية		رقم تقديم العينة : _____ رقم المواصفات : _____ رقم جدول الكميات : _____	
اسم المشروع :	المعهد المهني الصناعي - بالاسليل	رقم التقديم :	١٤٢٧ ٩ / ١٥ هـ
رقم البند :	بند (ع)	رقم البند :	بند (ع)
<input type="checkbox"/> معماري <input type="checkbox"/> انشائي <input checked="" type="checkbox"/> كهرباء <input type="checkbox"/> ميكانيكا <input type="checkbox"/> أخرى			
الوصف: حوامل الكابلات Cable Tray		المرفقات: <input checked="" type="checkbox"/> مواصفات تصنيع <input checked="" type="checkbox"/> كتالوجات <input type="checkbox"/> الضمان <input type="checkbox"/> شهادات <input type="checkbox"/> مخططات حسب الموقع <input type="checkbox"/> رسومات تنفيذية <input type="checkbox"/> أخرى <input checked="" type="checkbox"/> عينات	
توريد ٥- مصنع نجوم الفريد للضمان المعرضية ٥- مصنع طرفة الكهرباء		المصنع : ٥- مصنع نجوم الفريد للضمان المعرضية ملاحظات المقاول :	
المورد : شركة طرفة السمار للتجارة والمقاولات		مدير المشروع : _____	
راجعها : _____ ملاحظات الاستشاري :		مدير المشروع : _____	
قرار المؤسسة : _____ <input type="checkbox"/> موافق		راجعها : _____ <input checked="" type="checkbox"/> موافق بملاحظات اجبت الزلم باي غاي الرنف <input type="checkbox"/> غير موافق	
رئيس لجنة العينات  م / عبد العزيز بن محمد العنقري		أمين لجنة العينات  م / خالد بن عبد الله المسلميمان	

المقاول		الاستشاري المشرف		المالك		
						
مؤسسة ربوع أرمال للمقاولات والصيانة		شركة سوكوتيك السعودية		شركة حمد بن سعيدان وأولاده للتطوير العقاري		
مشروع : تنفيذ أعمال الألكتروميكا في مول السعيدان بحي النفل						
تقديم لاعتماد مواد , عينات , شهادات مطابقة						
رقم التقديم: 09		التاريخ : 2015-08-10		تقديم جديد : 2015-08-10		
رقم التقديم السابق: 08		تاريخ التقديم السابق: 2015-08-10		إعادة التقديم :		
إلى : الاستشاري المشرف (شركة سوكوتيك السعودية) من : مقاول المشروع : (مؤسسة ربوع أرمال للمقاولات والصيانة)						
برجاء مراجعة واعتماد الآتي .:						
بيانات التقديم (تعبأ بواسطة المقاول)						
CIVIL مدني		ARCH. معماري	ELEC. كهرباء	MECH. ميكانيكا	H.SCAPE تنسيق موقع	OTHERS
رقم الموصفة	عدد الختلوج	عدد العبئة	مواصفات المادة المقدمة		مواصفات البند	رقم البند
16110	2	1	ELECTRICAL WAYS FACTORY		CABLE TRAY SYSTEM	1
16110	2	1	ALFAREED STARS FACTORY		CABLE TRAY SYSTEM	2
<p>تعهد : ما تم تقديمه أعلاه صحيح , وتمت مراجعته ومطابق لوثائق العقد (الكميات والمخططات والمواصفات الخ) إلا إذا أشير إلى خلاف ذلك .</p> <p>المقاول (مدير المشروع) :</p> <p>التوقيع :</p> <p>10-8-2015</p>						
<p>ملاحظات : يعتبر Code B التوصية بالالتزام بطواحينه (الغرفة أرقام (16110))</p> <p>تمت</p>						
إجراء المهندس المشرف						
ترفض المادة ويعاد تقديم أخرى للأسباب الآتية:		تعاد المادة المقدمة لاستيفاء ما يلي :		ترفع المادة المقدمة للاعتماد مع التوصية بما يلي :		
				<p>يعتبر Code B التوصية بالالتزام بصناعاته ولتقديمه</p>		
				<p>المهندس المراجع :</p> <p>الوظيفة :</p> <p>التوقيع :</p> <p>التاريخ : 2015/11/11</p>		
* ملحوظة : الموافقة على الاعتماد لا تعفي المقاول من التزاماته التعاقدية .						



مصنع طرق الكهرباء	معمد	دكت كابلات حديد مجلفن	٨
-------------------	------	-----------------------	---

() صناعة غير وطنية . (✓) صناعة وطنية .

(✓) وجدت العينة مطابقة للمواصفات وقد تم اعتمادها والتوقيع عليها .

() رفضت العينة للأسباب التالية :

-
-

(✓) تم اعتماد العينة من قبل لجنة ضبط الجودة على أن يتم التوريد والتركيب في الموقع تحت مسؤولية المهندس المشرف على المشروع .

مدير ضبط الجودة
أ / عصام إبراهيم مخيزن

مهندس كهرباء ضبط الجودة
م / رضوان حسن



المهندس المشرف

م / محمد السالم موسى
م / عادل أحمد محمد

مدير شؤون المباني
م / علي إبراهيم معطي

مدير الإشراف والتنفيذ
م / ماجد محمد معدي



 <p>KINGDOM OF SAUDI ARABIA MINISTRY OF DEFENSE MEDICAL SERVICES DIRECTORATE ENGINEERING WORKS DEPARTMENT PROJECT SECTION</p>		<p>PROJECT NO: PROJECT NAME: SUBMITTAL NO.:</p>		<p>TO: CONTRACTOR  UNITED BUSINESS GROUP FOR CONTRACTING P.O. Box 22077, Jeddah 21511, Saudi Arabia CONTRACT NO. 1ST</p>	
<p>DRAWING / MATERIAL TITLE</p>		<p>ENGINEERING REVIEW COMMENTS</p>			
<p>1 APPROVAL FOR CABLE TRAY SYSTEM (Prequalification and Catalog) Manufacturer/ Supplier: Electrical Way Factory</p>	<p>COMMENTS 17-5-16 Engr. Rizalyn V. Lucero</p>				
<p>2 Al Misbah House for Steel Works Co.</p>	<p>ELECTRICAL: 1. Cable tray & accessories by Electrical Ways Factory & Al Misbah House for Steel Works to ASTM A123 are approved for the project. 2. Use heavy duty cable trays with formed edge type. The same shall be hot-dip galvanized steel after fabrication. 3. Provide brass nuts, bolts & washers across each joint for earthing connections. All joints shall be effectively bonded together. 4. Use the standard bend & accessories whenever changing in directions. 5. All cable trays, fittings & accessories shall be similar of sheet metal and finish. Accessories fabricated on site shall not be acceptable. 6. Cable tray size/depth can accommodate the cable sizes in feeder schedule plus 25% future used. 7. Use single manufacturer for the entire project.</p> <p>"B" "B"</p>				
<p>LEAD ENGINEER Engr. Akmed Rizk</p>		<p>HOU PROJECT COORDINATION Engr. Afaq Mohd. Khan</p>		<p>PROJECT OFFICER / ENGINEER Capt. Engr. Hamad Saleh Al Robian</p>	
<p>HOU TECHNICAL REVIEW Arc. Nisar Dastgir</p>		<p>MECHANICAL: No comment.</p>		<p>HEAD OF SUBMITTAL & APPROVAL SECTION Engr. Mashat Saad Al-Hemeed</p>	
<p>Signature & Date</p>		<p>Signature & Date 22/05/16</p>		<p>Signature & Date 22/5/16</p>	



CCE - CONTRACTING & CONSTRUCTION ENTERPRISES LTD.

P.O. Box 250991, Riyadh 11391, KSA
Tel: (+9661) 416-1122 Fax: (+9661) 416-1948
E-mail: cce@ccesaudi.com

FACSIMILE TRANSMISSION					
Our Ref:	CCE-ITCC-10092	Date:	01 February 2012	No. of Page(s):	1+1
From:	Engr. Georges Nasr	Location:	Riyadh		
To:	CCE Electro-Mechanical Department				
Attn.:	Mr. Raed Al Zaben	Cc:			
Tel.:	01-465 5660	Fax:	01-463 3386	Email:	

Project : Information Technology and Communication Complex (ITCC)
Convention Hotel – Package 2

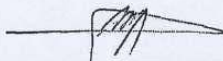
Subject: Approval of Cable Tray Trunking and Accessories
Submittal # E-005G (Rev-00)

Gentlemen,

Reference to the subject, enclosed please find Consultant Approval, Code-B “Approved as Noted” for cable tray trunking and accessories from M/s. Electrical Ways Trading for your reference and further action.

You are requested to proceed with placement of P.O. for the same taking into consideration the Consultant comments attached herewith and provide us with a copy duly highlighting the delivery date of the material for our further follow-up.

Best Regards,


Engr. Georges Nasr
Projects Director

*F.B. (R)
- N.M.*

Cc: - Project Manager
- Elect. Dept.

Encl: as above – 1 Page (A4)



PLEASE HIGHLIGHT OUR REF. # ON YOUR LETTER ANSWER
PLEASE SEND YOUR REPLY TO OUR FAX # 012148042 OR
E-MAIL: CCEITCCHOTEL@CCESAUDI.COM



التاريخ : ١٤٣٦/١٠/٢٥ هـ
الموافق : ٢٠١٥/٨/١٠ م

المشروع: مشروع توسعة مشروع مياه القرى والمجاورة لها بمنطقة الجوف
الموضوع : بخصوص طلب اعتماد الشركات الموردة والمصنعة لحوامل الكابلات

السادة / شركة العيونى للإستثمار و المقاولات بالتضامن مع شركة بالين العربية للمقاولات
المحترمون السلام عليكم ورحمة الله وبركاته

بالإشارة إلى خطاب المديرية رقم ٨٩٩٥٢/١٤٣٦/٤٤٠٠٠ بتاريخ ١٤٣٦/١٠/١٢ هـ الخاص بإعتماد
الشركات الموردة والمصنعة لحوامل الكابلات ضمن المشروع نرفق لسيادتكم الخطاب الخاص بتحديد
الشركات الموردة وهي شركة

١ - اعتماد (مصنع طرق الكهرباء) مورد رئيسي.

٢ - (AL-ASHOURY INDUSTRIAL) مورد بديل.

علما بأنه لا يتم اللجوء إلى المورد البديل إلا في حال ثبوت عدم قدرة المورد الرئيسي

علي الوفاء بالتزاماته مع الإلتزام الكامل بالمواصفات التقنية وشروط العقد

وجداول الكميات وطبقا لتعليمات المهندس المشرف.

وتفضلوا بقبول فائق الإحترام والتقدير

والسلام عليكم ورحمة الله وبركاته

مدير المشروع

م/ أحمد علي الغمري



CLIENT
Institut of Public Administration.



CONSULTANT
Saudi Consulting Services
P.O.Box 2341 Riyadh11451
Tel :4659975 Fax :4647540



CONTRACTOR
JAWDAT CONTRACTING
P.O.Box.3427 Riyadh11471
Tel :4124242 Fax :4022615

PROJECT : IPA Housing Complex

LOCATION:JEDDAH

PROJECT No.1027

MATERIAL SUBMITTAL

New Submittal: Submittal No. **E14** Submittal Date: 25/12/2013
 Resubmittal: Previous Submittal No. Previous Submittal Date:

PURPOSE OF SUBMITTAL
 For Information For Comments For Approval

DISCIPLINE
 CIVIL ARCHITECTURE STRUCTURAL HVAC PLUMBING ELECTRICAL MICCHANICAL

ATTACHMENT
 CATALOGUE DRAWING CERTIFICATE SAMPLE TECH. DATA CALCULATIONS

MATERIAL / EQUIPMENT Note : Please use the attachment in case Items are more than the provided space.

Sr.No.	Name, No. and Description	Origin	Manufact urer	Supplier	Specification Reference	Standard	Approval Status
	Heavy Duty Cable Tray						
1	Al Amal CO Electrical Switchboards	KSA	Al Amal		16100		(B)
2	Electrical ways Factory	KSA	E. Ways		16100		
3	Power solutions Industries	KSA	P. Solution		16100		
4	AL Fareed stars Factory	KSA	AL Fareed		16100		

Contractor's Remarks We clarify that above Submittal is strictly adhered with contract specifications except otherwise as stated below

CONTRACTOR PROJECT MANAGER
 Eng / Mostafa El Sayed
ENGINEER INCHARGE
 Name Khalid Wagen Signature
 Positior Electrical Engineer Date

Consultant's Comments Approval of the above materials does not relieve the contractor from his contractual obligations.

- AL-Amal heavy duty cable tray type TR are approved
 - Elec. way factory hot dip galvanized - heavy duty are approved
 - Power solution hot dip galvanized BS EN ISO1461 are approved
 - AL-fareed HDGAF are approved
 - NOTE : thickness not less than 2mm for wide more the 300mm.




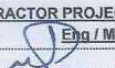
ENGINEER INCHARGE
 Name Signature
 Position Date 24/12/2013

CONSULTANT PROJECT MANAGER
 Signature Date 24/12/2013

Approval Status
 A Approved C Approved As Noted Resubmittal is required E No Action
 B Approved As Noted Resubmittal is not required D Disapproved

REF. IN : Signature Date

REF. OUT : Signature Date

 CLIENT Institut of Public Administration.	 CONSULTANT Saudi Consulting Services P.O.Box 2341 Riyadh11451 Tel :4659975 Fax :4647540	 CONTRACTOR JAWDAT CONTRACTING P.O.Box.3427 Riyadh11471 Tel :4124242 Fax :4022615					
PROJECT : IPA Housing Complex		LOCATION:JEDDAH	PROJECT No.1027				
MATERIAL SUBMITTAL							
<input checked="" type="checkbox"/> New Submittal: Submittal No. E15 Submittal Date: 25/12/2013 <input type="checkbox"/> Resubmittal: Previous Submittal No. Previous Submittal Date:							
PURPOSE OF SUBMITTAL <input type="checkbox"/> For Information <input type="checkbox"/> For Comments <input checked="" type="checkbox"/> For Approval							
DISCIPLINE <input type="checkbox"/> CIVIL <input type="checkbox"/> ARCHITECTURE <input type="checkbox"/> STRUCTURAL <input type="checkbox"/> HVAC <input type="checkbox"/> PLUMBING <input checked="" type="checkbox"/> ELECTRICAL <input type="checkbox"/> MICHAICAL							
ATTACHMENT <input checked="" type="checkbox"/> CATALOGUE <input type="checkbox"/> DRAWING <input checked="" type="checkbox"/> CERTIFICATE <input type="checkbox"/> SAMPLE <input checked="" type="checkbox"/> TECH. DATA <input type="checkbox"/> CALCULATIONS							
MATERIAL / EQUIPMENT Note : Please use the attachment in case items are more than the provided space.							
Sr.No.	Name, No. and Description	Origin	Manufacturer	Supplier	Specification Reference	Standard	Approval Status
	Heavy Duty Cable Ladder						
1	Al Amal CO Electrical Switchboards	KSA		Al Amal	16100		B
2	Electrical ways Factory	KSA		E. Ways	16100		
3	Power solutions Industries	KSA		P. Solution	16100		
4	AL Fareed stars Factory	KSA		AL Fareed	16100		
Contractor's Remarks		We clarify that above Submittal is strictly adhered with contract specifications except otherwise as stated below :					
		CONTRACTOR PROJECT MANAGER Eng / Mostafa EL Saved  ENGINEER INCHARGE Name Khalid Wagen Signatu Position Electrical Engineer Date					
Consultant's Comments		Approval of the above materials does not relieve the contractor from his contractual obligations.					
		- AL-Amal, Heavy duty cable Ladder are approved - Electrical way, Heavy duty cable Ladder are approved - Power Solution, Heavy duty Cable Ladder are approved * Submit Sample for AL-Freed Cable Ladder.					
ENGINEER INCHARGE				CONSULTANT PROJECT MANAGER			
Name <i>N. B. G. S. A. K.</i> Signature <i>[Signature]</i>		Position _____ Date 30/12/2013		Name _____ Signature <i>[Signature]</i>		Position _____ Date _____	
Approval Status		<input type="checkbox"/> A Approved <input type="checkbox"/> C Approved As Noted Resubmittal is required <input type="checkbox"/> B Approved As Noted Resubmittal is not required <input type="checkbox"/> D Disapproved		<input type="checkbox"/> E No Action			
REF. IN : _____ Signature _____ Date _____		REF. OUT _____ Signature _____ Date _____					



MATERIAL SUBMITTAL		No.: 035	Rev.1
PROJECT:	INNOVATIVE FOOD FACTORY		CONTRACT NO: 108-823-000
CLIENT:	INNOVATIVE FOOD CO.		
CONSULTANTS:	KHATIB & ALAMI \ SAUDI CONSOLIDATED ENGINEERING CO.		
CONTRACTOR:	YOUSSEF MARROUH CONTRACTING COMPANY		
INVOLVED DISCIPLINE:	<input type="checkbox"/> ARCHITECTURAL <input type="checkbox"/> CIVIL/ STRUCTURAL <input type="checkbox"/> MECHANICAL <input checked="" type="checkbox"/> ELECTRICAL <input type="checkbox"/> INSTRUMENT <input type="checkbox"/> PLUMBING <input type="checkbox"/> FIRE PROTECTION <input type="checkbox"/> OTHERS		
APPLICABLE SPECS./ DIV. NO.:	SPECS. COMPLIANCE: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO (If NO, State reasons)		
DESCRIPTION OF THE PROPOSED MATERIAL (Provide attachments as required): Cable Trays & Support			
SUB-CONTRACTOR/MANUFACTURER/SUPPLIER: Electrical Ways Factory			
LOCATION AND USAGE: Factory Area			
COUNTRY OF ORIGIN: KSA			
DOCUMENTS ATTACHED : Technical Data Sheet, Company Profile & References			
Issued by	Date	Name	Signature
YMCO Project Representative	14, Oct. 2017	Eng Muath Al Rawashdeh \ Elec. Eng	<i>[Signature]</i> 19/10/2017
CONSULTANT'S COMMENTS:			Approval/Recommendation:
<p><i>CABLE TRAYS from "Electrical Ways Factory" are approved as per follows: —</i></p> <p><i>1) Minimum thickness of trays should be 2mm.</i></p> <p><i>2) Sizes of Trays will be as per approved shop drawings.</i></p> <p><i>3) We're preparing for PC entries.</i></p> <p><i>4) Earthing numbers to be provided as per standards.</i></p> <p><i>5) Galvanizing finish will be tested at the site.</i></p>			<input type="checkbox"/> A: Approved <input checked="" type="checkbox"/> B: Approved as Noted <input type="checkbox"/> C: Revise/ Resubmit <input type="checkbox"/> D: Reject
Reviewed by	Date	Name/Signature	Name/Signature
Consultant's Representative	14, Oct. 2017	Eng Sami Hashim \ PM <i>[Signature]</i>	Eng Sami Hashim \ PM <i>[Signature]</i> 19/10/17
CLIENT'S APPROVAL:			Approval/Recommendation:
 			<input type="checkbox"/> A: Approved <input type="checkbox"/> B: Approved as Noted <input type="checkbox"/> C: Revise/ Resubmit <input type="checkbox"/> D: Reject
Reviewed and Confirmed By:	Date	Name	Signature
Client Representative			



Material Submittal Form

15-07-2017

Submittal Ref.	MAT EL 01 A	Revision	0	Date	13/07/17
Project Title:	DANAH PLAZA				
Client:	DANAT REALTY				
Consultant:	ARKI Tectonica	Contractor	Intelligent Engineering Solutions		

Discipline Civil Architecture Mechanical Electrical Others

Material Details	List of Enclosure
Specs. / BOB / Drawings Reference	Copy of related spec's
Specified Material	Compliance Statement
Proposed Material	Samples
Manufacturer / Local Supplier	Others (Specify)
Reason for Alternative (if any)	(A) (B) (C) (D) (E)
Remarks	

162
CABLE TRAY / 1.5 MM THICKNESS
ELECTRICAL WAY / STEEL
second supplier

Contractor Signature (s):

Technical Manager	QA/QC	HSE	MEP	Construction Manager
<i>[Signature]</i>			<i>M. SM</i> <i>13/07/17</i>	

Received By Engineer:

Name	Signature	Date	Time

Submittal Status:

A- Approved B- Approved with Comments C- Revise and Resubmit D- Rejected

Engineer's Comments:

Approved as second supplier, it only will be used if the first supplier not available.

- Cable tray with cover, Heavy duty, Hot dip galvanized with edges Bend outward, 1.5 thickness.

Note: This review does not relieve the contractor of his responsibilities under the terms of the contract nor authorize additional compensation.

Reviewed by (Engineer)	Name	Signature	Date
Approved by (Engineer)	M. ElSadiq	<i>[Signature]</i>	17-07-2017
Received By (Contractor)			

Distribution:

Engineer Contractor Others (Specify)

OPTION ①



المدينة الملكة لبحافظة العباد
Royal Commission for Al-Ula



C&P

PROJECT: RCU INTERIM HEADQUARTER PROJECT IN RIYADH

Material Submittal

Transmittal: MAR/ELEC/006 Date: 3-Apr-18
Rev: 0 Package

Contractor Name: C&P

Transmission of Drawings, Documents, Samples, etc.

To: PROJACS "Consultant"

For Contractor: *[Signature]*

DELIVERY: Counter, Recipient Messenger, Other

SUBMITTED FOR: APPROVAL INFORMATION COORDINATION

CODE: 1, 2, 3

FOR PROJACS USE ONLY:

Recd from Contr: 03 / 04 / 18
Out to Client: / / 18
In from Client: / / 18
Out to Contractor: / / 18

Sign: *[Signature]*

Client:

Out to Engrs: / / 18
In from Engrs: / / 18

APPROVAL ACTION CODE: APPROVED (A), APPROVED AS NOTED (B), REQUEST (C), REJECTED (D), FOR INFORMATION (E)

Rec.	Qty	Desig. / Spec Reference	Material	Vendor	Type**	Code	
						Submittal	Action
1		BOO	Cable Trays & Ladder Conspoxy Profile	ELECTRICAL WAYS FACTORY	SM MD		(B)

Remarks:

Electrical Ways Factory / Cabt Trays & Ladder are Approved as Noted :-

① Vendor / Material is Approved as Alternative Option
② All Accessories and Fittings should be by Approved Material Vendor

Reviewer's Signature: *[Signature]* Date: *[Date]*
Project Manager: *[Signature]* Date: *[Date]*
Client Signature: *[Signature]* Date: *[Date]*

Type**
 SD Shop Drawing
 Sample
 Manufacturer's Data
 CT Certificates
 QT Guarantees
 Other

Approval, correction or immediate field action by submittal during the review do not release the Contractor from compliance with the requirements of the drawings or specifications. This sheet is only for review of general performance with the design concept of the project and general compliance with the information given in the Contract documents. The Contractor is responsible for confirming and controlling all quantities and dimensions, verifying fabrication processes and techniques of construction, coordinating the work with that of other trades, and performing the work in a safe, timely, and satisfactory manner.

Distribution:
 CM Rev:
 CM Off:
 CONTRACTOR:

Contractor's Signature: *[Signature]*
 Received For: *[Signature]*
 Date: 4/4/18

C&P
 GPO
 Construction & Planning Co. Ltd. (C&P)
 (C&P) Project Office - Al-Ula

PROJECT: DALLAH HOSPITAL - WEST EXPANSION PROJECT		Submittal No.: DW1-MT-EE-0025A
Package No.:	FD	REV. No R01
EMPLOYER: 	PROJECT MANAGER: 	CONSULTANT: 
		CONTRACTOR: 

MATERIAL SUBMITTAL

TO: **TAKAMUL PROJECT MANAGEMENT** FROM: **YOUSSEF MARROUN CONTRACTING CO.**

Type of Submittal:	Samples <input checked="" type="checkbox"/>	Specifications <input checked="" type="checkbox"/>	Catalogues <input checked="" type="checkbox"/>
Manufacturer / Supplier Details <input checked="" type="checkbox"/>		Others <input checked="" type="checkbox"/>	Please Specify: TECHNICAL SUBMITTAL
Discipline:	AR <input type="checkbox"/>	SC <input type="checkbox"/>	CE <input type="checkbox"/>
	EE <input type="checkbox"/>	EL <input checked="" type="checkbox"/>	MP <input type="checkbox"/>
	MH <input type="checkbox"/>	MF <input type="checkbox"/>	
Description	CABLE TRAY & LADDERS, TRUNKS & SUPPORT SYSTEM		Locations: ALL FLOORS / ZONE A,B,C,D,E,F
ITEM	MANUFACTURER/SUPPLIER	ADDRESS	CONTRACT REFERENCE
	ELECTRIC WAYS FACTORY	RIYADH - KSA	DRWG. REF. ALL
			SPEC. REF. ??
			B.O.Q. REF. DIV.16
			ACTION CODE B

Attached all relevant technical literature marked to identify relevant description, current Test Certificates, samples as appropriate.

Country of Origin: Availability

Locally Manufactured Overseas

Delivery: Ex-works/Factory

Lead Time (from P.O. to Arrival on Site) [] Days

Estimated Time of Arrival on Site []

Program: Date Material Required on Site []

Latest Date for Order []



15 APR 2018

Dallah Hospital - West Expansion

Riyadh

100-829-000

Engr. Hani Hani 15 April 2018

Project Manager

CONTRACTOR'S REMARKS:

WE CERTIFY THAT THE ABOVE SUBMITTED ITEMS HAVE BEEN REVIEWED IN DETAIL, AND ARE CORRECT AND IN STRICT CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS.

STAMP

CONSULTANT COMMENTS / RECOMMENDATIONS:

* Follow SC COMMENTS ON THE NEXT PAGE.

[Signature]

[Signature]

27 / 5 / 2018

Engr. Reda Gad, PMP

Senior Resident Engineer

TPMC COMMENTS / CONCURRENCE:

Ahmed Ali

[Signature]

[Signature]

27/5/2018

Engr. Shauk Faiz

Construction Manager

A = Approved B = Approved as Noted C = Revise and Resubmit D = Rejected E = No Action

Distribution: Original to Contractor CLIENT Project Manager Consultant

Approval shall not relieve the contractor of his liabilities under the Contract or constitute authorization of any change to Contract Documents. Checking is only for review of general conformance with design concept of the project and general compliance with the information plus the drawings documents.

TPMC Receiving Stamp:	SG Receiving Stamp:	YMCO Receiving Stamp:
<i>[Signature]</i>	<p>West & South Expansions of Dallah Hospital</p> <p>DATE: 16.04.18 SIGNATURE: <i>[Signature]</i></p>	 <p>28 MAY 2018</p> <p>Dallah Hospital - West Expansion</p> <p>Riyadh</p> <p>100-829-000</p>



DALLAH HOSPITAL WEST EXPANSION PROJECT

Transmittal No: DW1-MT-EE-0025A

Approval Code : (B)



Subject : Cable Raceways (ELECTRIC WAYS FACTORY)

The cable raceways submittal (Cable tray, ladder, trunk and accessories from ELECTRIC WAYS FACTORY) is reviewed by SC and APPROVED subjected to the following comments:

1. Cable trays to be heavy duty perforated type inside returned J-shape flanged, hot dip galvanized for indoor uses, and epoxy coated for outdoor uses.
2. Cable ladders & trunks to be heavy duty, hot dip galvanized for indoor uses, and epoxy coated for outdoor uses.
3. Cable tray thickness to be 1.5mm for 100-300mm width and 2mm for 400-1000mm width, Cable ladder thickness 2mm thickness at least, Cable trunks thickness to be 2.5mm for 300mm width and 3mm at least for 500-600mm width.
4. All accessories of cable raceways (Tees, Crosses, Elbows, Reducers, Covers, ... , etc.) to be same specifications (thickness, material, coating, ... , etc.) of its raceways.
5. Contractor to commitment the widths and heights of raceways as listed in BOQ items No.# 16.12 a, b and c.
6. Installation details of cable raceways to be approved in shop drawing as per IFC drawings DET-005.
7. All cable raceways to be earthed well as per specifications

The above comments is for compliance & action

Engineer Feras Daqqaq
Senior Electrical Engineer

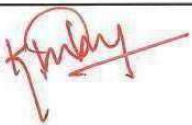
		NAMARIQ RESIDENCY YANBU (RC) Material Approval Request			
CONTRACTOR				EMPLOYER	
Date:	27-Mar-18	MAR Ref. No:	1306-YMC-MAR-EE-020 Rev.01	Contract Ref :	170416 Rev.03 (Contract for main construction work)
From : Mr. Ahmed Salah Project Manager/QC Manager Youssef Marroun Cont.Co			To : Mr. Victor Organ Project Manager Namariq Arabian Services Co.Ltd		
DISCIPLINE :					
1. MATERIAL DESCRIPTION (one item only on this form) : <i>Gladder</i> Cable Tray & Trunk (w/ Sample Board)					
Area of Application <u>ALL</u>					
Drawing Ref. : - B.O.Q. Ref. No. : -					
Specification Ref. : - Standards: -					
Attach all relevant technical literature marked to identify relevant description, current Test Certificates, samples as appropriate.					
2. MANUFACTURER/SUPPLIER :					
Company Name : <u>Electrical Ways Factory</u>					
Address : <u>KSA</u>					
Local Agent : <u>Electrical Ways</u>					
3. DELIVERY :					
Country of Origin : <u>KSA</u>					
Availability <input checked="" type="radio"/> Locally Manufactured <input type="radio"/> Overseas					
Delivery : Ex-works/factory <input type="checkbox"/> N/A <input type="checkbox"/>					
Lead Time (from P.O. to Arrival on Site) <input type="checkbox"/> N/A <input type="checkbox"/> Days					
Estimated Time of Arrival on Site <input type="checkbox"/> N/A <input type="checkbox"/>					
Program : Date Material Required on Site <input type="checkbox"/> N/A <input type="checkbox"/>					
Latest Date for Order <input type="checkbox"/> N/A <input type="checkbox"/>					
We certify that the above submitted items have been reviewed in detail and are correct and in strict conformity with the contract drawings and specifications except as otherwise stated; also that the material sources indicated above have been reviewed and that they will supply the submitted items in conformity with the above and deliver same timely.					
MEP Engineer Name: <u>Fadi Hojok</u> Signature: <i>[Signature]</i> Stamp: 27 MAR 2018					
Contractor's Rep. : <u>Eng. Ahmed Salah</u> Signature: <i>[Signature]</i> Stamp: Namariq Residency 113 826 000 YANBU					
Received By (Namariq) Name: <u>Mohammad Sumon</u> Sign: <i>[Signature]</i> Date: <u>27.3.18</u> Stamp:					
4. QA/QC INSPECTOR/ENGINEER'S COMMENTS :					
<i>Refer to attached comments.</i>					
<i>This submittal only for cable tray cable trunking & cable ladder submit separate material submittal</i>					
Signature over printed name: <i>[Signature]</i> DATE: <u>14/2018</u>					
RECOMMENDATION:					
<input type="checkbox"/> A - Approved					
<input checked="" type="checkbox"/> B - Approved As Noted					
<input type="checkbox"/> C - Revise and Resubmit					
<input type="checkbox"/> R - Rejected					
<input checked="" type="checkbox"/> Sample Required					
<input type="checkbox"/> Tests Required					
<input type="checkbox"/> Additional Information Required					
<input type="checkbox"/> Other					
5. EMPLOYER REPRESENTATIVE'S COMMENTS :					
Signature over printed name : <u>Victor Organ</u> Signature: <i>[Signature]</i> DATE: <u>14/18</u>					
Received By YMCO					
Name: <u>Jeff Clavido</u> Sign: _____ Date: _____					
Distribution: <input type="checkbox"/> Original to Contractor <input type="checkbox"/> Namariq <input type="checkbox"/> _____					
Approval shall not relieve Contractor of his liabilities under the Contract or constitute authorization of any change to Contract Documents.					

Site Staff Comments :

Subject : CABLE LADDER, TRAY, TRUNKING & ACCESSORIES
 Received Date : 27-Mar-18
 Contractor: YMCO
 Project Title : Namariq Residency Yanbu (RC)
 Attachments: 1
 Transmittal Number: 1306-YMC-MAR-EE-020-Rev.01

Design Drawings, Specification And Site Requirements have been used in the review with the following conducted remarks :

Item No	Comments	Remarks
	Proposed Cable Tray, Ladder, Trunking & Accessories as Manufactured by Electrical ways Factory	
1	All Manufacture ready made fitting & Accessories i.e. bends, branches, riser, intersection etc. shall be user fabrication on site is not allowed.	
2	Expansion coupling shall be used for each building expansion joint and installation to be as per code of practice.	
3	size of cable tray, ladder & trunking shall be according to application and approved shop drawings with 25% space spacing.	
4	Test for galvanization thickness shall be performed for each patch delivered to the site material.	
5	Cable Tray/Ladder to be heavy duty type.	
6	Submit sample board for Cable Tray, Ladder, Trunking & Accessories final Approval	

Name K.MD JAFFER Signature  Date 31-3-18

KFAB
KING FAHAD AIR. BASE – TAIF

Project Name & No. : معطلة معالجة الصرف الصحي في قاعدة الملك فهد الجوية بالطائف Technical submittal for Cable Tray تقديم فني لحوامل الكابلات		Contractor: شركة الكوثر للتصنيع المحدودة P.O. Box 7771 JEDDAH Kingdom of Saudi Arabia Tel: 966 (2) 6360644 Fax: 906 (2) 6374537
Owner : KFADAB – Taif	Transmittal No.: Sub-E-0030 Rev0 Transmittal Date : 14/12/2017	
First Submittal <input checked="" type="checkbox"/>	Re-submittal <input type="checkbox"/>	Indicate Previous Transmittal No. :
DETAILED DESCRIPTION OF TRANSMITTAL		
Full Report (مخبر) <input type="checkbox"/>	Drawings (مخططات) <input type="checkbox"/>	
Catalogue (جداول) <input checked="" type="checkbox"/>	Sample (عينات) <input type="checkbox"/>	
other (أخرى) <input type="checkbox"/>		
(وصف العنصر) ITEM DESCRIPTION		
Cable Tray submittal (Electrical ways Factory) تقديم فني لحوامل الكابلات (مصنع طرق الكهرباء)		
شركة الكوثر للتصنيع المحدودة Alkauthar Industries Co. Ltd. رقم بريد: 7771 ج. ب. جدة رقم هاتف: 966 (2) 6360644 رقم فاكس: 966 (2) 6374537 مشروع إنشاء محطة معالجة مياه الصرف الصحي في قاعدة الملك فهد الجوية بالطائف Signature of the Contractor: Eng. Yasser Al Rahaby		We confirm that enclosed samples and/or materials have been prepared and we certify that it is in accordance with the drawings and specifications of the project
Action Codes : The following action code/s are given Approved (مقبول) <input type="checkbox"/> Approved as Not (مقبول بملاحظات) <input checked="" type="checkbox"/> Revise & Resubmit (عدلة وتقديم) <input type="checkbox"/> Not Approved (مرفوض) <input type="checkbox"/>		Remarks (الملاحظات) : فحص العينات المرفقة مطابقة المواصفات المهندس / م. هادي الحارثي 14/12/2017
مدير قسم الدراسات والإشراف المهندس / أحمد بن محمد سعيد الزهراني		ضابط المشروع المهندس / عبدالله بن غازي السميري

Attachment 33

20

DR. SULAIMAN AL HABIB HOSPITAL (KHOBAR)



MATERIAL SUBMITTAL

TRADE :	ELECTRICAL	Submittal No.:	SA-HMG-EL-MS-20	Revision No.:	0
Specs. Code & Ref.	B.O.Q. Code Ref.	Building No.	Date Submitted:	7 Sep 17	
16114	Included		Date Returned:		

EQO Item no.	Description	Details
Included	CABLE MANAGEMENT SYSTEM CABLE TRAY, CABLE LADDERS, TRUNKING BRAND NAME: ELECTRICAL WAY	<p>Submitted for :</p> <p>APPROVAL <input checked="" type="checkbox"/></p> <p>INFORMATION <input type="checkbox"/></p> <p>COORDINATION <input type="checkbox"/></p> <p>REVIEW <input type="checkbox"/></p> <p>Trade:</p> <p>HVAC <input type="checkbox"/></p> <p>FIRE FIGHTING <input type="checkbox"/></p> <p>PLUMBING <input type="checkbox"/></p> <p>ELECTRICAL <input checked="" type="checkbox"/></p> <p>LOW CURRENT <input type="checkbox"/></p> <p>Attachment:</p> <p>CERTIFICATES <input type="checkbox"/></p> <p>TECH. BROCHURE <input checked="" type="checkbox"/></p> <p>MANUFACTURER'S DATA <input checked="" type="checkbox"/></p> <p>SHOP DRAWING <input type="checkbox"/></p> <p>SAMPLE <input type="checkbox"/></p> <p>MANUAL <input type="checkbox"/></p> <p>DATA FILE <input type="checkbox"/></p> <p>AS BUILT DRAWING <input type="checkbox"/></p> <p>WARRANTY <input type="checkbox"/></p> <p>OTHERS : (SPECIFY) <input type="checkbox"/></p>



For Contractor :	Prepared by:	Submitted by:	Project Manager :
	<i>[Signature]</i>	Eng. Rami <i>[Signature]</i>	<i>[Signature]</i>

FOR Consultant USE ONLY:	Received by:	Name	Signature	Date
	<i>[Signature]</i>	Ajay Kantam	<i>[Signature]</i>	9/9/2017

Remarks:

Cable Tray, Ladders & Trunking must follow the specifications.

Consultant Engineer	Signature:	<i>[Signature]</i>	Approved <input type="checkbox"/> A Approved with comments <input checked="" type="checkbox"/> B Resubmit <input type="checkbox"/> C Rejected <input type="checkbox"/> D
<i>[Signature]</i>	Date:	9/9/2017	
Project Manager	Signature:	<i>[Signature]</i>	
	Date:		

APPROVAL, CORRECTIONS OR COMMENTS MADE RELATIVE TO SUBMITTALS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE DRAWINGS OR SPECIFICATIONS. THIS CHECK IS ONLY OF REVIEW OF GENERAL PERFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING HIS WORK WITH THAT OF OTHER TRADES, AND PERFORMING HIS WORK IN A SAFE, TIMELY AND SATISFACTORY MANNER.





Distribution: _____ Received: _____

Material Submittal Form

Submittal Ref.	MAT-EL: 03	Revision	00	Date	11/10/2018
Project Title:	PANDA				
Client:					
Consultant:		Contractor	Intelligent Engineering Solutions		
Discipline	<input type="checkbox"/> Civil	<input type="checkbox"/> Architecture	<input type="checkbox"/> Mechanical	<input checked="" type="checkbox"/> Electrical	<input type="checkbox"/> Others

Material Details	List of Enclosure	
Specs. / BOQ / Drawings Reference	4.3 -	Copy of related spec's
Specified Material	CABLE TRAY - STEEL	Compliance Statement
Proposed Material	CABLE TRAY	Samples
Manufacturer / Local Supplier	ELECTRIC WAY -	Others (Specify)
Reason for Alternative (if any)		
Remarks	7	

Contractor Signature (s):				
Technical Manager	QA/QC	HSE	AE	Construction Manager
Received By Engineer:				
Name	Signature	Date	Time	
Submittal Status:				
<input type="checkbox"/> A- Approved <input checked="" type="checkbox"/> B- Approved with Comments <input type="checkbox"/> C- Revise and Resubmit <input type="checkbox"/> D- Rejected				
Engineer's Comments:				
Galvanised steel 2mm Min th. for 600mm, 1.8mm for others, and 100mm height.				
Note: This review does not relieve the contractor of his responsibilities under the terms of the contract nor authorize additional compensation.				
Reviewed by (Engineer)	Name	Signature	Date	
Approved by (Engineer)			18/10/2018	
Received By (Contractor)				
Distribution:				
<input type="checkbox"/> Engineer <input type="checkbox"/> Contractor <input type="checkbox"/> Others (Specify)				

		 OCC WEAVERS LTD GENERAL CONTRACTOR	
Project: SHARBATLY FRUIT COLD STORE & ACCOMMODATION BUILDING			
Material Submittal		Doc. No. OCC-MASCO-ACCOM-CS BLDG MAT-056	Rev. 1
To:	M. ABDALLAH SHARBATLY CO. LTD	Date:	6-Jan-2018
Attention:	ENGR. FRANCO TURINI		
CC:	MR. SALEM AL NAHDI		
From:	ENGR. MAHMOUD SAATI		
Material Detail : ELECTRICAL WAYS - CABLE TRAYS		List of Enclosure (Tick the Related Box)	
Item Description	CABLE TRAYS	<input checked="" type="checkbox"/> Vendor's Technical Literature	
Specs. Reference		<input type="checkbox"/> Compliance Statement	
BOQ Reference		<input type="checkbox"/> Previous Test Results	
Drwg. Reference		<input checked="" type="checkbox"/> Copy of the Related Specs.	
Material Specified		<input type="checkbox"/> Samples with Sample Tag	
Material Proposed	FOR ACCOMMODATION AND COLD STORE BUILDING	<input type="checkbox"/> List of Previous Projects Done	
Manufacturer / Supplier	ELECTRICAL WAYS	<input type="checkbox"/> Others (Specify):	
Purpose of Submittal:	FOR APPROVAL		
Contractor Statement: We certify that the material submitted herewith has been reviewed in details and is in compliance with the contract drawings and specifications except as otherwise stated here above. The approval will not involve any adjustment to the contract sum or contract time.			
Contractor Sign: 		Date:	6-1-18
Received Sign:		Date:	
		Ref.No	
SHARBATLY Engineer's Comments:			
		<input checked="" type="checkbox"/> Code A - Approved	
		<input type="checkbox"/> Code B - Approved As Noted	
		<input type="checkbox"/> Code C - Not Approved, Resubmit	
		<input type="checkbox"/> Code D - Disapproved	
		<input type="checkbox"/> Code E - Information Record	
Sign: 		Date:	10-2-2018
		Ref.No	
Contractor Received Sign:		Date:	
Corrections or comments made relative to submittals during this review do not relieve the contractor from compliance with the contract requirement and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents.			



**INTELLIGENT
ENGINEERING
SOLUTIONS**

Material Submittal

طلب اعتماد مواد

Submittal Reference #:	SACO-MS-004	Revision #:	2	Date:	08/04/2019
------------------------	-------------	-------------	---	-------	------------

Project Title:	SACO EXTENSION PROJECT				
Client:	SACO	Contractor:	IES		
Consultant:					

Discipline:	Civil/Structural	Architectural	Mechanical
	XXX Electrical	Others	

Material Details	Attachments
Specs. / BOQ / Drawing Reference	TECHNICAL DATA SHEET
Specified Material	CABLE TRAY
Proposed Material	CABLE SUPPORTS
Manufacturer / Supplier	ELECTRICAL WAYS
Reason for Alternative (if any)	
Remarks	

Contractor Signature(s):			
Technical Manager	Projects Control Manager	Construction Manager	Project Manager (Site)

Received By:			
Name	Signature	Date	Time

Submittal Status:			
<input type="checkbox"/> A - Approved	<input type="checkbox"/> B - Approved with Notes	<input type="checkbox"/> C - Revise / Resubmit	<input type="checkbox"/> D - Rejected






Approving Engineer's Comments:

** Site 100 mm & 300 mm & 400 mm
* Lay the cable keeping the distance as per calculation
* Tie the cable using cable tie & label the cables as required. Attached comments*

Note: This review does not relieve the contractor of his responsibilities under the terms of the contract nor authorize additional compensation.

Action (s):	Name	Signature	Date
Reviewed by:			
Approved by:	HAMZA		
Received by:			

Distribution:

					
MATERIAL APPROVAL REQUEST FORM			TS No.: YMCO/PDWR/MAR-0064	Rev.2	
PROJECT:	AL DAWAA PHARMACEUTICAL & DISTRIBUTION WAREHOUSE IN RIYADH		CONTRACT NO: 107-802-00		
CLIENT:	AL DAWAA MEDICAL SERVICES CO. LTD				
CONSULTANTS:	INTERNATIONAL LOGISTICS CONSULTANT/ WAREHOUSING PROJECTS AND LOGISTICS CO.				
CONTRACTOR:	YOUSSEF MARROUN CONTRACTING COMPANY				
INVOLVED DISCIPLINE:					
<input type="checkbox"/> ARCHITECTURAL		<input type="checkbox"/> CIVIL/ STRUCTURAL		<input type="checkbox"/> MECHANICAL	
<input type="checkbox"/> INSTRUMENT		<input type="checkbox"/> PLUMBING		<input checked="" type="checkbox"/> ELECTRICAL	
				<input type="checkbox"/> FIRE PROTECTION	
				<input type="checkbox"/> OTHERS	
APPLICABLE SPECS./ DIV. NO.: D26.05.33.74			SPECS. COMPLIANCE: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO (If NO, State reasons)		
DESCRIPTION OF THE PROPOSED MATERIAL (Provide attachments as required): <i>Cable Trays and Ladders</i>					
SUB-CONTRACTOR/MANUFACTURER/SUPPLIER: ELECTRICAL WAYS FACTORY					
LOCATION AND USAGE: For the project's electrical raceway requirements					
COUNTRY OF ORIGIN: KSA					
Documents Attached: <i>Technical Submittal For Cable Trays And Ladders Set Including New Comply.</i>					
Issued by	Date	Name		Signature	
YMCO Project Representative	21 March 2017	Mr. Jeffrey N. Clavido			
CONSULTANT'S COMMENTS:				Approval/Recommendation:	
See OCS for comments				<input type="checkbox"/> A: Approved <input checked="" type="checkbox"/> B: Approved as Noted <input type="checkbox"/> C: Reject/ Resubmission Required	
Reviewed by	Date	Name		Signature	
Consultant's Representative	24/3/2017	G. MONACHOS		 License No. 47800136 RAK-U.A.E. Middle East F.L.C.	
CLIENT'S APPROVAL:				Approval/Recommendation:	
				<input type="checkbox"/> A: Approved <input type="checkbox"/> B: Approved as Noted <input type="checkbox"/> C: Reject/ Resubmission Required	
Reviewed and Confirmed By:	Date	Name		Signature	
Signed by Client					

Note: Approval of items does not relieve the Contractor from complying with all requirements of the contract plans and specifications.

KINGDOM OF SAUDI ARABIA
 MINISTRY OF DEFENSE
 MEDICAL SERVICES DIRECTORATE
 PRINCE SULTAN MILITARY MEDICAL CITY
 ENGINEERING DEPARTMENT AND WORKS / PROJECT DEPT.



Date	09/11/2020	Project Name	BUILDING -05
Description Item	HDG CABLE 1.5 mm THICKNESS CABLE TRAY (ELECTRICAL WAYS)	Contract No.	
Contractor	AL MAWRAQI	Material	AMC-SD-EL-47

ENGINEERING REVIEW COMMENTS

ITEM NO.	Drawing Number / MATERIAL SUBMITTAL NUMBER	ACTION CODE	COMMENTS
	HDG CABLE 1.5 mm THICKNESS CABLE TRAY (ELECTRICAL WAYS)	ARCHITECTURE	NO COMMENT
		CIVIL	NO COMMENT
		MECHANICAL	NO COMMENT
		MED / HVAC	NO COMMENT
B		ELECTRICAL	-ACTUAL SAMPLE ARE APPROVE , BUT USE WIDTH SIZE OF CABLE AND TRUNKLING AS PER APPROVE SHOP DRAWING WITH 100 MM HEIGHT AND 1.5 mm THICKNESS -BONDING GROUNDING JUMPER FOR CABLE TRAY MUST BE PROVIDE UPON INSTALLATION
		LOW CURRENT	NO COMMENT
	PROJECT MANAGER		

RECEIVED
 23 NOV 2020

TECHNICAL REVIEW

ARCH	CIVIL	ELEC	MECH	BIO	PROJECTS COORDINATOR	TECHNICAL OFFICE MANAGER	SUPERVISION	HEAD OF PROJECTS
					Signature and date	Signature and date	Signature and date	Signature and date

A= APPROVED AS SUBMITTED B= APPROVED EXCEPT AS NOTED ON SUBMITTED ITEM (RESUBMISSION NOT REQUIRED) C= NOT APPROVED, SEE THE ATTACHED COMMENT D= RETURN WITHOUT ACTION



SUBMITTAL ROUTING FORM

Description Item
HDG CABLE 1.5mm THICKNESS CABLE TRAY
(ELECTRICAL WAYS)
Material Number
AMC-MT-EL-47
First Submittal

KINGDOM OF SAUDI ARABIA
MINISTRY OF DEFENCE
MEDIC : SERVICES DIRECTORATE
PRINCE SULTAN MILITARY MEDICAL CITY
Engineering and Works Department
Project Name BUILDING-05 (4TH FLOOR)
Contract No.
EWD
Contractor AL MAWRAQI

1. REGISTRY LOGIN DATA:		Submittal Type:	Material
Date of Contractor's Submittal:		Material Submittal	Electrical
Date of Receipt by T.O. Registry		Request for Clarification:	
Date to be returned to the contractor		Other:	
2. TECHNICAL REVIEW		Technical Reviewer	Planning Architect / Engineer
Required Release Date	Date Received	Released Date	Sign
05/11/2020	03/11/2020		
06/11/2020	05/11/2020	03/11/2020	<i>[Signature]</i>
07/11/2020	06/11/2020		
08/11/2020	07/11/2020	08/11/2020	<i>[Signature]</i>
09/11/2020	08/11/2020	05-11-2020	<i>[Signature]</i>
10/11/2020	09/11/2020	05-11-2020	<i>[Signature]</i>
3. FINAL REVIEW		Released Date	REMARKS
Project Coordinator (Engineer) (PC)			REMARKS
TECHNICAL OFFICE MANAGER			
4. REGISTRY LOGOUT DATE			

ACTION CODES: THE FOLLOWING CODES ARE GIVEN TO ITEMS SUBMITTED:
A= APPROVED AS SUBMITTED
B= APPROVED EXCEPT AS NOTED ON SUBMITTED ITEM (RESUBMISSION NOT REQUIRED)
C= NOT APPROVED, SEE THE ATTACHED COMMENTS ON A SEPERATE SHEET
D= RETURN WITHOUT ACTION

RECEIVED
11 NOV 2020

ARCHITECTURAL: CODE		CIVIL/STRUCTURAL: CODE		RECORD OF REMARKS		Transmittal No.	AMC-SD-EL-47
Signature _____ Date _____		Signature _____ Date 05/11/2020		(for PSMC / E&WD Internal Use Only)		03/11/2020	
MECHANICAL: CODE		ELECTRICAL: CODE		BUILDING-05		DESCRIPTION :	
Signature _____ Date _____		Signature _____ Date 05/11/2020		AL MAWRAQI CO.		HDG CABLE 1.5 mm THICKNESS CABLE TRAY (ELECTRICAL WAYS)	
Signature _____ Date _____		Signature _____ Date 05/11/2020		- NO COMMENT		CABLE TRAY MUST BE PROVIDED UPON INSTALLATION	
MECHANICAL: CODE		ELECTRICAL: CODE		- ACTUAL SAMPLE ARE APPROVE, BUT USE ^{width} SIZE OF CABLE AND TRUNKING AS PER APPROVE SHOP DRAWING WITH 100MM HEIGHT AND 1.5 mm THICKNESS		LOW CURRENT	
Signature _____ Date _____		Signature _____ Date 05/11/2020		- NO COMMENT		- BONDING GROUNDING JUNCTION FOR CABLE TRAY MUST BE PROVIDED UPON INSTALLATION	
HVAC/BIO-MEDICAL: CODE		ELECTRICAL: CODE		- NO COMMENT		RELEASE 1 MAY 2020	
Signature _____ Date 08/11/2020		Signature _____ Date 05/11/2020		- NO COMMENT		Signature _____ Date 05/11/2020	

KINGDOM OF SAUDI ARABIA
 MINISTRY OF DEFENSE
 MEDICAL SERVICES DIRECTORATE
 PRINCE SULTAN MILITARY MEDICAL CITY
 ENGINEERING DEPARTMENT AND WORKS / PROJECT DEPT.



Date	08/02/2021	Project Name	BUILDING-37
Description Item	CABLE TRAY AND SUPPORTING ACCESSORIES (ELECTRICAL WAYS FACTORY)	Contract No.	AMC-SD-41
Contractor	AL MAWRAQI	Shop Drawing	

ENGINEERING REVIEW COMMENTS

ITEM NO.	Drawing Number / MATERIAL SUBMITTAL NUMBER	ACTION CODE	COMMENTS
	CABLE TRAY AND SUPPORTING ACCESSORIES (ELECTRICAL WAYS FACTORY)	ARCHITECTURE	NO COMMENT
		CIVIL	NO COMMENT
		MECHANICAL	NO COMMENT
		MED / HVAC	NO COMMENT
B		ELECTRICAL	-USE CABLE SIZE AS PER APPROVE SHOP DRAWINGS WITH A MINIMUM OF 1.5 mm
		LOW CURRENT	-LC CABLE TRAY MUST BE AT LEAST 1.5 MM THICKNESS
		PROJECT MANAGER	RELEASE 14 FEB 2021

TECHNICAL REVIEW

TECHNICAL REVIEW					PROJECTS COORDINATOR	TECHNICAL OFFICE MANAGER	SUPERVISION	HEAD OF PROJECTS
ARCH	CIVIL	ELEC	MECH	BIO	Signature and date	Signature and date	Signature and date	Signature and date
					<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

A= APPROVED AS SUBMITTED
 B= APPROVED EXCEPT AS NOTED ON SUBMITTED ITEM (RESUBMISSION NOT REQUIRE)
 C= NOT APPROVED, SEE THE ATTACHED COMMENT
 D= RETURN WITHOUT ACTION

KINGDOM OF SAUDI ARABIA
 MINISTRY OF DEFENCE
 MEDICAL SERVICES DIRECTORATE
 PRINCE SULTAN MILITARY MEDICAL CITY
 Engineering and Works Department



المملكة العربية السعودية
 وزارة الدفاع
 الإدارة العامة للخدمات الطبية للقوات المسلحة
 مدينة الأمير سلطان الطبية العسكرية
 إدارة الخدمات الهندسية

SUBMITTAL ROUTING FORM

Description Item
 CABLE TRAY AND SUPPORTING ACCESSORIES
 (ELECTRICAL WAYS FACTORY)

Material Number
 AMC-MT-EL-41

1. REGISTRY LOGIN DATA:

Project Name	BUILDING-37 (GROUND FLOOR)
Contract No.	
EWD	
Contractor	AL MAWRAQI

Date of Contractor's Submittal:

Date of Receipt by T.O. Registry 04/02/2021

Date to be returned to the contractor

2. TECHNICAL REVIEW

	Required Release Date	Technical Reviewer		Planning Architect / Engineer	
		Date Received	Released Date	Sign	Action Code
Architect	06/02/2021	04/02/2021			
Civil / Structural Engineer	07/02/2021	06/02/2021	06/2/21	[Signature]	
Mechanical Engineer	08/02/2021	07/02/2021			
MED Gas / HVAC	09/02/2021	08/02/2021	08/02/21	[Signature]	
Electrical Engineer	10/02/2021	09/02/2021	08-2-2021	[Signature]	
Low Current Engineer	11/02/2021	10/02/2021	07-2-2021	[Signature]	

3. FINAL REVIEW

Project Coordinator (Engineer) (PC)

TECHNICAL OFFICE MANAGER

4. REGISTRY LOGOUT DATE

REMARKS

REMARKS

RELEASE

16 FEB 2021

ACTION CODES: THE FOLLOWING CODES ARE GIVEN TO ITEMS SUBMITTED:

A= APPROVED AS SUBMITTED

B= APPROVED EXCEPT AS NOTED ON SUBMITTED ITEM (RESUBMISSION NOT REQUIRED)

C= NOT APPROVED, SEE THE ATTACHED COMMENTS ON A SEPERATE SHEET

D= RETURN WITHOUT ACTION

RECORD OF REMARKS		Transmittal No.	AMC-SD-41
(for PSMC / E&WD Internal Use Only)		04/02/2021	
B-37		DESCRIPTION :	
AL MAWRAQI CO,		CABLE TRAY AND SUPPORTING ACCESSORIES (ELECTRICAL WAYS FACTORY)	
ARCHITECTURAL:	CODE	CIVIL/STRUCTURAL:	CODE
		- NO COMMENTS	
Signature	Date	Signature	Date
		<i>[Signature]</i>	07/2/21
MECHANICAL:	CODE	ELECTRICAL:	CODE
		(5)	
		- USE CABLE SIZE AS PER APPROVE SHOP DRAWINGS WITH A MINIMUM THICKNESS OF 1.5MM	
Signature	Date	Signature	Date
		<i>[Signature]</i>	08-2-2021
HVAC/BIO-MEDICAL :	CODE	LOW CURRENT	CODE
- NO COMMENTS		- LC CABLES MAY MUST BE AT LEAST 1.5 MM THICKNESS	
Signature	Date	Signature	Date
<i>[Signature]</i>	05/02/21	<i>[Signature]</i>	07-2-2021

TO: ENGINEERING SERVICES DEPARTMENT- PROJECTS SECTION
 PROJECT NAME: Strategic Offices
 LOCATION: PSMIMC-BLDG 37 Ground Floor
 FROM: (CONTRACTOR):



DATE: 3/2/2021
 PROJECT No.:
 SPECIFICATION No.:
 Electrical
 FIRST SUBMITTAL []
 RE-SUBMITTAL []
 TRANSMITTAL No.:
 PREVIOUS TRANS. No.:
 SHOP DRAWING / CATALOG SUBMITTAL NO.:
 CONTRACT No.:

1. WE TRANSMIT FOR APPROVAL THE FOLLOWING ITEMS:

ITEM No.	DESCRIPTION OF ITEM SUBMITTED	MANUFACTURER OR CONTRACTOR CATALOG CUT DRAWING OR BROCHURE NUMBER	No. OF COPIES	SPECIFICATION PARAGRAPH NUMBER	DRAWING SHEET PLATE OR FILE NUMBER	ACTION CODE
1	Cable Tray and supprotting accessories	COPY	2			
2	<i>Electrical Ways Factory</i>					
3						
4						
5						
6						
7						
8						
9						
10						

2. REMARKS
 A - Approved
 B - Approved as noted
 C - Disapproved

I certify that the above submitted items have been reviewed in detail, correct and in strict conformance with all the requirements of the contract except as otherwise stated herein.

3. ENCLOSURES RETURNED WITH COMMENTS:
 Comments:
 THIS SECTION WILL ONLY BE USED BY THE APPROVING AUTHORITY.

NAME, TITLE AND SIGNATURE OF CONTRACTOR'S PROJECT MANAGER:
 AL-MAWRAQI
 RECEIVED & RELEASED BY PSMIMC:
 RECEIVED BY: SIGNATURE / DATE
 RELEASED BY: SIGNATURE / DATE
 RECEIVED BY: SIGNATURE / DATE

NAME, TITLE & SIGNATURE OF APPROVING AUTHORITY: _____ DATE _____
 SUPERVISING ENGINEER _____ PROJECTS MANAGER _____ HEAD OF PROJECTS _____

RELEASE
 A = APPROVED AS SUBMITTED
 B = APPROVED EXCEPT AS NOTED ON SUBMITTED ITEM
 C = DISAPPROVED (SEE COMMENTS / SUGGESTIONS)

RECEIVED
 04 FEB 2021

TO: ENGINEERING SERVICES DEPARTMENT- PROJECTS SECTION
 PROJECT NAME: Patient Rooms
 LOCATION: PSMHC-BLDG. 5 (4th & 3rd Floors)
 FROM: (CONTRACTOR):



DATE: 6/9/2020
 PROJECT No.:
 SPECIFICATION No.:
 FIRST SUBMITTAL: []
 RE-SUBMITTAL: []
 TRANSMITTAL No.:
 PREVIOUS TRANS. No.:
 SHOP DRAWING / CATALOG SUBMITTAL NO.:
 CONTRACT No.:

1. WE TRANSMIT FOR APPROVAL THE FOLLOWING ITEMS:

ITEM No.	DESCRIPTION OF ITEM SUBMITTED	MANUFACTURER OR CONTRACTOR CATALOG CUT DRAWING OR BROCHURE NUMBER	No. OF COPIES	SPECIFICATION PARAGRAPH NUMBER	DRAWING SHEET PLATE OR FILE NUMBER	ACTION CODE
1	ELECTRICAL MATERIAL					
2	HDG CABLE 1.5MM THICKNESS CABLE TRY (ELECTRICAL WAYS FACTORY)	COPY	1			
3						
4						
5						
6						
7						
8						
9						
10						

2. REMARKS
- A - Approved
 - B - Approved as noted
 - C - Disapproved

RECEIVED
01 NOV 2020

I certify that the above submitted items have been reviewed in detail, correct and in strict conformance with all the requirements of the contract except as otherwise stated herein.

NAME, TITLE AND SIGNATURE OF CONTRACTOR'S PROJECT MANAGER:
 AL-MAWRAQI
 AL-HUWAJDI SAGD
 DATE: 6/9/2020

THIS SECTION WILL ONLY BE USED BY THE APPROVING AUTHORITY.

3. ENCLOSURES RETURNED WITH COMMENTS:

Comments:

NAME, TITLE & SIGNATURE OF APPROVING AUTHORITY: _____ DATE: _____
 SUPERVISING ENGINEER: _____ PROJECTS MANAGER: _____ HEAD OF PROJECTS: _____
 RECEIVED BY: _____ SIGNATURE / DATE: _____
 RELEASED BY: _____ SIGNATURE / DATE: _____
 ACTION CODES: THE FOLLOWING CODES ARE GIVEN TO ITEMS SUBMITTED:
 A = APPROVED AS SUBMITTED
 B = APPROVED EXCEPT AS NOTED ON SUBMITTED ITEM
 C = DISAPPROVED (SEE COMMENTS / SUGGESTIONS)

CLIENT 	CONSULTANT  Khatib and Alami Consolidated Engineering Co	CONSULTANT  International Building Systems Factory Co. Ltd.
---	---	--

FR-QC-14-00

PROJECT: BOULEVARD, TIME SQUARE, RIYADH
MATERIAL SUBMITTAL FORM (MTS)

SUBJECT: SAMPLE OF TRUNKING, MILD GALVANIZED

- GENERAL
 HOUSING
 DORMITORY
 INFRASTRUCTURE
 WAREHOUSE
 SWIMMING POOL

Discipline:
 Architectural/ID
 Structural
 Civil
 Mechanical
 Electrical
 Plumbing
 Hardscape and Landscaping

Specs. Code & Ref.	B.O.Q. Code Réf.	Drawing No.	<input checked="" type="checkbox"/> New Submittal	SUBMITTAL NO.: IBSF-J3902-MAT-ELE-004(2) - Rev: 01
Unavailable	Unavailable	Unavailable	<input type="checkbox"/> Re-submitted	1 st Submittal Date: _____
				Previous Sub Date: _____
				Present Sub Date: <u>24.07.2021</u>

Submittal Scheduled Date : _____

Sub-Contractor Name: SINMAR AL RIYADH CO. Signature: _____

Address: UMAR IBN ABDUL AZIZ ROAD, MALAZ, RIYADH Date: _____

Manufacturer Name: <u>ELECTRICAL WAYS</u> Address: <u>P.O BOX 40048, RIYADH 11499, KSA</u> Phone: <u>011-4124052</u> Fax: <u>011-4120803</u>	Supplier/Agent Name: <u>ELECTRICAL WAYS</u> Address: <u>P.O BOX 40048, RIYADH 11499, KSA</u> Phone: <u>011-4124052</u> Fax: _____
---	--

Information submitted and attached:

Certificates <input type="checkbox"/>	Operation & Maintenance Manual <input type="checkbox"/>
Technical Brochure <input checked="" type="checkbox"/>	Spare Parts List <input type="checkbox"/>
Manufacturer's Data & Specs <input type="checkbox"/>	As Built Drawings <input type="checkbox"/>
Shop Drawings <input type="checkbox"/>	Warranty <input type="checkbox"/>
Samples <input checked="" type="checkbox"/>	Others (specify) _____ <input type="checkbox"/>

Contractor's Comments: SAMPLE OF TRUNKING, MILD GALVANIZED (MANUFACTUER: ELECTRICAL WAYS), WIDTH: 15 - 20 CM, HEIGHT: 5 CM

Note: This review does not relieve the Contractor of his responsibilities under the terms of the contract nor authorize additional compensation.

Contractor Signature: _____ Date: 24.07.21

Consultant's Comments: *This approval only for brand name which shall be heavy duty which is 15 mm height cable trunk must be 30% space for future*

See Attachment

Construction Manager & Client's Comments: *Final APPROVAL after ins talation onsite*

See Attachment

Status: A Approved B Approved As Noted C Revise and submit D Rejected E No Action

Sign & Date	Consultant	Construction Manager	Client
<input type="checkbox"/> Architectural	Sign: _____	Sign: _____	Sign: _____
<input type="checkbox"/> Structural	Date: _____	Date: _____	Date: _____
<input type="checkbox"/> Civil			
<input type="checkbox"/> Mechanical			
<input type="checkbox"/> Electrical			

Contractor: 	Project: المسيف مول BOX@RIYADH	Owner: 
--	--------------------------------------	---

MATERIAL SUBMITTAL

Ref. No. : EE 01-R1	Date : 0 4 0 3 2 0 2 1	<input checked="" type="checkbox"/> New Submittal <input type="checkbox"/> Resubmittal
---------------------	------------------------	---


<input type="checkbox"/> Architectural	<input checked="" type="checkbox"/> Electrical	<input type="checkbox"/> Civil	<input type="checkbox"/> Furniture/Equipment	Specs. No.
<input type="checkbox"/> Structural	<input type="checkbox"/> Mechanical	<input type="checkbox"/> Interior Design	<input type="checkbox"/> Others	Drwg. No.

S.N	Description	Manufacturer	Supplier	Material	Code
	CABLE TRAY & ACCESSAORIS	ELECTRICAL WAYS			B

* Description: (Manufacture, Model, Type, Size, Colour, etc.)

Catalogue Drawing Sample Certificate Calculation Document

Having checked this submittal, we certify that it conforms to the requirements of the Contract Documents in all respects, except as otherwise indicated herein.

Engineer:  Technical Manager: _____

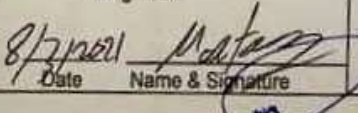
Received by:  Date: 8/2/2021

Name & Signature of Consultant

Remarks / Comments:

1- All cable trays sizes to be as per the approved
 1- جميع الكابلات بحجمها ووزنها وسمكها وارتفاعها و...
 Heavy duty & Hot, Ex. W, ...
 Heavy duty & Hot, Ex. W, ...

Status	A Approved	C Revise & Resubmit, Work shall not proceed	N No Action
	B Approved as noted	D Rejected - Resubmit	

Consultant Site Office		Consultant Head Office	
Engineer:	Project Manager:		
	_____	_____	_____
Date	Name & Signature	Name & Signature	Date



المركز المعماري
ARCH.CENTRE
CONSULTING ENGINEERS
استشارات هندسية



البروج الذهبي
Golden Chicken

PROJECT: GOLDEN CHICKEN NEW PPL PROJECT AT SHAHQRA

Transmittal No. YMCO-PPL-GC2-SP-EE-004

Manufacturer: local

Rev : 00

TRANSMISSION OF SAMPLES.

From: YOUSSEF MARROUN CONTRACTING Co. (YMCO)

TO: ARCH CENTRE Consulting Architects & Engineers

Date : 07 AUG 2022

PROJECT PHASE : 2

BUILDING : B21-PROCESS PLANT

TYPE: SAMPLE

LOT:

DISCIPLINE: EE

WE ARE SENDING HERewith THE SAMPLES LISTED BELOW.

SUBMITTED FOR	CODE
Approval	I
Information	II
ACTION	CODE
Approved	A
Approved As Noted	B
Revise & Resubmit	C
Rejected	D
For Information	R

QTY	DRWS., SPEC. OR BOQ. REF.	DESCRIPTION	TYPE	CODE	
				Submittal	Action
1		Sample board for Stainless Steel Pipe Installation (304) & accessories (316) at Processing Plant "B21" (Production Area as attached picture & sample).	SAMPLE	I	C

COPIES

FOR CONTRACTOR

CONSULTANT'S COMMENTS

YMCO
Chicken Poultry Farm Phase 2
Riyadh
123-872-000

• ليعاد تقديم غوزج تركيب القصبه مع الملاحظات الاتيم :-
 1) تركيب عدد 3 في تصان على قصبه الخلف مع طوره كبريا (SS 304) ونوصي
 بعد تركيب الماسكات (S+PP+RT) الا لدائمه فن
 2) تقديم طوره الكبريا (SS 304) للاعتماد مرضه مما سواره التصنيع موقعه
 وسواره الضاره
 3) تقديم الاكسوارت لهطوره SS 304 للاعتماد (Accessories) (Filling) مع التصان
 (Coupling and Connectors) (Clips)

COPIES

FOR CONSULTANT

DATE

Corrections or comments made relative to submittals during this review do not relieve the contractor from compliance with the requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions selecting fabrication processes and techniques of construction; coordinating his work with that of other trades, and performing his work in a safe and satisfactory manner.

ROUTING	DATE	SIGN	CONSULTANT STAMP	CONTRACTOR STAMP
RECIEVED BY CONSULTANT				
RECIEVED BY CONTRACTOR				

DOCUMENT SUBMITTAL



Transmittal No. YMCO-ICC-MAT-EE-09 R1		Date: 17-OCT-2022	Project Name: ICC - WATER BOTTLING PLANT	
Submitted by: YOUSEF MARROUN CONTRACTING CO.			Manufacturer/Supplier: ELECTRIC WAYS	
Document Name: MATERIAL SUBMITTAL FOR CABLE TRAY LADDERS AND TRUNKS				
Specification Ref:		Drawing No. Ref:		BOQ/Item No. Ref: n/a
Attachment	<input type="checkbox"/> Technical Brochures	<input type="checkbox"/> product tests		<input type="checkbox"/> certificates
	<input type="checkbox"/> COMPANY Profile	<input checked="" type="checkbox"/> Drawings	<input type="checkbox"/> SAMPLE	<input type="checkbox"/> Reference
Other (specify)				
Is the above material fully complying with contract specification? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO. If NO, explain your reason justifying your deviation to contract specification. (subject to Client/ Consultant review and approval)				
Signature:			Stamp:	
Reviewed by:	Mr. Ghalib Abusaif			
APPROVAL CODE				
<input type="checkbox"/> [A] Approved & Proceed		<input type="checkbox"/> [D] Do not proceed, more documents required as noted, resubmit		
<input type="checkbox"/> [B] Proceed, Approved as noted		<input type="checkbox"/> [E] For Information Only		
<input type="checkbox"/> [C] Do not proceed, change as noted and resubmit		<input type="checkbox"/> [F] Rejected		
APPROVAL				
		CONSULTANT ENGINEER		APPROVAL CODE
Name	Mohammed Al Momani			<u> B </u>
Sign				
Date				
Notes:				
1- Approved as Option #2				
2- HDGI approved Only				
3- All fitting and accessories must be ready made				
4- From 100 to 350mm wide must be not less than 1.5mm thick				
5- more than 350mm wide must be not less than 2.0mm thick				

Material Approval Request (MAR)

Ref. No. MS-ELECT-014	Request Date	30-Nov-22
Project No.: 132	Submittal <input type="checkbox"/>	Resubmittal <input checked="" type="checkbox"/>
Client: Al-Majdah Residence	Contractor	IES

Proposed Material Details

Complete in Spanish. By Providing full name information and sample to show if material is suitable to meet its intended purpose.

Civil <input type="checkbox"/>	Structural <input type="checkbox"/>	Architectural <input type="checkbox"/>	Mechanical <input type="checkbox"/>
Electrical <input checked="" type="checkbox"/>	HVAC <input type="checkbox"/>	Other <input type="checkbox"/>	

Manufacturers Details		Material Details	
S.No.	Manufacturer Name	Product Name	Cable Tray, Cable Trunk & Accessories
1	Electrical ways		
2			
Address		Description	Rev No.
Location		Cable Tray, Cable Trunk & Accessories	
Telephone			
Email	1	BOQ Item No.	

Material/Product Technical Documents		Material/Product Technical Samples	
Attachment 1 ref.	Data Sheet	Attachment 1 ref.	
Attachment 2 ref.	Sample Board	Attachment 2 ref.	
Attachment 3 ref.		Attachment 3 ref.	
Attachment 4 ref.		Attachment 4 ref.	
Attachment 5 ref.		Attachment 5 ref.	
Submitted By(Name): Eng. Muhammad Rowan Atal		Submitted By(Signature):	
Engineer Name: Eng. Muhammad Rowan Atal		Engineer Signature:	

Client Review

Received By(Name):	4 DEC 2022	Received By(Signature):	
--------------------	------------	-------------------------	---

Comment (include attachment if necessary)

لما فتحنا ما احتياج المصنع بميد دراسة وزن الكابلات و تقديم صواب
الوزن للمصنع لتوصيه المواد والاكسسوارات اللد زنه للتركيب
بميد الراتر ام بالاكسسوارات السعوديه بالمواد المتقدمة و مملقنه و بما كان
اصداره قطع من المواد بميد القيام بالبيع المولف عند مكان القطع.

محمد العسوي

Status: Approved Rejected Approved as noted For information Not Approved/Submit Again

Client Engineer Name:	Client Engineer Signature:	Date:
Client Representative Approval:	Signature:	Date:



CONTRACTOR PREQUALIFICATION SUBMITTAL FORM

Submittal Ref.	KSP-NUI-NU2-CMT-ELE-PQD-0095	Revision	00	Date	08-Dec-2022
Program	King Salman Park				
Project	CP12.1/Horticultural (Plant Import) & Acclimatization Nursery	Contract No.	20220519005		
Client	King Salman Park Foundation (KSPF)				
PMO	Saudi Arabian Parsons Ltd. (SAPL)	Contractor	Nesma United Industries (NUI)		
PMCM[1]	Faithful+Gould (FGS)	PMCM [3]	WSP Middle East (WSP)		

Discipline	<input type="checkbox"/> Civil <input type="checkbox"/> Architecture <input type="checkbox"/> Mechanical <input checked="" type="checkbox"/> Electrical <input type="checkbox"/> Information Technology <input type="checkbox"/> Landscape <input type="checkbox"/> Others __
-------------------	--

Sub-Contractor / Supplier Details	Attachments	Y / N
Name: ELECTRICAL WAYS FACTORY	Chamber of Commerce Membership.	Y
Trade: Manufacturer/Trade/Distributor	Municipality License	Y
Location: P O Box 79030 AL Khobar ·Dammam KSA	Other Licenses (Specify):	Y
Experience (Total No. of Years): 19 Years	
Experience in KSA: Since 2003	
Contact Name: Mohammad Imran Hussain Mobile Number: 050 5900 811	
Is the company certified against any quality standard? Yes	Pre-Qualification Docs (Specify):	Y
Is the company certified against any Health & Safety and Environment standards? Yes	
Subcontractors / Supplier's Proposed Scope of Work in this project	
Supplier of Cable Tray & Ladder	
	Completion Certificates for Previous Projects	Y



Contractor Signatures & Stamp		Date	08-Dec-2022
Discipline Engineer	QA/ QC	HSE	MEP
Mr. Moutaz Tarabzouni 	Mr. Danish Dag 	Mr. Abdulwahab 	Mr. Ibrahim Adra
Project Manager			
Mr. Tarek Chokr 			

PMCM Manager's Comments: Contractor to Ensure All Certificates & Legal Documents are Valid until scope of works is complete. Materials are subject to Material Approval. Factory Visit to be Available Upon Request.





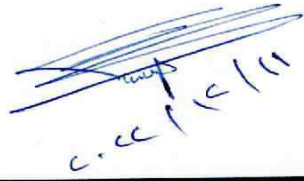
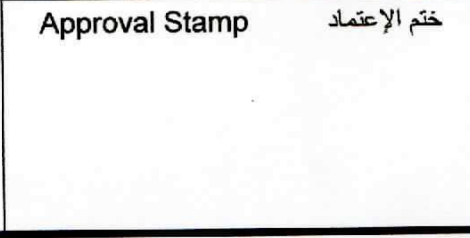
Status:

- A - Approved
 B - Approved as Noted
 C - Revise and Resubmit
 D - Rejected

Recommended by PMCM	Name	Signature	Date
	Ahmed Alashqar		11-Dec-22
Received by Contractor			
Distribution			

Distribution:

- PMCM
 Contractor
 Others (Specify)

Client المؤسسة العامة لتحلية المياه المالحة Saline Water Conversion Corporation		Contractor شركة الكوثر للصنعة المحدودة AlKawther Industries Co. Ltd.			
PROJECT No. J2120064 PROJECT NAME : Replacement of Sodium Hypochlorite System to Chlorine Dioxide System In Yanbu Plants (R01 Plant, Pahse-II)			LOCATION : YANBU	PAGE 01 of 01	
MATERIAL SUBMITTAL		المستندات المقدمة			
Ref. No. : 0.1 CABLE TRAY & ACCESSORIES		Submittal No. 01 PROJECT NOTES AND COMMENTS			
Date : 7-Dec-22		<input checked="" type="checkbox"/> New Submittal <input type="checkbox"/> Re-Submittal			
DISCIPLINE:					
<input type="checkbox"/> CIVIL <input type="checkbox"/> ARCHITECTURAL <input checked="" type="checkbox"/> STRUCTURAL <input type="checkbox"/> MECHANICAL <input checked="" type="checkbox"/> ELECTRICAL <input type="checkbox"/> INSTRUMENTS <input type="checkbox"/> GENERAL					
ENCLOSURES (مرفقات)					
DRAWINGS مخططات <input type="checkbox"/>		SAMPLE عينة <input type="checkbox"/>		TEST DATA بيان اختبار <input type="checkbox"/>	
MATERIAL SUBMITTAL مواد <input checked="" type="checkbox"/>		SKETCH مكنش <input type="checkbox"/>		SCHEDULES جداول <input type="checkbox"/>	
CATALOGS كتالوج <input checked="" type="checkbox"/>				REPORT تقارير <input type="checkbox"/>	
MFG. CERT. شهادات <input type="checkbox"/>				CLARIFICATIONS توضيحات <input type="checkbox"/>	
SPECIFICATIONS مواصفات <input checked="" type="checkbox"/>				OTHERS أخرى <input type="checkbox"/>	
رقم البند ITEM #	DRWG. NO. SPECS. NO.	رقم المراجعة REV.	بيان DESCRIPTION	عدد النسخ NO. OF COPIES	رمز القرار ACT. CODE
1	J2120064-E-01	1	Materials submittal for cable tray and Accessories	1	
1	J2120064-E-01	1	Supplies: Electrical ways Attached Datasheet	lot	
					
Contractor' Remarks We assure that the above submittal is strictly adhering with the contract specifications except otherwise as stated below.					
Name : DILSHAD ZAFAR Signature:  Date : 07/12/2022					
SWCC Representative Review & Comments: Heavy duty Trays shall be supplied specially for outdoor installations with additional 2 layers coating.					
Name : Abdallah AlYenbawi Signature:  Date : 08/12/2022					
ACTION CODES:					
A) Approved (موافقة) B) Approved as noted resubmit not required (موافقة بملاحظات) C) Revise and resubmit (تعديل وإعادة التقديم) D) Rejected (مرفوض)					
SWCC Project Manager "ممثل المالك" يعتمد من قبل			Approval Stamp ختم الإعتماد		
					

PROJECT: DALLAH NAMAR HOSPITAL CONSTRUCTION OF OUTPATIENT & REHABILITATION BUILDING		SUBMITTAL NO.: DNH-OPR-MT-EL-0005	
		REVISION #: 00	
		DATE: 16-Jan-2023	
EMPLOYER: 	PROJECT MANAGER: 	CONSULTANT: 	CONTRACTOR: 

MATERIAL SUBMITTAL

TO: TAKAMIL PROJECT MANAGEMENT CO		FROM: YOUSSEF MARROUN CONT. CO.				
Type of Submittal:	Samples <input type="checkbox"/>	Specifications <input checked="" type="checkbox"/>	Catalogues <input checked="" type="checkbox"/>			
Manufacturer / Supplier Details <input type="checkbox"/>		Others <input type="checkbox"/>	Please Specify: COMPLIANCE SHEET			
Discipline:	AR <input type="checkbox"/>	ST <input type="checkbox"/>	CE <input type="checkbox"/>			
	EE <input checked="" type="checkbox"/>	ME <input type="checkbox"/>	LA <input type="checkbox"/>			
Description:	CABLE TRAY, TRUNKS & LADDER SYSTEM		Location: ALL FLOOR			
ITEM	MANUFACTURER/SUPPLIER	ADDRESS	CONTRACT REFERENCE			ACTION CODE
			DRWG. REF.	SPEC. REF.	B.O.O. REF.	
1	ELECTRICAL WAYS FACTORY	KSA	IFC EP201-208	16139/16140	DIV.16	B

Attached all relevant technical literature marked to identify relevant description, current Test Certificates, samples as appropriate.

Country of Origin: TURKEY KSA

Availability:


Locally Manufactured Overseas

Delivery: Ex-works/Factory [] Days
Lead Time (from P.O. to Arrival on Site) [] Days
Estimated Time of Arrival on Site []

Program: Date Material Required on Site []
Latest Date for Order []

CONTRACTOR'S REMARKS:

WE CERTIFY THAT THE ABOVE SUBMITTED ITEMS HAVE BEEN REVIEWED IN DETAIL, AND ARE CORRECT AND IN STRICT CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS.

STAMP: 
16 JAN 2023
DALLAH NAMAR
RIYADH
100-883-000

ENGR. GHALIB ABUSAIF
PROJECT MANAGER

CONSULTANT COMMENTS / RECOMMENDATIONS:

see attached comments.

ENGR. EMAD SALEM
RESIDENT ENGINEER

22.01.2023

TPMC COMMENTS / CONCURRENCE:

** All fittings and accessories shall be from the manufacture Electrical ways factory.*

** Samples for all items shall be submitted for evaluation.*

ENGR. MAHMOUD NASR
PROJECT MANAGER

Review / Approval Code: A = Approved B = Approved as Noted C = Revise and Resubmit D = Rejected E = No Action

Distribution: Original to Contractor CLIENT Project Manager Consultant

Approval shall not relieve the contractor of his liabilities under the Contract or constitute authorization of any change to Contract Documents. Checking is only for review of general compliance with Design Concept (MTC) and general compliance with the information given in the contract documents.

TPM Receiving Stamp: 
RECEIVED
Name: []
Date: 16 JAN 2023

AJS Receiving Stamp: 
RECEIVED
Name: []
Date: 22 JAN 2023

YMCO Receiving Stamp: 
RECEIVED
Name: []
Date: 22 JAN 2023

Project: Dalla Namar Hospital
Construction of Outpatient & Rehabilitation Building
Submittal No.: DNH-OPR-MT-FI.0005
Revision #00 / Date: 16/01/2023
Cable Tray, Trunks, & Ladder System
Manufacturer: Electrical Ways Factory
Supplier: Electrical Ways Factory
CODE (B)

- 1- The Types, Size Shall be as per Approved Shop Drawing, Details, and Specs to be Followed Regarding to Filling Ratio.
- 2- Trays & Ladders to be Heavy Gauge Perforated Sheet Steel, hot-dip Galvanized.
- 3- Trays Minimum 1.5 mm Thick, With Sides Not Less Than 45 mm Deep with Outwards Return Flanges.
- 4- Covers Are to be Minimum 1.0 mm Thick Galvanized Sheet Steel, Snap-On or Bolt Type, forming a Rigid assembly with the Tray.
- 5- All Components Shall be from a single Manufacturer.
- 6- Submit Samples for Approval.
- 7- Final Approval Shall be by PMO (Takamul).

-
- ① * All materials shall be as per submitted catalogues.
 - ② * All fittings and accessories from the manufacture Electrical ways factory.
 - ③ * Samples for cable ladder, tray and trunking shall be submitted for approval and evaluation.

~~XXXX~~



Transmittal To SDC (Materials)

Submittal
 Resubmittal

Date :-	Project Code	Project Title	Trans. No.	Department			
23-May-23	SDC 1728	PHASE-3-1728	SDC-RY-1728-PH3-MAT-EE-0404-Rev-00	AR	CE/SE	ME	EE

To Resident Engineer
 Head Office
 Others

From **MBL - First Fix**

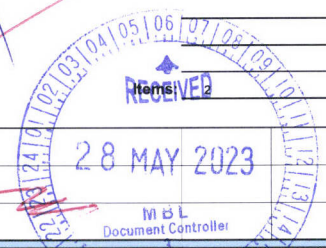
Location :- All Phase-3 Buildings **Area :-** All Phase-3 Buildings

Contractor Use

Item No.	Revision	Item Description (Name, Type, Size, Capacity, Specific Use, Etc.)	Manufacturer or Designer	Dwg. No., Catalog No. Brochure No., Others	No. of Copies
1	0	Cable Management system for all Phase-3 buildings	Electrical Ways	Technical datasheet	1
				Soft copy	1



Submitted by				Enclosures: HARD COPY SOFT COPY	
Name Basel Draki	Title MEP Manager (First Fix)	Signature		1	1
Name Ashraf El Saey	Title Tech Manager (First Fix)	Signature			
Name Md.Abdul Azeem	Title Tech. Engineer (MBL)	Signature			
Name Pervaz A Khan	Title QC Manager (MBL)	Signature			
Name Ahmed Mansour	Title Tech. Director (MBL)	Signature			
Name Ahmed Hegazy	Title Project Manger (MBL)	Signature			



Saudi Diyar Use					
Item #	1				
Code	2				
Reviewed By	ELTIGANI				

Action Code
1. No Exceptions Taken
2. Corrections as Noted ✓
3. Resubmit
4. Rejected
5. See Remarks

Remarks:
a) Installation shall only proceed when Action Code is 1 or 2.
b) Action Code 3, shall be resubmitted within time limit set in the contract.
c) Review does not relieve the Contractor from Responsibility of Compliance with all requirements of contract documents.

Special Instructions

Electrical Ways is approved as cable Management system Manufacturer subject to:

- 1- Ways should arrange loads test certificate as per approved B.O.O
- 2- Ways to verify the capability of Manufacturing all C/TYS
- 3- ways should arrange Hot dip galvanized certificate.
- 4- Submit FAT & type test certificate
- 5- All quantities and fitting should be from the same manufacturer (ways)

Reviewed by: _____ **Date** _____

Name ELTIGANI **Title** Sr. E. Eng **Signature** _____ **Date** 28-5-23

Signed off by: _____ **Date** 28-5-23

Name _____ **Title** _____ **Signature** _____



TEST REPORTS

Electrical Ways



TR- 006-2016 1

King Saud University
College of Engineering
Electrical Engineering Department
Riyadh, Saudi Arabia

Test Report
No. TR-006-2016

for

Electrical Continuity Test
on Cable Trays

Test carried out at

The High Voltage Laboratory

Sha'ban 1437
May 2016

Total No. of Pages including Appendix: 13





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1. Introduction

Electrical Ways Factory Company, Riyadh requested High Voltage Laboratory, King Saud University to carryout electrical continuity test on a set of cable trays and cable ladders supplied as a requirement of pre-qualification of metallic tray systems for Saudi Electricity Company as per SEC specification # 24-TMSS-01-Rev-0, Clauses 4.4.5 and 5.1.3. This report summarizes the details of the tested metallic cable trays and the resistance values measured across their splices.

2. Tested Samples

Electrical Ways Factory Company provided samples of cable trays and ladder of following types:

- Perforated trough type.
- Ladder type.

The detailed drawings of these samples and related connectors / fish plates are attached in Appendix (A) whereas the photo of one cable tray under test is shown in Appendix (B).

3. Test Requirements

Electrical continuity test was carried out on all of the supplied samples as per SEC specification # 24-TMSS-01 and NEMA VE-1, Clauses 5.1.3 and 4.4.5(c). The permissible maximum resistance across any splice connection is 330 $\mu\Omega$. Measurements should be carried out as per NAME-VE1 following the procedure given in Clause 5.1.3 of SEC specification # 24-TMSS-01. The two cable tray sections of each type were connected together with their specified joint connectors / fish plates to conduct these tests.



4. Test Results

Table (1) summarizes the results of the cable tray continuity resistance measurements, measured at following atmospheric conditions:

Pressure = 934mbar

Temperature = 23.3°C

Humidity = 29.8%

Table (1): Net resistance measured across splice connections.

S. No.	Cable Tray Type	Net resistance of the splice connections ($\mu\Omega$)
1.	Cable tray 600 × 55 × 2 mm HDG (perforated) (Two sections joined together)	144.5
2.	Cable tray 300 × 55 × 2.0 mm HDG (perforated) (Two sections joined together)	150.3
3.	Cable ladder, pipe TRO type CL-O 300 × 100 × 2.0 HDG (Two sections joined together)	140.3

Note: All nuts and bolts on the tray joints should be fully fastened otherwise the resistance shall exceed the specified value.

5. Conclusion

The three types of cable trays/ladders that were tested and whose details are provided in Appendix (A) successfully met the electrical continuity test requirements as per SEC specification # 24-TMSS-01-Rev-0, Clauses 4.4.5 and 5.1.3.



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6. *Tests Conducted By:*

The tests were conducted by the following team from College of Engineering, King Saud University, Riyadh, Saudi Arabia.

1. Prof. Nazar H. Malik
Electrical Engineering Department
2. Engr. Nissar R. Wani
Electrical Engineering Department

7. *Test Witnessed By:*

The tests were witnessed by the following members of Electrical Ways Factory Company, Riyadh.

1. Mr. Kefah Al-Dowik, Production Manager
2. Osama El-Gazar , Financial & Administrative Director
3. Yassin Al-Herbawi, Marketing Manager

8. *Tests Approved By:*

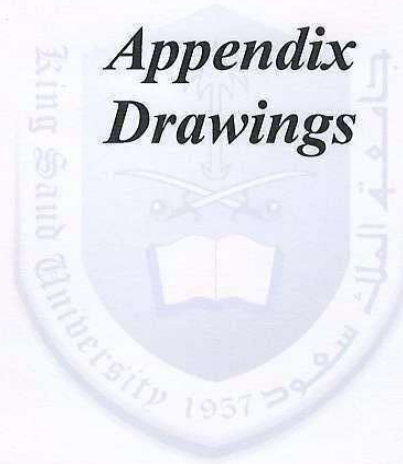
Prof. Abdulrehman A. Al-Arainy
Manager
High Voltage Laboratory





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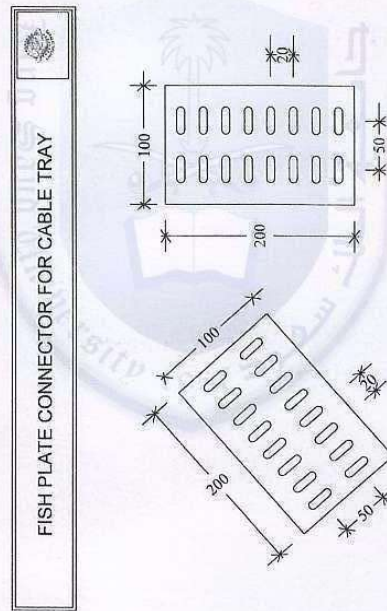
Appendix Drawings



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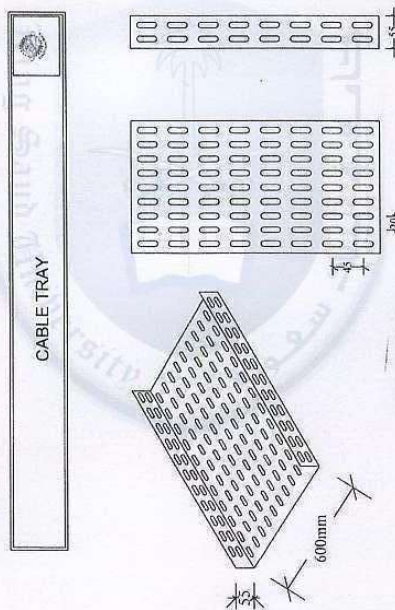


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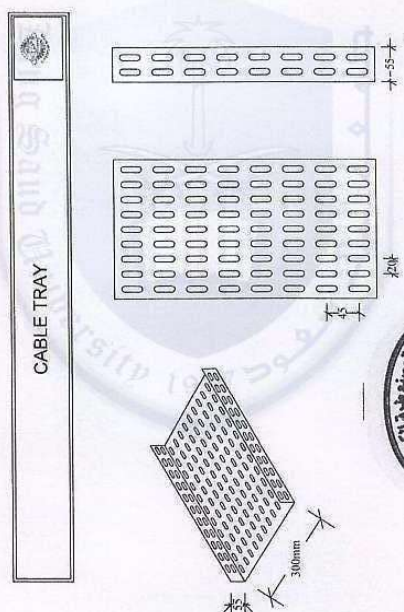


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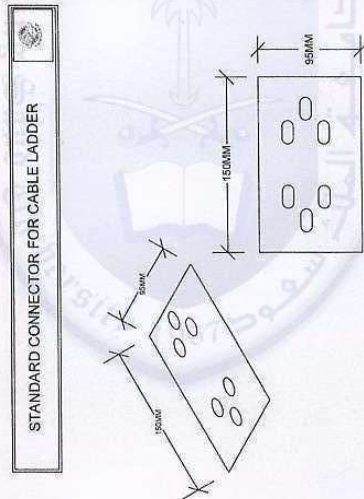


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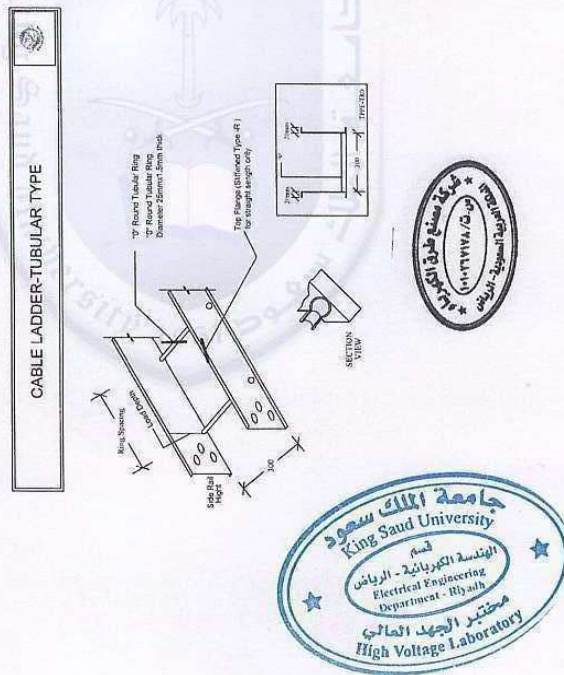


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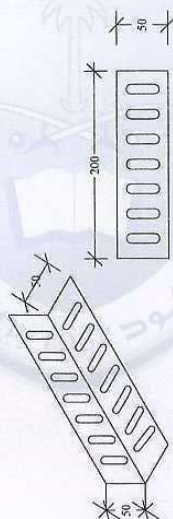


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STANDARD JOINT CONNECTOR FOR CABLE TRAY



STANDARD CONNECTORS
50X50X200MM
Part Reference : S.C.I

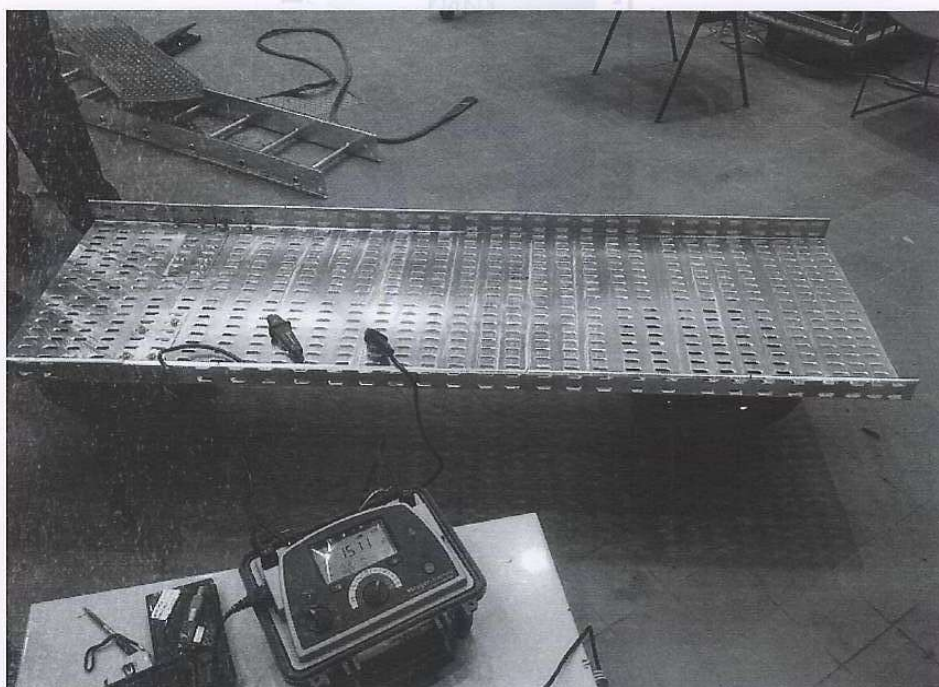


M.H.S.




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Photo *(One Cable Tray Under Test)*



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AL HOTY-STANGER 	ELECTRICAL WAYS FABRICATORS	
	RIYADH	Our Ref.: RD-11716
	CHEMICAL ANALYSIS REPORT ON CABLE CLAMP SAMPLES	Date: 03 Jan. 2007
		Page: 1 of 1

SAMPLE REFERENCE : Cable Clamps Aluminium 240
DATE SAMPLE RECEIVED : 04 December 2006

TEST METHOD:
i) ASTM E – 34
ii) ICP – OES

RESULTS:


COPPER	(Cu)	%	=	3.25
MANGANESE	(Mn)	%	=	0.10
ZINC	(Zn)	%	=	1.40
IRON	(Fe)	%	=	1.05
LEAD	(Pb)	%	=	0.07
CHROMIUM	(Cr)	%	=	0.03
TITANIUM	(Ti)	%	=	< 0.01
NICKEL	(Ni)	%	=	0.10
SILICON	(Si)	%	=	8.32
MAGNESIUM	(Mg)	%	=	< 0.01
ALUMINIUM	(Al)	%	=	85.6

< = Less Than

NOTE:
Test Method Variation: Nil



TEOFILO D. CABAL JR.
Assistant Regional Manager – Riyadh
For AL HOTY-STANGER LTD.

NAEEM ZAIDI
Materials Analysis Dept. – Manager
For AL HOTY-STANGER LTD.

This report relates only to the sample tested and shall only be reproduced in full with the written approval of Al Hoty Stanger Ltd. Co. Laboratory



PROJECTS REF.LIST

ELECTRICAL WAYS FACTORY CO. MAJOR PROJECTS LIST

S NO.	PROJECT NAME	CONTRACTOR / CLIENT	CONSULTANT
1	PP9 EXTENTION CONTRACT# 10421001/00 (SCECO)	ARABIAN BEMCO CONTRACTING CO.	SAUDCONSULT
2	PP10 PROJECTCONTRACT#10721026/00 (SCECO)	ARABIAN BEMCO CONTRACTING CO.	SAUDI ELECTRICITY COMPANY
3	PP9 EXTENTION CONTRACT# 10421001/00 (SCECO)	ARABIAN BEMCO CONTRACTING CO.	SAUDI ELECTRICITY COMPANY
4	EXENSION OF QURRAYAT OPEN CYCLE CN:31121092/00 (SCECO)	ARABIAN BEMCO CONTRACTING CO.	SAUDI ELECTRICITY COMPANY
5	KING ABDULAZIZ UNIVERSITY	SBG-IPP JV ARABIAN BEMCO CONTRACTING CO.	KING ABDULAZIZ UNIVERSITY
6	KING ABDULLAH FINANCIAL DISTRICT / DATA CENTERTS	JUFFALI A/C MECH &ELEC. (JAMED)	ZUHAIR FAYEZ
7	CONVENTION HOTEL - PACKAGE-2	CCE-CONTRACTING & CONSTRUCTION ENTERPRISES LTD.	ZUHAIR FAYEZ
8	FLUOR ARABIA, JUBAIL	CCE-CONTRACTING & CONSTRUCTION ENTERPRISES LTD.	ZUHAIR FAYEZ
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27	SILICA FACTORY	YOUSSEF MARROUN CONT. EST	YMES
28	AL YAMMAMA FACTORY MARBLE & FRANIT	YOUSSEF MARROUN CONT. EST	YMES
29	SACO DAHRAN	YOUSSEF MARROUN CONT. EST	YMES
30	AIR CRAFT MAINTENANCE	YOUSSEF MARROUN CONT. EST	YMES
31	AL OTHIM-ZOLFY EL GASSIM	YOUSSEF MARROUN CONT. EST	YMES
32	RIYADH SOCIAL CARE CENTER	YOUSSEF MARROUN CONT. EST	YMES
33	JUBAIL PLAZA	YOUSSEF MARROUN CONT. EST	YMES
34	HYPER PANDA - RAKKAH	YOUSSEF MARROUN CONT. EST	YMES
35	IMAM MALL	YOUSSEF MARROUN CONT. EST	YMES
36	HAFR AL BATIN MALL	YOUSSEF MARROUN CONT. EST	YMES
37	PANDA - RIYADH	YOUSSEF MARROUN CONT. EST	YMES
38	PANDA - JUBAIL	YOUSSEF MARROUN CONT. EST	YMES
39	PANDA - AL NAZEEM	YOUSSEF MARROUN CONT. EST	YMES
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84	Al Ghadeer Medical Center (D. Sulaiman Al Habib)	East Delta Saudi Co. Ltd. (EDSCO)	CEC
85	Dalah Namar Hospital	YOUSSEF MARROUN CONT. CO	
86	IMC Cinema (deferent location)	East Delta Saudi Co. Ltd. (EDSCO)	



PRODUCTS CATALOGUE

Electrical Ways



ELECTRICAL WAYS

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Listening Is Our Success



Electrical way's assister for electrical way's fabricators is situated in Riyadh Industrial Area show room's in All-Mojil Market, Prince Fahed bin Ebraheem Al-Saud Str. We are engaged in steel fabrication like, communication, computer and battery cabinets, cable tray's trunking, cable, ladder, since it's establishment(electrical way's) We care in taken in material protection to much the Saudi Arabia & Gulf specification.

We hope that engineer's, consultants and project manager will be accepted to maintain quality and design.

WE ARE KEEN INTRESTED FOR DROWTH & DEVELOPMENT OF THE KINGDOM.

REGARDS



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Electrical Ways

Electrical ways is dedicated to manufacture and distribute all types of Cable trays system; The Company's success over the past years can be traced to providing high quality cable trays that matches your needs, with the timeliest manner and within budget, not to mention the ongoing comprehensive quality control program that provides a 100% customer satisfaction. Electrical ways principle officers see each contract as an agreement not between a business and its customers, but between partners that with to create a close and mutually beneficial long-term relationship. This will help provide greater long-term profit through referrals and repeat business. Our sales agent and factory personnel endure that technical and the engineering experience to help you select and design the cable tray system that meets your specific requirements.

What is a Cable Tray System?.

Cable tray system, according to NEMA, is an assembly of units or sections and associated fittings forming a rigid structural system used to securely fasten or support cables and raceways.

- Cable trays support cable the way that roadway bridges support traffic.
- Abridge is a structure that provides safe passage for traffic across open spans.
- Cable tray is the bridge that allows for safe transport of wires across open spans.
- Therefore, think of cable tray as the structural component of a building's electrical system.

Type of Cable Tray

1. Ladder
2. Solid Bottom (Trunk)
3. Trough
4. Channel
5. Wire Mesh
6. Single Rail

1. ladder Cable Tray provides:

- a. Solid side rail protection and system strength with smooth radius fittings and wide selection of materials and finishes.
- b. maximum strength for long span applications
standard widths of 50;75;100;150;200;250;300;400;600; 700 & up to 1100 mm.



- c. standard depths of 75; 100 ; 140 & 175mm
- d. standard lengths of 2440 mm & 3000mm
- e. rung spacing of 190mm & 230mm.

ladder cable tray is generally used in applications with intermediate to long support pans,

2- Solid Bottom Cable Tray provides:

- a. Non-ventilated continuous support for delicate cables with added cable protection available in metallic
- b. Solid bottom metallic with solid metal covers for no plenum rated cable in environmental air areas.
- c. Standard width of : 50;75;100;150;200;250;300;400;500;700 & 900mm.
- d. Standard depth of cable tray 50;85;115 mm
- e. Standard length of cable tray 2440mm & 3000 mm

Solid Bottom cable tray is generally used for minimal heat generating electrical or telecommunication applications with short to intermediate support spans of (1200 mm to 3000) mm.

3. Trough Cable Tray provide

- a. Moderate ventilation with added cable support frequency and with the bottom configuration providing Cable support every 10 mm. Available in metal and nonmetallic materials.
- b. standard width of 50;75;100;150;200;250;300;400;500;700 &900mm.
- c. standard depth of 50;85;115 mm
- d. standard length of 2440mm&3000 mm
- e. fixed rung spacing of 10 mm on center.

Through cable tray is generally used for moderate heat generating applications with short to intermediate Support spans of (1200 mm to 3000) mm.

4. Channel Cable Tray provides:

- a. An economical support for cable drops and branch cable runs from the backbone cable tray system.
- b. standard widths of 75,100 and 150 mm. in metal systems and up to 200 mm. in nonmetallic systems,
- c. standard depth of 25 mm. in metal systems and 55 MM .In nonmetallic systems
- d. Standard length (1200 mm to 3000) mm.

Channel cable tray is used for installations with limited numbers of tray when conduit is undesirable.

Support frequency with short to medium support spans of (1200 mm to 3000) mm.



5. Wire Mesh Cable Tray provides:

- a. A job site, field adaptable support system primarily for low voltage, telecommunication and fiber optic cables. These systems are typically steel wire mesh,
- b. standard widths of 50, 75, 100, 150, 200, 250, up to 1000 mm.
- c. standard depth of 25, 50, 75, up to 150 mm.
- d. standard length 2440 mm, 3000mm.

Wire Mesh tray is generally used for telecommunication and fiber optic applications and are installed on short support spans, 1200mm to 3000 mm.

6. Single Rail Cable Tray provides:

- a. these aluminum systems are the fastest to install and provide the maximum freedom for cable to enter and exit the system.
- b. Single hung or wall mounted systems in single or multiple tiers.
- c. Standard width are 50, 75 up to 1000 mm.
- d. Standard depths are 50, 75 up to 150 mm.
- e. Standard length are 2440 mm, 3000 mm.

Single Rail Cable Tray is generally used for low voltage and power cables installations where maximum cable freedom, side fill, and speed to install are factors.

The materials / finishes are available for the various cable tray systems

1. Steel (Min. Yield = 33KSI) (35KSI for Stainless)

- a. **Plain:** hot rolled pickled and oiled steel per ASTM A569 (Commercial Quality) or A570 (Structural Quality).
- b. **Pre-Galvanized:** mill galvanized steel per ASTM A653 CS (Commercial) or SS (Structural) G90
- c. **Hot Dip galvanized After Fabrication:** plain steel which is hot dipped after fabrication per ASTM A123,
- d. **Stainless Steel:** type 304 or 316L fully annealed stainless steel.

2. Aluminum (Min. Yield = 23 KSI)

- a. 6063-T6 OR 5052-H32 alloy per ASTM B209

The support methods available

1. Trapeze Support (Single or Multi-tier)
2. Hanger rod clamps, "J" hangers.
3. Center Hung Support.
4. Wall Support.
5. Under floor support.
6. Pipe stanchions or other structures.

Each of these support methods is preferable in different applications. For instance, trapeze supports may be desired in an application where cables will be pulled through the cable tray. Center hung supports,



on the other hand, are generally used when cables will be installed from the side of the cable tray. Center hung supports are especially useful when future cable additions are desired. Wall supports and under floor supports are useful when ceiling structure is not available or undesired. Outdoor installations are controlled by the structures available to support the cable tray.

Job site and installation considerations:

a. Outdoor

1. supports available affect the length and strength requirements,
2. environmental loads, ice, wind, snow and possibly seismic
3. corrosion requirements affect the materials and finishes
4. classified hazardous locations affect the cable types acceptable.

b. Indoor

1. support locations available affect the length and strength of the system,
2. industrial installation may require a 200 lb. Concentrated Load.
3. commercial or institutional installation may make system appearance, system weight, and space available important factors
4. environmental air handling area may affect cable types, cable tray material, or cable tray type and need for covers.
5. classified hazardous locations affect the cable types acceptable.

History cable tray :

Metallic cable tray systems came of age in the mid -40's with the introduction of ladder cable tray for armored shielded cable and mesh cable tray. Cable tray a cost effect solution for routing and supporting power cables.

The growth, development, and application of cable tray has, from this early beginning, paralleled innovation and technical development in cable design and fabrication. It has evolved to keep pace with the increasing need for a safe economical means of supporting and distributing telephone cable, as well as power cable.

A significant part of this growth rate is reflect in the retrofit market, where cable tray is being installed to replace other types of distribution systems in existing structures. Another rapidly growing market for cable tray.

Cable tray systems include all the components and accessories necessary to integrate and support a cable system into a total electrical installation. Metallic cable tray has the required durability to withstand mechanical abuse and corrosive atmospheres.

Article 318-2 (C) of the National Electrical Code (NEC) permits the use of metallic cable tray as a grounding system for fault currents, and under-writers laboratories, Inc. (UL) Classifies metallic cable tray for this application. The NEC has significantly broadened the application of metallic cable tray because of the acceptance of power cable types now available.



Today, cable tray is accepted in virtually all industries and all application, including Hazardous class I and II environments of gas and dust atmospheres.

Although the market for cable tray expanded rapidly, rules and guidelines regarding installation, supports, loads and testing were not initially subject to a high degree of standardization. In fact, during the first 25 years virtually hundreds of different specifications were developed – many contradictory, one to the other-causing confusion among manufacturers and users alike.

developed covering the specification, installation and testing of metallic cable tray systems.

Article 318-1 of the NEC states: A cable tray system is a unit or assembly of units or sections and associated fittings made of metal, forming a rigid structural system used to support cables.

Metallic cable tray is a trof or ladder-like support system for electric power, signal, control and telephone cables. Cable tray is fabricated from a single sheet of metal or with rigid sided rails which form the structural framework for integral bottom transverse members of various styles.

Perforated cable tray

Is a prefabricated metal structure consisting of a bottom with opening within integral or separate longitudinal side rails. Steel 1-2 mm.

Ladder cable tray

Is prefabricate metal structure consisting of two longitudinal side rails connected by individual transverse members. Side rails hieght (75) to (155) mm, rung spacing (150) TO (300) mm

Channel cable tray

Is a prefabricated metal structure consisting of one-piece ventilated bottom or solid-bottom channel section, or both, not exceeding (150) in width.

Trof cable tray

Is a prefabricated metal structure greater than (100) in width consisting of ventilated bottom within integral or separate or longitudinal side rails.

Value , performance and cost- conscious engineers/ designers... contractors/installers .. and owners/ end users, all have good reasons to favor cable tray for their electric power, signal, control, and telephone cable distribution and support requirements.

Versatile.

Metallic cable tray systems are available in many sizes, styles and materials. A standard or special design is available for any job big or small, indoors or out doors. Hot dip Galvanized



Reduced design and drafting time:

Computer compatible, simple to design with, Easy to modify extend, Drawings can be started sooner and material can be ordered later.

Full ventilation

Power cables need not be derated, and explosive gases cannot be trapped or transmitted, as in totally enclosed wiring systems.

Space efficiency.

Cable tray is strong yet light, allowing durable systems to be installed quickly and easily.

Easy installation.

Even long run armored shielded cable can be pulled in simply with less chance for cable damage. Or, cable bundles can be laid in tray from the side.

Installation labor leveled.

Electrical ways Tray can be installed after concrete and major building steel and mechanical piping is complete. Crews can start later and finish sooner.

Simple field modification.

To tray runs can be made easily on the job without extensive re-engineering.

Accessibly for the future.

New cable can be easily added and all cable can be quickly replaced or repaired. Circuits can be visually traced, minimizing startup and troubleshooting.

Fully compatible with other wiring methods.

Cable tray is often used for main runs and other wiring methods used for branch circuits. With all these advantages, is it any wonder why cable tray is usually the most economical choice?

Applications.

Applications of cable tray can be found in virtually all industries. A few are illustrated here. Representative large users include electric utilities, steel, communications, computer, metal working and mining industries. Cable tray is also providing efficient service and finding ever-increasing acceptance for commercial and institutional projects.

Fossil power plant.

The power plant market accounts for more than 50% of cable tray sales. Utilities are the largest users and promoters of cable tray.

Petrochemical/ refinery.

Long-span cable tray is supported conveniently off pipe racks and trestles. Oil and petrochemical companies are large users of cable tray for such applications.



Pulp mill.

Cable tray provides protection and distribution for high voltage primary circuits where needed, Cable tray use (petrochemical/ Refinery/ TV station, GSM and tower plants, Grain elevator/ Telephone & computer Room, Airport corridor, Hospital, Building of towers.

Select cable tray.

Where multiple circuits in the same direction are required, use of single cable tray run instead of multiple wiring systems can save significant installation and material costs,

Common tray for different services.

Used field installed barrier strip in the tray to separate power and signal circuits,

Use wider cable tray.

Selecting a cable tray wider than initially required could provide additional capacity for future needs, with no future material or labor cost or new spaces requirements.

Use deeper cable tray

Where your requirements call for stacking cables, consider the use of deeper trays.

Consider using longer spans.

Determine the most economical span based on cable loading and available support location. Longer span not only reduce the number of supports needed, but also reduce the most of installing them.

Consider using wider rung spacing.

Depending on the diameter and flexibility of cables, use the widest possible rung spacing in ladder-type trays for material savings.

Use minimum-radius fittings.

About 61% of all cables installed in today's cable tray can be bent to a (300) radius. Used 20 (600) when unsure of cable flexibility, Select (600) Or (1200) only when cables demand large bending radii.

Use adjustable Splice plates

For bends less than (1100) and in emergencies when unexpected obstacles are encountered on the job, Order extras as they fit all tray widths,

Technical data

Electric ways swage ladder

Is a structure consisting of longitudinal side members connected by individual transverse members called rungs and is manufactured in accordance Electric ways rungs are fastened to the side members by an exclusive destroy the desirable metallurgical properties of either the side member of the rung and insures a superior mechanical and electrical connection.



Side Members- Electrical ways

side members are designed with top and bottom flanges turned outward. This simplifies fastening ladder to supports and fastening covers to ladder. Ladder with flanges outwards allows complete access within the cable loading area and eliminates the possibility of cable damage from sharp edges within the cable area. The return on the top flange strengthens the side member and allows cable to be smoothly dropped over the side.

Rung Electrical ways

Ladder rungs are 25mm” diameter tubing Non – flattened on top to provide cable bearing surface, construction allows cable to drop out anywhere without contacting a sharp edge.

Rung Spacing-

The interval at which rungs are swaged to the side member. This is measured from centerline of rung to centerline of rung. Electrical ways manufactures straight length with four standard rung spacing; (150) (230), (300) and (450). Rung spacing is a generally accepted compromise.

Length - the longitudinal dimensions of standard Electrical Ways cable ladder are 2440 mm or 3000 mm

Width – The transverse dimensions of Electrical Ways cable ladder are measured inside from side member web and are furnished in seven standard width: (150) (200) 250/300/400/500/600/760/ 850/900/1000,

Overall Width - overall ladder width is equal to the inside or nominal width plus the width plus the width of side member flanges.

Loading Depth - Measured from top surface of rung to top of side member, This is not to be confused with over all height. Electrical ways manufactures four loading depth; (75), (100) , (140) and (160).

Fittings –

For changing direction horizontally as well vertically . Electrical ways has elbows, tees and crosses in all widths and loading depth available in three standard radii; (300), (600) and (900) Electrical ways maintains a normal (230) rung spacing through the centerline of all fittings.

Materials:

Electrical ways Aluminum Cable ladder side rails are manufactured from extruded heat treated 6063T-6 alloy (min. yield of 25000 psi). Rung are 6063 NHT tubing. Electrical ways Steel cable ladder side rails and tubular rung are manufactured of mild carbon steel. ASTM A569 commercial grade; or A570, Grade 36 , certified steel when requested. (Specify if other grades are desire).

Standard Finishes

Hot Dip Mill-Galvanized (Pre-galvanized) to ASTM-525 which provides 1.25 oz, Zinc coating/sq.ft, of material (1.25 oz total weight of



coatings on both side of one sq. ft.) and Hot Dip Galvanized After Fabrication (HDGAF) to ASTM A-386 which provides a 15 oz. Zinc coating/sq. ft. (of surface area). In a mill galvanized product there is some wipe down of zinc into punched holes and along sheared edges. This does give some degree of protection as the coating will sacrifice itself. HDGAF covers all surfaces after fabrication.

Mill galvanized ladder is generally used indoors or in locations not exposed to the elements or corrosives. For extremely corrosives for extremely corrosive areas Electrical way can supply an Epoxy coating over aluminum or coated/un-coated steel, Stainless steel trays are available on special application, Weathering steel is also available; however, limits of availability vary. Sis teal 3040 R 130 L .

ELECTRICAL WAYS CABLE LADDER

1. New Universal Curvilinear Splice Plate System

The splice plates for rigid connections have a slight curve so they can be used on straight sections or fittings. Tightening of the fastener pulls the plate flush with the side rail. The fasteners are snug and the joint is superior structurally and electrically. Even when hand-tight, there is pressure on the fasteners to hold it securely. Standard hole patterns are used throughout. Connector and hardware will interface with other systems.

2. New Zero Tangent Fitting

Tangent as referred to on cable tray fitting is the straight at the end of the curve to accommodate a flat splice plate. This wastes space in tightly packed areas, such as spreader room, where the heat of thousands of cables accumulate. Eliminating tangents allow more tray runs to distribute the heat, Zero tangent fittings can save up to per row of tray.

Bonus :

Inspection for proper installation of splice plate is visual, If the plate is bowed away from the rail, nuts must be tightened,

3. ELECTRICAL WAYS Swaged Rung cable ladder system

A strong, efficient, economical cable ladder design allowing savings in installation labor, long service life, availability on production basis, and aesthetically pleasing appearance were the criteria for E.W ladder designs. The result was an exclusive concept which has stood the test of time and now is offered in many new models specifically oriented to NEMA standard. The heart of the E.W design is the tubular rung and it's connection to the side rail by cold swaging... and exclusive patented process. The tubular rung has a NON-FLATTENED cable bearing surface on top. Pulling cable is simple. There are no obstructions, and the tray is totally smooth everywhere, even underneath. There can be no outing of plastic cable ties.

Swaging is a process where special machinery, compresses the rung from the side thereby locking the tube ends into the web of the side rail for 360o on both sides. This unique action is done without heat. Heat disturbs the molecular structure of the metal. Aluminum is particularly susceptible to decreases, in yield levels when welded (yield may drop from 25000 psi. min. to 11000 psi. E. Ladder will not



camber or warp upward from heat as with welding. Camber can interfere with assembly labor and affect appearance.

Outstanding pullout strength of the swage in aluminum and steel. Pullout loads of 2500lbs. (11.1 KN) were reached other test show the same type rungs, when welded, pulled out with 35% less effort. Another metallurgical study indicates the overall superiority of the swage due to its 360o geometry. Macrographs, energy dispersive x-ray analysis (EDXA), and electron probe analysis in this study showed: Optical microscopy of the E,W tray showed second phase elongated grains in the rung and side rail, grains were equiaxed in side rail. This is typical when metal is heavily worked in one direction. Both show typical Type 6063 aluminum structures.

It is important to note that the side rail height is gripped tightly by the rung.

One the welded tray the rung had large, some what elongated grains. The grains of the side rail were equiaxed. Both showed similar amounts of second phase containing mainly aluminum but with some iron, silicon, manganese and copper; only aluminum was detected in the surrounding matrix by EDXA. The welded area shows much smaller grains that rung or side rail, which contains aluminum, silicon, some iron and copper, probably due to the welding rod used.

Conclusions:

1. The welds in the welded tray are very inadequate. An upward stress on the tray such as could be applied during shipping, installation, and wind conditions could break the weld as they are too small to prevent this, particularly when cracked as some welds on the assembly were
2. The weld is more cathodic due mainly to this high silicone and under corrosive conditions, it could cause the area in the side rail immediately adjacent to the weld to be attacked through galvanic mechanism.
3. The swaged joint is far superior in strength because it will resist stress in any direction, up or down, side to side, in of out.

Electrically, the 106 tons of pressure in the swaging process virtually eliminates the interstices and a homogenous electrical path results:

Resistance of E,W Aluminum Swaged Tray: 32 microhms
Resistance of Steel Swaged Tray: 38 microhms
Resistance of Popular Alumnum Welded Tray: 100 microhms.

Strength of the swage also maintains the 90o relationship of rungs to side rail. Tubes are very stiff and loads are transmitted to the web with much less deflection (typical of a close section). This, keeps the rails in the upright position during loading.

The tubular rung has many distinct advantages. Being open on both ends allows:

1. Passage of air continually; carries heat away.
2. There is no way for collection of debris or contaminants in any position.
3. Galvanizing protection is through and complete with the swaged tubuar rung since the surface is uniform, unchanged by welding heat. The dip is by total immersion. As a result, drainage and coating is uniform. Crevices between steel sheets in welded designs may not be full galvanized



3. Galvanizing protection is through and complete with the swaged tubular rung since the surface is uniform, unchanged by welding heat. The dip is by total immersion. As a result, drainage and coating is uniform. Crevices between steel sheets in welded designs may not be full galvanized.

E,W side rails are designed to give 100% access to the contents of the tray. Top and bottom flanges face outward. When required, the top flange has a stiffener to take higher stresses.

The swaged tubular rung system gives the ladder unusually rigid characteristics. One corner of a (3m) long ladder can be lifted and the other end of the same rail will lift with little or no racking. This is not possible with any other tray. Field personnel can handle the rigid tray section more safely. This also aids shippers and much less damage results during handling.

ELECTRICAL WAYS TROF

E,W Trof is a prefabricated metal structure consisting of a ventilated or solid bottom with separate longitudinal side rails manufactured and tested of NEMA Standard. Straight sections, fittings (elbows, tees, crosses, reducers, etc.) and a full line of matching and interfacing accessories are available. Corrugations give great lateral rigidity to the bottom, transmitting the load to the side rails. Lateral (transverse) deflection is nearly eliminated compared to rung type troughs where the rails are not continuously braced by the bottom. E,W Corrugated bottoms do NOT limit the tray load capacity.

Corrugated bottoms have (26) wide ribs on (51) centers. Ventilation holes in the valleys of the corrugations are (18) diameter on (26) centers. Free passage of air through the openings results in a 68% open area at the elevated cable support surface on top of ribs.

Solid Trof have the same corrugations but have no holes. Note: Where drain holes are required, one can be placed in the center of each valley, if specified. MATERIALS E,W aluminum Trof side rails are manufactured of heat treated 6063 aluminum alloy. Bottoms are 5052 of 3003 alloy. E,W steel cable Trofs are manufactured of mild carbon steel and are supplied in two standard finishes: Hot Dip Galvanized (pre-galvanized) to ASTM A-525 which provides 1.25 oz. zinc coating/sq. ft. of material (1.25 oz. total weight of coating on both sides of one sq. Ft.) and Hot Dip Galvanized After Fabrication (HDGAF) to ASTM A-123 which provides a 1.5 oz. zinc coating/sq. ft. (of surface area).

In a mill-galvanized product there is some wipedown of zinc onto punched holes and along sheared edges. This does give some degree of protection as the zinc coating will sacrifice itself. HDGAF covers all surfaces after fabrication.

Mill-galvanized and hot dip galvanized after fabrication does conform to the British standards.

Mill galvanized cable Trof is generally used indoors or in location not exposed of the elements. For extremely corrosive areas E,W can supply an Epoxy coating over aluminum or coated/uncoated steel. Weathering steel is also available; however, limits of availability vary.



E-WAYS TROF WITH 3 NEW, IMPORTANT INDUSTRY-LEADING FEATURES

1. Splice Plate System

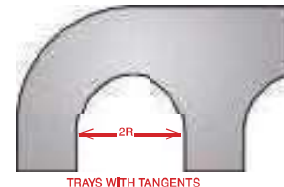
The splice plates for rigid connections have a slight curve so they can be used on straight sections or fittings. Tightening of the fastener pulls the plate flush with the side rail. The fasteners are snug and the joint is superior structurally and electrically. Even when hand-tight, there is pressure on the fastener to hold it securely. Standard E W hole patterns are used throughout. Connector and hardware will interface with other E.W system.

2. New Zero Tangent Fitting – (Optional)

Tangent as referred to on cable tray fittings is the straight at the end of the curve to accommodate a flat splice plate. This wastes space in tightly packed areas, such as spreader rooms, where the heat of thousands of cables accumulate. Eliminating tangents allow more tray runs to distribute the heat. E.W zero tangent fittings can save up to (30) per row of tray.

Bonus :

Inspection for proper installation of spliceplate is visual.
If the plate is bowed away from the rail, nuts must be tightened.



3. Arc-Welded Assembly System

Corrugated bottoms on straight sections are assembled to the side rails using an automatic self indexing mig-arc-welding system fusing a (12.0) diameter zone. These welds are 700% larger and stronger than the common resistance (spot) weld in use today. Electrical properties of the assembly are unequalled; are well within the NEMA requirements due to the continuous electrical path. The mechanical strength of this welded assembly withstands the rigors of shipping, handling, erection and service. The size of the welds keeps the vertical axis of the side rail from sloping inward under load. The weld maintains the 90o angle between the side rail and bottom. This allows full use of the section properties. Spot welds do not permit this. Also, stresses on spot welds are so severe that breakage often occurs during shipping and erection. E.WAYS Trof fittings are also assembled by mig-arc welding.

USE OF ELECTRICALWAYS

Generally, E.W Trof is optimum for ANY size cable. It offers continuous support with or without ventilation. The bottom design offers safety and security from unauthorized personnel. The vent holes may be bushed with a grommet for dropping out communication cables. CABLE BUS ENCLOSURE: E.W offers Trof, modified with welded-in cable block support angles, Permali or Maple cable block on (900) spacing (450) on vertical runs with a removal corrugated flanged cover as a Cable Bus Enclosure. Article 365 requires that cable bus be an engineered system.

Solid E.W Trof is optimum for use in the signal cable (computer, communication, etc) field. These have solid covers to offer some



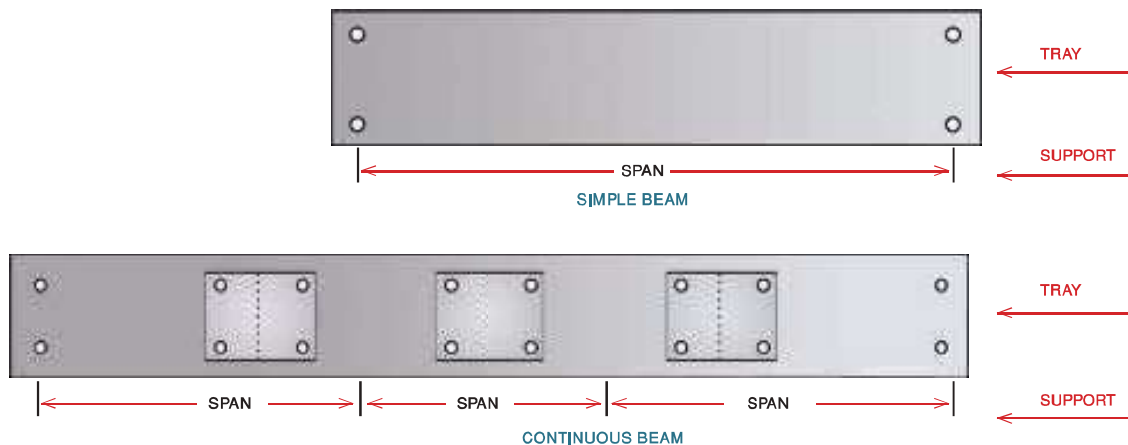
electromagnetic (EM) and/or electrostatic shielding.

NEMA DESIGN CONSIDERATIONS

The following is the basic criteria around which cable tray is designed

Cable load

The uniformly distributed static weight of cables is expressed in pounds per linear foot.



Beam – Simple Type and Continuous

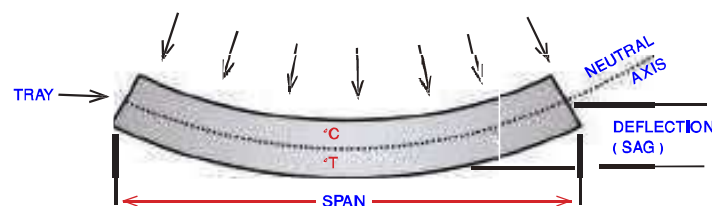
Any length of Material in the horizontal position on supports is a beam. When a single STRAIGHT section of tray is supported on each end, it is a SIMPLE BEAM. When a series of straight sections of tray are connected and supported by more than two supports, they are continuous beam. NEMA Standard considers only the simple beam because:

1. It requires maximum properties for a given load and support spacing.
2. It is easiest to approximate by calculation.
3. Destruction load capacity is easily verified by test and can be repeated reliably.
4. It represents the most severe loading – the worst case.

Span (Support Spacing)

The distance between the support is called the SPAN. Do not confuse span with tray length. When tray is supported as a simple beam, load causes bending moments all along the beam resulting in vertical deflection downward induction stress in the beam. The material above the longitudinal centerline (neutral axis) is compressed. Material below is stretched and is in tension. The maximum stress in a simple beam is at the center of the span. Failure of cable tray will occur in compression before tension. This is why tray rails often have stiffened top flanges.

SIMPLE BEAM



C = COMPRESSION
T = TENSION



Destruction Load Capacity

The total weight of the load on the tray that causes the tray collapse is called the “destruction load Capacity”. When trays do collapse, they do so generally by premature lateral buckling (compression) of the top flange.

Safety Factor

Safety factor is the reserve strength above the desired loading which is designed into the cable tray for contingencies.

Working (Allowable) Load

The static load (usually electrical and power cables) is equivalent to destruction load capacity divided by a safety factor (NEMA standard 1.5) E,W gives the working (allowable) load capacity of each system in the E,W selection charts. Multiply the loads given by 1.5 to obtain the load at which that tray will collapse on that span.

Deflection Economy

Cable tray that meets all performance and dimensional criteria with the safety factor specified without regards for deflection is the most economical tray for the installation. When deflection limitations are imposed, a less economical tray system results. E,W recommends that such limitations should be imposed in only that most stringent situations. If deflection is a concern E,W recommends these maximum limits for the optimum design.

Side Rail Structural Properties

Moment of Inertia, of a side rail, (letter I_x in E,W selection charts) is the algebraic sum of the various areas of the section in relation to the distance from the centroidal axis. It is expressed in 100 mm^4 and is a measure of the stiffness of the rail. The greater the I_x the lower the deflection; i.e, deflection is inversely proportional to I_x

Section Modulus of side rail (letter S_x) in E,W Selection Charts) is I_x divided by the distance (c) between the centroidal axis and where the strength (resistance to stress) is required – as stated above – at mid span of the upper flange. Section modulus is sometimes designated C/C

It is expressed in terms inches³. S_x is a measure of the strength of the side rail. Generally, the greater the S_x the greater the load carrying capability; i.e the strength is directly proportional to “ S_x ”

Tray Selection

By applying the above information, tray system selection can be made simply by comparing the moment of inertia (I_x) and section modulus (S_x) between trays as listed in the E,W Selection Chart. Selection may be made using only the performance of dimensional properties listed. Selection can best be made using the NEMA Standard load/Span Classifications. The following is an explanation of these and some hints on which to choose using the Selection Chart.



NEMA SYSTEMS

The permitted number, size, type and weight of cables, allowance for future loads, temporary loads, environmental loads, corrosive elements of the area and the support spans determine the type and size of tray to be chosen. E.W offers Selection Charts in Sections 3 and 4 for the various tray lines offered that offer that show the performance of each tray system on various spans and are the best tool for selecting the proper tray for your project and produce trays, and are Classified by Underwriters Laboratories, Inc. as equipment ground conductor. These can be used for many projects worldwide except where another standard may take precedence.

Cable Load

This is the total weight of cables in the tray. For purpose of selecting a suitable tray, this weight should be rounded off to the next higher NEMA working (allowable) load.

Concentrated Load

A concentrated static load is a static weight applied between the side rails at midspan. A concentrated static load is not included in NEMA Load/Span Tables. When so specified, the concentrated static load may be converted to an equivalent load (W_e) in pounds per linear foot using the formula:

$$W_e = 2 \times (\text{Concentrated Static Load})$$

Span length

And added to the static cable load before selecting the load/span designation. This automatically gives a 1.5 safety factor to both the cable and concentrated loads.

Wind, Ice and Snow Loading

Should be considered in any outdoor installation particularly where the tray is covered. The E.W factory should be consulted for specific information, but generally for cable tray installed outdoors, the following possible loads should be considered:

1. 75 mph (121 Kph) wind = (25) lbs./sq. ft. (122kg./sq.m.) pressure.
2. (1,20) thick ice on all cable and tray surfaces weight 2.4 lbs. (12.7) sq. ft. (11.7 kg./sq. m.) of surface.
3. Ice and snow loading should be considered prior to selection of tray.

Snow load varies greatly depending on latitude and altitude at the job site. Local weather bureau should be consulted to establish snow load per square foot. Snow is considered a uniformly distributed load.

Conversion of Factor of Safety from 1.5 to 2.0

If the user desires to convert a load given in our tables to a factor of safety 2.0, merely multiply the load given by .75.

Conversion of a Factor of Safety of 2.0 to 1.5

Multiply the load that has 2.0 factor of safety by 1.33 to arrive at a load with a factor of safety of 1.5.



Thermal Expansion and Contraction

E.W Expansion Connectors allow (25,0) of travel. Where expansion is a factor, three things must be considered for either steel or aluminum: (1) Spacing of expansion connectors for (25,0) of travel; (2) What gap to allow between trays when the tray is installed; (3) how to properly install the hold down clamp system.

1. Determine spacing from Table No. 1 below.
2. Determine gap using monograph (Table 2).
3. Install a firm hold down clamp close to the middle of a length of run between expansion plates. Use expansion guides at all other supports allowing longitudinal movement of the tray. Where there are many 90o horizontal and vertical fittings, there may be less expansion connectors required.

Table 1: (M) of Straight Length for a (1,27) Expansion of Construction.

Total Temp. Difference ΔT	Steel (M)	Alum. (M)	Copper (M)
(14)	(150)	(80)	(112)
(28)	(75)	(40)	(55)
(42)	(50)	(25)	(35)
(56)	(40)	(20)	(25)
(70)	(25)	(16)	(20)
(83)	(20)	(14)	(17)
(97)	(30)	(12)	(15)

Table 2: Establish maximum and minimum temperatures in summer and winter for the area. Draw line connecting them. Using the metal temperature at time of installation draw horizontal to temperature slope and plot straight down to find gap distance at expansion joint.

IMPORTANT

You must specify on you purchase order if your tray system is to be used as an equipment grounding conductor as we will then factory install special labels giving the cross sectional area category of both side rails.



Determining Size and Load Capacity Needed

Before the total cable weight can be calculated the user must make the necessary calculations

. When the size and number of single conductor or multi conductor cables has been determined, the total weight per linear foot for any Cable Tray run (s) from point A to point B can be calculated. If the number of cables or the weight is excessive for one tray, a second tray may be added. It is usually best to have all extra space in one tray to avoid extra future cable pulling expenses.

In cases where cable loads cannot be determined prior to specification or purchase, an estimate of cable weight may have to be made. The following table represents the maximum weight of insulated copper conductors which can be contained in a linear foot of tray of the widths and load depths given. Ten greatly limits cable fill area and actual loads will be less. For example, the weight of multi conductor control or signal cable is close to those in the table; however, of cross section of tray with (150) deep X (900) wide cross section would only be permitted to be loaded to 130 pounds per linear foot (193,4 kg per linear meter), using the table below. As cables increase in size and inter stices get larger between cables, the total weight decreases. Total weights of cable are rarely more than NEMA categories.

Width in. (mm)	Loading Depth (Lbs.Ft.) (kg/m)			
	(75)	(100)	(125)	(152)
(150)	(34)	(40)	(55)	(66)
(200)	(50)	(65)	(81)	(100)
(300)	(65)	(85)	(110)	(130)
(450)	(45)	(130)	(160)	(190)
(600)	(130)	(170)	(215)	(260)
(760)	(160)	(210)	(210)	(320)
(900)	(190)	(260)	(320)	(380)

SUMMARY

You are now ready to select the best Electrical Ways Cable Tray system to meet your needs. By now, we hope you've decided to select the system which makes your work so much easier. Selection is also possible using physical dimensions, performance of any combination of these data listed in our exclusive ELECTRICAL WAYS Selection Charts on the following pages. As always should you need additional info, you can contact ELECTRICAL WAYS direct at any of the listed addresses







Materials and Construction

Cable tray systems are commonly fabricated from a corrosion-resistant metal or from a metal with a corrosion-resistant finish. The selection of the proper material is essentially an economic consideration.

Every cable tray installation places requirements on the mechanical properties of the material from which it is fabricated. These properties influence the spacing frequency of supporting members, and the ease of installation. The selection of the material may also be dependent upon electrical (conductivity), physical (appearance), or chemical (corrosion resistance) properties, according to the demands of the specific installation. Although there are numerous metals available which could satisfy the basic requirements, certain wrought aluminum alloys and low carbon steels meet these requirements most economically.

Wrought Aluminum Alloys

Pure aluminum is soft and ductile. However, most commercial uses require greater strength than pure aluminum affords. This strength is achieved by the addition of other elements to produce alloys which singly, or in combination, impart strength to the metal. These alloys have been classified into seven categories according to their chemical composition, and have been given numerical designations for each series of alloys of 1000 through 7000 by the Aluminum Assoc. In addition to alloying the pure aluminum, further strengthening is possible by heat treating.

Heat-Treatable Alloys—the initial strength of alloys in this group is enhanced by the addition of such alloying elements as copper, magnesium, zinc and silicon, and are designated as 2000, 6000, and 7000 series. Since these alloys singly, or in various combinations, show increasing solid solubility in aluminum with increasing temperature, it is possible to subject them to thermal treatments which will impart pronounced strengthening.

Non-Heat-Treatable Alloys—the initial strength of alloys in this group depends upon the hardening effect of elements such as manganese, silicon, iron and magnesium, singly or in various combinations.

The non-heat treatable alloys are designated as 1000, 3000, 4000, and 5000 series. As these alloys are work-hardenable, further strengthening is made possible by various degrees of cold working, denoted by the "H" series of tempers. Alloys containing appreciable amounts of magnesium when supplied in strain-hardened tempers are usually given a final elevated temperature "stabilizing" to insure stability of properties.

In determining the proper aluminum alloy for structural applications, such as ventilated cable tray systems, the design engineer should recognize the advantages inherent in using alloys that are heat-treatable and of being able to fabricate the structure from materials possessing known minimum values of yield strength.

Cable tray products are most widely formed from the 6000 series alloys. Alloys in this group contain silicon and magnesium in approximate proportions to form magnesium silicide, thus making them capable of being heat-treated. Major alloys in this series are 6061 and 6063, which are among the most versatile of the heat-treatable alloys. Though not as strong as most 2000 or 7000 alloys, the magnesium-silicon (or magnesium silicide) alloys possess good formability and corrosion resistance.

Basic structural members of aluminum cable tray systems can be made from 6063-T6 aluminum extrusions, a material which economically meets the requirements of the majority of installations. The 6063-T6 alloy has adequate strength and good corrosion resistance. It is light weight, maintenance-free, and because of the non-magnetic properties of aluminum, keeps electrical losses to a minimum.

Steel

Steel cable trays are used principally in environments which are relatively free from corrosive attack. They are available with various types of corrosion-resistant finishes; usually hot-dip galvanized. The main advantages of using steel in cable tray fabrication are its high strength and low cost. Its disadvantages are increased structural weight, poor corrosion-resistance, and low electrical conductivity.



Materials and Construction

The idea that all steels are the same, except for chemical disposition is false. Carbon steels may be produced with chemical compositions (carbon, manganese, phosphorus, sulphur and silicon) within the specified limits of a given grade and still have characteristics that are widely dissimilar. Each grade and quality variation has a useful place, depending upon the end use and the methods of fabrication.

Basic components of steel cable trays are normally fabricated from either hot or cold rolled steel strips of commercial quality. Steels in this category are ASTM A-1011 CS Type A,B,C (formerly ASTMA-569) and ASTM A-1008 CS Type A,B,C (formerly A-366). Pre-galvanized steel conforms to ASTM A-526.

Stainless Steel

Today, hundreds of different alloy combinations exist for the endless variety of applications which utilize stainless and heat resisting steels. The primary elements added to obtain the various properties required in the steels include chromium, nickel, manganese, silicon, molybdenum, and the stabilizing elements of titanium columbium and tantalum.

Stainless steel contains at least 10 percent chromium, along with other elements to develop specific properties. Depending on the quality of the elements present in a stainless alloy, it will have a metallurgical structure which will be characteristic of the basic stainless steel groups. Metallurgists refer to these groups as the martensitic, ferritic, austenitic and precipitation hardening stainless steels. All standard austenitic alloys are given numbers in the "200" and "300" series, while the martensitic and ferritic alloys are numbered in the "400" series.

E.W. offers cable trays and accessories in both the 304 and 316 series. These austenitic alloys are remarkable in several respects. Unlike the other two classes, they contain nickel in quantities from 4 to 22 percent, while the percentage of carbon is kept relatively low. When chromium is increased for improved corrosion resistance, nickel must also be increased to retain the austenitic structure.

304 stainless steel has chromium and nickel increased and carbon lowered to reduce carbide precipitation and increase corrosion resistance. Lowering the carbon content also makes welding easier.

316 stainless steel has molybdenum added to improve corrosion resistance and high temperature strength. The carbon content is also lowered to improve welding performance.

Typical Applications include:

Type 304

- Beer barrels
- Chemical Equipment
- Coal hopper linings
- Cooling coils
- Cryogenic vessels and components
- Dairy equipment
- Evaporators
- Food handling equipment
- Milking machines
- Nuclear vessels and components
- Oil well filter screens
- Pressure vessels
- Sanitary fittings and valves
- Shipping drums
- Still tubes
- Textile dyeing equipment
- Hypodermic needles
- Feedwater tubing

Type 316

- Chemical processing equipment
- Chemical storage and transportation tanks
- Food processing equipment
- Steam cooking kettles
- Oil refining equipment
- Paper pulp digesters and evaporators
- Petroleum refining equipment
- Pharmaceutical processing equipment
- Scrubbers for environmental control
- Soap and photographic handling equipment
- General applications in textile industry



CORROSION RESISTANCE

Corrosion Resistance

The underlying causes of corrosion are the same for all metals, all stemming from electrochemical phenomena. But the ways in which corrosion manifests itself are characteristic of each particular metal. Steel corrodes in the atmosphere with the formation of rust, which develops very rapidly on unprotected surfaces. In a clean atmosphere, aluminum slowly develops a white or silver grey patina.

Aluminum surfaces weather by a characteristic of pitting, and corrosion rates are often assessed by measuring the depth of the pits. The rate of pitting falls off after the first year or two, moving gradually to a standstill.

The strong, heat-treatable alloys of aluminum, with copper as one of the chief alloy elements, or certain fully heat-treated alloys with magnesium and silicon as major alloying elements, may manifest another type of attack, intercrystalline in nature, which may cause more pronounced loss of strength if allowed to continue. Such materials may require protection by painting, cladding, or metal spraying, depending on the environment.

Several characteristic modes of corrosive attack may be distinguished as follows:

Simple Chemical Attack—the solution of a metal by an acid is an obvious example of simple chemical attack. Simple chemical attack occurs when sulfides are in contact with steel or copper. Ordinarily, aluminum is not subject to such attack. A classic example of such chemical attack is sludge retaining rainwater in the bottom of guttering. In this case, a corrosive solution is held in constant contact with the metal, and rapid attack may follow.

Electrochemical Corrosion—corrosion of a metal accelerated through contact with another metal in moist or wet conditions is known as bimetallic or electrolytic corrosion. This corrosion is due to the action of a simple voltaic cell. The presence of a conducting solution is essential to this phenomenon but the presence of dissimilar metals is not essential provided that a difference of potential exists.

In addition to the nature of the two metals, the extent of galvanic attack depends upon many other factors. Among these are:

- Concentration of the electrolyte, which determines its electrical resistance

- Nature of ions present in the electrolyte
- Polarization effects
- Effect of stable surface films on the metal
- Relative areas of anode and cathode
- The physical nature of the corrosion product
- Temperature variations

Each of these factors can influence the total resistance of the circuit.

The following table is a compilation of solution potentials of metals and alloys with respect to a calomel electrode. It provides an initial guide to the possible effects of bi-metallic contact.

Galvanic Potential

Corroded End (Anodic or Least Noble)

- Magnesium
- Magnesium Alloys
- Zinc
 - Galvanized Steel or Galvanized Iron
- Aluminum Alloy 5052-H
- Aluminum Alloy 3004-S
- Aluminum Alloy 3003-S
 - Aluminum Alloy 1100-S
- Aluminum Alloy 6053-T
- Alclad
 - Cadmium
- Aluminum Alloy 2117-T
 - Aluminum Alloy 2017-T
 - Aluminum Alloy 2024-T
- Mild Steel
 - Wrought Iron
 - Cast Iron
 - Nickel Cast Iron
- Lead-Tin Solders
 - Lead
 - Tin
 - Brass
 - Copper
 - Bronze
- Copper-Nickel Alloys
 - Monel
 - Silver Solder
 - Nickel
 - Inconel
 - Chromium Iron
- 18-8 Stainless Steel
 - Type 304 (passive)
 - Type 316 (passive)
 - Hastelloy C
 - Silver
 - Graphite
 - Gold

Protected End (Cathodic or Most Noble)



The corrosive nature of sea water and of coastal environments is partly due to the low electrical resistance of salt solution. Similarly, the bad effects of industrial atmospheres on metals arise largely from the sulphur compounds, sulphurous and sulfuric acids, which are largely formed as a result of burning coal, and which dissolve in the moisture in the air or in the rain as it falls, or in films of condensed water on the metal.

To summarize, the extent and type of moisture is an important factor in determining the severity of galvanic attack. For indoor service, where wetting is infrequent, galvanic corrosion normally is no problem. Outdoors, attack may be relatively rapid in sea coast and industrial environments, where contamination, hence conductivity, of rain and condensed moisture is high. Several general rules can be applied in selecting metal combinations for use in corrosive environments. These are:

- Select metals as close together in the galvanic series as possible.
- For the anodic protection of steel, metals above steel in the series should be selected, or the steel should be galvanized or otherwise protective-coated.
- Avoid combinations having a smaller area of the more anodic metal than of the cathodic, to avoid excessive current density on the anodic areas.
- Insulate dissimilar metals wherever possible to minimize galvanic corrosion.

Aluminum Alloys

The corrosion-resistance of aluminum alloys is due to the presence on the surface of a very thin protective film of aluminum oxide which has strong self-healing properties when damaged. The oxide film begins to form immediately on the surface of the bare metal exposed to air and grows rapidly for several days, then slowly for a month, when it reaches a thickness of approximately 0.0000002". Corrosion of aluminum can only occur when the oxide film is damaged or removed and conditions prevent its formation.

Substances which may come in contact with aluminum can be divided into three groups:

Those substances which attack the oxide film. These are most strong alkalis, mercurical compounds, and most strong acids.

Substances which cause localized breakdown of the oxide film (pitting).

And for which aluminum is suitable only under certain conditions, such as some natural fresh waters and aqueous solutions containing traces of mercury, copper, or other heavy metals.

Substances which do not attack the oxide film.

The majority of substances fall in this group, including many industrial chemicals.

The majority of aluminum installations give perfectly satisfactory service, free from corrosion, and only in exceptional cases do problems occur. When problems do occur, they can be attributed to one or more of the following causes:

- Wrong choice of alloy
- Exposure conditions
- A bimetallic joint which causes galvanic corrosion
- Crevices
- Unwise location of the aluminum assembly, resulting in deposition corrosion
- Contact with aggressive chemicals

Among the heat-treatable alloys, the 6000 series has good resistance to industrial and marine atmospheres.

With the exception of certain corrosive chemicals, no corrosion at all will occur if water is not present. Thus, indoor installations that are not in actual contact with water or installations which are maintained in dry conditions, will not corrode.

Steel with Zinc Coatings

The data from which comparative performance of different types of zinc coating can be inferred, are generally obtained from comprehensive exposure tests in various atmospheres, such as those conducted since 1926 by the American Society of Testing Materials. From the results of these tests, the following conclusions can be made:

The corrosion rate of zinc on galvanized sheets is practically linear in industrial or rural atmospheres, and in a marine atmosphere that is polluted with industrial contaminants. Thus, in these atmospheres, a sheet with double the weight of coating than that of another sheet can be expected to last twice as long before rusting of the base metal occurs.



The composition of the base metals has no measurable effect on the life of zinc coatings. However, the composition of the base metals is the major factor in the years to perforation.

The corrosion rate of zinc varies more with the type of atmosphere (marine, industrial) than does that of steel or iron.

The chloride content of sea air apparently has an accelerating effect on the corrosion of zinc coating.

Rainfall removes about 75% of the corrosion products from zinc surfaces if the results of tests in rural, industrial and marine exposures are averaged together. The residual corrosion products remaining on the surface become basic in character and exert a retarding influence on corrosion. In highly industrialized or polluted atmospheres, this basic film may not exist, a fact which helps explain the more rapid attack experienced in such atmospheres.

Indoor atmospheres correspond in a general way to that prevailing outside in a given locality. Variations in humidity and temperature are somewhat less extreme and there is no rainfall indoors to dissolve and remove soluble corrosion products. In general, it may be assumed that the protective life of zinc coatings indoors is at least five times greater than that of coatings of the same thickness exposed to the outdoor atmosphere in the same locality.

The indoor corrosion of zinc may be severe when moisture condensation is frequent and air circulation is restricted. This effect is particularly bad in humid, tropical locations with nightly condensation.

These conclusions indicate zinc coatings will in any event have an acceptable service life expectancy regardless of how the end point of failure is defined. However, it should be noted that whenever maintenance, such as painting, is neglected, it is unreasonable to expect galvanized steel to last indefinitely.

Finishes

Metallic

Cable trays fabricated of steel can be protected from corrosion by coating with another metal using one of the following methods:

- **Continuous Hot-Rolled Galvanizing**
ASTM Designation Specifications for Zinc Coated (Galvanized) Iron or Steel Sheets, Coils, and Cut Lengths—This process applies a zinc coating to sheet steel prior to fabrication of the product (pre-galvanized cable tray) by passing the metal downward through a molten ammonium chloride flux bath, and then into the zinc and out again by means of rolls.

The EWAYS standard zinc coating designation is G90, which has an average zinc coating weight of 1.25 ounces per square foot of steel for an average coating on both surfaces of 1.06 mils.

- **Hot Dipped Galvanizing After Fabrication**
ASTM Designation A123 Specification for Zinc Coating (Hot Dip) on Assembled Steel Products—This process is used to apply a zinc coating to an already fabricated product. The product is first cleaned in a caustic bath, then further cleaned by a pickling acid bath. The article is then thoroughly rinsed and dipped in a bath of molten zinc. The nature and thickness of the coating depend largely on the immersion rate, temperature of the bath, immersion period, and withdrawal rate. The resulting coating consists of an outer layer of relatively pure zinc, and lower layers of iron-zinc compounds.

Generally, hot dip coatings are highly non-uniform, except on very simple shapes and are usually thickest at small recesses (unless these remain uncoated altogether). The advantage of this method is that the zinc applied is thicker than when applied by other processes. However, the protective characteristics of zinc coating under atmospheric conditions have been found to be equal, regardless of process: i.e. zinc coatings of the same weight have approximately the same service life.





LOADING

This section presents guidelines for classification of design conditions with respect to weather factors, methods of determination and application of various types of loadings encountered, maximum allowable working stresses and other pertinent considerations. This information will assist the designer in evaluating materials and product catalog information so that he can design a system which will achieve the desired strength and rigidity at the lowest possible installed cost.

Load Classification

Loads on structures are usually divided into three types:

Dead loads that do not change their magnitude or their position during the life of the structure.

Live loads that change their magnitude, their position and/or their direction during the life of the structure.

Dynamic loads that are caused by the motion of the live load, or the movement of the structure.

Because of their general nature, these load classifications can be used for any structure. However, for the purpose of establishing a practical load classification for cable tray system design, it is necessary to create additional subdivisions and provide a guide for assumption of specific loads.

Thus, for cable tray system design, the three basic load types is also considered as follows:

Dead Loads

Since dead loads are the weight of the members that make up a tray or tray support, they have a known value. A summation of the weights of the individual members is all that is required to calculate the dead load.

Live Loads

In cable tray design, dynamic loads are considered to be as follows:

The design load is the weight of cables, cable tray accessories, and sometimes workers (which vary in both magnitude and position). Cable only design loads can be determined by adding the component weights of the system. Any provision for workers will require an assumption of magnitude and position—for practical purposes, an assigned weight acting at mid span of the tray.

Parasitic loads such as ice, snow, wind, traction, and electromagnetic forces exist only because the tray exist. They are the most difficult to determine, and different assumptions can be made about their effect on the overall loadings. The following information will provide a general guide.



Three general degrees of loading due to weather conditions are recognized in the National Electrical Safety Code, and are designated as heavy, medium and light loading.

Districts in which these loadings are normally applicable. Values used in determining conductor loadings under these conditions for ice, wind and temperature are given in the Table 1—Degrees of Loading Due to Weather.

However, modifications of these values are necessary when applied to cable tray systems, since the NESC is concerned primarily with the construction of overhead supply and communication lines. These modifications are:

Ice Loading

The NESC loading of 1/2" thickness is applied to both cables and cable tray. In applying loadings to interlocked armored cables, and bare stranded conductors or suspension cables, the coating of ice is considered as a hollow cylinder with an inside diameter equal to the outside diameter of the cable or strand. Ice is assumed to weight 57 lbs. per cubic foot.

Snow Loading

The NESC does not consider snow loading, and in general this also applies to cable tray systems. However, in the case of a solid cover on a tray, the minimum load of 5lbs. per square foot should be used for outdoor installations where snow is a factor.

Wind Loading

The NESC loadings are modified as follows, in order to provide adequate protection against the maximum wind velocities encountered with consideration of the shapes of the various structures (not considered by NESC).

Wind velocity—in the loading tables, wind means horizontal wind. Wind velocity should be considered to be true wind speed, corrected for instrumentation errors. Any variation of velocity with height is not considered. All structures will be under 100 feet in height, and 100% of the ground velocity is assumed to be adequate.

Wind loads—the exteriors of all structures, with the exception of cylindrical structures, should be loaded with a wind pressure normal to the surface, having an intensity given by the formula:

$$W_p = C V_p$$

W_p = wind pressure in pounds per square foot.

C = coefficient depending upon the size, shape, and position of the structure in the wind and having values specified in Table 2, Shape Factors.

V_p = impact pressure = $0.00256V^2$ where V = the design velocity. Values of V_p may be obtained from Table 3, Impact Pressures.

Wind Direction and Distribution—the allowance for wind pressure shall be made assuming the wind from any possible direction to be critical. Wind loads shall be considered uniformly distributed. Average annual tornado frequency, average wind velocities for different areas.

Traction Forces—these forces are caused by the cables starting and stopping during the cable installation period and they vary in magnitude and direction. They are of such nature, therefore, that no general assumptions can be made to provide for them. However, the safety factors selected for the basic design stresses should be conservative enough to provide for these forces when they do occur.

Table 1

Degrees of Loading Due To Weather National Electrical Safety Code Values			
Condition	Loading District		
	Heavy	Med.	Light
Radial thickness of ice (ins)	0.50	0.25	0.00
Horizontal wind pressure (lbs./sq. ft.)	4	4	9
Temperature (°F)	0	15	30

Table 2

Shape Factors	
Structure	Shape Factor "C"
Isolated Structural Shapes	2.0
Trusses, Towers, Etc.	2.0
Wires, Cables, Etc.	1.2
Pipe Supports, Poles, Etc.	1.0

For trusses and towers the wind load is assumed to be acting on the projected area of the windward face only. For structures with circular cross sections, the affected area is the area projected on a vertical plane.



Table 3

Impact Pressures			
V (mph)	Vp (psf)	V (mph)	Vp (psf)
15	0.58	85	18.5
20	1.02	90	20.7
25	1.60	95	23.1
30	2.30	100	25.6
35	3.13	105	28.2
40	4.09	110	30.9
45	5.18	115	33.8
50	6.39	120	36.8
55	7.73	125	40.0
60	9.21	130	43.3
65	10.80	135	46.6
70	12.50	140	50.1
75	14.40	145	53.8
80	16.40	150	57.6

These values are for an air density of 0.07651 lbs. per cu. ft. corresponding to a temperature of 60°F and barometric pressure of 14.7 lbs. per sq. in.

Electromagnetic Forces

These forces, caused by short-circuit current during a cable fault, vary in magnitude and position. It is impractical to make an assumption providing for them. Ordinarily, the safety factors selected for the basic design stresses will be adequate. However, in installations where these forces are of such magnitude that they become a factor in the design of the cable tray system, adequate provision must be made so that the design stresses are not exceeded. (The Average Annual Number of Days with Thunderstorms for various areas

Dynamic Loads

Impact loads which result because the live load is in motion, are loads in addition to the static weight of the live load. Such loads could be caused by cables being dropped onto it, or by workmen walking on it or climbing up or down a ladder leaning against it. These loads are provided for in the same manner as traction forces—the safety factors selected for the basic design stresses should be conservative enough to provide for these forces if they occur.

Inertia loads are caused when the structure itself is in motion, such as may occur during an earthquake. It is usually considered that an earthquake gives the structure a horizontal acceleration, and the resulting acceleration and deceleration cause forces proportional to the mass and to the acceleration and deceleration. These loads represent special design requirements, and the design loading should be in accordance with the ASA's "American Standard Building Code Requirements for Minimum Design Loads in Buildings and Other Structures" or other suitable specifications. Seismic probability for various areas

Design Loadings

Basic cable trays are designed on the basis of maximum allowable stress for a certain section and material. Therefore, the allowable cable load will vary with span, type and width of tray. The design loadings for cable tray are given in the form of load tables. These tables appear in another section of the catalog.

The design loadings are to be used for designing standard supports, which necessitates assuming design loadings for the cable trays to be supported. If the design loadings of the cable trays exceed those listed, or if the assumptions for the loading of the open area or frame type supports exceed the conditions herein, standard

supports cannot be used. Special supports must be designed on the basis of data for actual conditions.

Application of Loads

The application of all loads shall be to "conventional" or "simple" framing (unrestrained, free-ended), which assumes that the ends of the members are connected for shear only and are free to rotate under load.

When calculating lateral strength, the lateral and vertical design loads shall be taken as acting simultaneously. It is assumed that maximum ice loads and maximum wind loads do not occur simultaneously.

When calculating longitudinal strength, the longitudinal design loads shall be taken without consideration of the vertical and lateral design.

When latticed structures are concerned, the actual exposed area of one lateral face shall be used in computing lateral and longitudinal loading.

Where a change of direction or suspension cables occurs, the loading upon the structure, including workmen, shall be assumed to be a resultant load equal to the vector sum of the lateral wind load and the resultant load imposed by the suspension cables due to their change in



direction. In order to obtain these loadings, a wind direction shall be assumed which will give the maximum resultant load.

If recognized that deformation, deflection, or displacement of parts of the structure, will in some cases change the effects of the loads assumed. In the calculations of stresses, however, no allowance shall be made for such deformation, deflection, or displacement of supporting structures.

Members subject to stresses produced by a combination of wind and other loads may be proportioned for unit stresses 33.3% greater than those specified for dead and live load stresses provided the section thus required is not less than that required for the combination of dead load, live load, and impact (if any). A corresponding increase may be applied to the allowable unit stresses in their connecting rivets, bolts, or welds.

Members subject to stresses produced by the assumed Class 1 tray lateral loading may be proportioned as specified for wind loads.

Determination of Design Loadings

The following procedures and values for design loadings have been established by E.W. The data is based on test results under various installation conditions, and the experience of practical application in the design of components and systems.

In each instance, the loadings are given for three classes of design conditions as shown in Table 4, Design Conditions.

These classifications have been established from modifications of the National Electrical Safety Code's "Degrees of Loading Due to Weather Conditions".

Table 4

Design Conditions			
Location	Class 1 Indoor	Class 2 Outdoor	Class 3 Outdoor
Wind Velocity (mph)	0	25.0	100.0
Wind Pressure (psf)	0	1.6	25.6
Ice (in)	0	0.5	0.5

These conditions do not provide for tornadoes or earthquakes.

Cable Tray Loading (tray in horizontal position)

Vertical Design Loading

CLASS 1

The uniformly distributed load of the cables and accessories in pounds per linear foot.

CLASS 2

The uniformly distributed load of the cables and accessories with an additional 12 lbs. ice load on tray and cables. The weight of ice is based on a thickness of 1/2 inch and a density of 57 pounds per cubic foot.

CLASS 3

The same as the design loading for Class 2.

Values (in pounds per linear foot)

- Class 1: W_{ca}
- Class 2: $W_{ca} + 12$
- Class 3: $W_{ca} + 12$

W = Weight of cables and accessories in pounds per linear foot

Lateral Design Loading

CLASS 1

A uniformly distributed load of 120 divided by the span length (in feet) lbs. per foot, equivalent to a 50 lb. ladder leaning against the tray at an angle of 75° with horizontal plane and 200 pound person at mid-span. The person on the ladder should be positioned in such a way as to give the maximum resultant loading.

CLASS 2

A lateral, horizontal wind pressure of 1.6 lbs. per square foot acting upon the projected area of an ice-covered tray multiplied by a shape factor of 2.0, or the design loading for Class 1 if it is greater.

CLASS 3

A lateral, horizontal wind pressure of 25.6 lbs. per square foot acting upon the projected area of a cable tray without ice-coating multiplied by a shape factor of 2.0.

Values (in pounds per linear foot)

- Class 1: $120/sp$
- Class 2: $0.3 \times H$
- Class 3: $4.25 \times H$

sp = span length (feet)

H = Height of cable tray side rail (inches)



CLASS 1

The loading shall be the same as the design loading for Class 3.

CLASS 2

The loading shall be the same as the design loading for Class 3.

CLASS 3

The loading shall be a lateral, horizontal wind acting against the tray at an angle of 45° to the longitudinal axis and on the projected area of the cable tray (without ice-coating) with a pressure of 25.6 lbs. square foot multiplied by a shape factor of 2.

Longitudinal Design Loading as above will ensure adequate provision for traction forces when they occur.

Values established for the above (in pounds per linear foot)

Class 1: $3.0 \times H$

Class 2: $3.0 \times H$

Class 3: $3.0 \times H$

H = Height of cable tray side rail (inches)

The concept of "Cables in Free Air" for power distribution and control cables has been adopted primarily for economic reasons. Cable tray support systems should be designed, whenever possible, for minimum installed cost. In order to achieve this objective, the engineer must bear in mind that the general design rules established for aluminum and steel structures are not always compatible with design rules for a cable tray system. This is particularly applicable in the case of restrictions on deflection.

Since the most economical cable tray system uses heat treated aluminum alloys, or high strength steels with long spans, any limitation on deflection which will not permit the best utilization of material and design will increase the cost. By limiting the maximum fiber and shear stress used in the design the adequacy and safety of the structure is assured.

Why Limit Deflection?

The primary reason to limit deflection in cable tray systems is appearance. Engineers and owners take pride in the appearance of their installations. So rigid restrictions on deflection of cable trays installed at eye level or in a prominent location are common. However, it is neither economical nor good engineering practice to restrict deflection of a cable tray system in less prominent areas.

Methods of Decreasing Deflection

There are various ways to limit deflection of a cable tray. If the objective is minimal installed cost, they should be considered in this order:

- **Decreasing stress by decreasing the bending moment.** This can be accomplished by introducing restraining moments at the end of a span in the form of a rigid support. The deflection in a continuous beam, with negative bending moments at the intermediate support points, is only a fraction of the deflection in a simple beam.
- **Increasing depth of the tray.** Deflection in any location can be reduced by increasing the depth of the load-carrying side members and/or by adding to their cross-sectional area. Adding to the depth generally utilizes the material most economically.
- **Increasing modulus of elasticity.** Since the modulus of elasticity of steel is 29×10^6 psi, and that of aluminum alloys is only 10×10^6 psi, greater deformation of aluminum alloy trays is to be expected at any given stress level. Under its own weight, an aluminum beam will deflect the same amount as an identical steel beam, since not only the weight, but also the modulus of elasticity is only one-third that of steel. However, under the same applied load (disregarding the beam's own weight), aluminum will deflect almost three times as much as steel. Therefore, consideration must be given to the choice of material for any one location, for an isolated run or for an entire installation.
- **Decreasing span length.** For economic reasons, this method of reducing deflection should be a last resort, since it increases field labor considerably. However, it can be an effective means to improve the appearance of an installation when the number of spans to be reduced is small in comparison to the number in the entire installation.



Deflection Criteria Applied to Cable Tray

Design rules and specifications developed for steel should not be applied to aluminum alloys since this would not permit the most economical use of these materials. Deflection criterias which apply only to steel, and should not be used when the most economical system is desired include:

- **Span-deflection ratio**

Example: Deflection is limited to 1/300 of the span by the National Electrical Manufacturers Association specifications for structures supporting air switches. While very important in that instance, as even slight deflection could cause misalignment in the operating mechanism and result in binding and difficult switch operation, the application of this specification to a cable tray is uneconomical and not recommended.

- **Depth to span ratio**

Example: The American Institute of Steel Construction, in the specifications for buildings, specifies the depths of beams and girders in floors to be not less than 1/24 of the span, or not less than 1/20 of the span where shock or vibration may be encountered. This specification ensures a certain rigidity and levelness of the structure which is important in that instance, but cannot be justified for cable tray systems because of the higher cost involved.

- **Deflection constant**

Example: Deflection is limited to a certain amount by an engineering company for a tray system. While such specifications might make a system using 8-foot spans look better, it prohibits the use of more economical designs with longer spans which have a much greater deflection and still look acceptable. Such a specification increases the cost of the tray system unnecessarily, especially if the trays are to be installed well above eye level.

Summary

As a guide, a span-deflection ratio of around 1/200 satisfies most owners. This ratio provides an allowable deflection of 0.6" in a 10-foot span, 0.72" in a 12-foot span, and 1.20" in a 20-foot span under the actual loads encountered. Data for calculating deflection is presented in Table 5, *Constants for Beam Deflections*.



DEFLECTION

Constants for Beam Deflections

		2 Span		3 Span		4 Span		5 Span		Table 5	
r	Free Beam	Span 1 Span 2	Span 1 Span 3	Span 2	Span 1 Span 4	Span 2 Span 3	Span 1 Span 5	Span 2 Span 4	Span 3	Fixed Beam	r
0	0	0	0	0	0	0	0	0	0	0	12
1	2.94	1.490	1.800	-0.363	1.680	-0.155	1.71	0.251	0.337	0.190	11
2	5.79	2.780	3.360	-0.311	3.180	0.078	3.24	0.389	0.804	0.691	10
3	8.03	3.970	4.640	-0.078	4.400	0.544	4.37	1.710	1.810	1.23	9
4	9.75	4.450	5.500	0.181	5.220	-1.020	5.10	2.570	2.200	1.77	8
5	10.88	4.570	*5.910	0.389	5.530	-1.350	5.65	3.130	2.450	2.14	7
6	11.31	4.490	5.860	0.449	5.470	1.620	5.56	4.150	2.720	2.25	6
7	10.88	3.980	5.360	0.389	4.970	1.640	4.88	3.320	2.450	2.14	5
8	9.75	3.160	4.480	0.181	4.110	1.360	4.19	3.200	2.200	1.77	4
9	8.03	2.080	3.270	-0.078	2.930	1.030	3.01	2.590	1.810	1.23	3
10	5.79	1.180	2.090	-0.311	1.830	0.640	1.89	1.850	0.804	0.691	2
11	2.94	0.285	0.804	-0.363	0.657	0.147	0.70	0.838	0.337	0.190	1
12	0	0	0	0	0	0	0	0	0	0	0

*Maximum Deflection for Continuous Beams up to and including 5 Spans.

$$\Delta = C \frac{W_c l^4}{EI} \quad \text{where}$$

Δ = Deflection (ins)
 W_c = Carrier Load (lbs./ft.)
 l = Span Length (ft.)
 E = Modulus of Elasticity (psi)
 I = Moment of Inertia of Carrier Stringer (in⁴)
 C = Values shown in table

Example: A cable tray with specified load has a simple beam deflection of 1.92 inches at mid-span. Find the deflection for the fifth span of the 5-span installation. From the table above, the maximum constant in the free beam columns is 11.31. Note that this is the center of the span. For the 5-span installation, the maximum constant in the 5-span column is 5.65, which is not in the center, but 7/12 of the span length from the support between spans 4 and 5. The maximum deflection of this fifth span is given by:

$$\Delta = 1.92 \times \frac{5.65}{11.31} = 0.96 \text{ inches}$$

A cable tray system must provide protection to life and property against faults caused by electrical disturbances, lightning, failures which are a part of the system, and the failure of equipment that is connected to the system. For this reason, all metal enclosures of the system, as well as non-current carrying or neutral conductors, should be tied together and reduced to a common earth potential.

This includes the structural steel of a building, all piping for water, gas, steam, and sewers, tanks, well casings, down spouts, gutters, siding and roofing. There are two distinct divisions to the grounding problem:
System grounding and Equipment grounding.



ELECTRICAL DESIGN & GROUNDING

The following explanation gives the reasons for grounding, and how to provide for it.

System Grounding

The purpose of system grounding is to drain off any excessively high voltages that may accidentally come on the tray system. If the system is properly grounded by means of a low-resistance conductor of sufficient capacity, the current will be carried off to earth immediately with a minimum danger of fire or shock. In a grounded system, an accidental grounding of one of the current carrying conductors will result in a short circuit, and cause a fuse or circuit breaker to open.

Equipment Grounding

Equipment grounding means the connection to earth of all exposed, non-current carrying metallic parts of the components of the distribution system. The purpose of this ground is to prevent a voltage higher than earth potential on cable tray or equipment. Grounding thus reduces the danger of shock or fire in the event a live conductor comes in contact with these conductive parts.

Methods of Grounding

Effective grounding must be permanent and continuous, and have ample capacity to safely conduct any current likely to be imposed on it. It should also have impedance sufficiently low to limit the potential above ground and to facilitate operation of over-current devices in the circuit. A continuous, underground metallic water supply system is acknowledged to be the best electrical ground. Other suitable methods of grounding include continuous metallic steam and gas piping systems, the grounded metal framing of the building, or an artificial electrode such as a driven steel pipe, galvanized or otherwise protected from corrosion, or a buried metallic plate. The tray

system and equipment ground connections should be made to the same electrode at the service entrance, on the supply side of the equipment used for disconnecting the service. Equipment should be solidly tied in with the system ground. It is also important, that wherever multiple grounds are used, they be tied together in order to avoid any difference of potential between the various parts of the tray system.

Complete rules for grounding are contained in Article 250 of the National Electric Code.

Electrical Properties of Cable Tray

E WAYS has always recognized the importance of electrical design, as well as structural design, to provide positive, safe protection to personnel, facility and equipment. Thorough testing has proven that the cable support system must be electrically designed for maximum carrying capacity, in that: power cables may have short circuit capacity from 5000 to 150,000 amperes, and the division of fault current places considerable burden on the support system, even though adequate grounding has been provided. Table 6 shows the division of fault current determined by tests of an aluminum and a steel interlocked armored 3-conductor 4/0 cable on a MPHusky aluminum cable ladder.

It is not the purpose or intent that the support system be used for a continuous ground, but to provide extremely high one second current carrying capacity as a safety feature. The entire system should be grounded at periodic intervals to keep the potential at or below 100 volts in case of a cable fault. ELECTRICAL WAYS cable trays are classified by Underwriters Laboratories as to their suitability as an equipment grounding conductor only.

Division of Fault Currents

Table 6

Fault Current Path	Steel Armored Cable			Aluminum Armored Cable		
	% through armor	% through Ground wire	% through ladder	% through armor	% through Ground wire	% through ladder
Armor and Ladder	50	—	50	23	—	77
Armor, External Ground Wire and Ladder	50	23	27	17	37	46
Armor, Internal Ground Wire and Ladder	5	74	21	9	54	37





Table 7

UL Grounding

Electrical Properties of Cable Trays

Product			Resistance Across One Foot of Rail (Microhms/ft)	Resistance Across Splice (Microhms)	Resistance Of 12ft. Length With Splices (Microhms)	Copper Equivalent (MCM)
SH	S()H		234	57	1461	83
SJ	S()J	S()B	230	68	1448	94
SJC	S()JC	S()BC	163	69	1047	108
SY	S()Y	S()C	144	59	923	160
SY1	S()Y1	S()C1	103	40	658	222
SYA	S()YA	S()CA	182	58	1150	129
SYD	S()YD	S()CD	163	75	1053	143
SM	S()M	S()P	110	40	700	128
SM14	S()M14	S()P14	89	31	565	160
SMC	S()MC	S()PC	108	39	687	110
SMD	S()MD	S()PD	124	38	782	133
SX	S()X	S()E	116	44	740	203
SX1	S()X1	S()E1	88	43	571	283
SXB	S()XB	S()EB	111	35	701	155
SXC	S()XC	S()EC	98	35	623	193
SXD	S()XD	S()ED	93	32	590	215
AJA	A()JA	A()BA	38	12	240	521
AJB	A()JB	A()BB	27	12	174	712
AY	A()Y	A()C	19	11	125	1024
AY1	A()Y1	A()C1	18	11	119	1305
AYA	A()YA	A()CA	31	12	206	819
AM	A()M	A()P	23	8	146	944
AX	A()X	A()E	18	8	116	1268
AX1	A()X1	A()E1	14	7	91	1499
AXA	A()XA	A()EA	26	13	169	981
		A()IEB	19	16	130	1282
		A()IEC	17	11	113	1539
		A()IE6	15	6	96	1835
SG-4			121	50	776	160
SG-6			68	33	441	203
AG-4			26	22	178	1024
AG-6			24	9	153	1268

Note:

- For electrical properties of pre-galvanized cable trays, refer to the electrical properties given above for hot dipped galvanized cable trays of the same style.
Example: For electrical properties of PH cable tray, refer to SH in the above table.

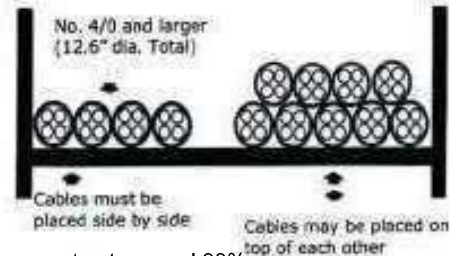


Sizing Trays for Multiple-Conductor Cables

Section Cable carrying capacity lists the requirements for installing multiple-conductor cables in ladder, ventilated trough, solid-bottom, or ventilated channel type trays.

For ladder or ventilated trough trays, the diameter of all cables No. 4/0 and larger must be added together and the total must not exceed the side by side. Table carrying capacity column 1 is used for cable less than 4/0. These cables do not have to be placed side by side. Table carrying capacity Column 2 is used for a combination of cables rated larger than 4/0 and smaller than 4/0.

The total cross-sectional areas of the cables in trays with an inside depth of 6" or less, containing control and/or signal cable must not exceed 50% of the cross-sectional area of the tray.



For solid bottom trays, the diameter of all cables No. 4/0 and larger must not exceed 90% of the cable tray width. Table carrying capacity Column 3 is used for cable smaller than 4/0. Table carrying capacity column 4 is used for combination of cables rated 4/0 or larger or less than 4/0.

For trays with an inside depth of 6 inches or less, containing control and/or signal cables, the total cross-sectional areas of the cables must not exceed 40% of the cross sectional area of the tray.

For ventilated channel type trays, the total cross-sectional areas of all cables must not exceed 2.5 square inches for 3 inch wide trays or 3.8 square inches wide trays.

Sizing Trays for Single conductor Cables

For ladder or ventilated trough trays, the total diameter of all cables 1000MCM and larger must not exceed the width of the cable tray. Table carrying capacity is used for cable smaller than 1000MCM. Table carrying capacity is used for a combination of cables rated 1000MCM and larger, and smaller than 1000MCM.

For ventilated channel type trays, the total diameter of all cables must not exceed the inside width of 4" or 6" wide trays

Problem:

What size ladder-type cable tray is required for nine multi conductor smaller than 4/0 and four multi-conductor larger than 4/0? The total diameter (in inches) for the 4/0 and larger cables is 12.6" and the total area for cables rated less than 4/0 is 22 sq.in.

Cable tray width must be selected from Table carrying capacity and be based calculation

Note: Square inch area of cables obtained from manufacturer

Step 1: Cable carrying capacity
 Sq.in of cables smaller than 4/0=22 sq.in
 Diameter of cables larger than 4/0=12.6 in

Step 2: Cable carrying capacity $22\text{sq.in.} + (12.6 \times 1.2) = 37.12\text{ sq in.}$
 A 36" tray has 42 sq.in.area

Answer: The inside width of the cable tray must be equal to 36"

Problem:

What size tray is required for ten No. 250 MCM RHH RHW copper conductors and twelve No. 750 MCM RHH RHW copper conductors laid in a ladder-type tray

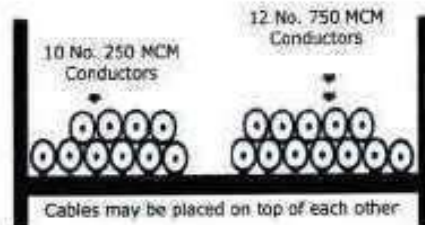
Cable tray must be selected from Table carrying capacity based on square inch area.

Step 1: 250 MCM = .554 sq. in.
 750 MCM = 1.286 sq. in.

Step 2: Table carrying capacity $.554 \times 10 = 5.54\text{ sq. in.} + 1.286 \times 12 = 15.43\text{ sq. in.} = 20.97\text{ sq. in.}$ tray must be

Step 3: Table carrying capacity 18" wide tray = 19.5 sq. in.
 24" wide tray = 26.0 sq. in.

Answers: The inside width of the cable tray must be equal to 24".(600mm)

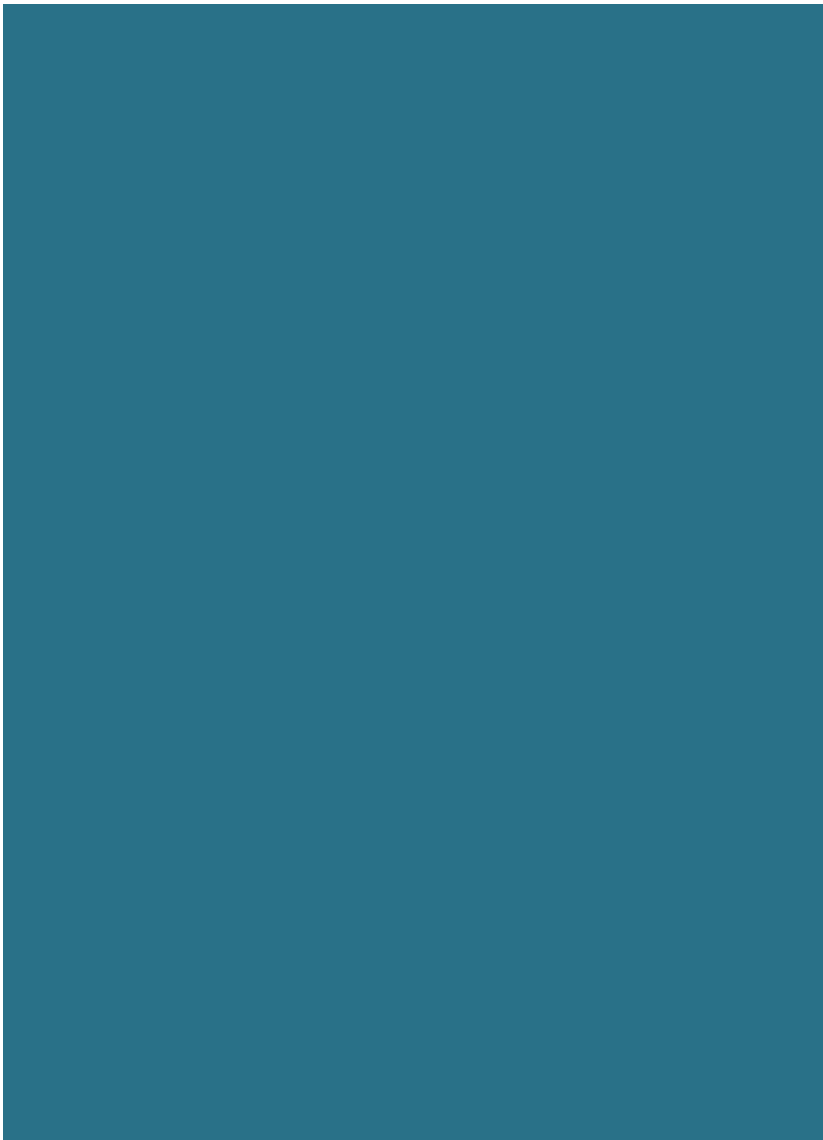


in 1
 in. = 20.97 sq. in.





CABLE TRAY'S



Listening Is Our Success



ELECTRICAL WAYS CABLE TRAY

ELECTRICAL WAYS CABLE TRAY ARE FABRICATE AS FLOWING SPECIFICATION

(M) (H) (SST) (ALUM) (PCO) (EPOC)

(L) STANDARD LENGTHS 2440 MM & 3000 MM

(EP) TYPE PLAIN FLANGE

(EA) TYPE OUTSIDE RETURN FLANGE

(EC) TYPE 90 DEG OUTSIDE OR INSIDE FLANGE

(EY) TYPE INSIDE RETURN FLANGE

OUR STANDARD WIDTH FOR CABLE TRAY 100/150/200/250/300/400/500/600/700/750/800/900/1000
MM (OR AS YOUR ORDER)

SIDE HEIGHT STANDARD 25/55/85/115/145 MM (OR AS YOUR ORDER).

THE OTHER SIDE HEIGHT ARE AVAILABLE ON ORDER

LIGHT DUTY TRAYS

50mm - 200mm WIDE x 1.0mm METAL THICKNESS
225mm - 350mm WIDE x 1.2mm METAL THICKNESS
400mm - 600mm WIDE x 1.5mm METAL THICKNESS

MEDIUM DUTY TRAYS

100mm - 300mm WIDE x 1.2mm METAL THICKNESS
350mm - 600mm WIDE x 1.5 mm METAL THICKNESS

HEAVY DUTY TRAYS

100mm - 350mm WIDE x 1.5 mm METAL THICKNESS
400mm - 1000mm WIDE x 2.0mm METAL THICKNESS



MATERIAL AND FINISH

MINIMUM COATING OF 275 g/m ON
BOTH SIDE'S A525-77G 90 & BS2989-75C

- A:** MILL GALVAIZED STEEL (M) : STEEL SHEET SENDZIMIR
ZINC PLATED (PRE-GALVAIZED)
- B:** HOT DIP GALVAIZED AFTER FABRAICATION (H) : MILD STEEL TO ASTM A 123 . A386,
DIN50976. STANDARD
- C:** STAINLESS STEEL (SST) : AISI 403, 316 L
(MARINE GRADE)
- D:** ALUMINUM (ALUM) : ALUMINUM ALLOY 6063- T6 CAN USED.
- E:** POWER COATING (PCO) : POLYESTER POWERED COATING
: ON MILD STEEL IN R.A.L COLOURS
- F:** EPOXY POLYESTER COATING (EPOC) : EPOXY POLYESTER COATING ON
MILD STEEL IN R.A.L COLORS.

MATERIAL THICK.

- 1- L 1 - 1 MM
- 2- L2 - 1,2 MM
- 3- L3 - 1.5 MM
- 4- L4 - 2 MM



ELECTRICAL WAYS CABLE TRAY

TYPE (EA) AND (EY) MILL GALVANIZED OUTSIDE RETURN FLANGE LIGHT DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	LONG	WEIGHT K /G/ PER PCS
50MM	1MM	55MM	2440MM	3.35
100MM	1MM	55MM	2440MM	4.34
150MM	1MM	55MM	2440MM	5.33
200MM	1MM	55MM	2440MM	6.32
250MM	12MM	55MM	2440MM	8.77
300MM	12MM	55MM	2440MM	9.96
400MM	12MM	55MM	2440MM	12.33
500MM	15MM	55MM	2440MM	18.38
600MM	15MM	55MM	2440MM	21.34
700MM	15MM	55MM	2440MM	24.60

TYPE (EA) AND (EY) MILL GALVANIZED OUTSIDE RETURN FLANGE MIDUM DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	LONG	WEIGHT K /G/ PER PCS
50mm	12mm	55MM	2440mm	4.03
100mm	12mm	55MM	2440mm	5.45
150mm	12mm	55MM	2440mm	6.64
200mm	12mm	55MM	2440mm	7.82
250mm	12mm	55MM	2440mm	9.01
300mm	15mm	55MM	2440mm	12.74
400mm	15mm	55MM	2440mm	15.71
500mm	2.0mm	55MM	2440mm	124.90
600mm	2.0mm	55MM	2440mm	28.85
700mm	2.0mm	55MM	2440mm	32.80

Type EY



Type EA



TYPE (EA) AND (EY) MILL GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	LONG	WEIGHT K /G/ PER PCS
50MM	15MM	55MM	2440MM	5.03
100MM	15MM	55MM	2440MM	6.81
150MM	15MM	55MM	2440MM	8.30
200MM	15MM	55MM	2440MM	9.78
250MM	15MM	55MM	2440MM	11.26
300MM	2.0MM	55MM	2440MM	16.99
400MM	2.0MM	55MM	2440MM	20.94
500MM	2.0MM	55MM	2440MM	24.90
600MM	2.0MM	55MM	2440MM	28.85
700MM	2.0MM	55MM	2440MM	32.80

TYPE (EA) AND (EY) DIP GALVANIZED OUTSIDE RETURN FLANGE MEDIUM DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	LONG	WEIGHT K /G/ PER PCS
50MM	12MM	55MM	2440mm	4.13
100MM	12MM	55MM	2440mm	5.28
150MM	12MM	55MM	2440mm	6.43
200MM	12MM	55MM	2440mm	7.58
250MM	12MM	55MM	2440mm	8.73
300MM	15MM	55MM	2440mm	12.35
400MM	15MM	55MM	2440mm	15.22
500MM	2.0MM	55MM	2440mm	24.13
600MM	2.0MM	55MM	2440mm	27.96
700MM	2.0MM	55MM	2440mm	31.79

TYPE (EA) AND (EY) MILL GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	LONG	WEIGHT K /G/ PER PCS
50MM	15MM	55MM	2440MM	5.17
100MM	15MM	55MM	2440MM	6.60
150MM	15MM	55MM	2440MM	8.04
200MM	15MM	55MM	2440MM	9.48
250MM	15MM	55MM	2440MM	10.91
300MM	2.0MM	55MM	2440MM	16.47
400MM	2.0MM	55MM	2440MM	20.30
500MM	2.0MM	55MM	2440MM	24.13
600MM	2.0MM	55MM	2440MM	27.96
700MM	2.0MM	55MM	2440MM	31.79
800MM	2.0MM	55MM	2440MM	35.62
900MM	2.0MM	55MM	2440MM	39.45
1000MM	2.0MM	55MM	2440MM	43.28



TYPE (EA) AND (EY) MILL GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	LONG	WEIGHT K /G/ PER PCS
100MM	2.0MM	85MM	2440MM	1110
150MM	2.0MM	85MM	2440MM	13.02
200MM	2.0MM	85MM	2440MM	14.94
250MM	2.0MM	85MM	2440MM	16.85
300MM	2.0MM	85MM	2440MM	18.77
400MM	2.0MM	85MM	2440MM	22.60
500MM	2.0MM	85MM	2440MM	26.43
600MM	2.0MM	85MM	2440MM	30.26
700MM	2.0MM	85MM	2440MM	34.09
800MM	2.0MM	85MM	2440MM	37.92
900MM	2.0MM	85MM	2440MM	41.75
1000MM	2.0MM	85MM	2440MM	45.58

TYPE (EA) AND (EY) MILL GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	LONG	WEIGHT K /G/ PER PCS
100MM	2.0MM	115MM	2440MM	13.40
150MM	2.0MM	115MM	2440MM	15.32
200MM	2.0MM	115MM	2440MM	17.23
250MM	2.0MM	115MM	2440MM	19.15
300MM	2.0MM	115MM	2440MM	21.06
400MM	2.0MM	115MM	2440MM	24.90
500MM	2.0MM	115MM	2440MM	28.73
600MM	2.0MM	115MM	2440MM	32.56
700MM	2.0MM	115MM	2440MM	36.39
800MM	2.0MM	115MM	2440MM	40.22

Type EP

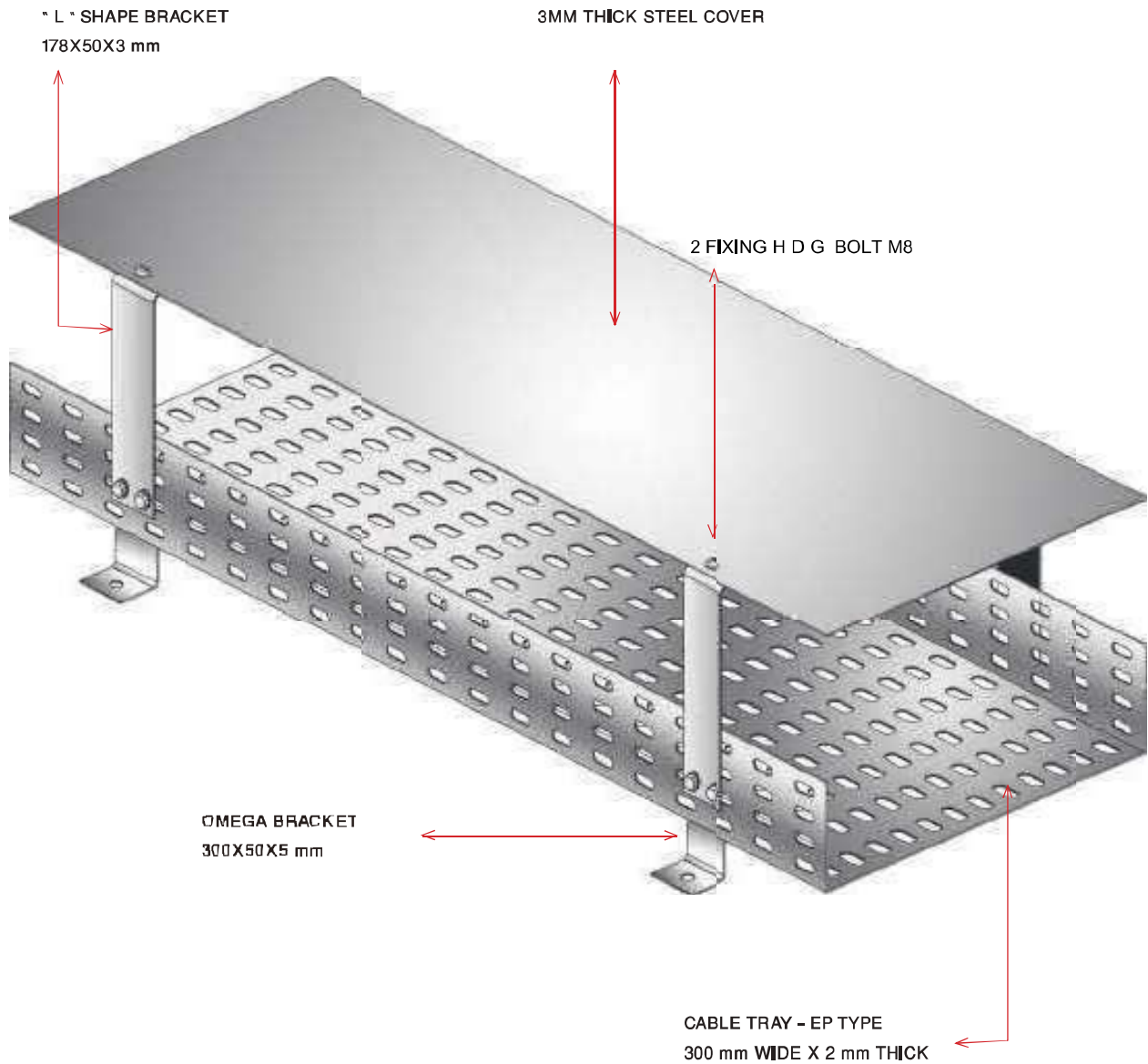


Type EQ



CABLE TRAY TYPE FOR TELECOMMUNICATION

STANDARD CABLE TRAY FOR STC & MOBILE & MTC (KSA)
ESTISALAT & DU (UAE)



The cable tray set as mobile & MTC specification
STC specification same but cover & L clamp 5 mm THK

All Hot Dip Galvanized



CABLE TRAY

ELECTRICAL WAYS CABLE TRAY

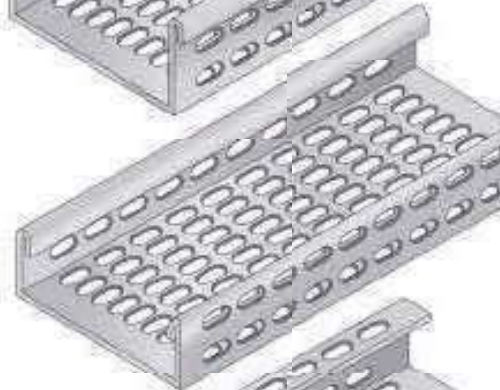
Type EP



Type EA



Type EY



Type EC



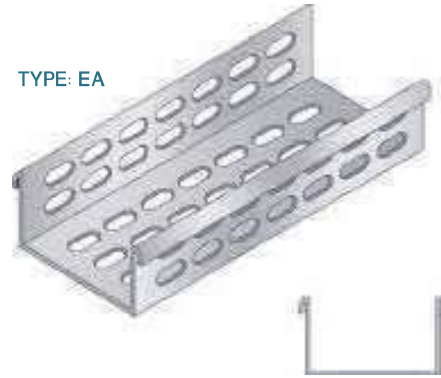
TYPE OF ELECTRICAL WAY'S CABLE TRAY'S

TYPE: EP



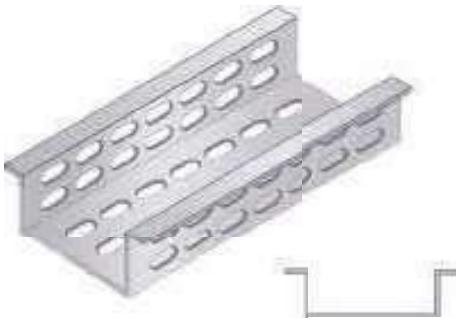
CABLE TRAY (EP) TYPE PLAIN FLANGE

TYPE: EA



CABLE TRAY (EA) TYPE OUTSIDE RETURN FLANGE

TYPE: EC



CABLE TRAY (EC) TYPE 90° OUTSIDE OR INSIDE FLANGE

TYPE: EY



CABLE TRAY (EY) TYPE INSIDE RETURN FLANGE



TYPE (EA) CABLE TRAY 90° HORIZONTAL ELBOW HOT DIP GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT 300 MM RADIUS

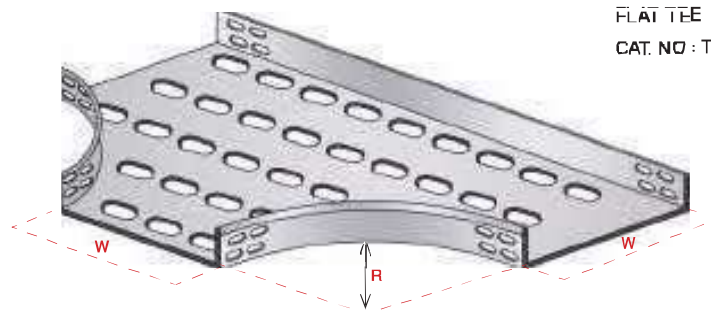
WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	15MM	55MM	100-EA-9HL-5-L3-H-30
150MM	15MM	55MM	150-EA-9HL-5-L3-H-30
200MM	15MM	55MM	200-EA-9HL-5-L3-H-30
250MM	15MM	55MM	250-EA-9HL-5-L3-H-30
300MM	2.0MM	55MM	300-EA-9HL-5-L4-H-30
400MM	2.0MM	55MM	400-EA-9HL-5-L4-H-30
500MM	2.0MM	55MM	500-EA-9HL-5-L4-H-30
600MM	2.0MM	55MM	600-EA-9HL-5-L4-H-30



HORIZONTAL ELBOW
CAT. NO : 9 HL

TYPE (EA) CABLE TRAY HORIZONTAL TEE HOT DIP GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT 300 MM RADIUS

WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	15MM	55MM	100-EA-9HL-5-L3-H-30
150MM	15MM	55MM	150-EA-9HL-5-L3-H-30
200MM	15MM	55MM	200-EA-9HL-5-L3-H-30
250MM	15MM	55MM	250-EA-9HL-5-L3-H-30
300MM	2.0MM	55MM	300-EA-9HL-5-L4-H-30
400MM	2.0MM	55MM	400-EA-9HL-5-L4-H-30
500MM	2.0MM	55MM	500-EA-9HL-5-L4-H-30
600MM	2.0MM	55MM	600-EA-9HL-5-L4-H-30



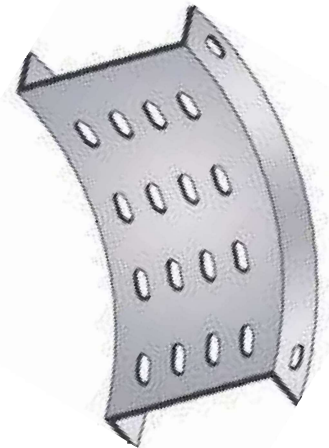
FLAT TEE
CAT. NO : TH



TYPE (EA) CABLE TRAY 90° VERTICAL OUTSIDE ELBOW (RIZER) HOT DIP GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT 300 MM RADIUS

WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	1.5MM	55MM	100-EA-9OR-5-L3-H-30
150MM	1.5MM	55MM	150-EA-9OR-5-L3-H-30
200MM	1.5MM	55MM	200-EA-9 OR L-5-L3-H-30
250MM	1.5MM	55MM	250-EA-9 OR -5-L3-H-30
300MM	2.0MM	55MM	300-EA-9 OR -5-L4-H-30
400MM	2.0MM	55MM	400-EA-9 OR -5-L4-H-30
500MM	2.0MM	55MM	500-EA-9 OR -5-L4-H-30
600MM	2.0MM	55MM	600-EA-9 OR -5-L4-H-30

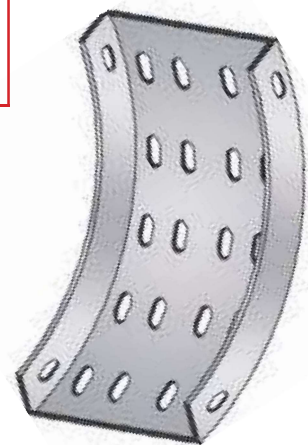
OUTSIDE RISE R 90
CAT NO. 9 OR



TYPE (EA) CABLE TRAY 90° VERTICAL INSIDE ELBOW (RIZER) HOT DIP GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT 300 MM RADIUS

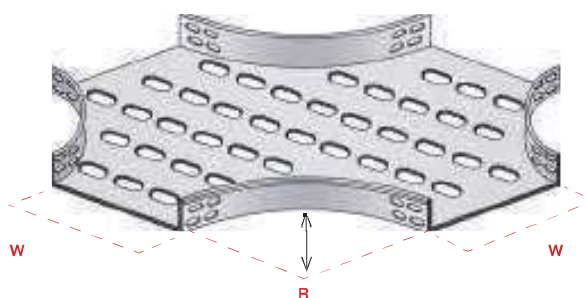
WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	1.5MM	55MM	100-EA-9IR-5-L3-H-30
150MM	1.5MM	55MM	150-EA-9IR-5-L3-H-30
200MM	1.5MM	55MM	200-EA-9 IR L-5-L3-H-30
250MM	1.5MM	55MM	250-EA-9 IR -5-L3-H-30
300MM	2.0MM	55MM	300-EA-9 IR -5-L4-H-30
400MM	2.0MM	55MM	400-EA-9 IR -5-L4-H-30
500MM	2.0MM	55MM	500-EA-9 IR -5-L4-H-30
600MM	2.0MM	55MM	600-EA-9 IR -5-L4-H-30

INSIDE RISE R 90
CAT NO. : IR



TYPE (EA) CABLE TRAY HORIZONTAL CROSS HOT DIP GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT 300 MM RADIUS

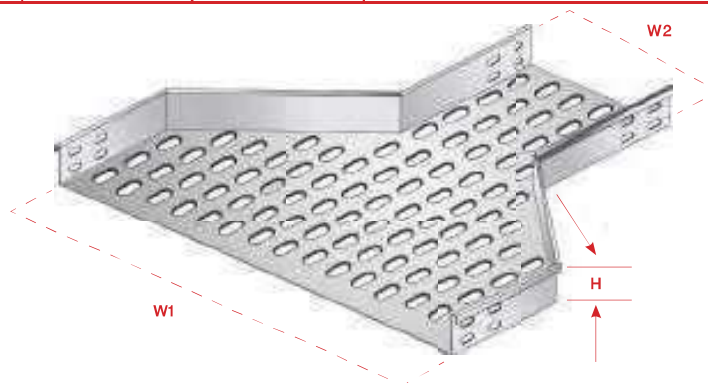
WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	15MM	55MM	100-EA-CH-5-L3-H-30
150MM	15MM	55MM	150-EA- CH -5-L3-H-30
200MM	15MM	55MM	200-EA- CH L-5-L3-H-30
250MM	15MM	55MM	250-EA- CH -5-L3-H-30
300MM	2.0MM	55MM	300-EA- CH -5-L4-H-30
400MM	2.0MM	55MM	400-EA- CH -5-L4-H-30
500MM	2.0MM	55MM	500-EA- CH -5-L4-H-30
600MM	2.0MM	55MM	600-EA- CH -5-L4-H-30



Flat Cross
CAT. NO : CH

TYPE (EA) CABLE TRAY STRAIGHT REDUCER HOT DIP GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	15MM	55MM	100-EA-SR-5-L3-H-30
150MM	15MM	55MM	150-EA- SR -5-L3-H-30
200MM	15MM	55MM	200-EA- SR L-5-L3-H-30
250MM	15MM	55MM	250-EA- SR -5-L3-H-30
300MM	2.0MM	55MM	300-EA- SR -5-L4-H-30
400MM	2.0MM	55MM	400-EA- SR -5-L4-H-30
500MM	2.0MM	55MM	500-EA- SR -5-L4-H-30
600MM	2.0MM	55MM	600-EA- SR -5-L4-H-30



STRAIGHT REDUCER (SR)



TYPE (EA) CABLE TRAY LEFT HAND REDUCER HOT DIP GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	15MM	55MM	100-EA-LH-5-L3-H-30
150MM	15MM	55MM	150-EA- LH -5-L3-H-30
200MM	15MM	55MM	200-EA- LH L-5-L3-H-30
250MM	15MM	55MM	250-EA- LH -5-L3-H-30
300MM	2.0MM	55MM	300-EA- LH -5-L4-H-30
400MM	2.0MM	55MM	400-EA- LH -5-L4-H-30
500MM	2.0MM	55MM	500-EA- LH -5-L4-H-30
600MM	2.0MM	55MM	600-EA- LH -5-L4-H-30



LEFT HAND REDUCER (LH)

TYPE (EA) CABLE TRAY RIGHT HAND REDUCER HOT DIP GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	15MM	55MM	100-EA-RH-5-L3-H-30
150MM	15MM	55MM	150-EA- RH -5-L3-H-30
200MM	15MM	55MM	200-EA- RH L-5-L3-H-30
250MM	15MM	55MM	250-EA- RH -5-L3-H-30
300MM	2.0MM	55MM	300-EA- RH -5-L4-H-30
400MM	2.0MM	55MM	400-EA- RH -5-L4-H-30
500MM	2.0MM	55MM	500-EA- RH -5-L4-H-30
600MM	2.0MM	55MM	600-EA- RH -5-L4-H-30

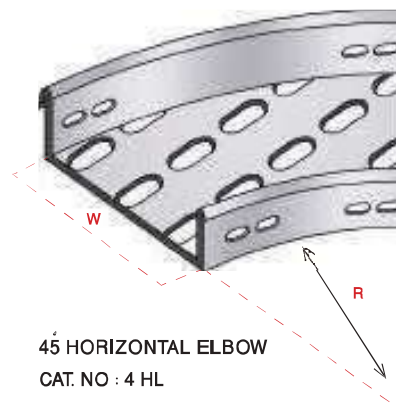


RIGHT HAND REDUCER (RH)



TYPE (EA) CABLE TRAY 45° HORIZONTAL ELBOW HOT DIP GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT 300 MM RADIUS

WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	1.5MM	55MM	100-EA-4HL-5-L3-H-30
150MM	1.5MM	55MM	150-EA-4HL-5-L3-H-30
200MM	1.5MM	55MM	200-EA-4HL-5-L3-H-30
250MM	1.5MM	55MM	250-EA-4HL-5-L3-H-30
300MM	2.0MM	55MM	300-EA-4HL-5-L4-H-30
400MM	2.0MM	55MM	400-EA-4HL-5-L4-H-30
500MM	2.0MM	55MM	500-EA-4HL-5-L4-H-30
600MM	2.0MM	55MM	600-EA-4HL-5-L4-H-30



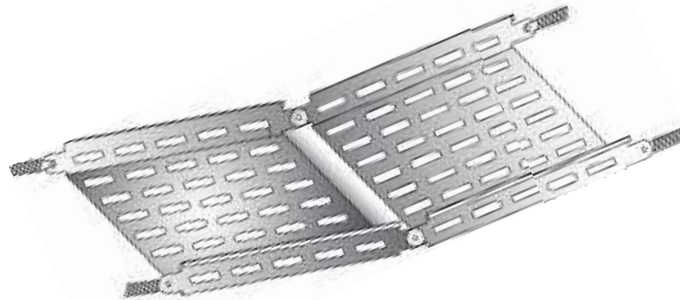
TYPE (EA) CABLE TRAY VERTICAL ADJUSTABLE BEND ELEMENTS HOT DIP GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	1.5MM	55MM	100-EA-VA-5-L3-H-30
150MM	1.5MM	55MM	150-EA-VA-5-L3-H-30
200MM	1.5MM	55MM	200-EA-VA-5-L3-H-30
250MM	1.5MM	55MM	250-EA-VA-5-L3-H-30
300MM	2.0MM	55MM	300-EA-VA-5-L4-H-30
400MM	2.0MM	55MM	400-EA-VA-5-L4-H-30
500MM	2.0MM	55MM	500-EA-VA-5-L4-H-30
600MM	2.0MM	55MM	600-EA-VA-5-L4-H-30



TYPE (EA) CABLE TRAY 90° VERTICAL ADJUSTABLE INSIDE BEND ELEMENTS HOT DIP GALVANIZED INSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	15MM	55MM	100-EA-9AI-5-L3-H-30
150MM	15MM	55MM	150-EA- 9AI -5-L3-H-30
200MM	15MM	55MM	200-EA- 9AI -5-L3-H-30
250MM	15MM	55MM	250-EA- 9AI -5-L3-H-30
300MM	20MM	55MM	300-EA- 9AI -5-L4-H-30
400MM	20MM	55MM	400-EA- 9AI -5-L4-H-30
500MM	20MM	55MM	500-EA- 9AI -5-L4-H-30
600MM	20MM	55MM	600-EA- 9AI -5-L4-H-30



90° VERTICAL ADJUSTABLE INSIDE BEND
CAT NO 9AI

TYPE (EA) CABLE TRAY 90° VERTICAL ADJUSTABLE OUTSIDE BEND ELEMENTS HOT DIP GALVANIZED OUTSIDE RETURN FLANGE HEAVY DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	15MM	55MM	100-EA-9AO5-L3-H-30
150MM	15MM	55MM	150-EA- 9AO -5-L3-H-30
200MM	15MM	55MM	200-EA- 9AO -5-L3-H-30
250MM	15MM	55MM	250-EA- 9AO-5-L3-H-30
300MM	20MM	55MM	300-EA- 9AO-5-L4-H-30
400MM	20MM	55MM	400-EA- 9AO-5-L4-H-30
500MM	20MM	55MM	500-EA- 9AO -5-L4-H-30
600MM	20MM	55MM	600-EA- 9AO -5-L4-H-30

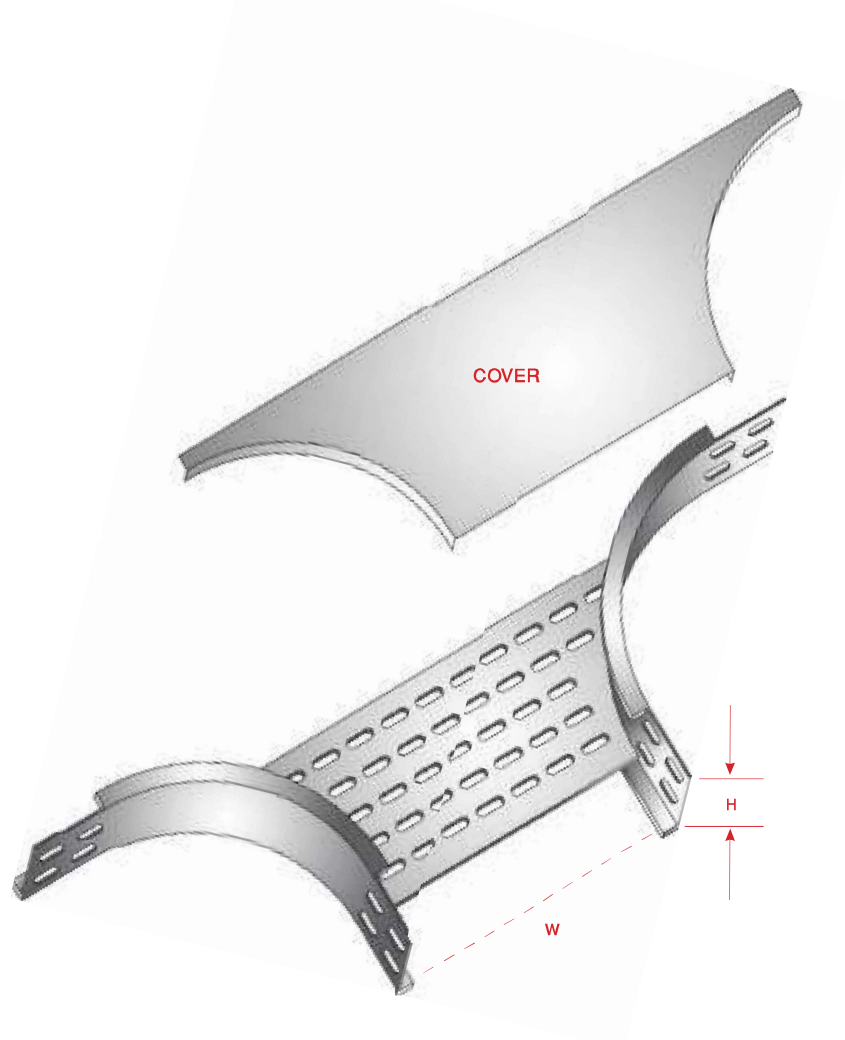


90° VERTICAL ADJUSTABLE OUTSIDE BEND
CAT NO 9AO



TYPE (EA) CABLE TRAY TAKE - OF TRAY (ADD ON BRANCH) HOT DIP GALVANIZED OUTSIDE RETURN FLANGE
HEAVY DUTY (55 MM) SIDE HEIGHT

WIDTH	STEEL THK	SIDE HEIGHT	CAT NO H D G
100MM	1.5MM	55MM	100-EA-TO-5-L3-H-30
150MM	1.5MM	55MM	150-EA- TO -5-L3-H-30
200MM	1.5MM	55MM	200-EA- TO =5-L3-H-30
250MM	1.5MM	55MM	250-EA- TO=5-L3-H-30
300MM	2.0MM	55MM	300-EA- TO=5-L4-H-30
400MM	2.0MM	55MM	400-EA- TO=5-L4-H-30
500MM	2.0MM	55MM	500-EA- TO -5-L4-H-30
600MM	2.0MM	55MM	600-EA- TO -5-L4-H-30



TAKE - OF TRAY
CAT - NO - TO



COVER FOR CABLE TRAYS AND FITTING



(EWS)-SOLID COVER
W/ FLANGE



(EWPI)-SOLID COVER
W/O FLANGE



(EWVS)- VENTILATED
COVER W/ FLANGE



(EWVP)-VENTILATED
COVER W/O FLANGE



COVER FOR HORIZONTAL
90 ELBOW CAT NO. 9 HLC



COVER FOR 45 HORIZONTAL ELBOW
CAT NO. 4 HLC



COVER FOR HORIZONTAL
EQUAL TEE
CAT - NO. THC



COVER FOR HORIZONTAL
EQUAL CROSS
CAT -NO. CHC



COVER FOR 90 VERTICAL
INTERNAL RISER
CAT NO. 5 IRC



COVER FOR 90 VERTICAL
EXTERNAL RISER
CAT NO. 9 ORC



COVER FOR RIGHT HAND
REDUCER
CAT NO RHC



COVER FOR STRAIGHT
REDUCER
CAT - NO. SRC



COVER FOR LEFT HAND
REDUCER
CAT - NO LHC



CABLE TRAY ACCESSORIES



STANDARD COUPLER (Ew1)



FISH PLATE COUPLER (Ew2)

fish plate coupler is recommended for use with all trays



STRAIGHT COUPLER (Ew3)



VERTICAL ADJUSTABLE CONNECTOR (Ew4)



**LENGTH = 2440 mm
BARRIER STRIPS (Ew5)**



REDUCING CONNECTOR (Ew6)



CABLE TRAY ACCESSORIES



BLIND END (Ew7)

BLIND END USE FOR CABLE TRAY & CABLE LADDER AS SIZE OF C LADDER OR CABLE TRAY



DROP OUT (Ew8)

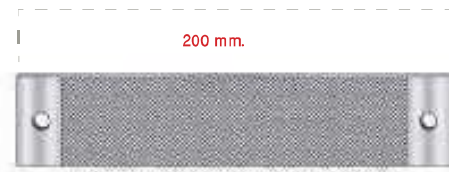
DROP OUT USED FOR DROPPING CABLE TRAY OR CABLE LADDER



BOX CONNECTOR (Ew9)

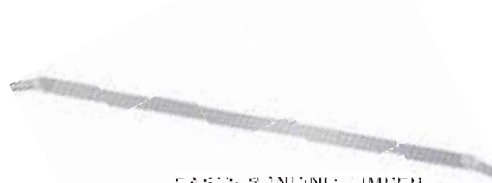


HORIZONTAL FITTING CONNECTOR (Ew10)



**EARTH CONTINUITY JUMPER (Ew11)
OTHER SIZE AVAS ORDER**

**INSULATED JUMPER
cat no -EW11-IN
BAR JUMPER
Cat.No-EW11-10
MESH WIRE JUMBER
Cat.No-EW 11**



**EARTH BONDING JUMPER
CAT NO EW11-10 MM**

ALL LONG 230 MM OR AS ORDER

BONDING JUMBER USE FLEX CABLE 10mm, 16mm, 35mm. (as order)



CABLE TRAY ACCESSORIES

ORDEING INFORMATION



DOUBLE CLAMP CONNECTOR
FOR C TRAY COVER (EWL)
A9 HEIGHT

WRAP AROUND CLAMP FOR
C. TRAY COVER (EWD)



SIDE COVER CLAMP
FOR C. TRAY COVER
A9 HEIGHT OF CABLE TRAY
55, 85, 100, 115
CAT - NO. EWC-55



ELECTRICAL WAYS CABLE TRAY & FITTING ORDERING INFO

WIDTH mm	CABLE TRAY TYPE	PART DESCRIPTION	SIDE HEIGHT	THICKNESS	MATERIAL	LENGTH RADIUS
50	(EA)	SL- STRAIGHT LENGTH	25	L1	M	STRAIGHT SECTION
100	OUTSIDE RETURN	(9 HL) 90 DEG. HORIZONTAL BEND	25 mm.	1MM	MILL	
150	FLANGE	(4HL) 45 DEG HORIZONTAL BEND	5	L2	GALVANIZED	24
200	(EY)	(9IR) 90 DEG INSIDE RESER	55 mm.	1.2 mm.	(H)	2.44
250	INSIDE RETURN	(4IR) 90 DEG INSIDE RESER	85	L3	HOT DIP	METERS
300	FLANGE	9 OR 90 DEG. OUTSIDE RESER	85 mm.	1.5 mm.	GALVANIZED	30
400	(EP)	(4OR) 45 DEG. OUTSIDE RESER		L4	SST	3.00
500	PLAIN	TH-HORIZONTAL TEE.	10	2 mm.	STAINLESS	METERS
600	(EC)	CH- HORIZONTAL CROSS	100 mm.		STEEL	
700	90 FLANGE	LH- LEFT HAND REDUCER	11		ALUM	FITTING RADIUS
800	OUTSIDE	SR - STRAIGHT REDUCER	115 mm.		ALUMINUM	
900		RH - RIGHT HAND REDUCER	15			30
1000		9 AI - VERTICAL ADJ 90 INSIDE BEND	150 mm.			300 mm.
		9 AO - VERTICAL ADJ 90 OUTSIDE BEND				60
		VA - VERTICAL ADJ BEND ELEMENTS				600 mm.
		TO - TAKE - OF TRAY				90
						900 mm.

PART NO. SYSTEM

STRAIGHT SECTION



CABLE TRAY 200 X 55 X 12 mm X 2440 MILL GALVANIZED

PART NO. SYSTEM

FITTING SECTION



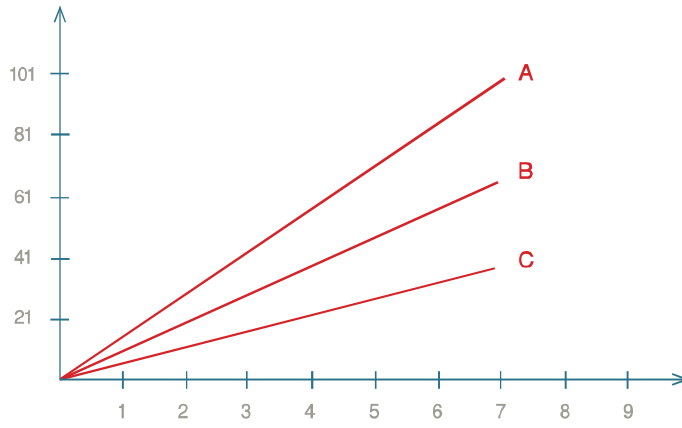
90 HORIZONTAL ELBOW 200mm WIDE X 55mm HIGH MILL GALVANIZED



TECHNICAL DATA

Loading test
110 meter

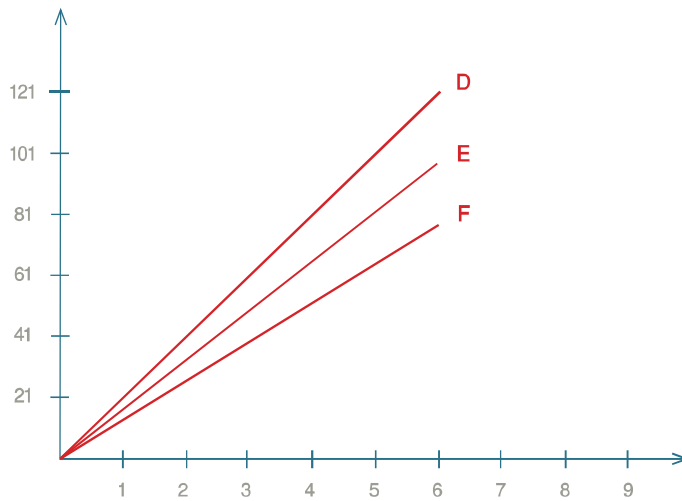
distributed load kg/m



- A: Tray Size : 600 × 50 × 2 MM
- B: Tray Size : 500 × 50 × 2 MM
- C: Tray Size : 400 × 50 × 2 MM

Deflection (mm)

distributed load kg/m



- D: Tray Size : 300 × 50 × 15 m
- E: Tray Size : 200 × 50 × 15 m
- F: Tray Size : 100 × 50 × 15 m

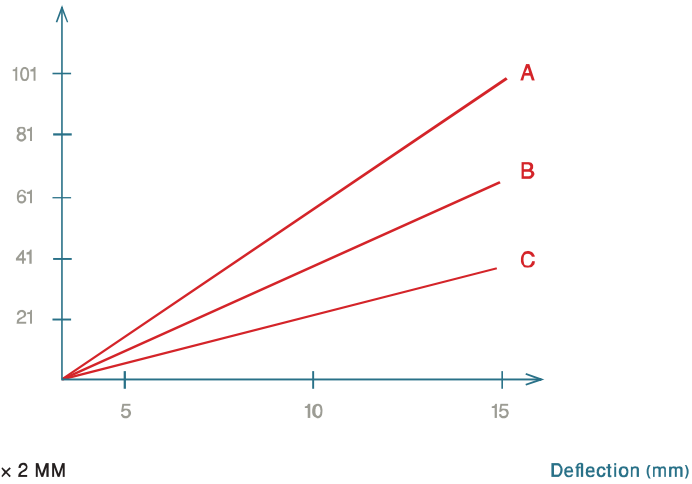
Deflection (mm)



TECHNICAL DATA

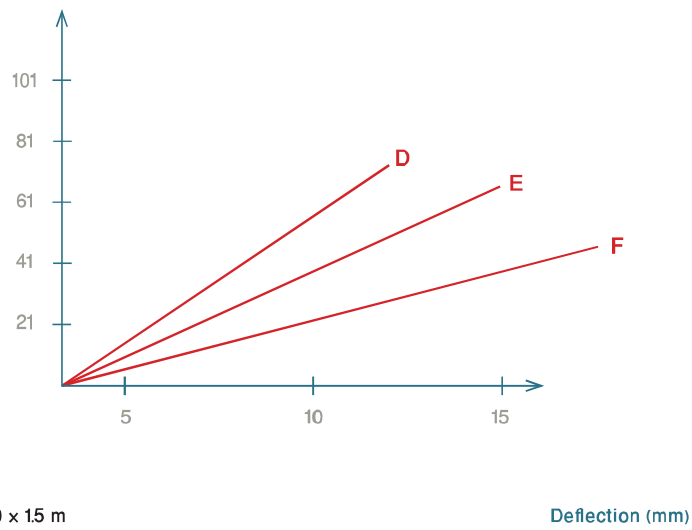
Loading test
1.45 meter

distributed load kg/m



- A: Tray Size : 600 × 50 × 2 MM
- B: Tray Size : 500 × 50 × 2 MM
- C: Tray Size : 400 × 50 × 2 MM

distributed load kg/m



- D: Tray Size : 300 × 50 × 15 m
- E: Tray Size : 200 × 50 × 15 m
- F: Tray Size : 100 × 50 × 15 m







LOADING CAPACITY OF CABLE TRAYS 1.45 M - H.V. CABLE 600 / 1000 V

Cables NYN	Outside appr. Mm	Weight Kg/m	Allowable Radius Of Curvature mm	Inside height 25		Inside height 50		Inside height 75		Inside height 100	
				Number of Cable	Cable Weight Kg/m	Number of Cable	Cable Weight Kg/m	Number of Cable	Cable Weight Kg/m	Number of Cable	Cable Weight Kg/m

15	12.5	0.235	144	6	14.0	120	28.5	180	41.0	240	56.0
2.5	14.50	0.305	165	4	13.0	80	24.0	160	48	190	57.0
4	15.55	0.415	180	25	10.0	70	29.0	120	49	140	60.0
6	16.57	0.527	190	25	12.45	75	36.0	115	58	139	73.0
10	18.57	0.729	220	25	15.10	40	29.55	80	57	120	88.55
16	22.50	1.101	260	19	19.85	36	38.55	50	56	85	95.75
25	27.55	1.655	320	-	-	18	28.05	39	65	50	89.75
35	31.5	2.155	370	-	-	12	25.84	20	48	30	73.10
50	36.70	3.15	430	-	-	10	43.11	20	64	28	96.1
70	41.50	4.15	490	-	-	8	36.90	15	63	16	96.75
95	47.50	5.55	560	-	-	7	44.01	7	43	14	82.55
120	51.57	8.39	610	-	-	-	-	6	45	12	87.10
150	57.57	8.39	680	-	-	-	-	6	57	9	83.05
185	63.54	10.25	750	-	-	-	-	5	60	5	61.25
240	71.52	13.015	850	-	-	-	-	4	64	4	65.05

Width 400 mm

15	12.5	0.239	144	78	18.15	150	35.5	230	51.1	307	70.80
2.5	14.50	0.350	165	55	16.85	100	30.95	200	61.1	240	72.35
4	15.55	0.415	180	31	13.15	49	38.0	150	62.3	188	77.35
6	16.57	0.525	140	30	15.65	88	45.0	140	57	175	92.05
10	18.55	0.725	220	26	19.40	50	38.0	100	57.3	159	114.46
16	22.70	0.10	260	21	23	40	47.0	60	70.4	106	117.76
25	27.55	1.655	320	-	-	20	36.0	49	79	70	115.58
35	30	2.155	370	-	3-	15	34.0	30	65.6	45	98.99
50	35	3.119	430	-	-	12	40.0	24	76.5	36	114.77
70	40	4.155	490	-	-	11	29.0	23	90	22	94.77
95	45	5.59	560	-	-	10	35.0	9	55	18	104.55
120	44	8.35	610	-	-	-	-	8	60	16	113.91
150	55	8.35	680	-	-	-	-	7	66	12	107.91
185	60	10.25	750	-	-	-	-	7	71	7	74.5
240	70	13.05	850	-	-	-	-	7	91.0	7	91.05

Width 500 mm

15	12.5	0.235	144	94	21.80	180	42	278	61.1	370	85.55
2.5	14.60	0.305	165	67	20.45	120	36	248	71.7	290	87.05
4	15	0.415	180	36	15.56	110	45	186	75.6	226	91.2
6	16	0.529	190	31	18.76	100	55	176	90	210	110
10	17	0.729	220	30	23.06	60	45	125	90	185	136.05
16	21	1.17	260	25	29.67	50	58	78	85.9	130	140
25	25	1.657	320	-	-	25	40.9	60	100	80	135
35	30	2.150	370	-	-	18	40	38	78	54	118
50	35	3	430	-	-	15	45	30	96	45	143
70	40	4	490	-	-	14	56	25	105	26	110
95	46	5	560	-	-	12	65	11	66	22	126
120	50	8	610	-	-	-	-	10	73	10	141
150	56	8	680	-	-	-	-	10	32	16	141
185	60	10	750	-	-	-	-	9	90	9	91
240	70	13	850	-	-	-	-	8	103	8	103

Width 600 mm



LOADING CAPACITY OF CABLE TRAYS 1.45 M - H.V. CABLE 600 / 1000 V

Cables NYN	Outside appr. Mm	Weight Kg/m	Allowable Radius Of Curvature mm	Inside height 35		Inside height 60		Inside height 80		Inside height 100	
				Number of Cable	Cable Weight Kg/m	Number of Cable	Cable Weight Kg/m	Number of Cable	Cable Weight Kg/m	Number of Cable	Cable Weight Kg/m

15	12.5	0.235	0.235	144	14	31	6.95	38	8.95	5	11
25	14.50	0.305	0.305	165	1	18	5.75	31	9.65	45	13
4	15.55	0.415	0.415	180	5	15	6.56	27	11.45	32	13
6	16.57	0.527	0.527	140	5	13	7.20	23	11.45	30	16
10	18.55	0.729	0.729	220	4	8	6.45	19	12.95	26	19
16	22.50	1.101	1.101	260	4	6	7.75	12	12.15	16	18
25	27.55	1.655	1.655	320	-	5	8.25	8	13.25	9	16
35	31.50	2.155	2.155	370	-	3	6.45	6	12.95	7	15
50	36.70	3.154	3.154	430	-	2	6.25	4	12.45	4	12
70	41.50	4.15	4.15	490	-	2	8.25	3	12.35	3	12
95	47.50	5.55	5.55	560	-	2	10	2	11.05	3	16
120	54.57	8.39	8.39	610	-	-	-	1	6.75	2	13
150	57.52	8.39	8.39	680	-	-	-	1	8.35	1	7
185	63.52	10.25	10.25	750	-	-	-	1	10.25	1	9
240	71.52	13.015	13.015	850	-	-	-	1	13	1	12

15	12.5	0.239	144	30	70	57	13	85	20	115	26
25	14.50	0.350	165	20	6.0	39	12	65	20	93	28
4	15.55	0.415	180	13	4.95	36	15.15	49	20	74	30.75
6	16.57	0.525	140	11	6	33	17	45	22	68	35.85
10	18.55	0.725	220	10	70	18	12	47	26	56	41
16	22.70	1.10	260	8	8.85	16	17	24	26	41	46.29
25	27.55	1.655	320	-	-	7	13	18	30	25	42
35	30	2.155	370	-	-	5	12	10	22	15	34.45
50	35	3.119	430	-	-	5	15	9	26	12	40.35
70	40	4.155	490	-	-	4	16	6	28	6	28.7
95	45	5.59	560	-	-	4	21	4	21	6	38.57
120	44	8.35	610	-	-	-	-	3	19	5	33.58
150	55	8.35	680	-	-	-	-	3	23	4	33.28
185	60	10.25	750	-	-	-	-	3	29	3	30.65
240	70	13.05	850	-	-	-	-	2	2	2	26

15	12.5	0.235	144	46	10	89	20	134	31	18	41
25	14.60	0.305	165	32	9	60	18	120	36	141	42
4	15	0.415	180	18	7	64	21.5	90	38	110	45
6	16	0.529	190	12	9.35	50	26	86	45	100	54
10	17	0.729	220	8	11.55	30	21.3	60	44	90	66
16	21	1.17	260	12	14.35	24	26	36	40	60	68
25	25	1.657	320	-	-	12	20.4	11	46	36	61.75
35	30	2.150	370	-	-	8	18	17	39	24	53.75
50	35	3	430	-	-	7	23	14	46	21	53.75
70	40	4	490	-	-	6	28	9	41	12	68.25
95	46	5	560	-	-	6	32	5	33	11	50.38
120	50	8	610	-	-	-	-	5	33	8	61.55
150	56	8	680	-	-	-	-	5	41	6	49.85
185	60	10	750	-	-	-	-	4	40	4	41.85
240	70	13	850	-	-	-	-	4	51	4	51.60



CABLE CARRYING CAPACITY OF CABLE TRAY

CABLE TRAY WIDTH	CABLE DATA				CABLE TRAY CAPACITY							
	SECTION SQ MM	OVER ALL DIA MM	WEIGHT KG /M	HIGHT – 25MM		HIGHT – 50MM		HIGHT – 75MM		HIGHT – 100MM		
				NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	
CABLE TRAY WIDTH – 50MM	15	1340	0.240	5	1.2	11	2.64	17	4.00	23	5.52	
	2.5	1440	0.300	4	1.2	8	2.40	15	4.50	21	6.30	
	4.0	16.60	0.420	3	0.72	7	1.20	12	1.26	15	6.30	
	6.0	1780	0.525	2	1.05	6	3.10	10	5.25	14	7.30	
	100	19.70	0.745	2	1.49	4	3.00	8	6.00	11	8.00	
	160	23.10	1.050	2	2.1	3	3.15	5	5.25	7	7.40	
	250	27.20	1.545	-	-	1	1.54	3	4.60	4	6.18	
	350	25.10	1.690	-	-	1	1.70	2	3.40	3	5.00	
	500	29.20	2.275	-	-	1	2.20	2	4.50	2	4.50	
	700	32.90	3.140	-	-	1	3.10	1	3.10	1	3.10	
	950	37.60	4.280	-	-	1	4.30	1	4.30	1	4.30	
	1200	39.90	5.250	-	-	1	5.30	1	5.30	1	5.30	
	1500	44.50	6.485	-	-	1	6.50	1	6.50	1	6.50	
	1850	50.30	8.095	-	-	-	-	1	8.00	1	8.00	
	2400	56.50	10.52	-	-	-	-	1	10.50	1	10.50	
3000	62.60	13.11	-	-	-	-	1	13.10	1	13.10		
CABLE TRAY WIDTH – 75MM	15	1340	0.240	8	1.90	18	4.30	26	6.30	35	8.40	
	2.5	1440	0.300	6	1.80	12	3.60	22	6.60	31	9.30	
	4.0	16.60	0.420	4	1.70	11	4.60	18	7.50	23	9.60	
	6.0	1780	0.525	4	2.10	9	4.70	15	7.80	20	10.50	
	100	19.70	0.745	3	2.20	6	4.40	12	8.90	18	13.40	
	160	23.10	1.050	3	2.20	5	5.30	7	7.40	12	12.60	
	250	27.20	1.545	-	3.20	3	4.60	5	7.70	7	10.80	
	350	25.10	1.690	-	-	3	5.00	3	5.00	4	6.80	
	500	29.20	2.275	-	-	2	4.60	3	6.60	3	6.60	
	700	32.90	3.140	-	-	2	6.30	2	6.30	2	6.30	
	950	37.60	4.280	-	-	1	4.30	1	4.30	2	8.60	
	1200	39.90	5.250	-	-	1	5.25	1	5.25	1	5.25	
	1500	44.50	6.485	-	-	1	6.50	1	6.50	1	6.50	
	1850	50.30	8.095	-	-	-	-	1	8.00	1	8.00	
	2400	56.50	10.52	-	-	-	-	1	10.50	1	10.50	
3000	62.60	13.11	-	-	-	-	1	13.10	1	13.10		
CABLE TRAY WIDTH – 100MM	15	1340	0.240	12	2.88	25	6.00	38	9.10	50	12.00	
	2.5	1440	0.300	9	2.70	18	5.40	31	9.30	44	13.20	
	4.0	16.60	0.420	6	2.52	15	5.30	25	10.50	32	13.40	
	6.0	1780	0.525	6	3.15	13	6.80	20	10.50	29	15.20	
	100	19.70	0.745	5	3.72	8	6.00	17	12.60	24	17.80	
	160	23.10	1.050	4	4.20	7	7.30	10	10.50	16	16.80	
	250	27.20	1.545	-	-	4	6.18	7	10.78	10	15.40	
	350	25.10	1.690	-	-	3	5.07	5	8.45	6	10.40	
	500	29.20	2.275	-	-	2	4.55	4	9.10	4	9.00	
	700	32.90	3.140	-	-	2	6.28	3	9.42	3	9.40	
	950	37.60	4.280	-	-	2	8.56	2	8.56	3	12.80	
	1200	39.90	5.250	-	-	2	10.50	1	5.25	2	10.50	
	1500	44.50	6.485	-	-	2	12.90	1	6.48	1	6.48	
	1850	50.30	8.095	-	-	-	-	1	8.95	1	8.90	
	2400	56.50	10.52	-	-	-	-	1	10.50	1	10.50	
3000	62.60	13.11	-	-	-	-	1	13.10	1	13.10		



CABLE CARRYING CAPACITY OF CABLE TRAY

CABLE TRAY WIDTH	CABLE DATA					CABLE TRAY CAPACITY					
	SECTION SQ MM	OVER ALL DIA MM	WEIGHT KG / M	HIGHT – 25MM		HIGHT – 50MM		HIGHT – 75MM		HIGHT – 100MM	
				NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M
CABLE TRAY WIDTH = 150MM	15	1340	0.240	18	4.30	38	910	60	1440	80	19.20
	2.5	1440	0.300	14	4.2	26	780	46	13.80	65	19.50
	4.0	16.60	0420	9	3.8	25	1050	35	14.70	50	21.00
	6.0	1780	0.525	8	5.2	23	12.00	30	15.80	45	23.60
	100	19.70	0.745	7	6.3	12	9.00	24	17.80	38	28.30
	160	23.10	1.050	6	-	6	10.50	15	15.80	27	28.40
	250	27.20	1.545	-	-	5	8.80	13	20.00	18	27.80
	350	25.10	1.690	-	-	4	8.50	8	13.60	12	20.30
	500	29.20	2.275	-	-	3	9.10	6	13.70	9	20.50
	700	32.90	3.140	-	-	3	9.50	6	18.90	6	18.90
	950	37.60	4.280	-	-	2	12.90	3	12.90	6	25.70
	1200	39.90	5.250	-	-	-	10.50	3	15.80	4	21.00
	1500	44.50	6.485	--	-	-	-	3	19.50	3	19.50
	1850	50.30	8.095	--	-	-	-	3	24.30	3	24.30
	2400	56.50	10.52	-	-	-	-	1	10.50	1	10.50
3000	62.60	13.11	-	-	-	-	1	13.10	1	13.10	
CABLE TRAY WIDTH = 200MM	15	1340	0.240	26	6.24	54	13.00	82	19.60	110	26.40
	2.5	1440	0.300	21	6.30	36	10.80	65	19.50	90	27.00
	4.0	16.60	0420	14	5.80	35	14.70	48	20.10	70	29.40
	6.0	1780	0.525	13	6.80	32	16.80	43	22.50	65	34.10
	100	19.70	0.745	10	7.40	18	13.40	34	25.30	53	39.40
	160	23.10	1.050	8	8.40	15	15.70	22	23.10	38	40.00
	250	27.20	1.545	-	-	8	12.30	19	7.70	26	40.20
	350	25.10	1.690	-	-	7	11.80	11	18.60	16	27.00
	500	29.20	2.275	-	-	6	13.60	9	20.40	13	29.50
	700	32.90	3.140	-	-	5	15.70	8	25.20	8	25.20
	950	37.60	4.280	-	-	4	17.20	5	21.40	8	34.30
	1200	39.90	5.250	-	-	3	15.70	4	21.00	6	31.50
	1500	44.50	6.485	-	-	3	19.40	4	26.00	5	32.50
	1850	50.30	8.095	-	-	-	-	4	32.40	4	32.40
	2400	56.50	10.52	-	-	-	-	2	21.00	2	21.00
3000	62.60	13.11	-	-	-	-	2	26.20	2	26.20	
CABLE TRAY WIDTH = 250MM	15	1340	0.240	28	6.70	60	14.40	90	21.60	123	29.50
	2.5	1440	0.300	25	7.50	45	13.50	80	24.00	103	40.00
	4.0	16.60	0420	15	6.30	33	13.90	60	25.20	85	35.70
	6.0	1780	0.525	11	5.70	30	15.80	55	28.90	70	36.80
	100	19.70	0.745	13	9.60	24	17.80	48	31.30	72	53.60
	160	23.10	1.050	9	9.50	19	20.00	30	31.50	40	42.00
	250	27.20	1.545	-	-	11	17.00	22	34.00	32	42.40
	350	25.10	1.690	-	-	11	18.60	20	33.80	25	42.30
	500	29.20	2.275	-	-	8	18.20	14	31.80	20	45.50
	700	32.90	3.140	-	-	7	22.00	12	37.70	14	44.00
	950	37.60	4.280	-	-	6	25.70	7	30.00	11	47.00
	1200	39.90	5.250	-	-	5	11.25	6	31.50	9	47.30
	1500	44.50	6.485	-	-	-	-	5	32.50	7	45.50
	1850	50.30	8.095	-	-	-	-	4	32.40	5	40.50
	2400	56.50	10.52	-	-	-	-	3	31.60	4	42.00
3000	62.60	13.11	-	-	-	-	1	26.20	2	26.20	



CABLE CARRYING CAPACITY OF CABLE TRAY

CABLE TRAY WIDTH	CABLE DATA				CABLE TRAY CAPACITY							
	SECTION SQ MM	OVER ALL DIA MM	WEIGHT KG /M	HIGHT – 25MM		HIGHT – 50MM		HIGHT – 75MM		HIGHT – 100MM		
				NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	
CABLE TRAY WIDTH = 300MM	15	1340	0.240	38	910	80	19.20	123	29.50	162	38.80	
	2.5	1440	0.300	28	840	60	18.00	105	31.50	135	4.50	
	4.0	16.60	0420	17	720	47	19.80	76	31.90	103	43.30	
	6.0	1780	0.525	15	790	43	22.50	67	35.20	90	47.30	
	100	19.70	0.745	13	9.60	26	19.40	53	39.50	73	54.40	
	160	23.10	1.050	11	11.60	23	24.20	35	36.80	51	53.60	
	250	27.20	1.545	-	-	13	20.00	26	40.20	38	58.70	
	350	25.10	1.690	-	-	12	20.30	21	35.50	30	35.50	
	500	29.20	2.275	-	-	11	25.00	20	45.50	26	45.50	
	700	32.90	3.140	-	-	8	25.20	15	47.10	15	47.10	
	950	37.60	4.280	-	-	7	30.00	8	34.30	14	34.30	
	1200	39.90	5.250	-	-	4	21.00	6	31.50	12	31.50	
	1500	44.50	6.485	--	-	3	19.50	5	32.50	8	32.50	
	1850	50.30	8.095	--	-	-	-	6	48.50	6	48.50	
2400	56.50	10.52	-	-	-	-	4	42.00	4	42.00		
3000	62.60	13.11	-	-	-	-	3	39.40	3	39.40		
CABLE TRAY WIDTH = 350MM	15	1340	0.240	45	10.80	93	19.20	145	34.80	190	45.60	
	2.5	1440	0.300	43	10.20	68	18.00	422	36.60	160	48.00	
	4.0	16.60	0420	20	840	55	19.80	90	37.80	120	50.40	
	6.0	1780	0.525	18	9.50	50	22.50	78	41.00	104	54.40	
	100	19.70	0.745	15	11.20	32	19.40	60	44.70	86	54.60	
	160	23.10	1.050	13	13.70	26	24.20	42	44.10	60	64.00	
	250	27.20	1.545	-	-	14	20.00	31	47.90	43	63.00	
	350	25.10	1.690	-	-	12	20.30	25	42.30	34	66.40	
	500	29.20	2.275	-	-	11	25.00	21	47.70	31	57.50	
	700	32.90	3.140	-	-	9	25.20	16	50.30	18	70.50	
	950	37.60	4.280	-	-	7	30.00	9	38.50	15	56.50	
	1200	39.90	5.250	-	-	4	21.00	7	36.80	13	64.20	
	1500	44.50	6.485	-	-	3	19.50	6	39.00	10	68.30	
	1850	50.30	8.095	-	-	-	-	7	56.60	7	64.90	
2400	56.50	10.52	-	-	-	-	5	52.60	5	56.60		
3000	62.60	13.11	-	-	-	-	4	52.40	4	52.60		
CABLE TRAY WIDTH = 400MM	15	1340	0.240	53	12.70	19	26.00	167	40.00	220	53.00	
	2.5	1440	0.300	41	12.30	80	24.00	142	42.60	185	55.50	
	4.0	16.60	0420	24	10.00	66	27.70	105	44.10	140	58.80	
	6.0	1780	0.525	22	11.55	60	31.50	92	48.30	122	64.00	
	100	19.70	0.745	19	14.20	38	28.30	73	54.40	101	75.30	
	160	23.10	1.050	16	16.80	32	33.60	50	52.50	71	74.60	
	250	27.20	1.545	-	-	19	29.30	38	58.70	52	80.40	
	350	25.10	1.690	-	-	16	27.00	30	50.70	42	71.00	
	500	29.20	2.275	-	-	15	34.10	27	61.40	38	86.50	
	700	32.90	3.140	-	-	12	37.60	20	62.80	22	69.00	
	950	37.60	4.280	-	-	10	42.80	11	47.00	19	81.30	
	1200	39.90	5.250	-	-	6	31.50	9	47.20	16	84.00	
	1500	44.50	6.485	-	-	5	32.40	7	45.40	13	84.30	
	1850	50.30	8.095	-	-	-	-	8	64.70	8	64.70	
2400	56.50	10.52	-	-	-	-	6	63.12	6	63.12		
3000	62.60	13.11	-	-	-	-	5	65.50	5	65.50		



CABLE CARRYING CAPACITY OF CABLE TRAY

CABLE TRAY WIDTH	CABLE DATA				CABLE TRAY CAPACITY							
	SECTION SQ MM	OVER ALL DIA MM	WEIGHT KG / M	HIGHT – 25MM		HIGHT – 50MM		HIGHT – 75MM		HIGHT – 100MM		
				NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	
CABLE TRAY WIDTH = 450MM	15	1340	0.240	58	13.90	120	28.80	180	43.20	245	50.80	
	2.5	1440	0.300	48	1440	90	2700	155	46.50	210	63.00	
	4.0	16.60	0420	23	9.60	77	32.30	118	50.00	160	67.20	
	6.0	1780	0.525	21	11.00	66	34.60	102	53.60	136	71.40	
	100	19.70	0.745	20	15.00	43	32.00	83	61.80	112	83.40	
	160	23.10	1.050	16	16.80	35	36.80	54	56.70	80	84.00	
	250	27.20	1.545	-	-	18	27.80	42	64.90	56	86.60	
	350	25.10	1.690	-	-	16	27.00	32	54.00	44	74.40	
	500	29.20	2.275	-	-	14	31.90	25	56.90	38	86.50	
	700	32.90	3.140	-	-	12	37.70	22	69.00	25	78.50	
	950	37.60	4.280	-	-	10	42.80	11	47.00	20	85.60	
	1200	39.90	5.250	-	-	9	47.25	10	52.50	18	94.50	
	1500	44.50	6.485	--	-	5	32.50	9	58.40	16	103.80	
	1850	50.30	8.095	--	-	-	-	8	64.80	12	97.20	
2400	56.50	10.52	-	-	-	-	6	63.20	10	105.20		
3000	62.60	13.11	-	-	-	-	5	65.50	5	56.20		
CABLE TRAY WIDTH = 500MM	15	1340	0.240	67	16.00	135	32.50	206	49.50	275	66.00	
	2.5	1440	0.300	55	16.50	100	30.00	175	52.50	236	70.80	
	4.0	16.60	0420	27	11.40	88	37.00	134	56.30	180	75.60	
	6.0	1780	0.525	26	18.70	76	40.00	116	61.00	155	81.40	
	100	19.70	0.745	25	18.70	51	38.00	95	70.70	127	94.60	
	160	23.10	1.050	21	22.00	42	44.00	63	66.00	92	96.60	
	250	27.20	1.545	-	-	22	34.00	48	74.00	65	100.00	
	350	25.10	1.690	-	-	21	33.50	38	64.00	52	88.00	
	500	29.20	2.275	-	-	18	41.00	30	68.30	44	100.00	
	700	32.90	3.140	-	-	16	50.00	27	85.00	30	94.20	
	950	37.60	4.280	-	-	13	55.70	14	60.00	24	103.00	
	1200	39.90	5.250	-	-	10	52.50	13	68.30	23	121.00	
	1500	44.50	6.485	-	-	7	45.30	12	77.80	20	130.00	
	1850	50.30	8.095	-	-	-	-	10	81.00	11	89.00	
2400	56.50	10.52	-	-	-	-	8	84.00	8	84.20		
3000	62.60	13.11	-	-	-	-	7	92.00	7	92.00		
CABLE TRAY WIDTH = 550MM	15	1340	0.240	72	17.30	145	34.80	224	53.80	285	68.40	
	2.5	1440	0.300	57	17.00	104	31.20	185	55.50	245	73.50	
	4.0	16.60	0420	28	11.80	90	37.80	138	58.00	185	77.70	
	6.0	1780	0.525	27	14.20	80	42.00	120	63.00	160	84.00	
	100	19.70	0.745	26	19.40	53	39.50	97	72.30	130	96.90	
	160	23.10	1.050	22	23.10	44	46.20	65	68.30	95	99.80	
	250	27.20	1.545	-	-	23	35.50	50	77.30	67	103.50	
	350	25.10	1.690	-	-	22	37.20	39	65.90	54	91.30	
	500	29.20	2.275	-	-	14	43.30	31	70.50	45	102.30	
	700	32.90	3.140	-	-	17	53.40	28	88.00	31	97.00	
	950	37.60	4.280	-	-	14	60.00	15	64.20	25	107.00	
	1200	39.90	5.250	-	-	12	63.00	14	73.50	24	126.00	
	1500	44.50	6.485	-	-	7	45.30	13	84.30	21	136.10	
	1850	50.30	8.095	-	-	-	-	11	89.00	12	97.20	
2400	56.50	10.52	-	-	-	-	8	84.00	8	84.20		
3000	62.60	13.11	-	-	-	-	7	92.00	7	92.00		



CABLE CARRYING CAPACITY OF CABLE TRAY

CABLE TRAY WIDTH	CABLE DATA				CABLE TRAY CAPACITY							
	SECTION SQ MM	OVER ALL DIA MM	WEIGHT KG /M	HIGHT – 25MM		HIGHT – 50MM		HIGHT – 75MM		HIGHT – 100MM		
				NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	
CABLE TRAY WIDTH = 600MM	15	1340	0.240	72	1730	155	3720	242	58.00	320	76.80	
	2.5	1440	0.300	52	15.60	115	34.50	206	61.80	266	79.80	
	4.0	16.60	0420	30	12.60	90	37.80	148	62.20	202	84.80	
	6.0	1780	0.525	26	13.60	82	43.00	130	68.30	176	92.40	
	100	19.70	0.745	22	16.40	50	37.30	102	76.00	142	105.80	
	160	23.10	1.050	18	19.00	42	44.10	66	69.30	100	105.00	
	250	27.20	1.545	-	-	22	34.00	50	77.30	72	111.30	
	350	25.10	1.690	-	-	20	33.80	40	67.60	56	94.70	
	500	29.20	2.275	-	-	18	41.00	36	82.00	50	113.80	
	700	32.90	3.140	-	-	14	44.00	28	88.00	30	94.20	
	950	37.60	4.280	-	-	12	51.40	14	60.00	25	107.00	
	1200	39.90	5.250	-	-	7	36.70	10	25.50	22	115.50	
	1500	44.50	6.485	--	-	5	32.50	9	58.40	14	90.80	
	1850	50.30	8.095	--	-	-	-	10	81.00	10	81.00	
2400	56.50	10.52	-	-	-	-	7	76.60	7	73.60		
3000	62.60	13.11	-	-	-	-	5	65.50	5	65.50		
CABLE TRAY WIDTH = 650MM	15	1340	0.240	87	18.70	167	40.00	260	62.40	340	81.60	
	2.5	1440	0.300	56	16.80	124	37.20	220	66.00	280	84.00	
	4.0	16.60	0420	32	13.40	97	40.70	155	65.10	210	88.20	
	6.0	1780	0.525	28	14.70	88	46.20	135	70.80	185	97.10	
	100	19.70	0.745	24	17.90	54	40.30	106	79.00	150	111.80	
	160	23.10	1.050	19	20.00	45	47.30	70	73.50	110	115.5	
	250	27.20	1.545	-	-	23	35.50	52	80.40	75	115.80	
	350	25.10	1.690	-	-	21	35.50	42	71.00	58	98.00	
	500	29.20	2.275	-	-	19	43.20	37	84.10	52	118.30	
	700	32.90	3.140	-	-	15	47.00	30	94.20	31	97.30	
	950	37.60	4.280	-	-	13	55.60	15	64.20	26	111.30	
	1200	39.90	5.250	-	-	7	36.70	10	25.50	23	120.00	
	1500	44.50	6.485	-	-	5	32.50	9	28.40	15	97.20	
	1850	50.30	8.095	-	-	-	-	10	81.00	10	81.00	
2400	56.50	10.52	-	-	-	-	7	73.60	7	73.60		
3000	62.60	13.11	-	-	-	-	5	65.50	5	65.50		
CABLE TRAY WIDTH = 700MM	15	1340	0.240	85	20.40	182	43.70	286	68.70	375	90.00	
	2.5	1440	0.300	62	18.60	132	39.60	240	72.00	315	94.50	
	4.0	16.60	0420	36	15.20	106	44.50	175	73.50	235	98.70	
	6.0	1780	0.525	32	16.80	96	50.40	152	80.00	20+	108.20	
	100	19.70	0.745	26	19.40	60	44.70	115	85.60	170	126.60	
	160	23.10	1.050	24	25.20	50	52.50	80	84.00	115	120.80	
	250	27.20	1.545	-	-	26	40.20	60	92.70	82	126.70	
	350	25.10	1.690	-	-	22	37.20	46	77.80	66	108.20	
	500	29.20	2.275	-	-	20	45.50	40	91.00	60	136.50	
	700	32.90	3.140	-	-	16	50.20	30	94.20	32	100.50	
	950	37.60	4.280	-	-	12	51.40	16	68.50	27	115.60	
	1200	39.90	5.250	-	-	7	36.80	12	63.00	25	131.30	
	1500	44.50	6.485	-	-	5	32.50	11	71.30	18	116.70	
	1850	50.30	8.095	-	-	-	-	12	107.40	12	107.40	
2400	56.50	10.52	-	-	-	-	9	94.70	9	94.70		
3000	62.60	13.11	-	-	-	-	7	91.70	7	91.70		



CABLE CARRYING CAPACITY OF CABLE TRAY

CABLE TRAY WIDTH	CABLE DATA				CABLE TRAY CAPACITY							
	SECTION SQ MM	OVER ALL DIA MM	WEIGHT KG / M	HIGHT – 25MM		HIGHT – 50MM		HIGHT – 75MM		HIGHT – 100MM		
				NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	
CABLE TRAY WIDTH = 750mm	15	1340	0.240	95	22.80	190	45.60	300	72.00	400	96.00	
	2.5	1440	0.300	75	22.50	140	42.00	250	75.00	345	103.50	
	4.0	16.60	0.420	40	16.80	130	54.60	190	79.80	260	109.20	
	6.0	17.80	0.525	37	19.50	110	57.80	170	89.30	230	120.80	
	100	19.70	0.745	30	22.40	68	50.70	135	100.50	188	140.00	
	160	23.10	1.050	26	27.30	55	57.80	85	89.30	130	136.50	
	250	27.20	1.545	-	-	30	46.40	65	100.50	90	139.00	
	350	25.10	1.690	-	-	26	44.00	50	48.50	70	118.30	
	500	29.20	2.275	-	-	24	54.60	43	97.80	62	141.00	
	700	32.90	3.140	-	-	20	62.80	32	100.50	38	119.30	
	950	37.60	4.280	-	-	16	68.50	18	77.00	32	137.00	
	1200	39.90	5.250	-	-	13	68.30	15	78.80	28	147.00	
	1500	44.50	6.485	--	-	10	64.90	13	84.60	23	149.20	
	1850	50.30	8.095	--	-	-	-	12	97.20	13	105.30	
	2400	56.50	10.52	-	-	-	-	10	105.20	11	115.70	
3000	62.60	13.11	-	-	-	-	9	118.00	9	118.00		
CABLE TRAY WIDTH = 800MM	15	1340	0.240	100	24.00	200	48.00	330	79.20	430	103.20	
	2.5	1440	0.300	80	24.00	150	45.00	20	84.00	365	109.50	
	4.0	16.60	0.420	45	19.00	125	25.20	202	84.90	270	113.40	
	6.0	17.80	0.525	40	21.00	115	60.40	180	94.50	235	123.40	
	100	19.70	0.745	35	26.00	70	52.20	140	104.30	194	144.50	
	160	23.10	1.050	28	29.40	60	63.00	90	94.50	135	141.80	
	250	27.20	1.545	-	-	35	54.00	40	108.20	95	146.80	
	350	25.10	1.690	-	-	30	52.70	55	93.00	74	125.00	
	500	29.20	2.275	-	-	26	59.20	50	113.80	66	150.20	
	700	32.90	3.140	-	-	22	69.00	53	100.00	40	125.00	
	950	37.60	4.280	-	-	18	77.00	20	85.60	35	150.20	
	1200	39.90	5.250	-	-	15	78.80	16	84.00	30	157.50	
	1500	44.50	6.485	-	-	9	58.40	14	90.80	24	155.60	
	1850	50.30	8.095	-	-	-	-	14	113.40	14	113.40	
	2400	56.50	10.52	-	-	-	-	11	115.80	11	115.80	
3000	62.60	13.11	-	-	-	-	9	118.00	9	118.00		
CABLE TRAY WIDTH = 850MM	15	1340	0.240	110	26.40	225	54.00	340	81.60	440	105.60	
	2.5	1440	0.300	90	27.00	170	51.00	285	85.50	385	115.50	
	4.0	16.60	0.420	46	19.40	145	61.00	215	90.30	285	119.70	
	6.0	17.80	0.525	42	22.00	12	65.60	185	97.10	250	131.20	
	100	19.70	0.745	40	29.80	82	61.00	150	111.80	200	149.00	
	160	23.10	1.050	33	43.60	70	73.50	100	105.00	145	152.30	
	250	27.20	1.545	-	-	34	52.50	76	117.00	100	154.50	
	350	25.10	1.690	-	-	35	59.20	60	101.40	80	135.20	
	500	29.20	2.275	-	-	30	68.30	51	116.00	70	159.30	
	700	32.90	3.140	-	-	27	84.80	40	125.60	45	141.30	
	950	37.60	4.280	-	-	22	94.20	22	94.20	37	158.40	
	1200	39.90	5.250	-	-	18	94.50	20	105.00	34	178.50	
	1500	44.50	6.485	-	-	11	71.40	16	103.80	28	181.60	
	1850	50.30	8.095	-	-	-	-	15	121.50	18	145.70	
	2400	56.50	10.52	-	-	-	-	12	126.50	12	126.50	
3000	62.60	13.11	-	-	-	-	10	131.00	11	144.10		



CABLE CARRYING CAPACITY OF CABLE TRAY

CABLE TRAY WIDTH	CABLE DATA				CABLE TRAY CAPACITY							
	SECTION SQ MM	OVER ALL DIA MM	WEIGHT KG /M	HIGHT – 25MM		HIGHT – 50MM		HIGHT – 75MM		HIGHT – 100MM		
				NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	NO OF CABLE	WIGHT KG/ M	
CABLE TRAY WIDTH = 900mm	15	1340	0.240	110	2640	233	55.90	350	84.00	457	114.00	
	2.5	1440	0.300	90	2700	170	51.00	300	90.00	410	123.00	
	4.0	16.60	0420	40	16.80	150	63.00	230	96.60	310	130.20	
	6.0	1780	0.525	38	20.00	430	68.30	195	102.30	260	136.50	
	100	19.70	0.745	37	27.50	82	61.00	160	119.20	210	156.50	
	160	23.10	1.050	32	33.60	70	73.50	103	108.20	150	157.50	
	250	27.20	1.545	-	-	32	49.50	75	115.90	105	162.20	
	350	25.10	1.690	-	-	30	50.70	64	108.20	85	143.70	
	500	29.20	2.275	-	-	30	61.50	48	109.20	70	159.30	
	700	32.90	3.140	-	-	22	69.00	40	125.60	48	150.70	
	950	37.60	4.280	-	-	1	7.700	25	10.700	43	184.00	
	1200	39.90	5.250	-	-	16	84.00	23	120.80	41	215.30	
	1500	44.50	6.485	--	-	11	71.30	21	136.20	36	233.50	
	1850	50.30	8.095	--	-	-	-	18	145.70	27	218.50	
2400	56.50	10.52	-	-	-	-	14	147.30	14	147.30		
3000	62.60	13.11	-	-	-	-	12	157.20	12	157.20		
CABLE TRAY WIDTH = 950MM	15	1340	0.240	125	30.00	255	61.20	385	92.40	500	120.00	
	2.5	1440	0.300	100	30.00	190	57.00	320	96.00	442	132.60	
	4.0	16.60	0420	50	21.00	165	69.30	245	102.90	340	142.80	
	6.0	1780	0.525	49	21.00	140	73.50	215	112.90	290	152.30	
	100	19.70	0.745	47	35.00	94	70.00	174	129.60	240	178.80	
	160	23.10	1.050	38	40.00	75	78.80	115	120.80	170	178.50	
	250	27.20	1.545	-	-	41	63.40	90	139.00	119	183.90	
	350	25.10	1.690	-	-	39	65.90	64	108.20	94	158.90	
	500	29.20	2.275	-	-	34	77.00	55	125.20	78	177.50	
	700	32.90	3.140	-	-	29	91.00	50	157.00	54	169.60	
	950	37.60	4.280	-	-	23	98.50	24	102.80	43	184.00	
	1200	39.90	5.250	-	-	20	105.00	23	120.80	37	194.30	
	1500	44.50	6.485	-	-	11	71.00	19	123.20	32	207.50	
	1850	50.30	8.095	-	-	-	-	17	137.60	22	178.00	
2400	56.50	10.52	-	-	-	-	13	136.80	12	136.80		
3000	62.60	13.11	-	-	-	-	11	144.10	11	144.10		
CABLE TRAY WIDTH = 1000MM	15	1340	0.240	130	31.20	226	63.80	400	96.00	510	122.40	
	2.5	1440	0.300	106	31.80	195	58.50	325	97.50	450	135.00	
	4.0	16.60	0420	50	21.00	174	73.00	260	109.20	340	142.80	
	6.0	1780	0.525	48	25.20	150	78.80	220	115.50	300	157.50	
	100	19.70	0.745	46	34.30	100	74.50	175	130.40	245	182.50	
	160	23.10	1.050	40	42.00	80	84.00	120	126.00	175	183.70	
	250	27.20	1.545	-	-	40	61.80	84	129.80	120	185.40	
	350	25.10	1.690	-	-	38	64.30	70	118.30	95	160.50	
	500	29.20	2.275	-	-	35	79.60	55	125.20	80	182.00	
	700	32.90	3.140	-	-	30	94.20	50	157.00	55	172.70	
	950	37.60	4.280	-	-	25	107.00	25	107.00	44	188.30	
	1200	39.90	5.250	-	-	21	110.30	22	115.50	38	199.50	
	1500	44.50	6.485	-	-	12	77.90	20	129.70	33	214.00	
	1850	50.30	8.095	-	-	-	-	18	145.70	24	194.30	
2400	56.50	10.52	-	-	-	-	14	147.30	14	147.30		
3000	62.60	13.11	-	-	-	-	12	157.20	12	157.20		

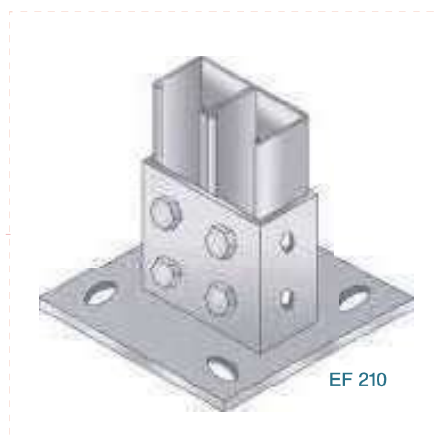
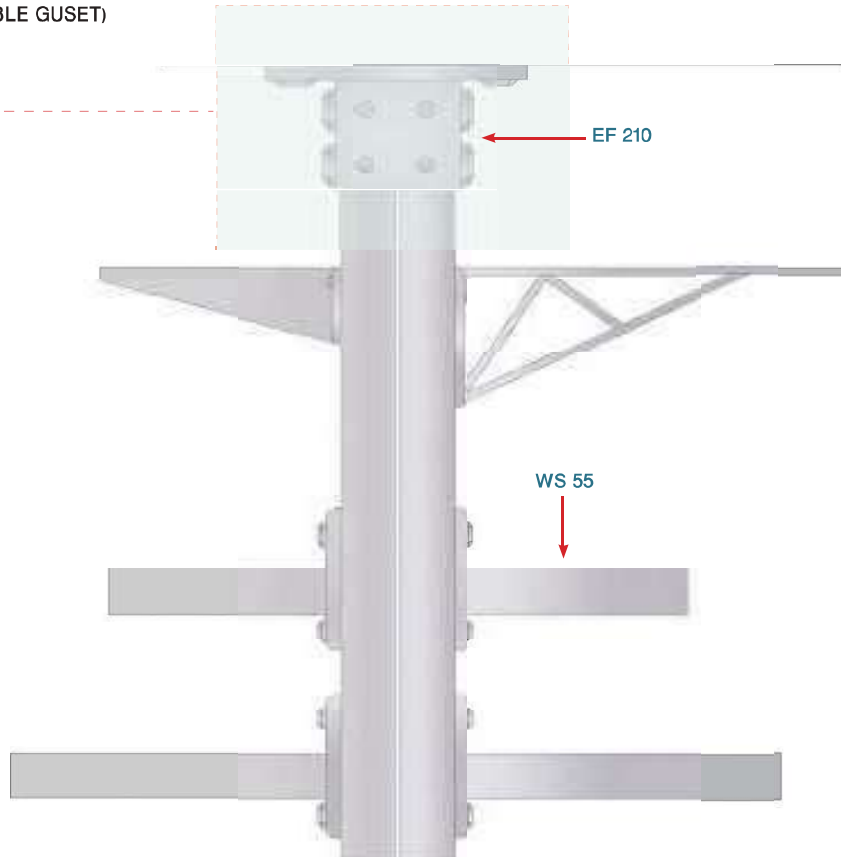


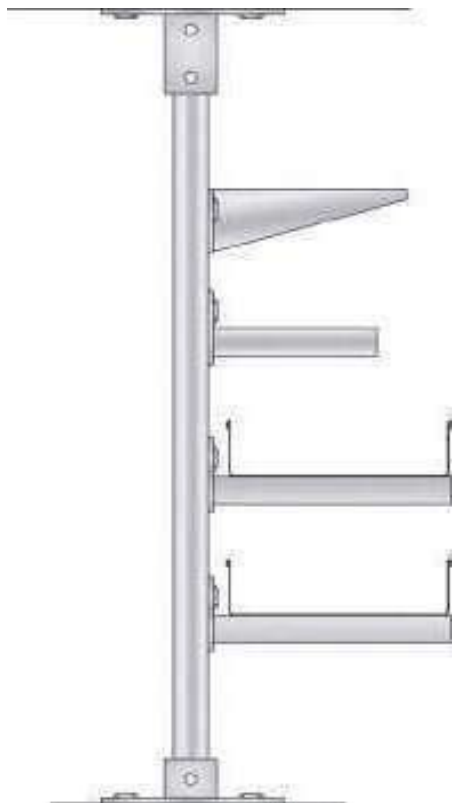
CABLE TRAY & LADDER SUPPORT SYSTEM

CABLE TRAY AND LADDER ARE INSTALLED ACCORDING TO THE SITE REQUIREMENTS.

CABLE TRAY AND LADDER CEILING MOUNTED SYSTEM

BACK TO BACK CHANNEL CEILING SUPPORT
(DOUBLE GUSET)

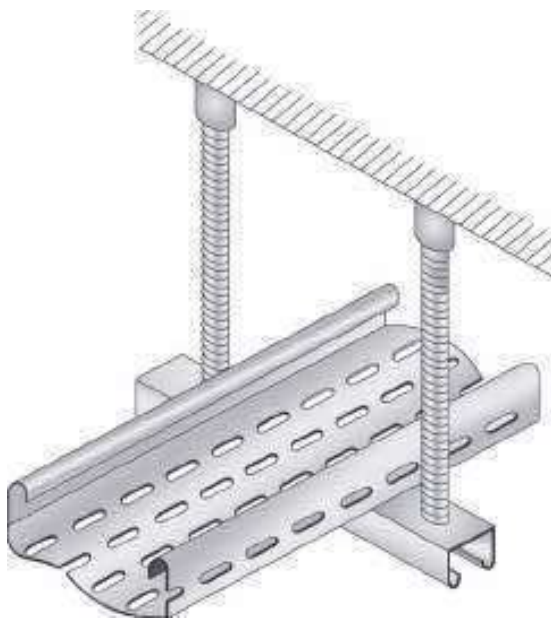




**SINGLE CHANNEL (41x41) CEILING SUPPORT
(W/GUSET)**



**SINGLE CHANNEL CEILING SUPPORT
OR FLOOR SUPPORT**



CEILING SUPPORT

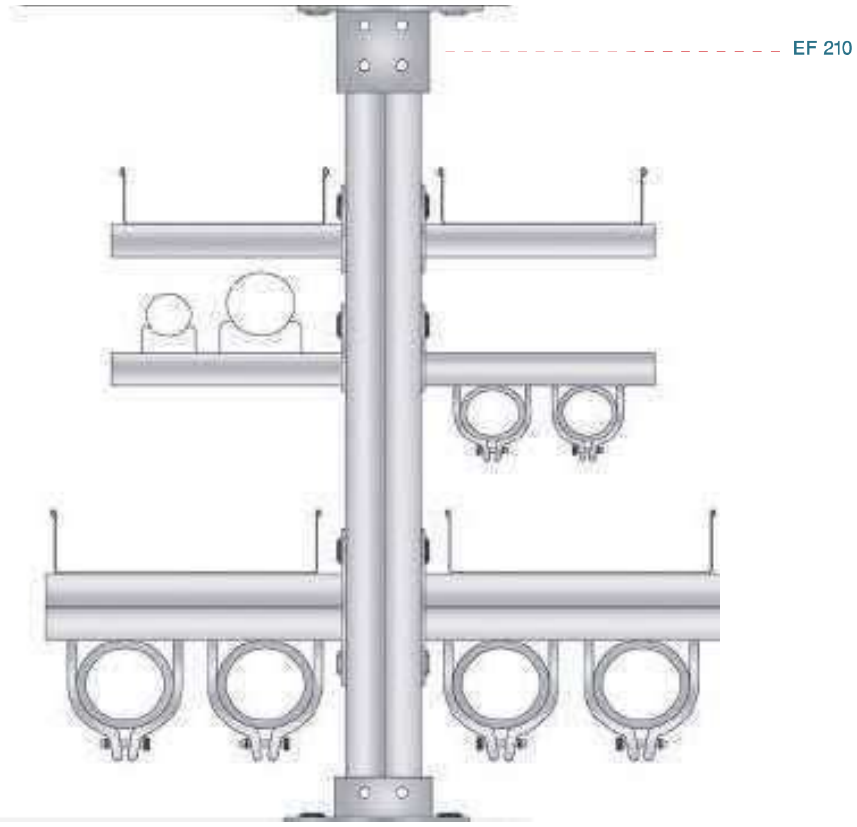


CEILING SUPPORT

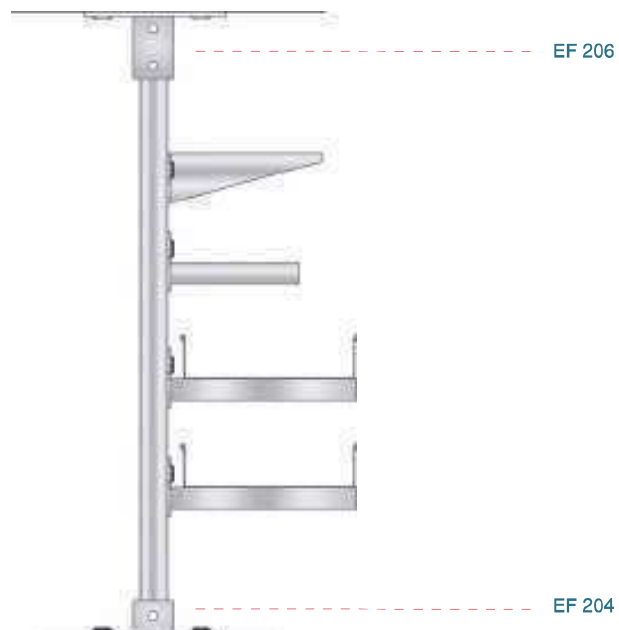


CABLE TRAY & LADDER SUPPORT SYSTEM

CABLE TRAY & LADDER FLOOR TO CEILING MOUNTED SYSTEM

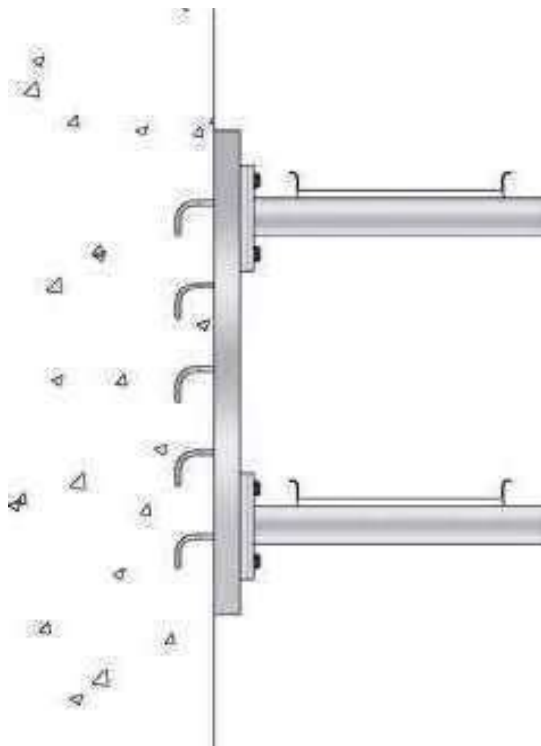


BACK TO BACK CHANNEL FLOOR TO CEILING SUPPORT



SINGLE CHANNEL FLOOR TO CEILING SUPPORT

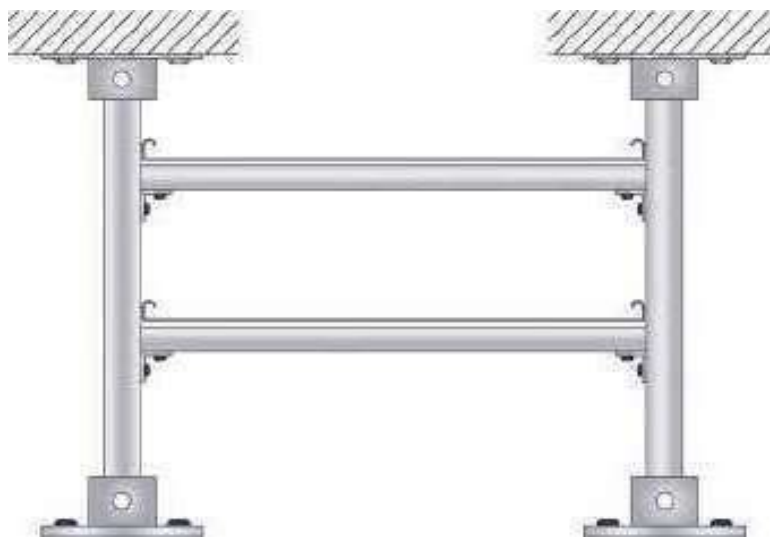




WALL MOUNTED SUPPORT ON CONCRETE
INSERT



HORIZONTAL & VERTICAL WALL MOUNTED
SUPPORT ON CONCRETE WALL

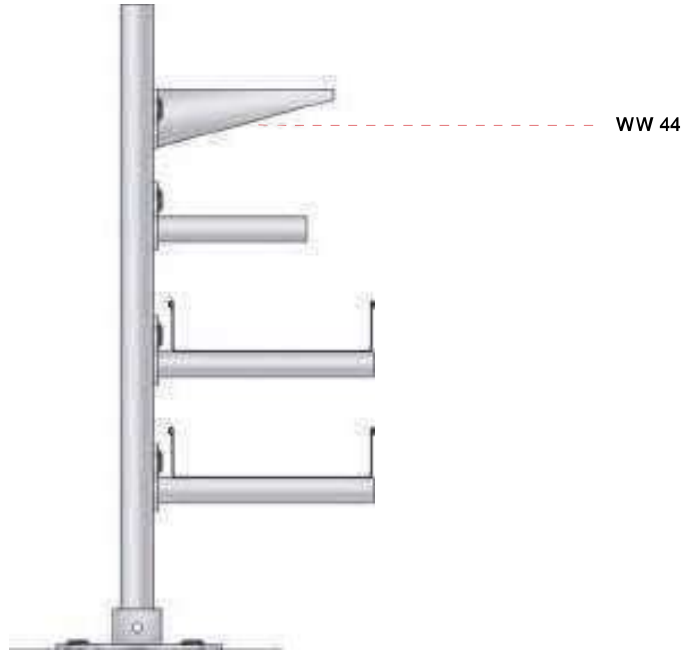


DOUBLE CHANNEL FLOOR TO CEILING SUPPORT



CABLE TRAY SUPPORT SYSTEM

CABLE TRAY & LADDER FLOOR MOUNTED SYSTEM

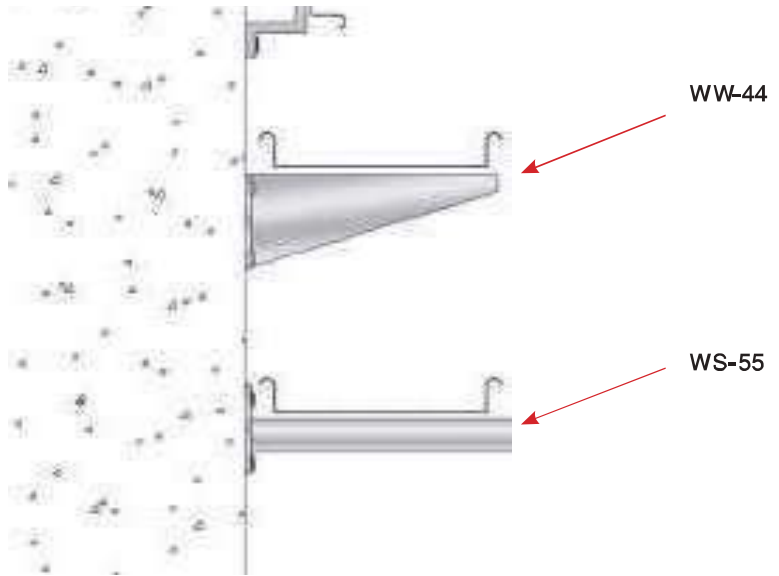


SINGLE CHANNEL FLOOR MOUNTED SUPPORT

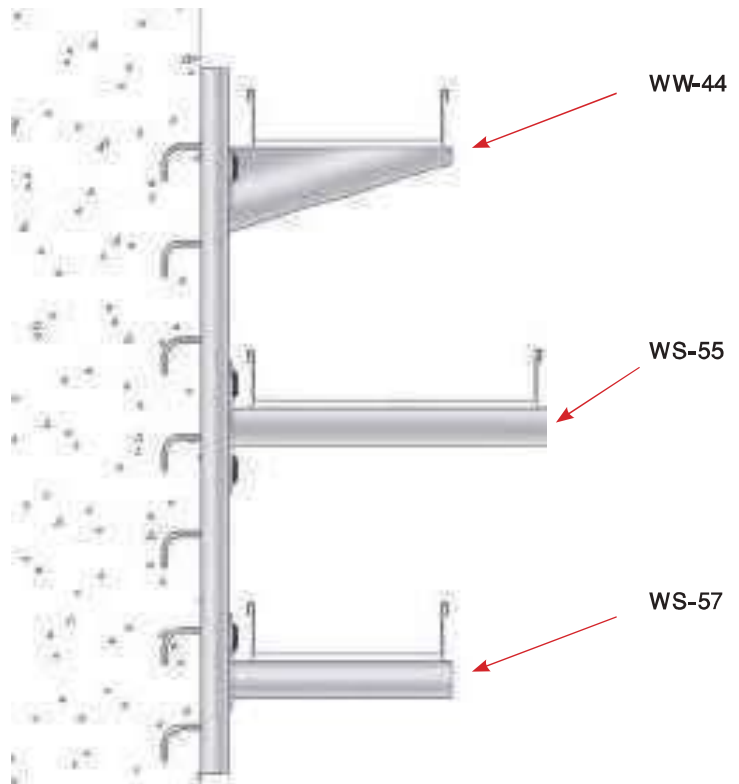


DOUBLE CHANNEL FLOOR MOUNTED SUPPORT



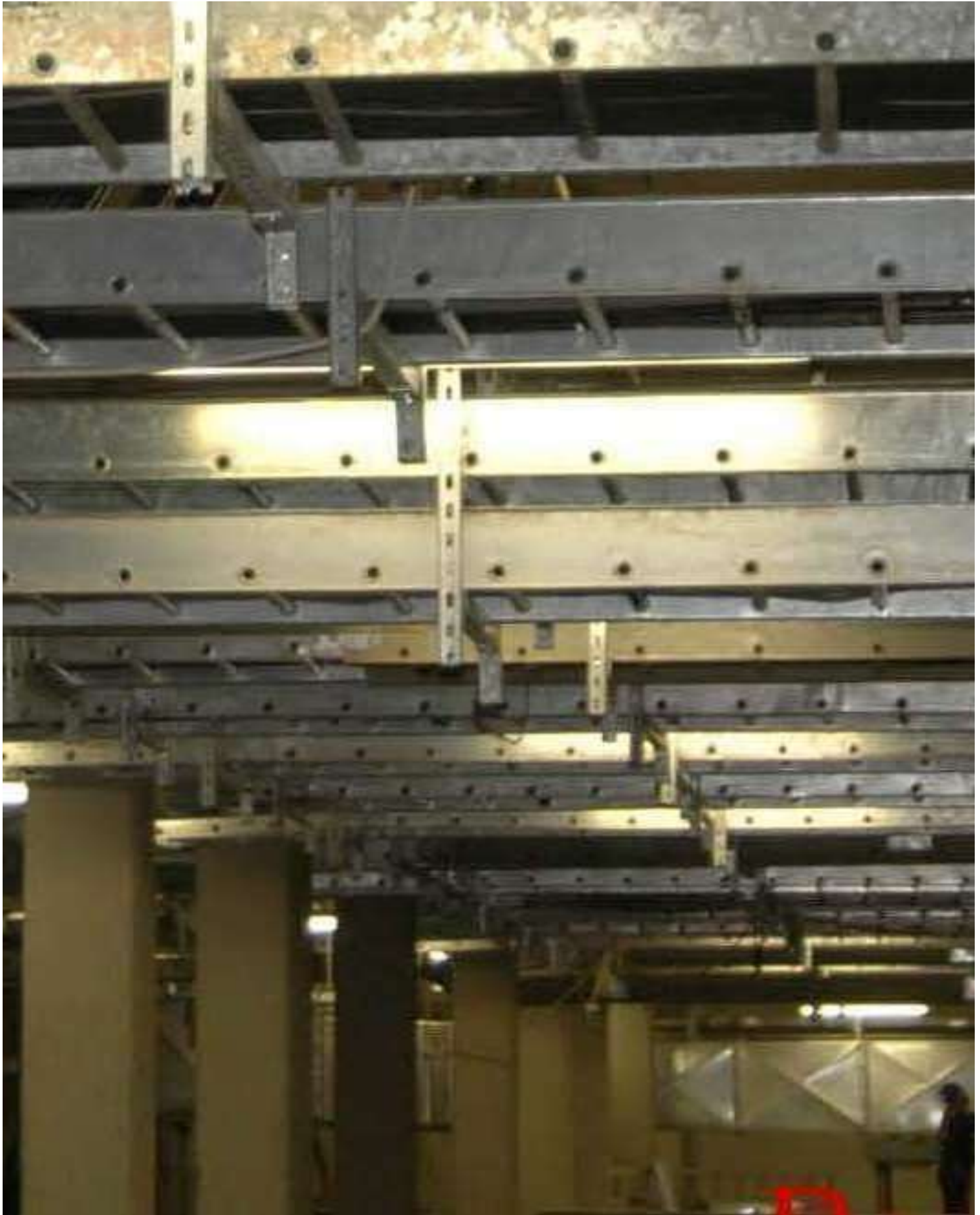


WALL MOUNTED SUPPORTS ON CONCRETE
WALL



WALL MOUNTED SUPPORTS ON CONCRETE INSERT







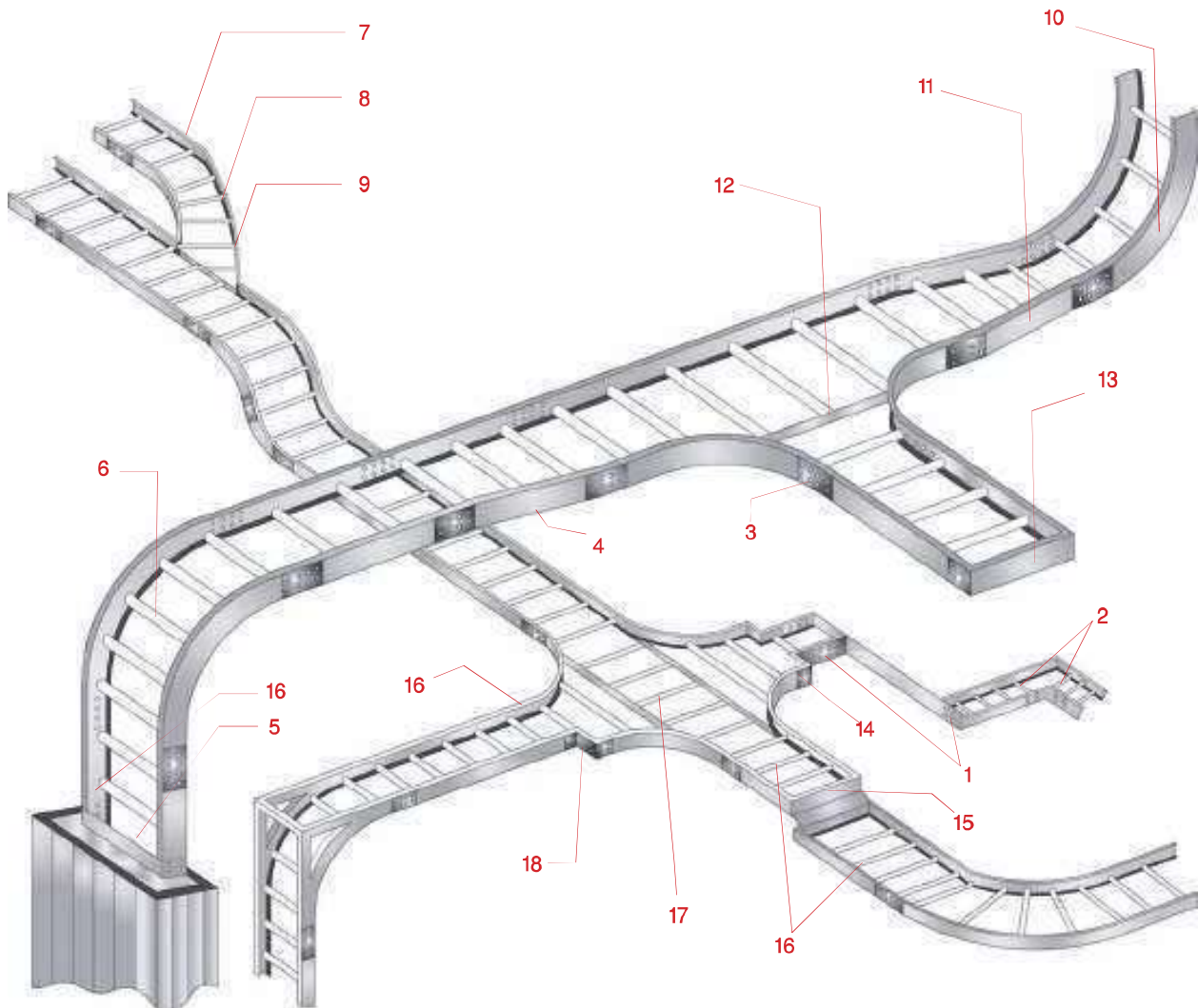
LADDER



ELECTRICAL WAYS



CABLE LADDER SYSTEM

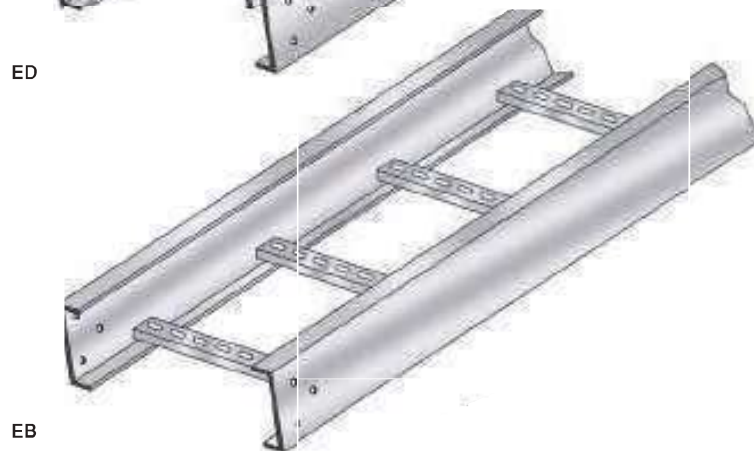
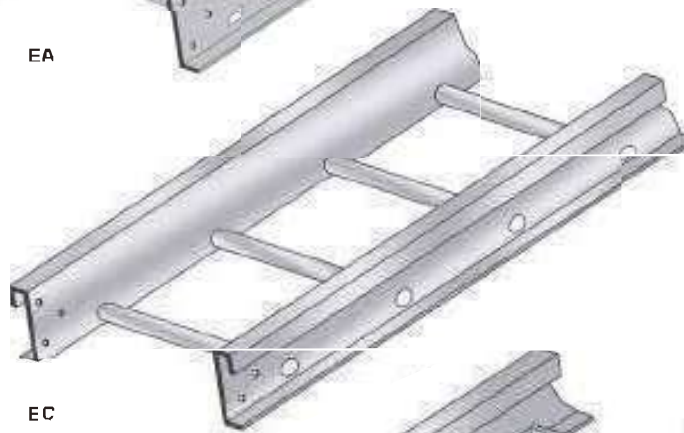


- 1 - ADJUSTABLE RISER CONNECTOR
- 2 - ADJUSTABLE HORIZONTAL CONNECTOR
- 3 - JOINT CONNECTOR
- 4 - RIGHT HAND OFFSET REDUCER
- 5 - DROPOUT BOX CONNECTOR
- 6 - OUTSIDE 90 VERTICAL ELBOW
- 7 - 45 HORIZONTAL ELBOW

- 8 - 45 OUTSIDE VERTICAL ELBOW
- 9 - 45 INSIDE VERTICAL ELBOW
- 10 - INSIDE 90 VERTICAL ELBOW
- 11 - REDUCER
- 12 - HORIZONTAL TEE
- 13 - BLIND END PLATE
- 14 - STRAIGHT REDUCING CONNECTOR



CABLE LADDER



ELECTRICAL WAYS CABLE LADDER SYSTEM

MATERIAL & FINISH

ELECTRICAL WAYS CABLE LADDER

ELECTRICAL WAYS CABLE LADDER ARE FABRICATED AS FOLLOWING SPECIFICATION

(M) (H) (SST) (PCO) (EPOC)

(L) STANDARD LENGHTS 2440 mm. & 3000 mm.

(TT) RUNG TYPE AS ORDER (PIPE TYPE SWAGE OD 25 mm.) NO WELDING

(CH1) CHANNEL TYPE 41 x41 WELDED WITH SIDE HAIGHT

(CH2) CHANNEL TYPE 41 x21 WELDED WITH SIDE HAIGHT

(UU) U TYPE PLAIN CHANEL 40mm x20mm x2mm steel THK

(CC) U TYPE SLOTED CHANEL 40mmx20mm x2mm steel THK

OUR STANDARD WIDTH FOR CABLE LADDER

100/150/200/250/300/400/500/600/700/750/800/900/1000/1100 mm. (OR AS YOUR ORDER)

SIDE RAIL HAIGHT STANDARD 75/100/150/200 (OR AS YOUR ORDER)

OUR STANDARD FOR SIDE RAIL HEIIGHT STEEL THK FOR CABLE LADDER

FROM 100 TO 250 STEEL THK 1.5 mm. FROM 300 TO 1100 STEEL THK 2 mm. (OR AS YOUR ORDER) 2.5 mm. & 3 mm. ARE AV.

ALL CABLE LADDER SIDE HAIGHT WITH OUT SIDE FLANGE (TYPE EA)

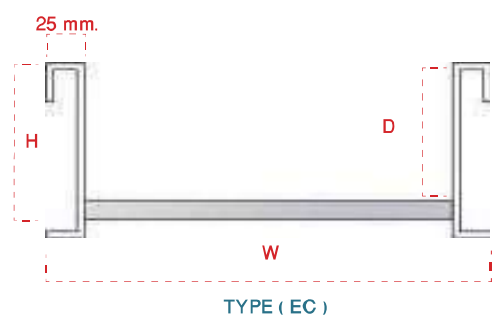
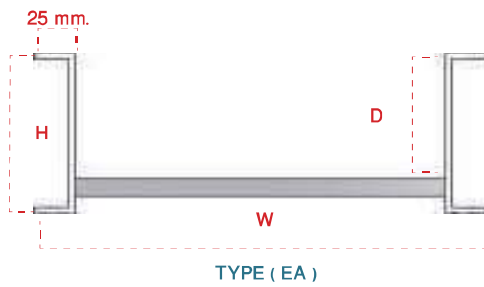
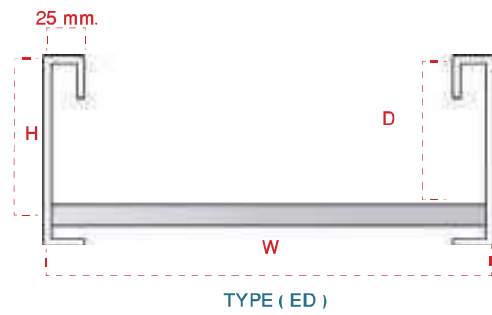
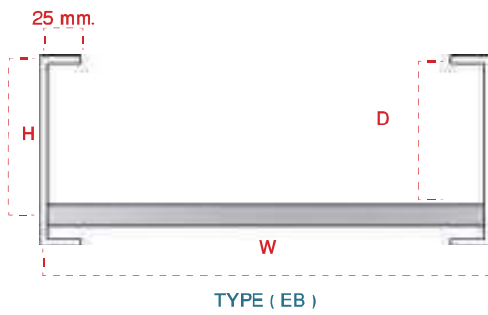
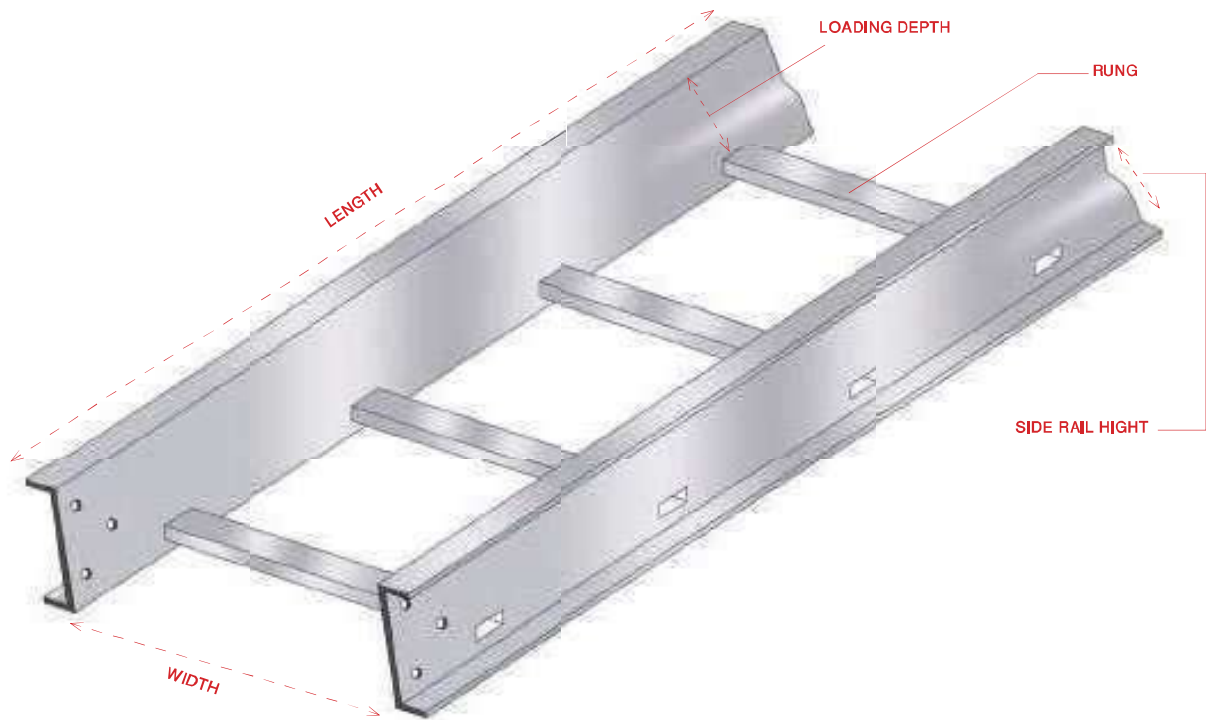
AND FOR HEAVY DUTY OUT SIDE RETURENED UPPER FLANGE FOR EXTRA RIGIDITY (TYPE EC)

ALL TYPES ARE AVILABLE ON REQUEST

MIL GALVANIZED (M)	:	STEEL SHEET SENDZIMIR ZINC PLATED (PRE - GALVANIZED) MINU . COATING OF 2759/M ON BOTH SIDES AS A525-G 90-AND BS2989-75C
HOT DIP GALVANIZED (H)	:	MILD STEEL TO AST MA - 50976 - BS 729 ASTM 123
STAINLESS STEEL (SST)	:	AISI - 304 / 316 (MARINE GRADE)
ALUMINUM (ALUM)	:	ALUMINUM ALLOY 6063.-T6 CAN USED
POWDER COATING (PCO)	:	POLYESTER POWDER COATING ON MILD STEEL IN R.A.L. COLOURS
EPOXY POLYESTER COATING (EPOC)	:	EPOXY POLYESTER COATING ON MILD STEEL IN R.A.L. COLOURS.

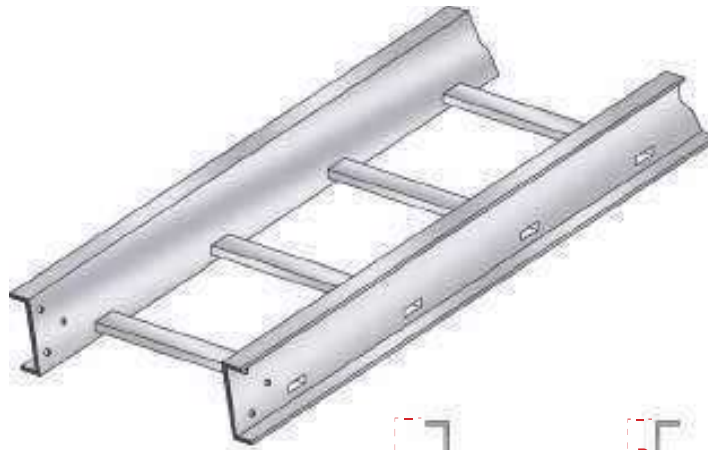


CABLE LADDER ORDERING GUIDE



CABLE LADDER

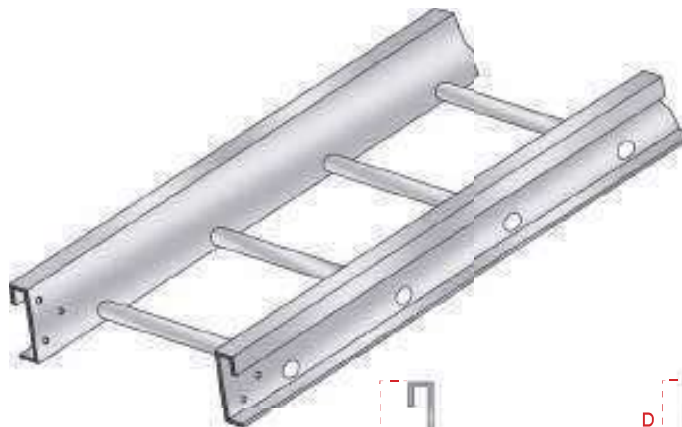
1 - HEAVY DUTY CABLE LADDER



TYPE (EA)



CUTAWAY
ELECTRICAL WAYS SWAGE



TYPE (EC)





TYPE (EB)



TYPE (ED)



ELECTRICAL WAY'S CABLE LADDER

RUNG SYSTEM



CH1 RUNG (41X41)



CH2 RUNG (41X21)



U, U RUNG (40x20) FLAIN



CC(40x20) SLOTED



TT (PIPE 25 mm)



HORIZONTAL ELBOW

WIDTH THK		90°			45°		
(MM)	(MM)	MG	HDG	ALUM	MG	HDG	ALUM
150	15	150-EA-9H-M	150-EA-9H-H	150-EA-9H- ALUM	150-EA-4H-M	150-EA-4H-H	150-EA-4H- ALUM
200	15	200-EA-9H-M	200-EA-9H-H	200-EA-9H- ALUM	200-EA-4H-M	200-EA-4H-H	200-EA-4H- ALUM
250	15	250-EA-9H-M	250-EA-9H-H	250-EA-9H- ALUM	250-EA-4H-M	250-EA-4H-H	250-EA-4H- ALUM
300	2	300-EA-9H-M	300-EA-9H-H	300-EA-9H- ALUM	300-EA-4H-M	300-EA-4H-H	300-EA-4H- ALUM
400	2	400-EA-9H-M	400-EA-9H-H	400-EA-9H- ALUM	400-EA-4H-M	400-EA-4H-H	400-EA-4H- ALUM
500	2	500-EA-9H-M	500-EA-9H-H	500-EA-9H- ALUM	500-EA-4H-M	500-EA-4H-H	500-EA-4H- ALUM
600	2	600-EA-9H-M	600-EA-9H-H	600-EA-9H- ALUM	600-EA-4H-M	600-EA-4H-H	600-EA-4H- ALUM
700	2	700-EA-9H-M	700-EA-9H-H	700-EA-9H- ALUM	700-EA-4H-M	700-EA-4H-H	700-EA-4H- ALUM



HORIZONTAL ELBOW

90 DEG. HORIZONTAL BEND

CAT NO. 9H



45 DEG. HORIZONTAL BEND

CAT NO. 4H



HORIZONTAL TEE

WIDTH THK		MG	HDG	ALUM
(MM)	(MM)			
150	1.5	150-EA-TL-M	150-EA- TL -H	150-EA- TL - ALUM
200	1.5	200-EA- TL -M	200-EA- TL -H	200-EA- TL - ALUM
250	1.5	250-EA- TL -M	250-EA- TL -H	250-EA- TL - ALUM
300	2	300-EA- TL -M	300-EA- TL -H	300-EA- TL - ALUM
400	2	400-EA- TL -M	400-EA- TL -H	400-EA- TL - ALUM
500	2	500-EA- TL -M	500-EA- TL -H	500-EA- TL - ALUM
600	2	600-EA- TL -M	600-EA- TL -H	600-EA- TL - ALUM
700	2	700-EA- TL -M	700-EA- TL -H	700-EA- TL - ALUM



HORIZONTAL TEE

CAT NO. TL

HORIZONTAL CROSS

WIDTH THK		MG	HDG	ALUM
(MM)	(MM)			
150	1.5	150-EA-CL-M	150-EA- CL -H	150-EA- CL - ALUM
200	1.5	200-EA- CL -M	200-EA- CL -H	200-EA- CL - ALUM
250	1.5	250-EA- CL -M	250-EA- CL -H	250-EA- CL - ALUM
300	2	300-EA- CL -M	300-EA- CL -H	300-EA- CL - ALUM
400	2	400-EA- CL -M	400-EA- CL -H	400-EA- CL - ALUM
500	2	500-EA- CL -M	500-EA- CL -H	500-EA- CL - ALUM
600	2	600-EA- CL -M	600-EA- CL -H	600-EA- CL - ALUM
700	2	700-EA- CL -M	700-EA- CL -H	700-EA- CL - ALUM



HORIZONTAL CROSS

CAT NO. CL

HORIZONTAL CROSS



LEFT HAND REDUCER

WIDTH THK				
(MM)	(MM)	MG	HDG	ALUM
150	15	150-EA-LL-M	150-EA-LL-H	150-EA-LL-ALUM
200	15	200-EA-LL-M	200-EA-LL-H	200-EA-LL-ALUM
250	15	250-EA-LL-M	250-EA-LL-H	250-EA-LL-ALUM
300	2	300-EA-LL-M	300-EA-LL-H	300-EA-LL-ALUM
400	2	400-EA-LL-M	400-EA-LL-H	400-EA-LL-ALUM
500	2	500-EA-LL-M	500-EA-LL-H	500-EA-LL-ALUM
600	2	600-EA-LL-M	600-EA-LL-H	600-EA-LL-ALUM
700	2	700-EA-LL-M	700-EA-LL-H	700-EA-LL-ALUM



LEFT HAND REDUCER
CAT NO. LL

RIGHT HAND REDUCER

WIDTH THK				
(MM)	(MM)	MG	HDG	ALUM
150	15	150-EA-RL-M	150-EA-RL-H	150-EA-RL-ALUM
200	15	200-EA-RL-M	200-EA-RL-H	200-EA-RL-ALUM
250	15	250-EA-RL-M	250-EA-RL-H	250-EA-RL-ALUM
300	2	300-EA-RL-M	300-EA-RL-H	300-EA-RL-ALUM
400	2	400-EA-RL-M	400-EA-RL-H	400-EA-RL-ALUM
500	2	500-EA-RL-M	500-EA-RL-H	500-EA-RL-ALUM
600	2	600-EA-RL-M	600-EA-RL-H	600-EA-RL-ALUM
700	2	700-EA-RL-M	700-EA-RL-H	700-EA-RL-ALUM



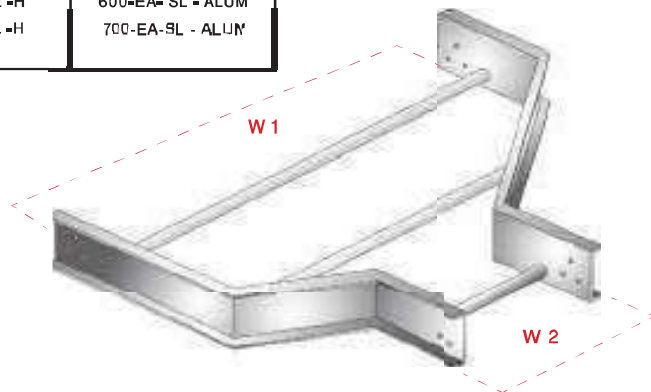
RIGHT HAND REDUCER
CAT NO. RL



STRAIGHT REDUCER

WIDTH THK		MG	HDG	ALUM
(MM)	(MM)			
150	15	150-EA-SL-M	150-EA- SL -H	150-EA- SL - ALUM
200	15	200-EA- SL -M	200-EA- SL -H	200-EA- SL - ALUM
250	15	250-EA- SL -M	250-EA- SL -H	250-EA- SL - ALUM
300	2	300-EA- SL -M	300-EA- SL -H	300-EA- SL - ALUM
400	2	400-EA- SL -M	400-EA- SL -H	400-EA- SL - ALUM
500	2	500-EA- SL -M	500-EA- SL -H	500-EA- SL - ALUM
600	2	600-EA- SL -M	600-EA- SL -H	600-EA- SL - ALUM
700	2	700-EA-SL -M	700-EA- SL -H	700-EA-SL - ALUM

STRAIGHT REDUCER
Cat.No. (SL)



Y- WYE BRANCH RIGHT

WIDTH THK		MG	HDG	ALUM
(MM)	(MM)			
150	15	150-EA-WR-M	150-EA- WR -H	150-EA- WR - ALUM
200	15	200-EA- WR -M	200-EA- WR -H	200-EA- WR - ALUM
250	15	250-EA- WR -M	250-EA- WR -H	250-EA- WR - ALUM
300	2	300-EA- WR -M	300-EA- WR -H	300-EA- WR - ALUM
400	2	400-EA- WR -M	400-EA- WR -H	400-EA- WR - ALUM
500	2	500-EA- WR -M	500-EA- WR -H	500-EA- WR - ALUM
600	2	600-EA- WR -M	600-EA- WR -H	600-EA- WR - ALUM
700	2	700-EA- WR -M	700-EA- WR -H	700-EA- WR - ALUM

Y- WYE BRANCH RIGHT
Cat.No. WR



Y- WYE BRANCH LEFT

WIDTH THK				
(MM)	(MM)	MG	HDG	ALUM
150	15	150-EA-WL-M	150-EA- WL -H	150-EA- WL - ALUM
200	15	200-EA- WL -M	200-EA- WL -H	200-EA- WL - ALUM
250	15	250-EA- WL -M	250-EA- WL -H	250-EA- WL - ALUM
300	2	300-EA- WL -M	300-EA- WL -H	300-EA- WL - ALUM
400	2	400-EA- WL -M	400-EA- WL -H	400-EA- WL - ALUM
500	2	500-EA- WL -M	500-EA- WL -H	500-EA- WL - ALUM
600	2	600-EA- WL -M	600-EA- WL -H	600-EA- WL - ALUM
700	2	700-EA- WL -M	700-EA- WL -H	700-EA- WL - ALUM

Y- WYE BRANCH LEFT
CAT NO. WL



VERTICAL OUTSIDE ELBOW (OUTSIDE RIZER)

WIDTH THK		90			45		
(MM)	(MM)	MG	HDG	ALUM	MG	HDG	ALUM
150	15	150-EA-9HO-M	150-EA-9HO-H	150-EA-9HO- ALUM	150-EA-4HO-M	150-EA-4HO-H	150-EA-4HO- ALUM
200	15	200-EA-9HO-M	200-EA-9HO-H	200-EA-9HO- ALUM	200-EA-4HO-M	200-EA-4HO-H	200-EA-4HO- ALUM
250	15	250-EA-9HO-M	250-EA-9HO-H	250-EA-9HO- ALUM	250-EA-4HO-M	250-EA-4HO-H	250-EA-4HO- ALUM
300	2	300-EA-9HO-M	300-EA-9HO-H	300-EA-9HO- ALUM	300-EA-4HO-M	300-EA-4HO-H	300-EA-4HO- ALUM
400	2	400-EA-9HO-M	400-EA-9HO-H	400-EA-9HO- ALUM	400-EA-4HO-M	400-EA-4HO-H	400-EA-4HO- ALUM
500	2	500-EA-9HO-M	500-EA-9HO-H	500-EA-9HO- ALUM	500-EA-4HO-M	500-EA-4HO-H	500-EA-4HO- ALUM
600	2	600-EA-9HO-M	600-EA-9HO-H	600-EA-9HO- ALUM	600-EA-4HO-M	600-EA-4HO-H	600-EA-4HO- ALUM
700	2	700-EA-9HO-M	700-EA-9HO-H	700-EA-9HO- ALUM	700-EA-4HO-M	700-EA-4HO-H	700-EA-4HO- ALUM

VERTICAL OUTSIDE RISER 90
CAT NO. 9 HO



VERTICAL INSIDE ELBOW (INSIDE RIZER)

WIDTH THK		90			45		
(MM)	(MM)	MG	HDG	ALUM	MG	HDG	ALUM
150	15	150-EA-9HI-M	150-EA-9HI-H	150-EA-9HI- ALUM	150-EA-4HI-M	150-EA-4HI-H	150-EA-4HI- ALUM
200	15	200-EA-9HI-M	200-EA-9HI-H	200-EA-9HI- ALUM	200-EA-4HI-M	200-EA-4HI-H	200-EA-4HI- ALUM
250	15	250-EA-9HI-M	250-EA-9HI-H	250-EA-9HI- ALUM	250-EA-4HI-M	250-EA-4HI-H	250-EA-4HI- ALUM
300	2	300-EA-9HI-M	300-EA-9HI-H	300-EA-9HI- ALUM	300-EA-4HI-M	300-EA-4HI-H	300-EA-4HI- ALUM
400	2	400-EA-9HI-M	400-EA-9HI-H	400-EA-9HI- ALUM	400-EA-4HI-M	400-EA-4HI-H	400-EA-4HI- ALUM
500	2	500-EA-9HI-M	500-EA-9HI-H	500-EA-9HI- ALUM	500-EA-4HI-M	500-EA-4HI-H	500-EA-4HI- ALUM
600	2	600-EA-9HI-M	600-EA-9HI-H	600-EA-9HI- ALUM	600-EA-4HI-M	600-EA-4HI-H	600-EA-4HI- ALUM
700	2	700-EA-9HI-M	700-EA-9HI-H	700-EA-9HI- ALUM	700-EA-4HI-M	700-EA-4HI-H	700-EA-4HI- ALUM

VERTICAL INSIDE RISER 90
CAT NO. 9 HI



VERTICAL TEE DOWN

WIDTH THK		MG	HDG	ALUM
(MM)	(MM)			
150	15	150-EA-CD-M	150-EA- CD -H	150-EA- CD - ALUM
200	15	200-EA- CD -M	200-EA- CD -H	200-EA- CD - ALUM
250	15	250-EA- CD -M	250-EA- CD -H	250-EA- CD - ALUM
300	2	300-EA- CD -M	300-EA- CD -H	300-EA- CD - ALUM
400	2	400-EA- CD -M	400-EA- CD -H	400-EA- CD - ALUM
500	2	500-EA- CD -M	500-EA- CD -H	500-EA- CD - ALUM
600	2	600-EA- CD -M	600-EA- CD -H	600-EA- CD - ALUM
700	2	700-EA- CD -M	700-EA- CD -H	700-EA- CD - ALUM

VERTICAL TEE DOWN
CAT NO. CD



VERTICAL TEE UP

WIDTH THK		MG	HDG	ALUM
(MM)	(MM)			
150	1.5	150-EA-CU-M	150-EA- CU -H	150-EA- CU - ALUM
200	1.5	200-EA- CU -M	200-EA- C U-H	200-EA- C U - ALUM
250	1.5	250-EA- C U -M	250-EA- C U -H	250-EA- C U - ALUM
300	2	300-EA- C U -M	300-EA- C U -H	300-EA- C U - ALUM
400	2	400-EA- C U -M	400-EA- C U -H	400-EA- C U - ALUM
500	2	500-EA- C U -M	500-EA- C U -H	500-EA- CU - ALUM
600	2	600-EA- C U -M	600-EA- C U -H	600-EA- CU - ALUM
700	2	700-EA- C U -M	700-EA- C U -H	700-EA- C U - ALUM



VERTICAL TEE UP
CAT NO. CU



ELECTRICAL WAYS CABLE LADDER

BASIC CATALOGUE NO

CATALOGUE	DESCRIPTION
L	STRAIGHT LENGTH
9H	HORIZONTAL ELBOW 90°
4H	HORIZONTAL ELBOW 45°
3H	HORIZONTAL ELBOW 30°
6H	HORIZONTAL ELBOW 60°
CL	HORIZONTAL CROSS
TL	HORIZONTAL TEE
LL	LEFT HAND REDUCER
RL	RIGHT HAND REDUCER
SL	STRAIGHT REDUCER
WL	Y- WYE BRANCH LEFT
WR	Y- WYE BRANCH RIGHT
CD	VERTICAL TEE DOWN
CU	VERTICAL TEE UP
9HO	VERTICAL OUTSIDE ELBOW 90° (OUTSIDE RIZER)
4HO	VERTICAL OUTSIDE ELBOW 45° (OUTSIDE RIZER)
3HO	VERTICAL OUTSIDE ELBOW 30° (OUTSIDE RIZER)
6HO	VERTICAL OUTSIDE ELBOW 60° (OUTSIDE RIZER)
9HI	VERTICAL OUTSIDE ELBOW 90° (INSIDE RIZER)
4HI	VERTICAL OUTSIDE ELBOW 45° (INSIDE RIZER)
3HI	VERTICAL OUTSIDE ELBOW 30° (INSIDE RIZER)
6HI	VERTICAL OUTSIDE ELBOW 60° (INSIDE RIZER)



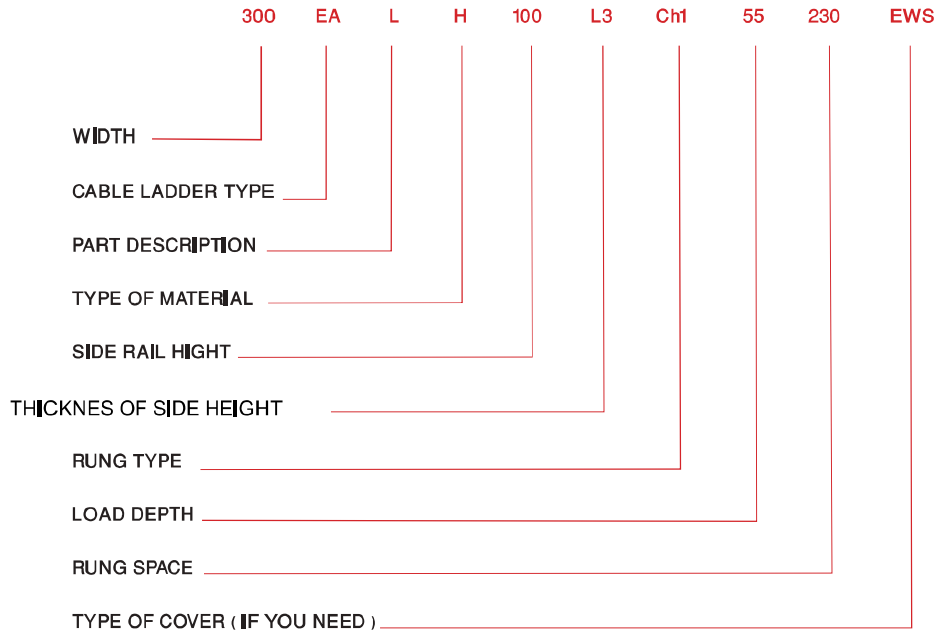
Electrical Ways Cable Ladder & Fitting Ordering Information (Standard Length 244 MTR)

Width mm	Cable Ladder Type	Part Description	Type Material End	Side Rail Height	Thickness of Side Height	Rung Type	Load Depth	Rung Space	Type of cover
100	E A	L-straight length	M	75	L2	CH1	55	230	EWS (Solid Cover)
150	E B	9 H -90 Horizontal BEND	Mill	100	(12mm)	CH2	80	250	
200	E C	4 H -45 Horizontal BEND	Galvanized	150	L3	UU	130	300	
250	ED	CL -Horizontal cross	H	200	(15mm)	CC	160	350	EMP Solid Cover W/ O-Flange
300		TL -horizontal TEE	Hot Dip		L4	TT	180		
400		LL -Left hand reducer	Galvanized		(2mm)				
500		RL -Right hand reducer	Sst		L5				
600		SL -Straight reducer	Stainless		(25mm)				EWS Ventilated Cover/Flange
700		WL -Y -Wye branch left	steel						
750		WR -Y -Wye branch right	Aluminum						
800		Cd - Vertical Tee down	Alum						
900		Cu -vertical Tee up							EWVP Vent Cover W/O Flange
1000		9 Ho -90 Vertical outside Riser							
1100		9 Hi -90 Vertical Inside Riser							



PART NO. SYSTEM

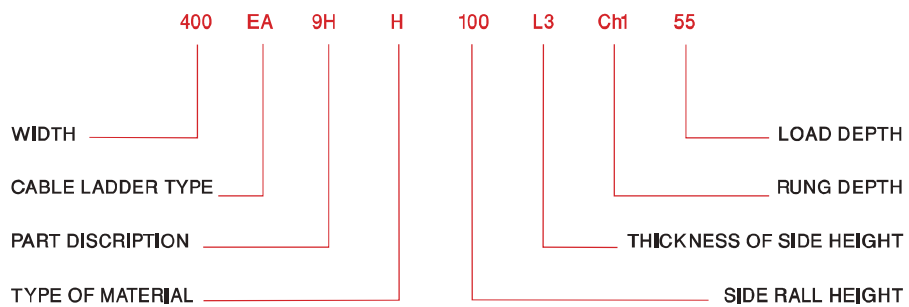
SATRLIGHT LENGHT



300 - EA - L - H - 100 - L3 - Ch1 - 55 - 200 - EWS

PART NO SYSTEM

FITTING SECTION



400 - EA - 90H - H - 100 - L3 - Ch1 - 55

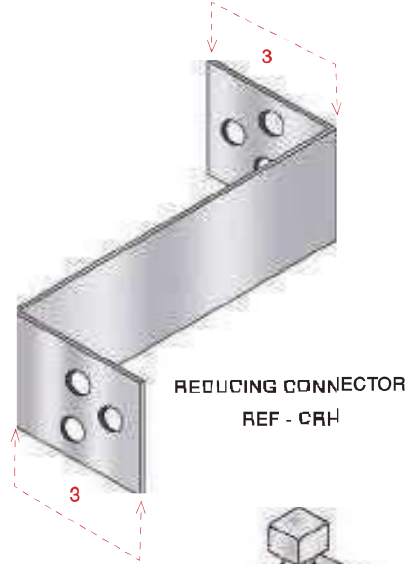
(90° HORIZONTAL ELBOW 400x100x15 H.D.G RUNG TYPE SLOTTED CHANEL 41x41)



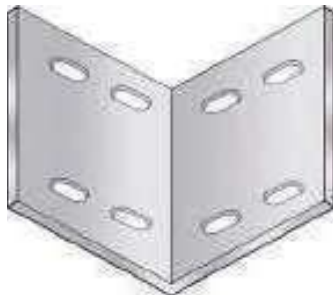
CABLE TRAY & LADDER ACCESSORIES



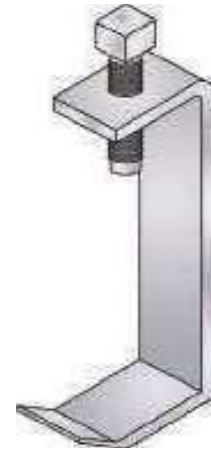
ADJUSTABLE VERTICAL CONNECTOR
REF - CVH



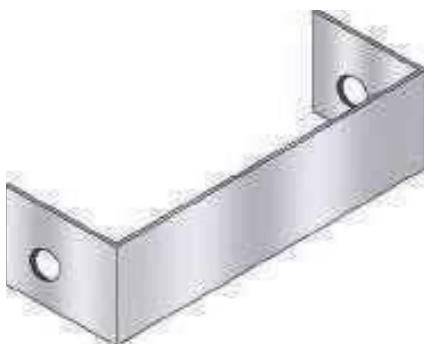
REDUCING CONNECTOR
REF - CRH



REF - CEA
90° ANGLE CONNECTOR



SIDE COVER CLAMP
REF - CSH

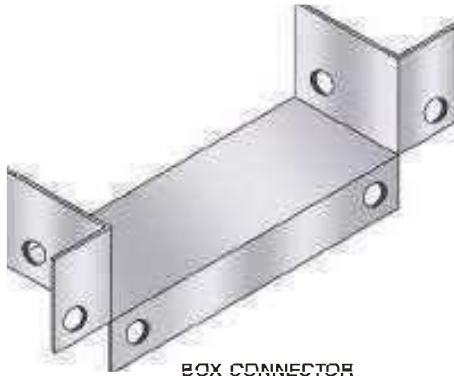


BLIND END
REF - EBH



BONDING JUMPER
PART NO. EW11





BOX CONNECTOR
CAT NO. CBH



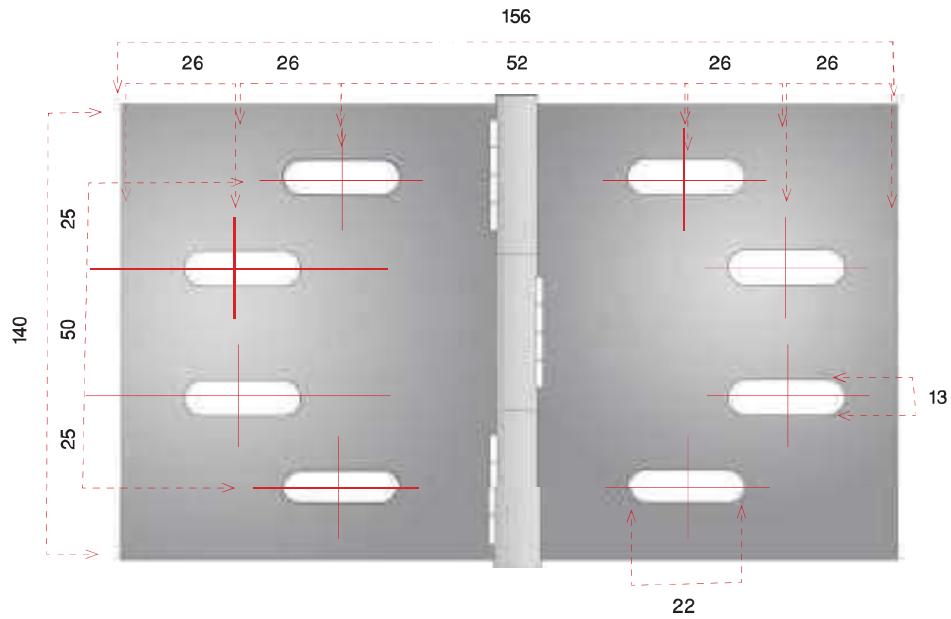
EXPANSION GUIDE
CAT NO. GEH



EXPANSION CONNECTOR
CAT NO. CAH

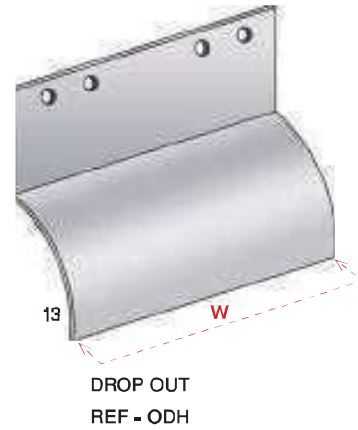
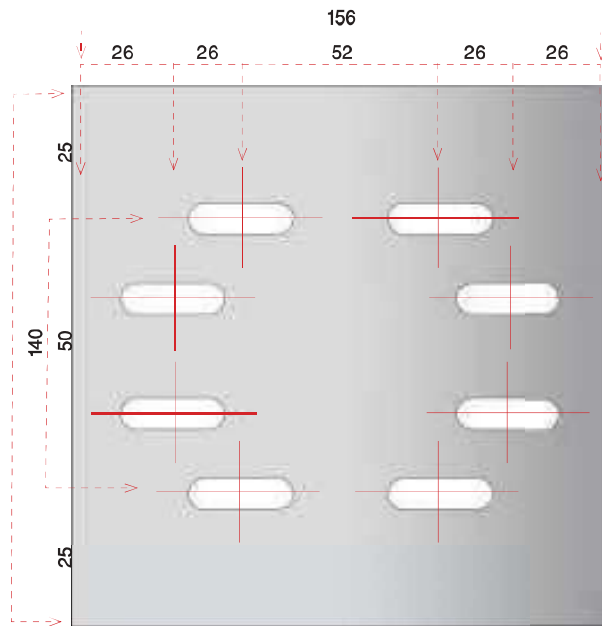


HOLD DOWN CLAMP
CAT NO. CDH



HORIZONTAL ADJUSTABLE CONNECTOR
CAT NO. CCA

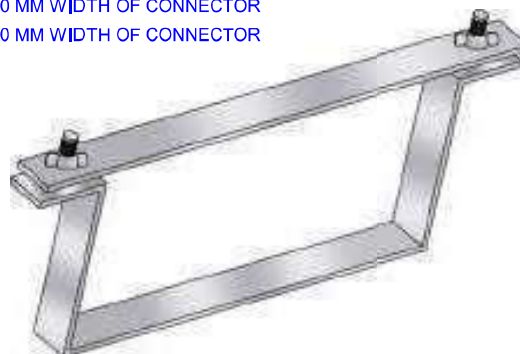




STANDARD CONNECTOR

CAT NO. CCH

FOR HEIGHT 150MM USE 156 LONG X140 MM WIDTH OF CONNECTOR
 FOR HEIGHT 100 MM USE 156 LONG X90 MM WIDTH OF CONNECTOR



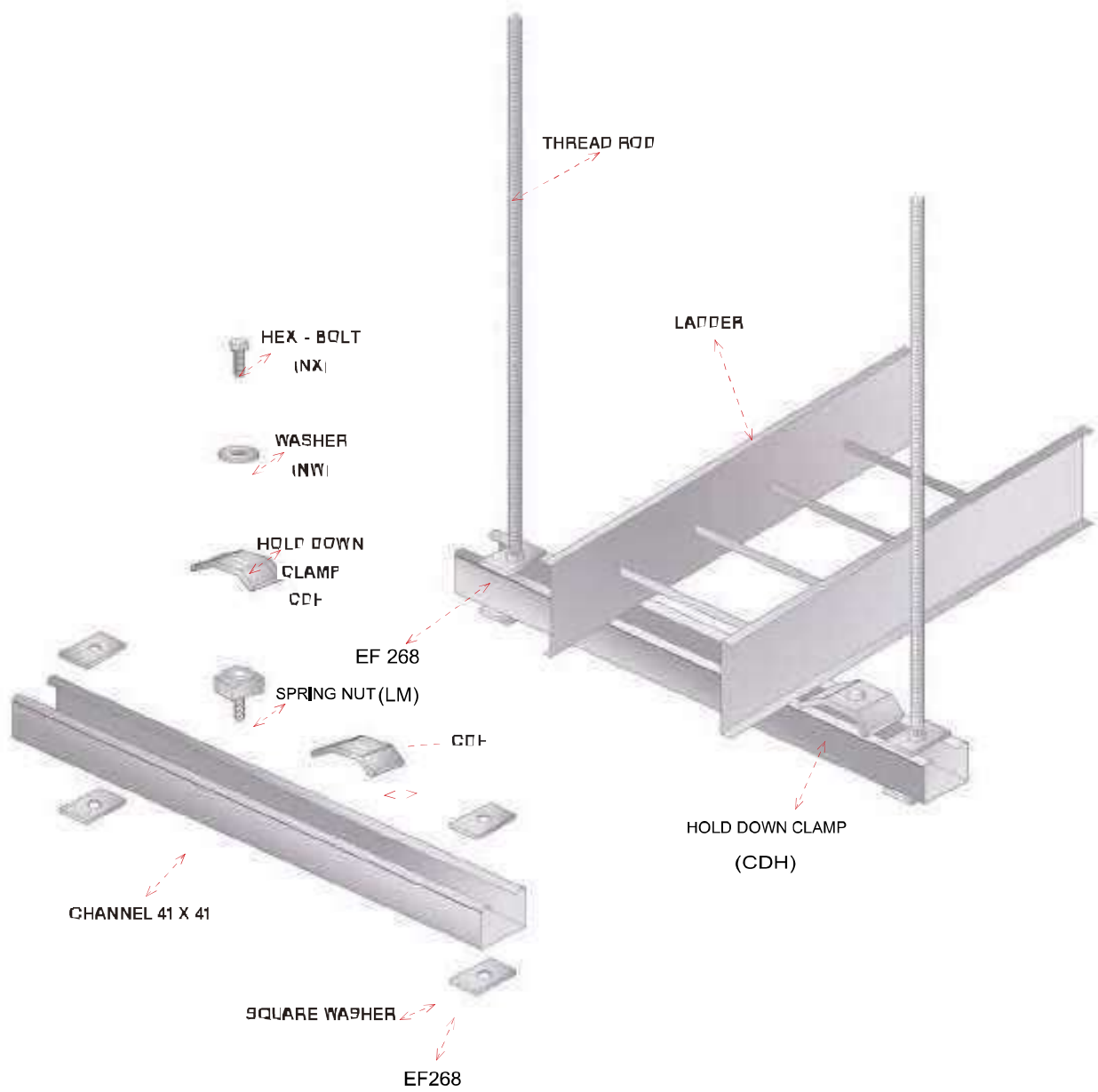
WRAP AROUND CONNECTOR

REF - CAH

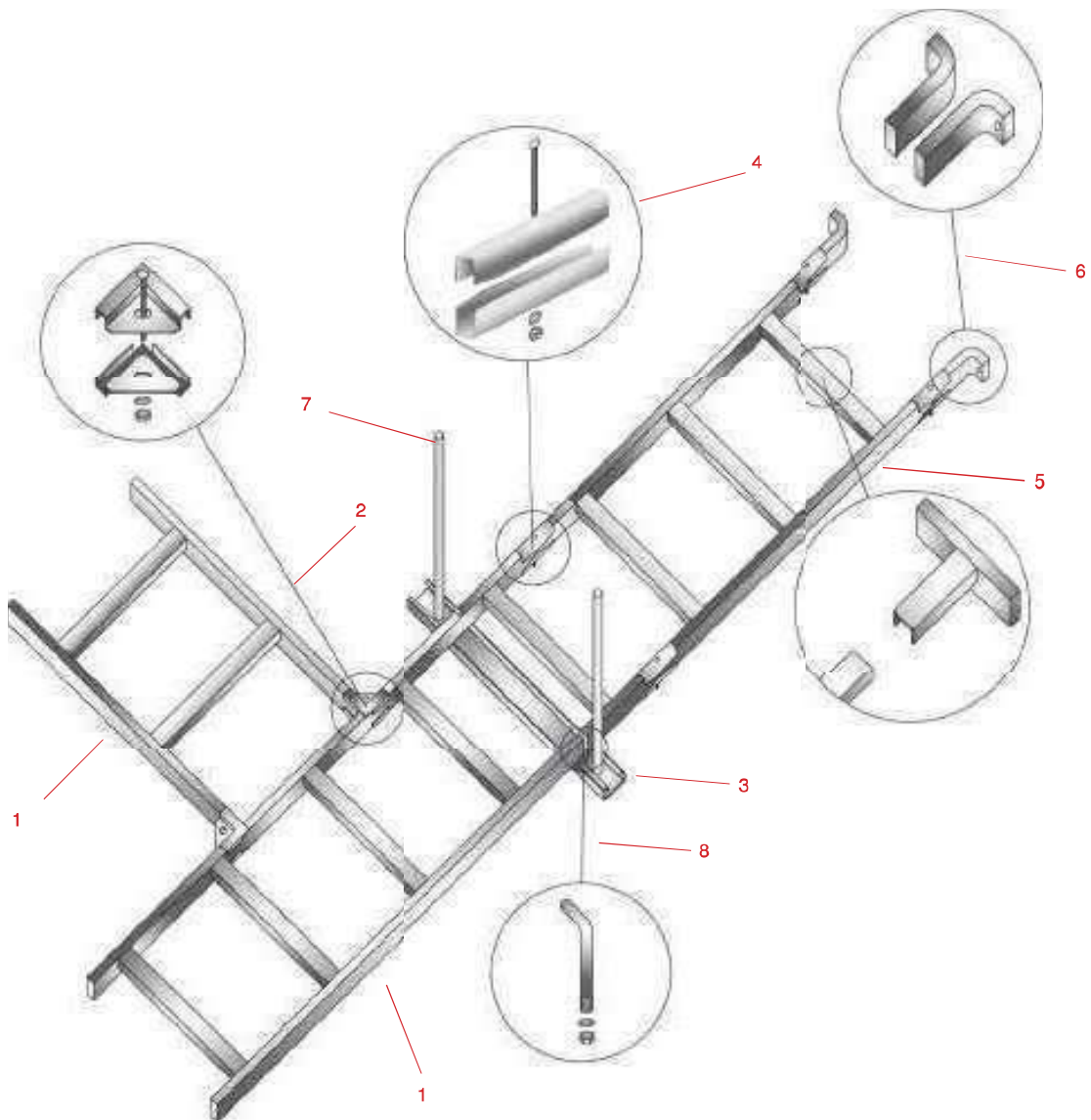


DOUBLE CLAMP CONNECTOR





SHELTER CABLE RACK



- 1- Cable / Rack
Hot Dip Galvanized
(40 x 10 mm) Flatbar
- 2- Corner Connector
- 3- 41 x 21 mm solid channel
- 4- Straight Connector

- 5- U - Rung type
- 6- Leg foot
- 7- Full Threded Rod
- 8- J- Bolt

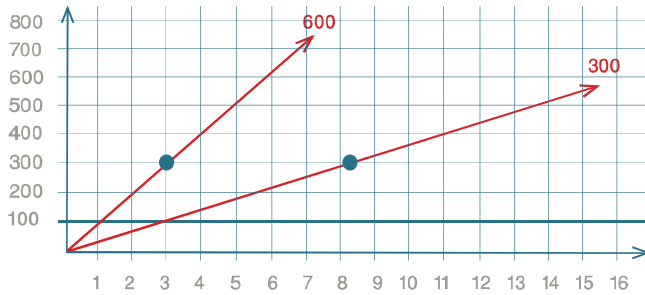
Also we can manufacture Cable Ladder Tube
type 40 x 10 mm



LOADING FOR CABLE LADDER

LIGHT DUTY CABLE LADDER

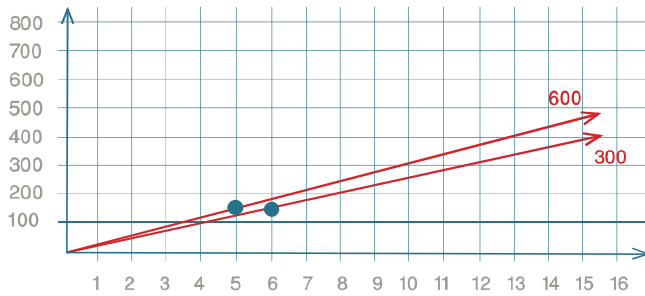
LOAD IN KG / MET



FLANGED DEFLECTION IN MM
SPAN 2 MTR
SIDE RAIL HEIGHT - 90 mm

LIGHT DUTY CABLE LADDER

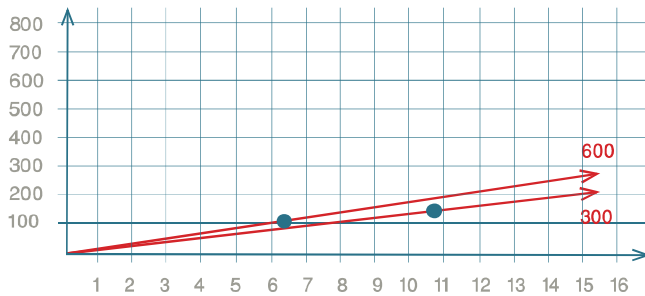
LOAD IN KG / MET



FLANGED DEFLECTION IN MM
SPAN 3 Mtr
SIDE RAIL HEIGHT - 90 mm

LIGHT DUTY CABLE LADDER

LOAD IN KG / MET



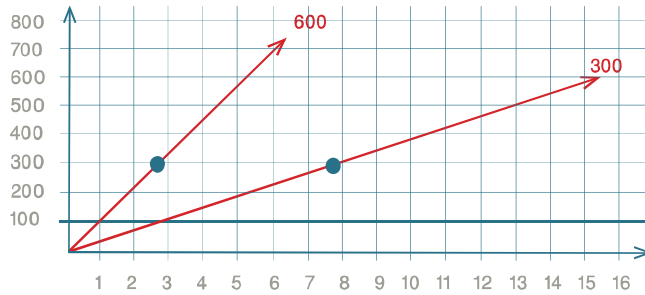
FLANGED DEFLECTION IN MM
SPAN 4 Mtr
SIDE RAIL HEIGHT - 90 mm



LOADING FOR CABLE LADDER

LIGHT DUTY CABLE LADDER

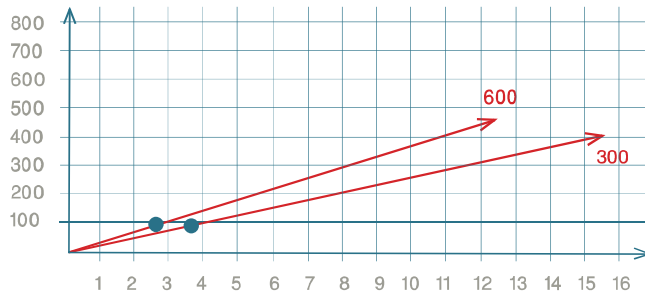
LOAD IN KG / MET



FLANGED DEFLECTION IN MM
SPAN 2 MTR
SIDE RAIL HEIGHT - 105 mm

LIGHT DUTY CABLE LADDER

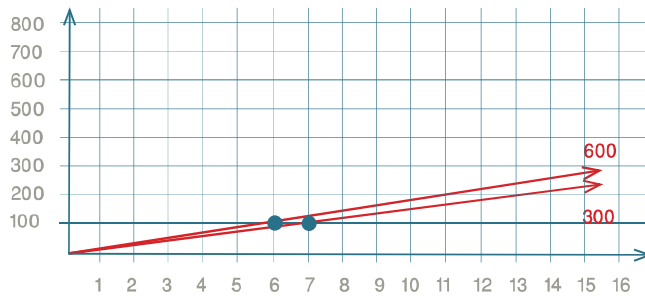
LOAD IN KG / MET



FLANGED DEFLECTION IN MM
SPAN 3 Mtr
SIDE RAIL HEIGHT - 105 mm

LIGHT DUTY CABLE LADDER

LOAD IN KG / MET



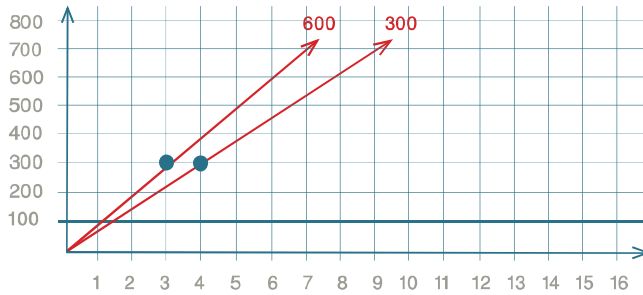
FLANGED DEFLECTION IN MM
SPAN 4 Mtr
SIDE RAIL HEIGHT - 105 mm



LOADING FOR CABLE LADDER

MEDIUM DUTY CABLE LADDER

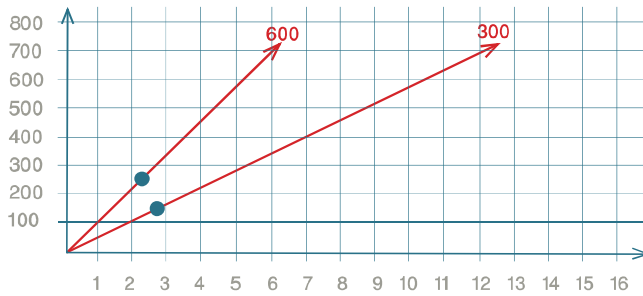
LOAD IN KG / MET



FLANGED DEFLECTION IN MM
SPAN 2 MTR
SIDE RAIL HEIGHT - 120 mm

MEDIUM DUTY CABLE LADDER

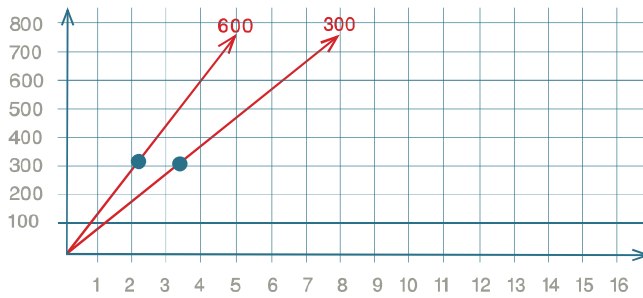
LOAD IN KG / MET



FLANGED DEFLECTION IN MM
SPAN 3 Mtr
SIDE RAIL HEIGHT - 120 mm

MEDIUM DUTY CABLE LADDER

LOAD IN KG / MET



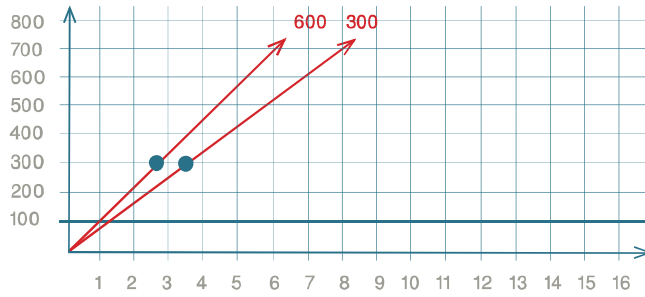
FLANGED DEFLECTION IN MM
SPAN 4 Mtr
SIDE RAIL HEIGHT - 120 mm



LOADING FOR CABLE LADDER

HEAVY DUTY CABLE LADDER

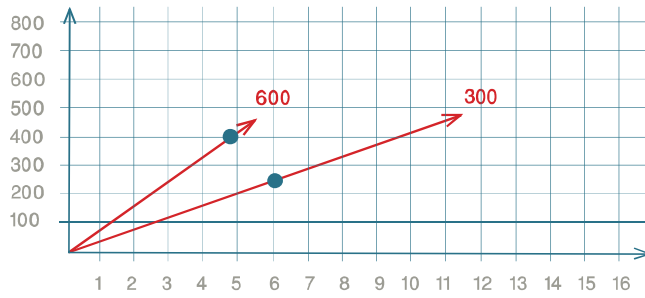
LOAD IN KG / MET



FLANGED DEFLECTION IN MM
SPAN 2 MTR
SIDE RAIL HEIGHT - 155 mm

HEAVY DUTY CABLE LADDER

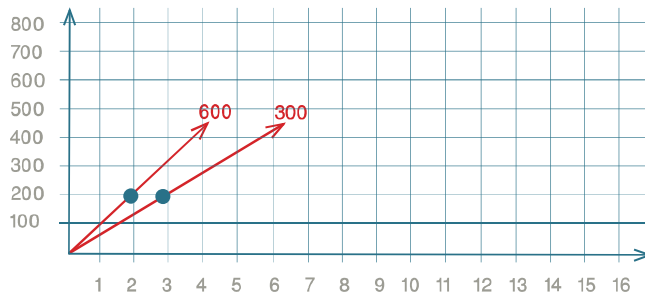
LOAD IN KG / MET



FLANGED DEFLECTION IN MM
SPAN 3 Mtr
SIDE RAIL HEIGHT - 155 mm

HEAVY DUTY CABLE LADDER

LOAD IN KG / MET



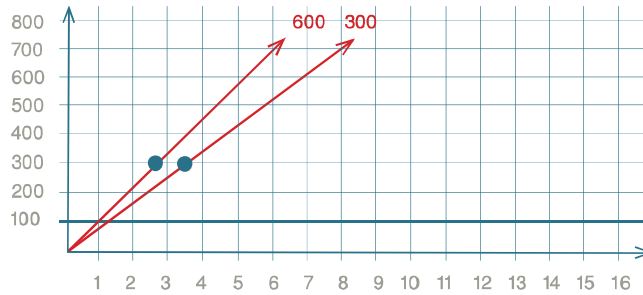
FLANGED DEFLECTION IN MM
SPAN 4 Mtr
SIDE RAIL HEIGHT - 155 mm



LOADING FOR CABLE LADDER

HEAVY DUTY CABLE LADDER

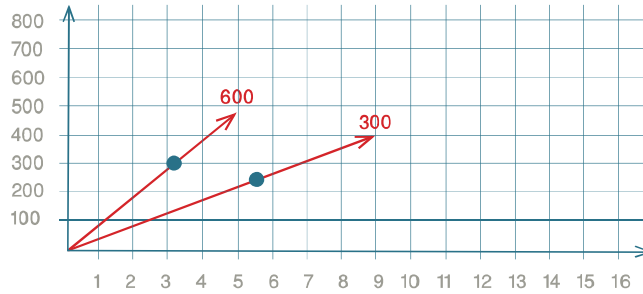
LOAD IN KG / MET



FLANGED DEFLECTION IN MM
SPAN 2 MTR
SIDE RAIL HEIGHT - 180 mm

HEAVY DUTY CABLE LADDER

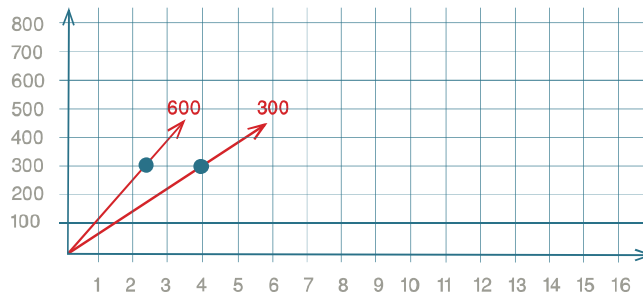
LOAD IN KG / MET



FLANGED DEFLECTION IN MM
SPAN 3 Mtr
SIDE RAIL HEIGHT - 180 mm

HEAVY DUTY CABLE LADDER

LOAD IN KG / MET

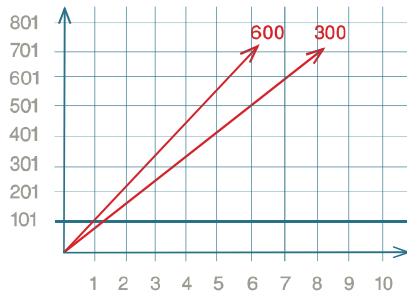


FLANGED DEFLECTION IN MM
SPAN 4 Mtr
SIDE RAIL HEIGHT - 180 mm



LOADING FOR CABLE LADDER

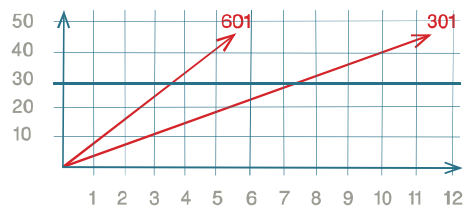
LOAD IN KG / MET



FLANGED DEFLECTION IN MM
SPAN 2.1 M+R
SIDE RAIL HEIGHT - 159 mm

HEAVY DUTY CABLE LADDER

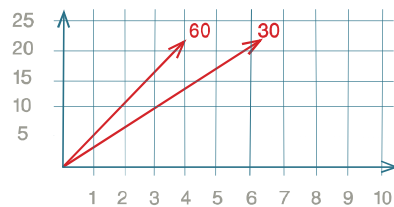
LOAD IN KG / MET



FLANGED DEFLECTION IN MM
SPAN 3.1 Mtr
SIDE RAIL HEIGHT - 150 mm

HEAVY OUT CABLE LADDER

LOAD IN KG / MET

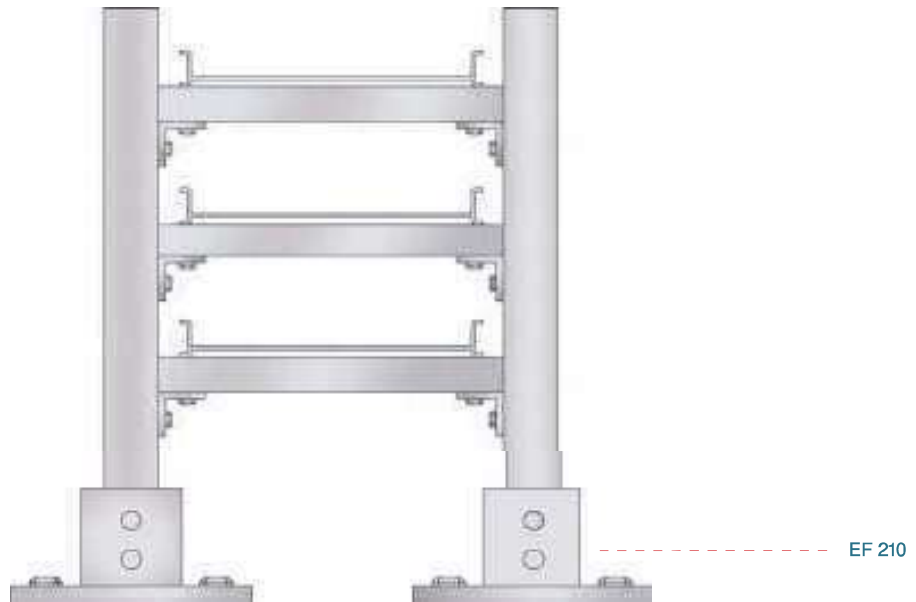


FLANGED DEFLECTION IN MM
SPAN 4.1 Mtr
SIDE RAIL HEIGHT - 150 mm



CABLE LADDER WALL MOUNTED SYSTEM

B - CABLE LADDER FLOOR MOUNTED SYSTEM



DOUBLE CHANNEL FLOOR MOUNTED SUPPORT

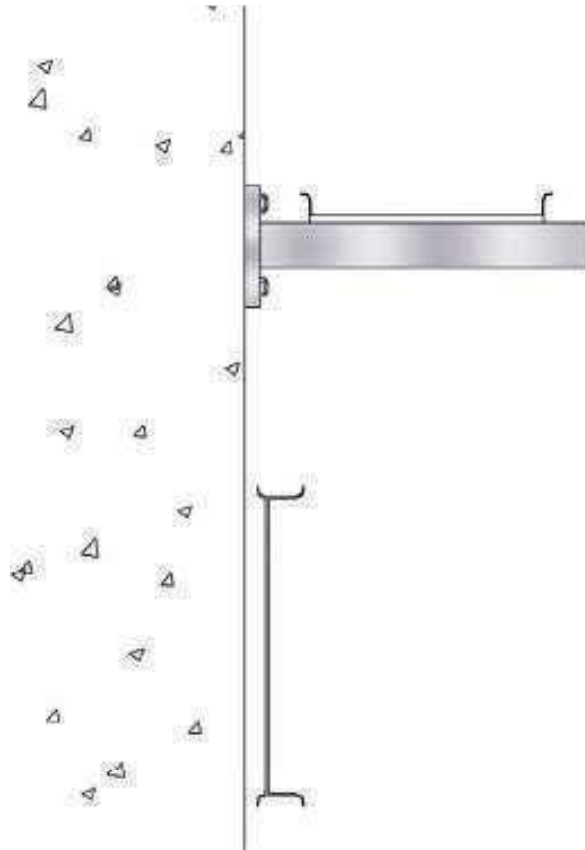


BACK TO BACK CHANNEL FLOOR MOUNTED SUPPORT

SINGLE CHANNEL FLOOR MOUNTED SUPPORT

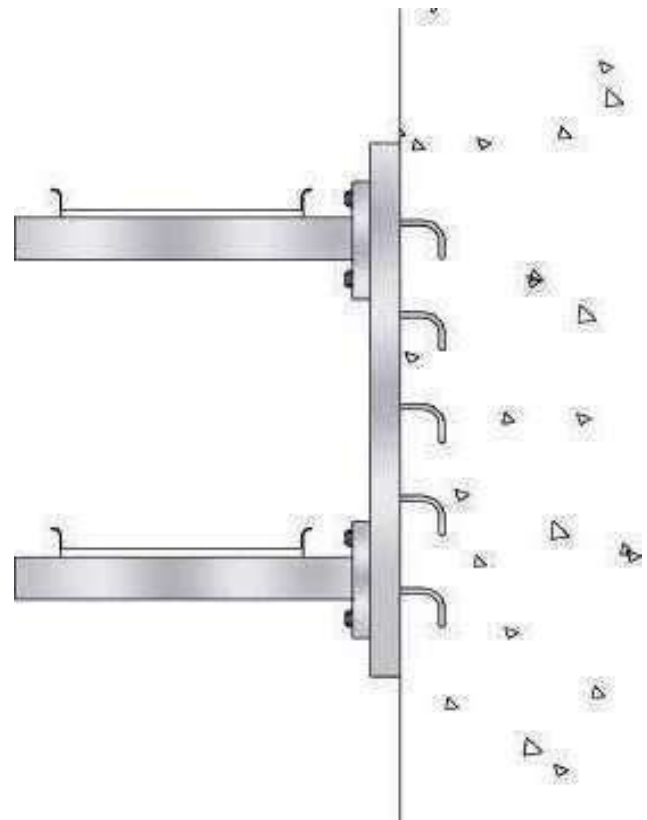


CABLE LADDER WALL MOUNTED SYSTEM



WALL MOUNTED SUPPORT ON CONCRETE
INSERT

HORIZONTAL & VERTICAL WALL MOUNTED
SUPPORT ON CONCRETE WALL

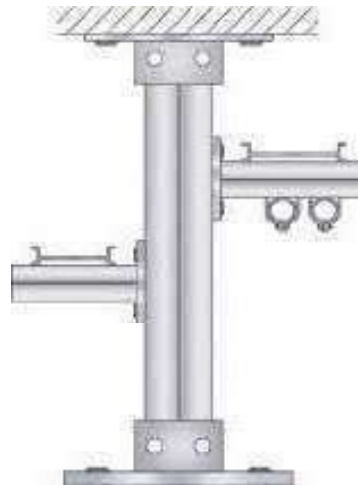


CABLE LADDER FLOOR TO CEILING MOUNTED SYSTEM



SINGLE CHANNEL FLOOR TO CEILING SUPPORT

BACK TO BACK CHANNEL FLOOR TO CEILING SUPPORT



DOUBLE CHANNEL FLOOR TO CEILING SUPPORT



CABLE LADDER SUPPORT SYSTEM

CABLE LADDER ARE INSTALLED ACCORDING TO THE SITE REQUIREMENTS.
H WE MENTION STANDARD INSTALLATION SYSTEM HERE.

CABLE LADDER CEILING MOUNTED SYSTEM



SINGLE CHANNEL CEILING SUPPORT
WITH GUSSET



DOUBLE CHANNEL CEILING SUPPORT
WITH GUSSET

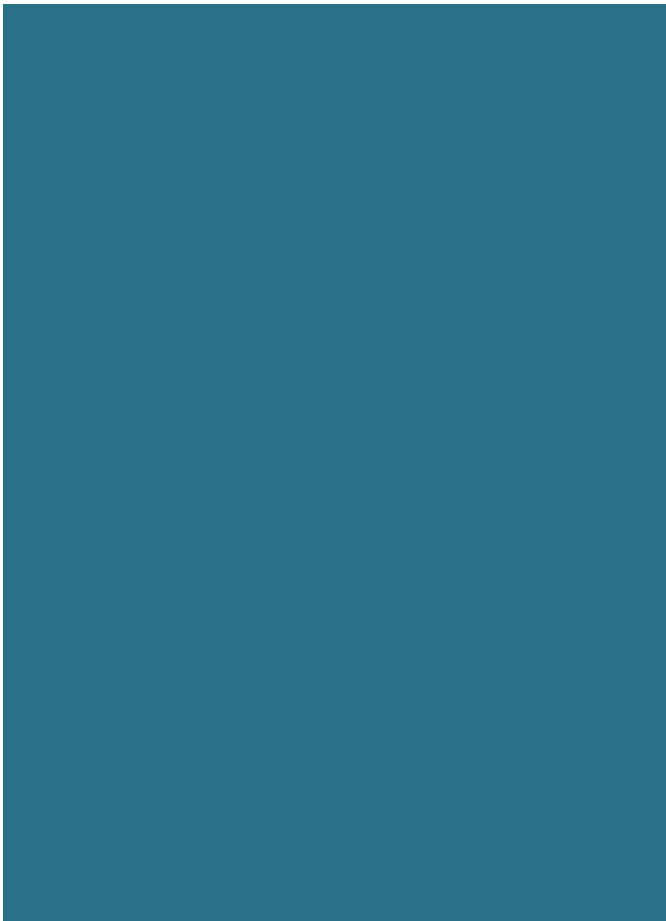


CEILING SUPPORT





TRUNKING



Listening Is Our Success





CABLE TRUNKING / WIREWAY

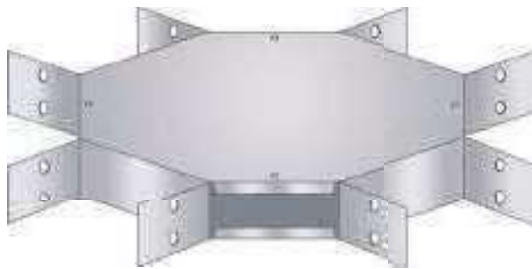
OVER FLOOR TRUNKING ACCESSORIES



SINGLE COMPARTMENT
REF - 1 TR



3 - EQUAL COMPARTMENT
REF - 3 TR



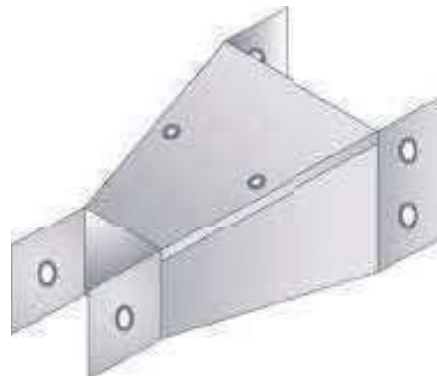
HORIZONTAL CROSS
REF - 1 TCR



3 COMPARTMENTS 90° BEND
COVER ON TOP
REF - 3 TGL



3 COMPARTMENTS TEE PIECES
COVER ON TOP
REF - 3 TTE



REF - 1 TRR REDUCER





VERTICAL OFFSET
REF 1 TVO



HORIZONTAL OFFSET
REF - 1 THO



PLATE CONNECTOR
REF - TFP



ANGLE CONNECTOR
REF - TCO









U-CONNECTOR
REF - UC



END CAP
REF - 1 EC





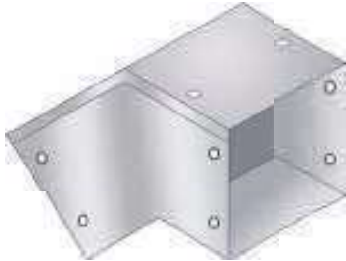



BENDS AND TEE'S

	Cover Top	Cover Inside	Cover On Outside
90° Bend	<p>REF - Te1</p> 	<p>REF - Te2</p> 	<p>REF - Te3</p> 
90° Gusset Bend	<p>REF - Tg1</p> 	<p>REF - Tg2</p> 	<p>REF - Tg3</p> 





NOTE: ALL TRUNKING COVERS ARE (LOCK TYPE)
SCREW TYPE ARE AV,

	Cover Top	Cover Inside	Cover On Outside
45Bend	REF - Te4 	REF - Te5 	REF - Te6 
Tee	REF - T11 	REF - T12 	REF - T13 



FLUSH FLOOR TRUNKING SERVICE OUTLET SYSTEM

FLUSH FLOOR TRUNKING OFFERS DESIGNER A FLEXIBLE SERVICE OUTLET SYSTEM INSTALLED IN A SCREEDED FLOOR. THE REMOVABLE TO LOAD BEARING IS DESIGNED TO LIE FLUSH WITH THE FLOOR SURFACE, WITHIN THE SCREED.

- A. THE TRUNKING IS OFFERED IN THREE REMOVABLE COMPARTMENT AS STANDARD. THE TRUNKING WIDTH IS 300MM AND HEIGHT 65 MM LENGTH 2440, HAVING FIVE LIDS 485 MM LONG
- B. BODIES AND PARTITIONS ARE MANUFACTURED FROM 1.5 GALVANIZED STEEL AND LIDS ARE MANUFACTURED FROM 3 MM GALVANIZED STEEL.

UNDER FLOOR TRUNKING IS DESIGNED FOR PLACING ON CONSTRUCTION CONCRETE SLAB, TO BE COMPLETELY COVERED WHEN THE FINAL FLOOR SCREED IS LAID.

- A. THE TRUNKING IS OFFERED IN 3 COMPARTMENTS AS STANDARD. EACH LENGTH IN 2440 mm,
- B. THE TRUNKING IS MANUFACTURED GALVANIZED STEEL OR HDG.

- 1- 90° FLAT BEND (REF: 9 TTR)
- 2- 230x25 mm 3 EQUAL COMPARTMENT (REF: 3 TTR)
- 3- RISER BEND (REF: OTTR)
- 4- CONNECTORS (REF: TTC)

All Ref of Material & Finish are Same of all type of cable
Tray + Cable Ladder
M/H/SST/ALum//Pco/Epoc/ & Material trunking.

Standard Size :

50 × 25 + 50 × 50
75 × 50 + 75 × 75
100 × 50 + 100 × 75 + 100 × 100
150 × 50 + 150 × 75 + 150 × 100 + 150 × 150
200 × 50 + 200 × 75 + 200 × 100 + 200 × 150 + 200 × 200
250 × 50 + 250 × 75 + 250 × 100 + 250 × 150 + 250 × 200 + 250 × 250

ALL SIZE ARE AVA.

1 - Single Compartment Standard Length 2440

Ref: 1-TR - Size of Trunking - L1 + M

1-TR - 75 × 75 × L1 - m

Cable Trunking Single Comp. X1mm×2440×Mill Galvanized.

2 - Double Compartment

Ref 2 - TR - Size of Trunking - L1 - M

2 - TR - 75 × 75 × L1 - M

3 - Tripu Compartment

Ref 3 - TR - Size of trunking - L2 - M

3 - TR 230 × 50 × L2 - M





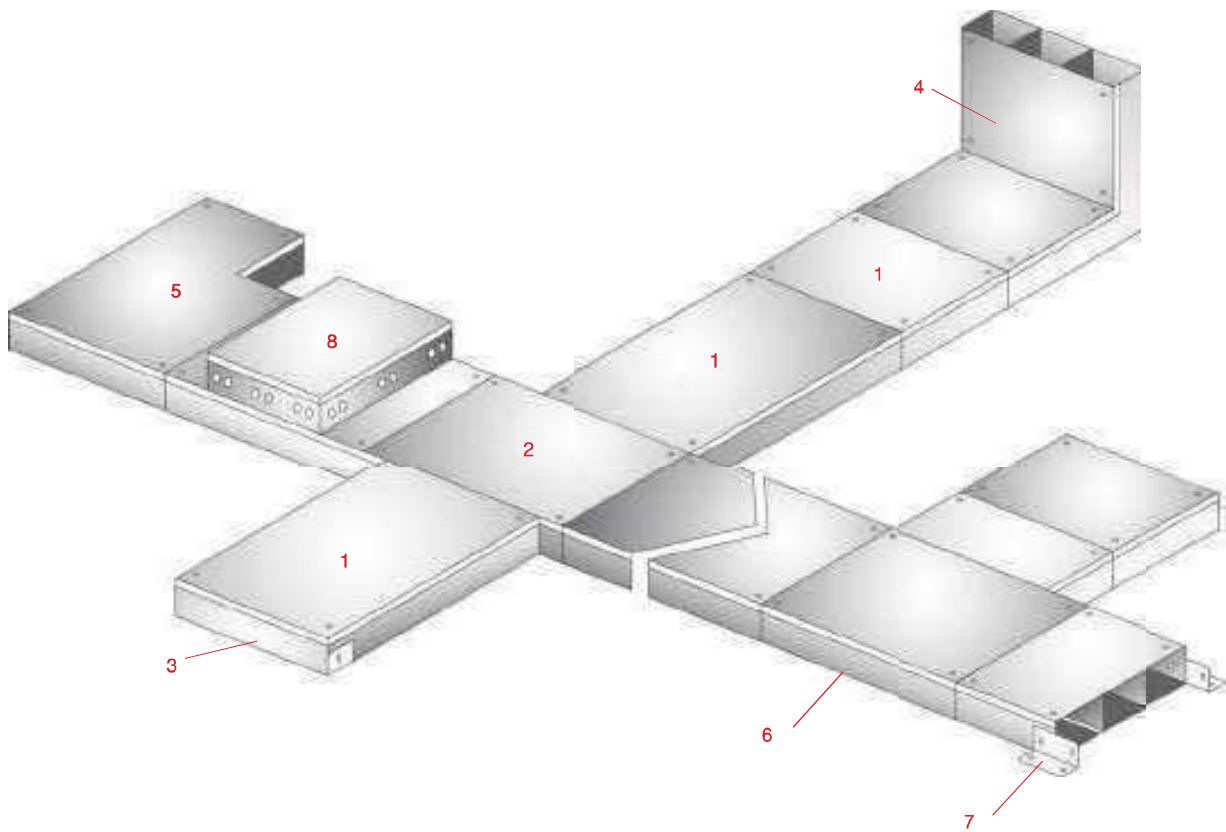
Listening Is Our Success



UNDER FLOOR IN-CAVITY TRUNKING FLUSH FLOOR

Listening Is Our Success

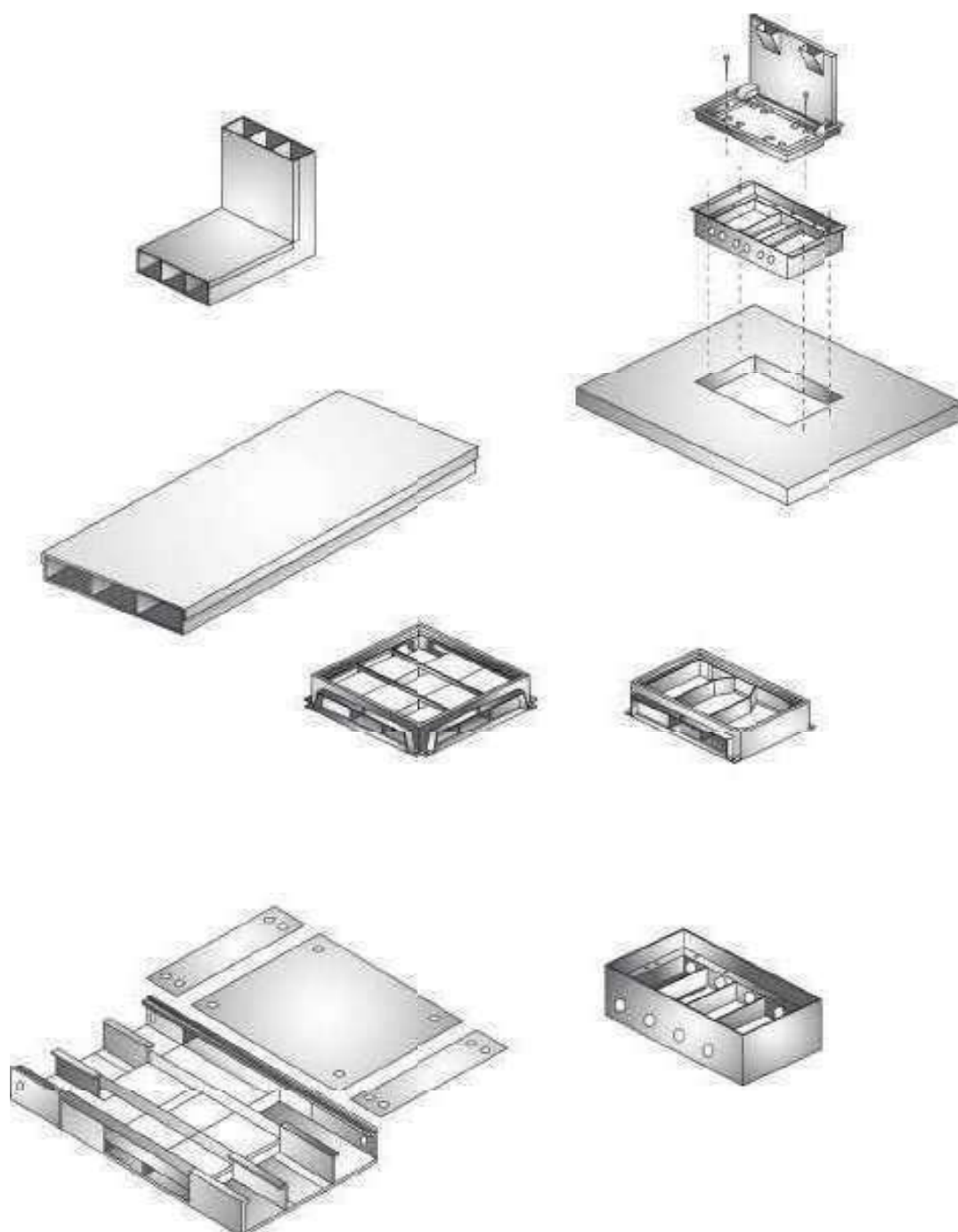
IN-CAVITY TRUNKING



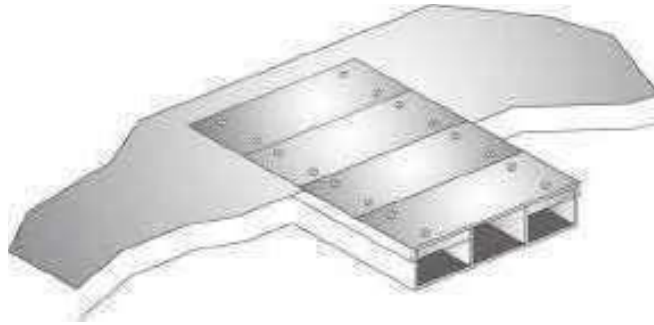
- | | |
|----------------------|----------------------|
| 1 METAL TRUNKING | 5 90° ANGLE |
| 2 4-WAY JUNCTION BOX | 6 3-WAY JUNCTION BOX |
| 3 STOP END | 7 CONNECTOR |
| 4 90° RISER BEND | 8 TAP-OFF UNIT |



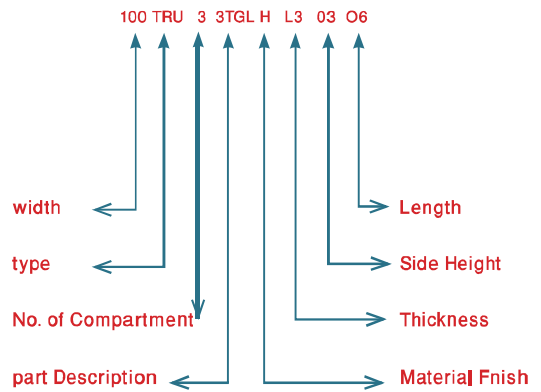
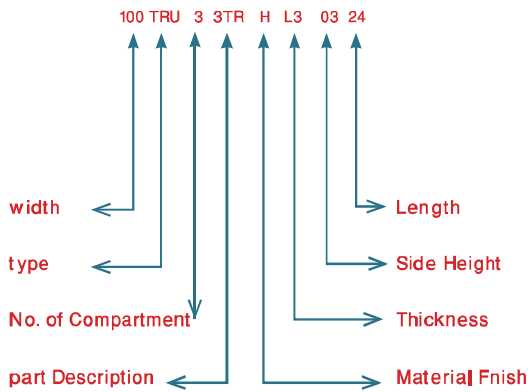
UNDER FLOOR TRUNKING
FLUSH FLOOR TRUNKING
INCAVITY FLOOR TRUNKING



TRUNKING ORDERING CHART



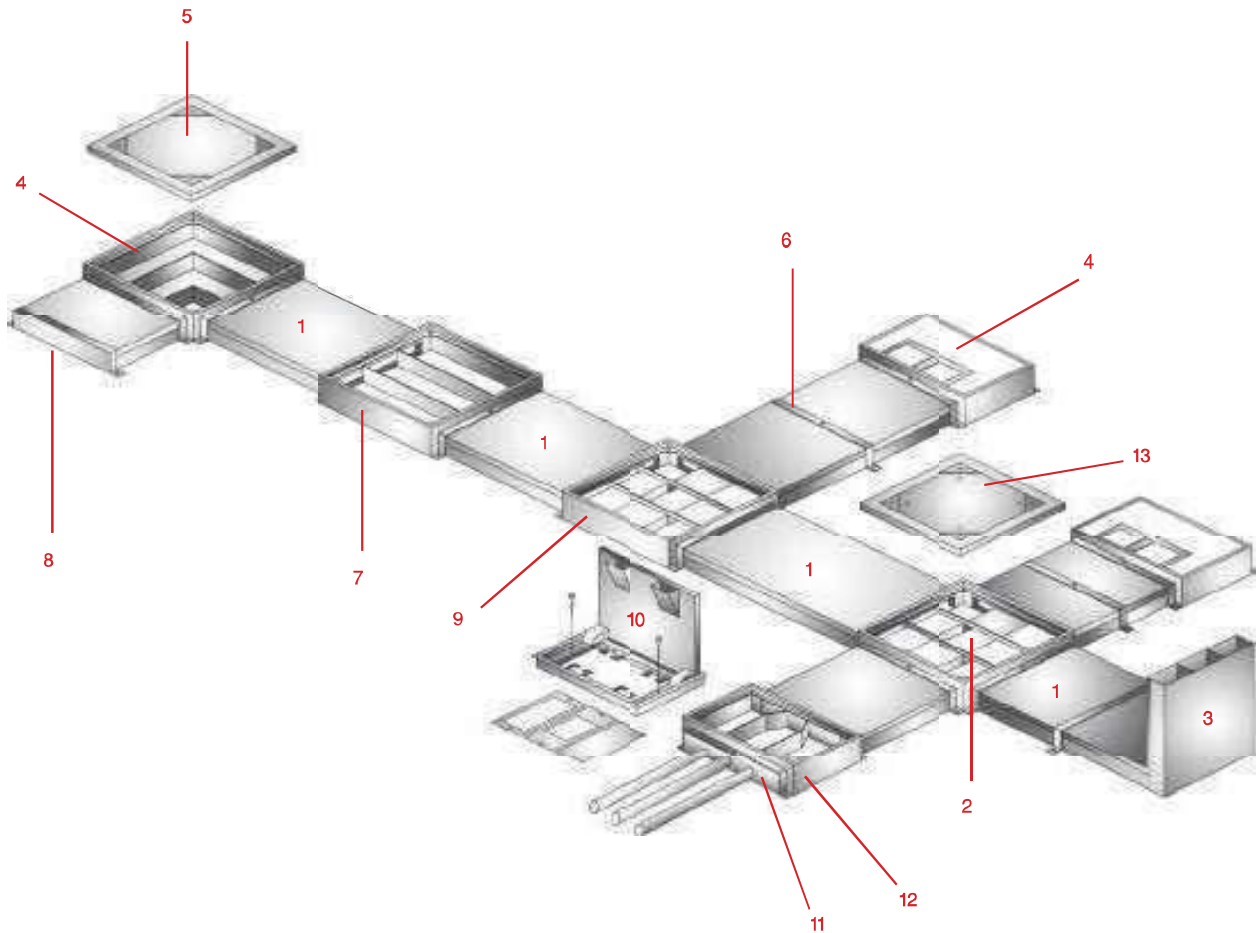
3- COMPARTMENT



Width	Thickness	Side Height	Part Description	Type	Length
100	L1 : 1.0 Mm.	03:30 Mm	3- TR / straight length	TRU	06:600mm
150	L2 :1.2 Mm .	04:38 Mm	3- TGL / 90 Deg. Bend	Under Floor Trunking	12:1220mm
200	L3: 1.5mm.	05:50 Mm	3- TGL4 / 45 Deg. Bend		24:2440mm
225	L4:2.0 Mm.	06:65 Mm	3- TGL5/ 90 Deg. Gusset Bend	TRI	30:3000mm
300	L5: 2.5 Mm	07 :75 Mm	3- TTE / Horizontal Tee Piece	Incavity Floor Trunking	
400	L6 :3.0 Mm	10:100 Mm	3- TTEG / Gusset Tee piece	TRF	
			3- TCR / Horizontal Cross	Flush Floor Trunking	
			3- TRR / Reducer		
			3- TVO / Vertical Offset		
			3- THO / Horizontal Offset	TR	
			3- TCO / Angle Connector	Over Floor Trunking	
			3- TFP / Fish Plant Connector		
			3-UC / U-Connector		
			EC / End Cap		
			3- TT3 / 3 way Junction		
			4- TT3 / 4 way Junction		
				Material Finish	
				M Mill Galvanized	
				H Hot Dip Galvanized	



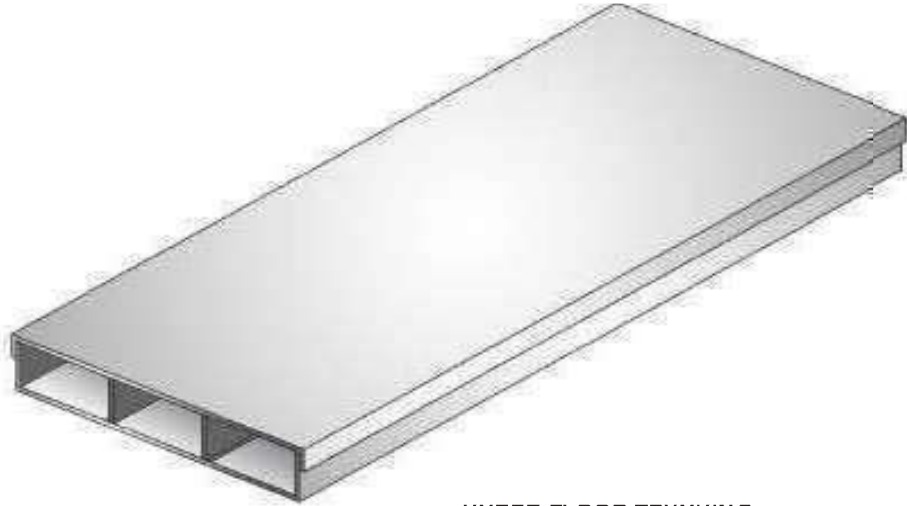
UNDER FLOOR TRUNKING



NO	CODE	PRODUCT	NO	CODE	PRODUCT
1	3 - TR	METAL TRUNKING	8	3- EC	Stop end
2	3- TCR	4- WAY JUNCTION BOX	9	3- tt	3- way junction box
3	3- TE3	90° RISER BEND	10	3- bo	Hinged lid assembly
4	3 - JB	90° ANGLE JUNCTION BOX	11	3- cp	Conduit connector
5	3- CO	JUNCTION BOX COVER	12	3- box	Service outlet box
6	3- CLT	JOINT / FIX CONNECTOR	13	3- sb	Service outlet box w / cover
7	3-2 W	2 - WAY JUNCTION BOX			



UNDER FLOOR TRUNKING



UNDER FLOOR TRUNKING



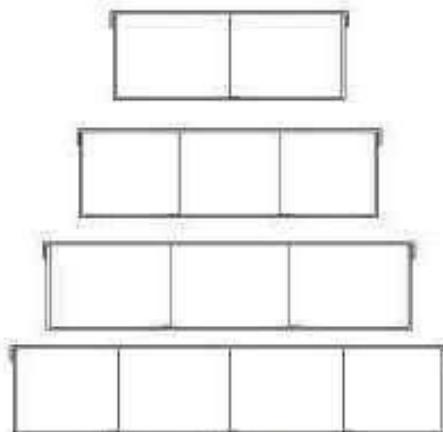
JC INT / FIX CONNECTOR
JF



STOP END
FN



CONDUIT CONNECTOR
CC

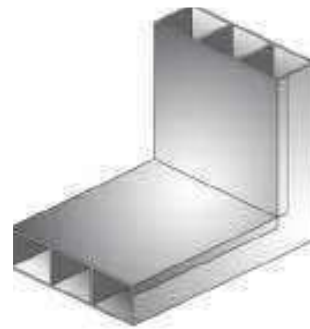
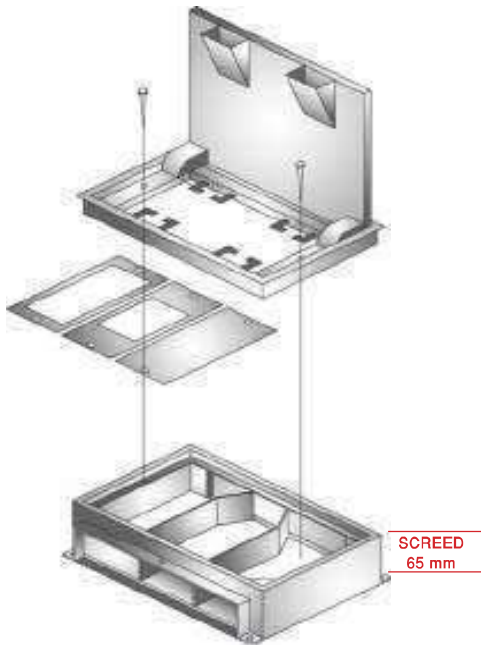


SECTION

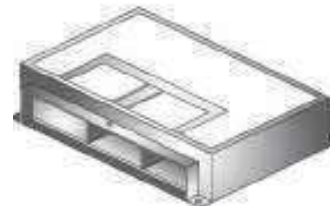


UNDER FLOOR TRUNKING

HINGED LID ASSEMBLY
CAT - NO - 3 BO



90° RISER BEND
CAT - NO - 3TE3



SERVICE OUTLET BOX
CAT - NO - 3 -BOX

SERVICE OUTLET BOX
WITH COVER
CAT - NO - 3 -SB



90° ANGLE JUNCTION BOX
CAT - NO - 3 - JR



3 WAY JUNCTION BOX
CAT - NO - 3 - TT



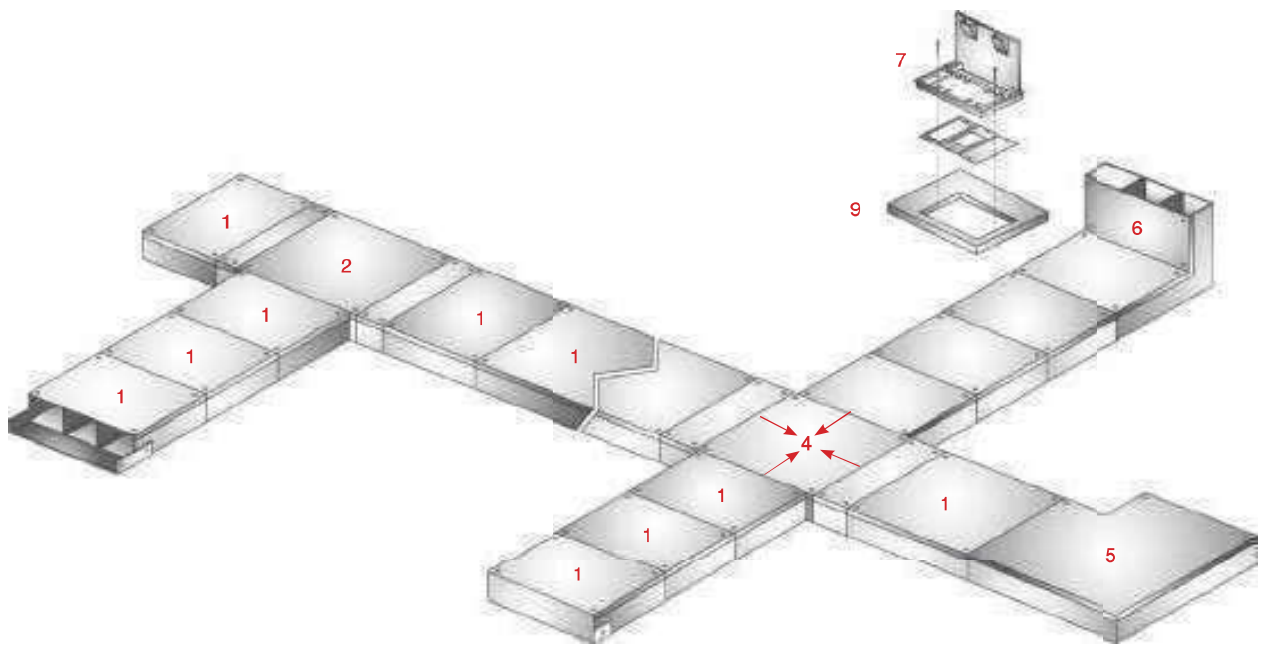
2 WAY JUNCTION BOX
CAT - NO - 3 - 2W



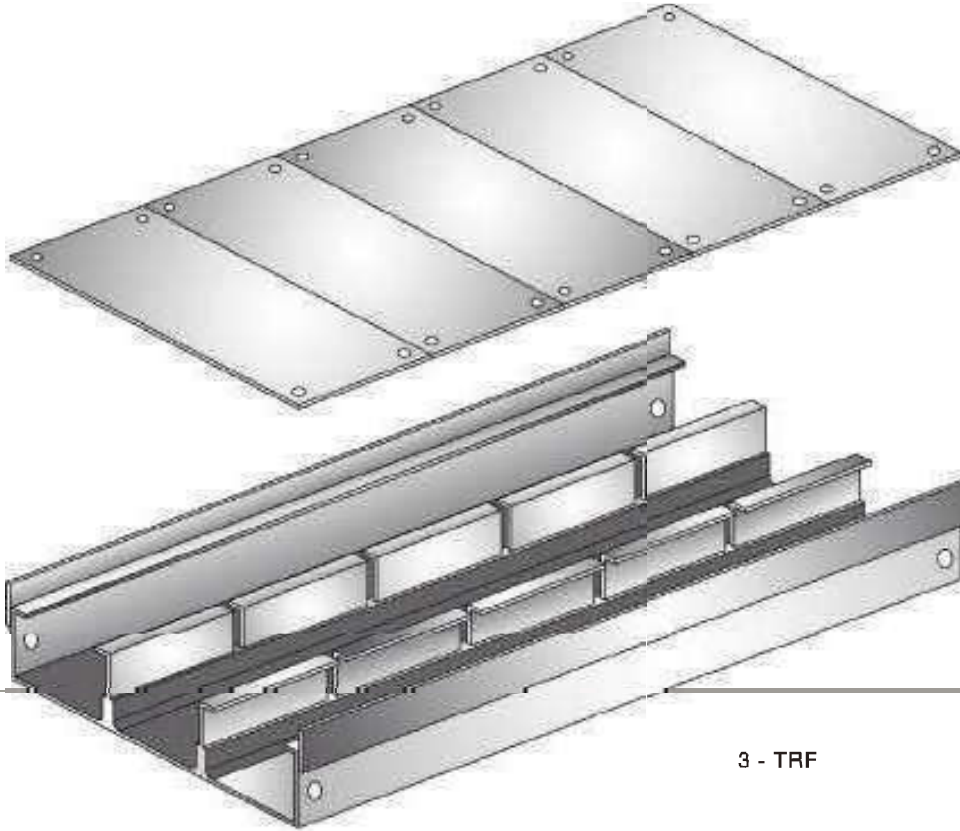
4 WAY JUNCTION BOX
CAT - NO - 3 - TCR



FLUSH FLOOR TRUNKING

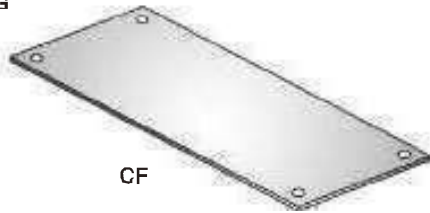


FLUSH FLOOR TRUNKING

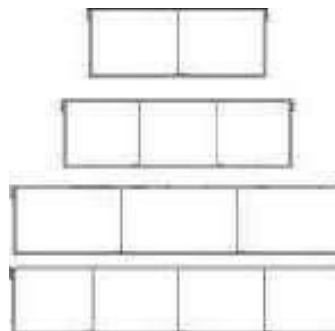


3 - TRF

COVER FIXING



CF

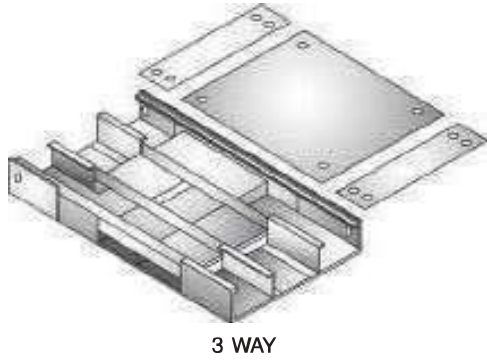


COVER FIXING



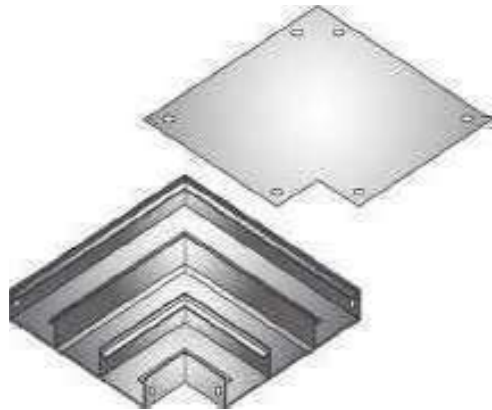
FLUSH FLOOR TRUNKING

3 - TTEG - F

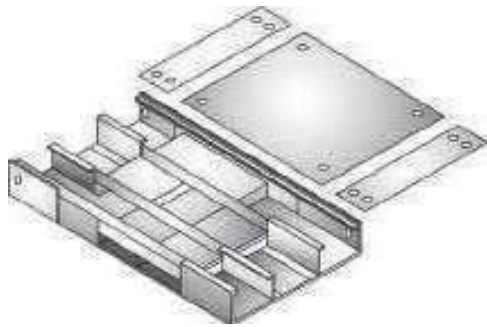


3 WAY

3 - TGLF

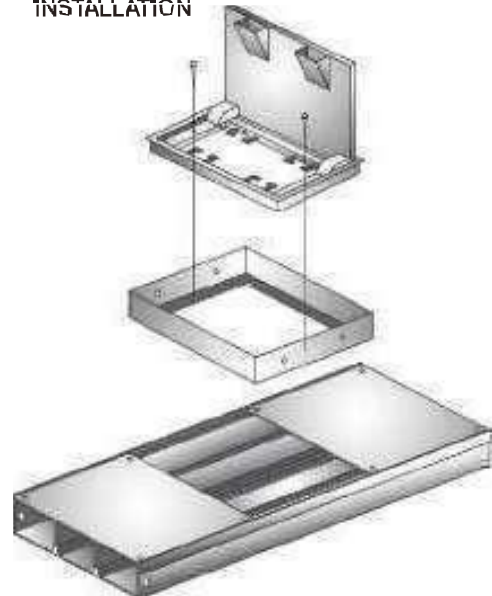


3 - TCRE

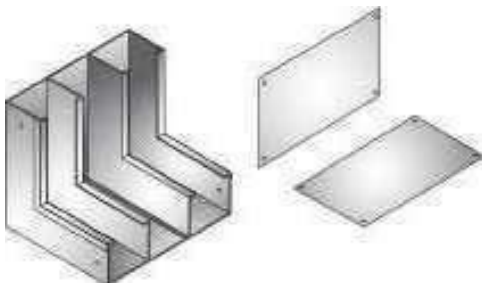


4 WAY

SERVICE OUTLET
INSTALLATION



RISER BEND

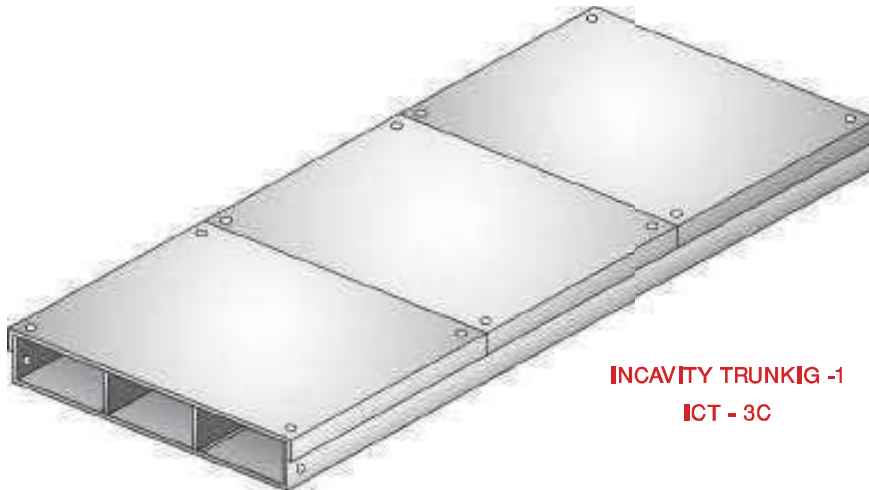


3 - TGL



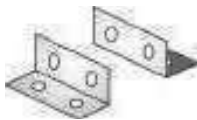
IN CAVITY FLOOR TRUNKING

Our trunking system is designed to provide a solution for laying cables in most types of floor voids. The system is light weight, quick assembly and sits on the subfloor in void under the raised access floor. Our systems ensure maximum flexibility and convenience for the end user



INCAVITY TRUNKING -1
ICT - 3C

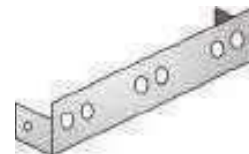
JOINT / FIX CONNECTOR
TCO



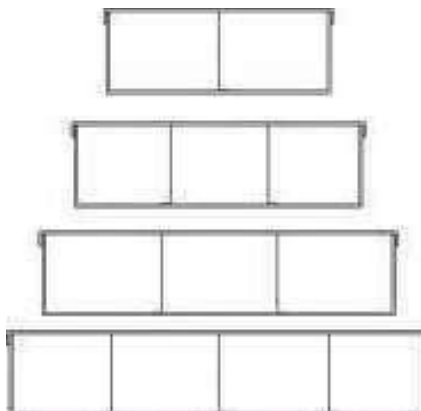
STOP END
C

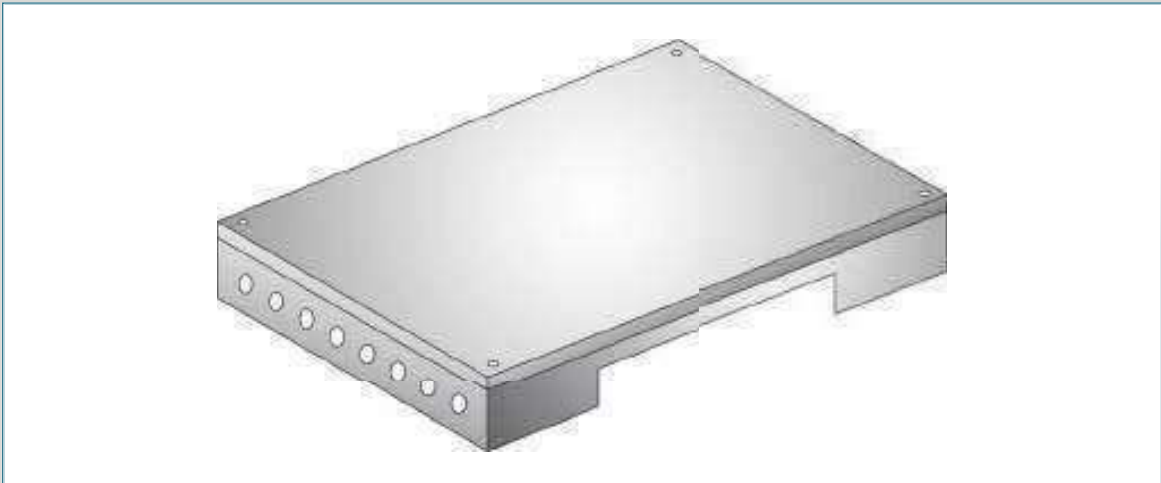
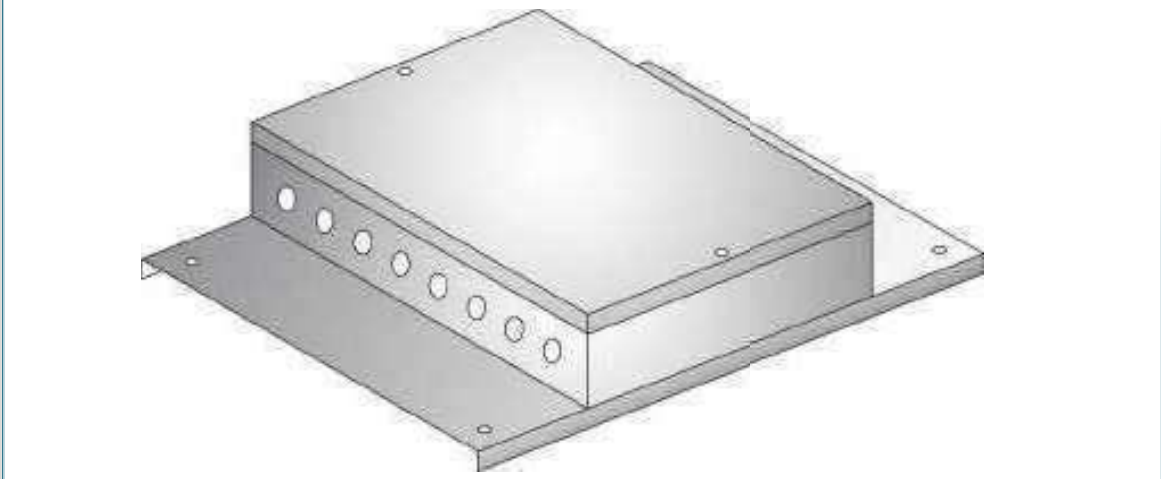
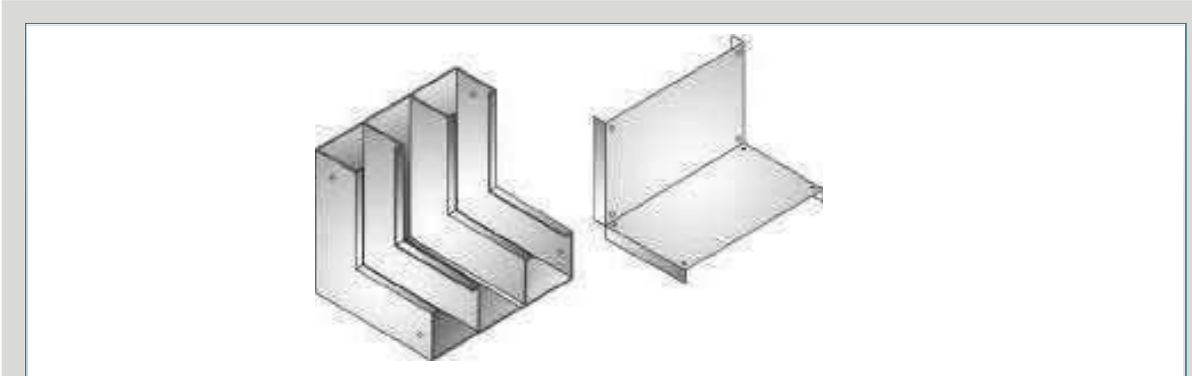


CONDUIT CONNECTOR
CC



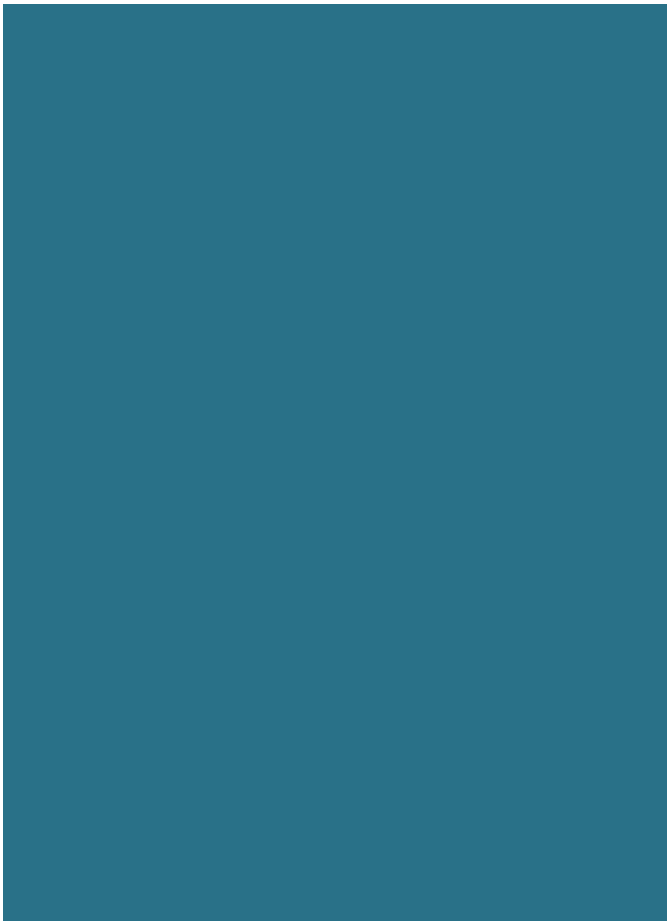
SECTION







CHANNEL



Listening Is Our Success

LISTENING IS OUR SUCCESS

LISTENING IS OUR SUCCESS

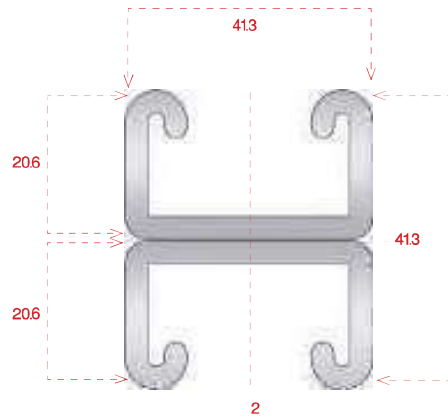
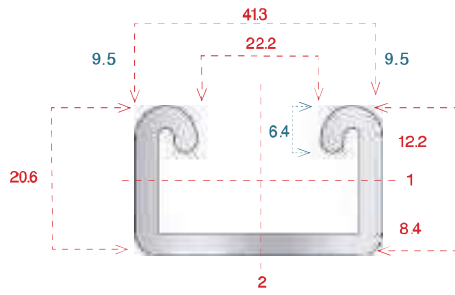
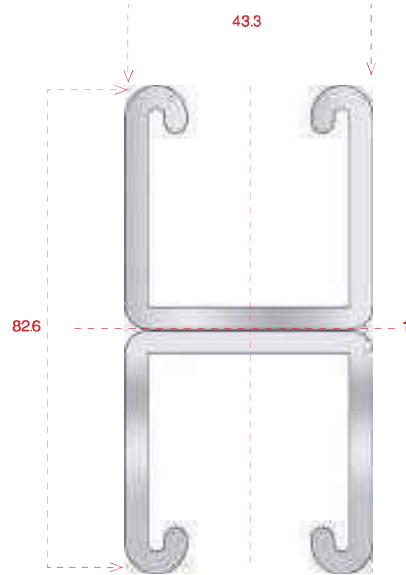
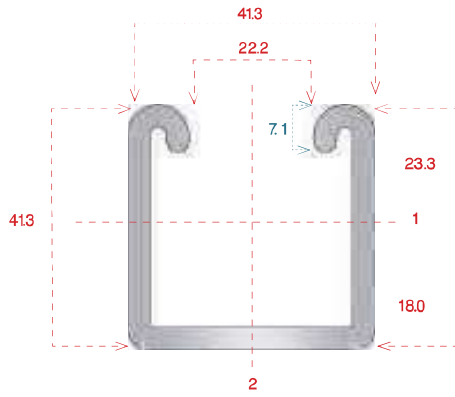
LISTENING IS OUR SUCCESS



CHANNELS



CHANNELS



CHANNELS

ALL CHANNELS AV. 2.5mm & 2mm & 1.5 mm.

STANDARD LENGTH 3 METER

WE CAN MANUFACTURING 3 METER UP TO 6 METER

STANDARD LENGTH 3 METER.

PART NO.	41 x 41 x 2mm	41 x 41 x 2.5mm	BACK TO BACK 41 x 82 x 2mm	BACK TO BACK 41 x 82 x 2.5mm
HOT DIP GALVANISED	CM1 - 41 H	CM2 - 41 H	CM1 - 82 H	CM2 - 82H
MILL GALVANISED	CM1 - 41 M	CM2 - 41 M	CM1 - 82 M	CM2 - 82 M
STAINLESS STEEL	CM1 - 41 SS	CM2 - 41 SS	CM1 - 82 SS	CM2 - 82 SS

STANDARD LENGTH 3 METER.

PART NO.	41 x 21 x 2mm	41 x 21 x 2.5mm	BACK TO BACK 41X82X2MM	BACK TO BACK 41X82X2,5MM
HOT DIP GALVANISED	CM1 - 21 H	CM2 - 21 H	CM1 - 42 H	CM2 - 42 H
MILL GALVANISED	CM1 - 21 M	CM2 - 21 M	CM1 - 42 M	CM2 - 42 M
STAINLESS STEEL	CM1 - 21 SS	CM2 - 21 SS	CM1 - 42 SS	CM1 - 42 SS

PART NO OF SLOTTED CHANNEL JUST ADD - S

EX - CM1 - 41 HS - SLOTTED CHANNEL 41x41x2mmx3 METER HOT DIP GALVANIZED

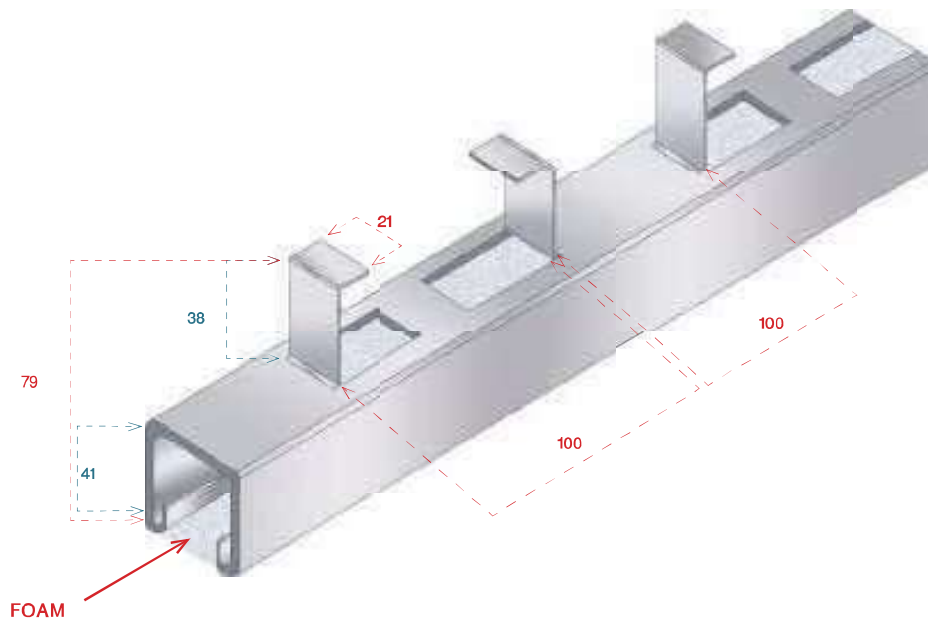
CM2 - 21 HS - SLOTTED CHANNEL 41x21x2.5x3 METER HOT DIP GALVANIZED



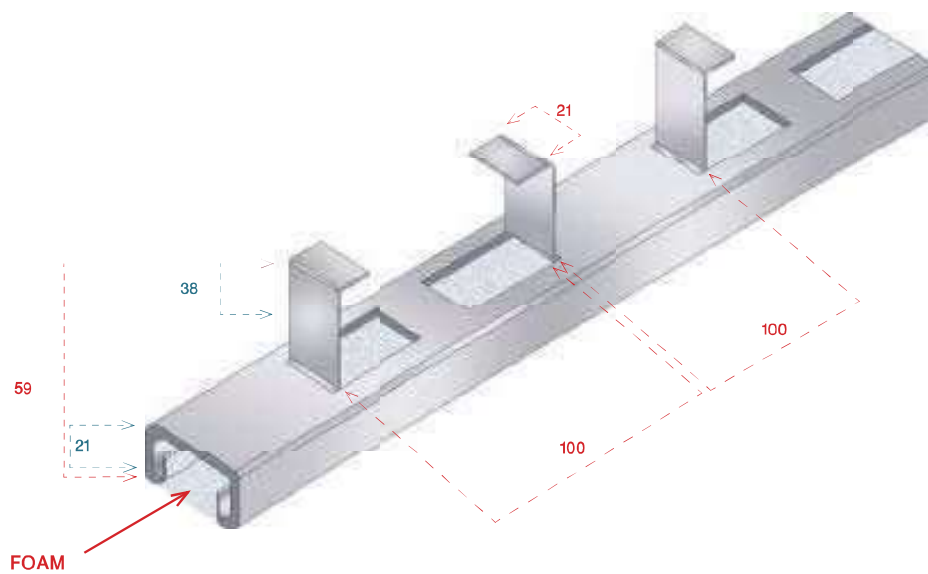
CONCRETE INSERTS MANUFACTURED HOT-DIP GALVANIZED CHANNELS

41x41 channel

CAT. NO - CC 41 X 41 X 3 Mtr. (or As your Req.)



41x41 channel (part no CC41x41x3Mtr) (or As your Req.)



41 x 21 Channel Part No. CC 41 x 21 x 3 Mtr or as your Req
PART NUMBER FOR 3 METERS LENGTH ONLY



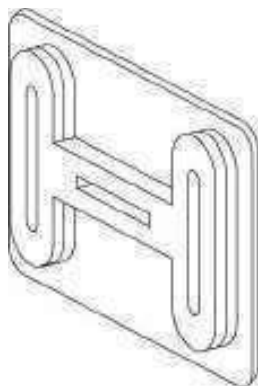
CHANNELS

CHANNELS ARE MANUFACTURED BY COLD ROLLED TO
 BS 2989 ZINC COATING TYPE G275 - DINEN 10147 - ASTM A527
 HOT DIP GALVANIZED TO ASTM A123 DIN 50976
 BACK TO BACK CHANNELS ARE MANUFACTURED BY SPOT
 WELDING TO OTHER, AT 175MM CENTERS ALL WELDS
 ARE SUITABLY PROTECTED
 THE STANDARD FINISH FOR CHANNELS IS PRE-GALV
 MILD STEEL BSEN 10147 - HOT DIP GALVANIZED AFTER
 MANUFACTURED TO BS 729 -
 ALL WEIGHTS ARE FOR STANDARD MILL GALVANIZED FINISH
 GAUGE 14 =2 mm. GAUGE 12=2.5 mm.

STAINLESS STEEL CHANNELS ARE ROLLED USING MATERIAL FORMED FROM BS EN 10088 - 2 (GRADE 304 OR 316)
 ALL CHANNELS FROM 15 mm. TO 25 mm.

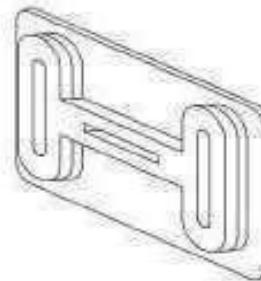
PART NO	WEIGHT TK 2 MM KG/M	WEIGHT TK 2.5 MM KG/M
CM1-41 41x41 PLAIN	2.09 KG/M	2.61 KG/M
Cm1 - 21 41x 21 PLAIN	1.45 KG/M	1.65 KG/M
Cm1 = 41S 41 x 41 SLOTTED	1.88 KG/M	2.39 KG/M
Cm1 = 21S 41 x 21 SLOTTED	1.25 KG/M/1.25 KG/M	1.46 KG/M

PVC END CAP FOR CHANNEL 41 X 41



CAT NO -END-41

PVC END CAP FOR CHANNEL 41 X 21

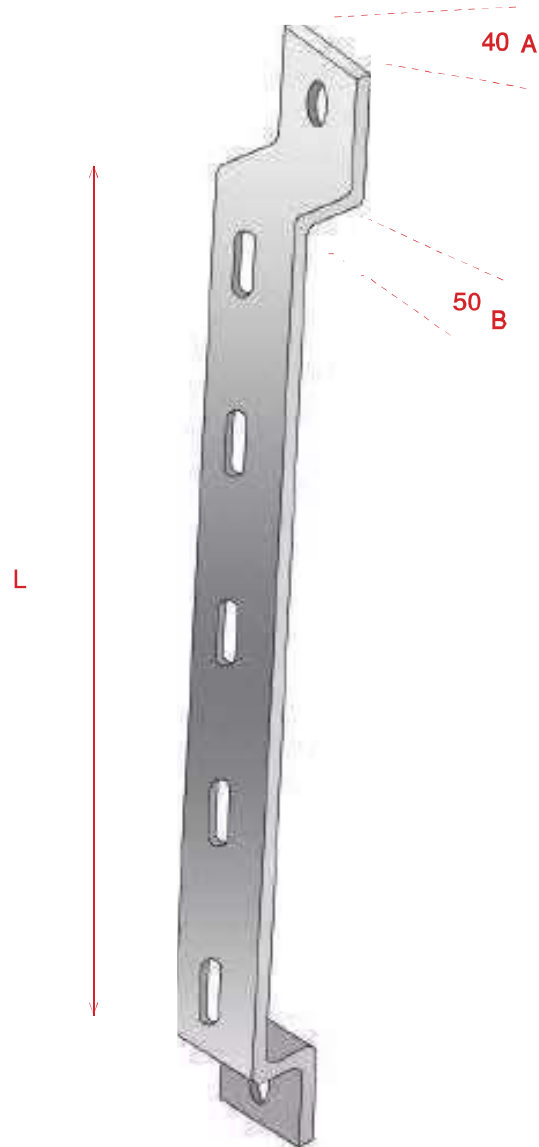


CAT NO -END-21



TRAY STAND OFF BRACKETS

ELECTRICAL WAYS STAND OFF BRACKETS ARE SUITABLE FOR FIXING CABLE TRAY ON WALL OR FLOOR



TYPE YY

USE BY FLAT BAR

40 mm or 50 mm flat bar and thk 5 mm

B- Haight As Order

Standard Haight 50 mm

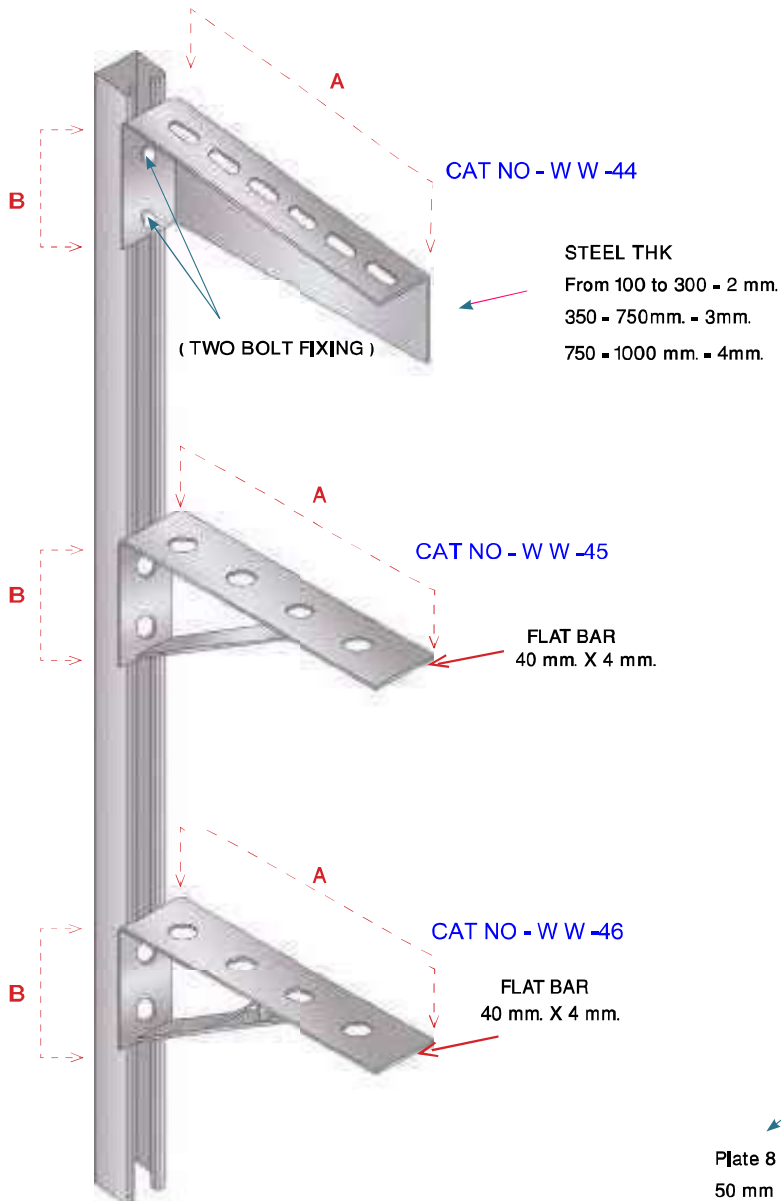


TRAY STAND OFF BRACKETS PART NO

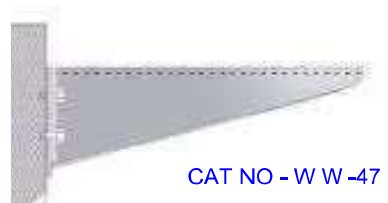
CABLE TRAY WIDTH	TYPE	L	FIXING SIZE	ThK mm	PART NO:
50	YY	75	M 8	5	YY-50
100	YY	130	M 8	5	YY-100
150	YY	180	M 8	5	YY-150
200	YY	230	M 8	5	YY-200
250	YY	280	M 8	5	YY-250
300	YY	335	M 8	5	YY-300
350	YY	380	M 8	5	YY-350
400	YY	430	M 8	5	YY-400
450	YY	480	M 8	5	YY-450
500	YY	530	M 8	6	YY-500
550	YY	580	M 8	6	YY-550
600	YY	630	M 10	6	YY-600
650	YY	680	M 10	6	YY-650
700	YY	730	M 10	6	YY-700
750	YY	780	M 10	6	YY-750
800	YY	830	M 10	6	YY-800
850	YY	880	M 10	6	YY-850
900	YY	930	M 10	6	YY-900
950	YY	980	M 10	6	YY-950
1000	YY	1030	M 10	6	YY-1000



WALL BRACKETS



HEAVY DUTY WALL BRACKET



ALL WALL BRACKETS CAN FIX DIRECT TO WALL BY ANCHORS OR FIXING ON CHANNEL USE SPRING NUT WITH BOLT



WALL BRACKETS PART NO

TYPE	SIZE 'A'	SIZE 'B'	Thk. Mm	PART NO:
WW 45	150	150	5	WW 45 - 150
WW 45	200	150	5	WW 45 - 200
WW 45	300	150	5	WW 45 - 300
WW 45	400	200	5	WW 45 - 400

A- As Order

PART NO W W 45 & W W 46 ALL USE FLAT BAR 40 MM OR 50 MM

TYPE	SIZE 'A'	SIZE 'B'	Thk. Mm	PART NO:
WW 44	150	170	2	WW 44 - 150
WW 44	200	170	2	WW 44 - 200
WW 44	300	170	2	WW 44 - 300
WW 44	400	210	2	WW 44 - 400

STEEL USE

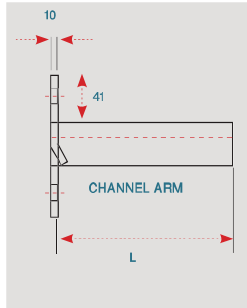
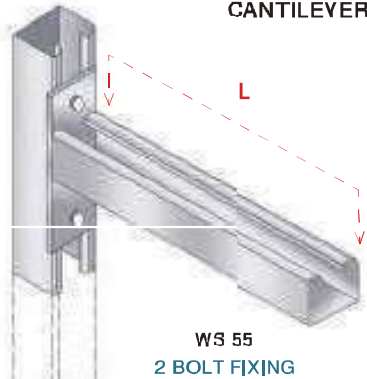
- 1- FROM 100 - 200 - 2 mm.**
- 2 - FROM 350 - 750 - 3 mm.**
- 3 - FROM 750 - 1000 - 4 mm.**

TYPE	SIZE 'A'	SIZE 'B'	Thk. Mm	PART NO:
WW 46	150	150	5	WW 44 - 150
WW 46	200	150	5	WW 44 - 200
WW 46	300	150	5	WW 44 - 300
WW 46	400	200	5	WW 44 - 400

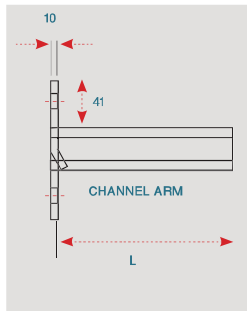
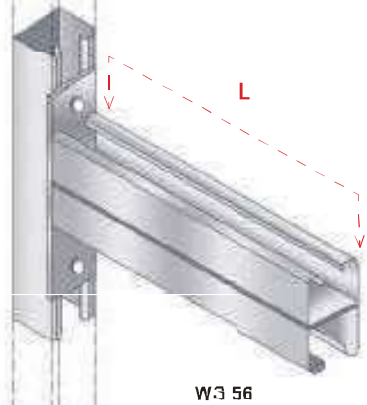


CANTILEVER ARMS

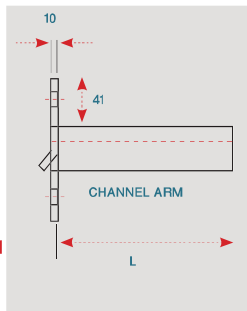
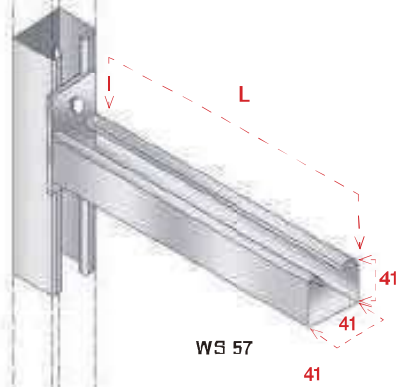
CANTILEVER ARMS ARE MANUFACTURED HOT-DIP GALVANIZED



TYPE	LENGTH "L" "A"	UNIFORM LOAD kg	PART NO:	WT. EACH kg.
WS 55	120	505	WS 55 - 100	0.70
WS 55	170	480	WS 55 - 150	0.99
WS 55	220	425	WS 55 - 200	1.16
WS 55	320	240	WS 55 - 300	1.20
WS 55	620	120	WS 55 - 600	2.10
WS 55	720	100	WS 55 - 700	2.500



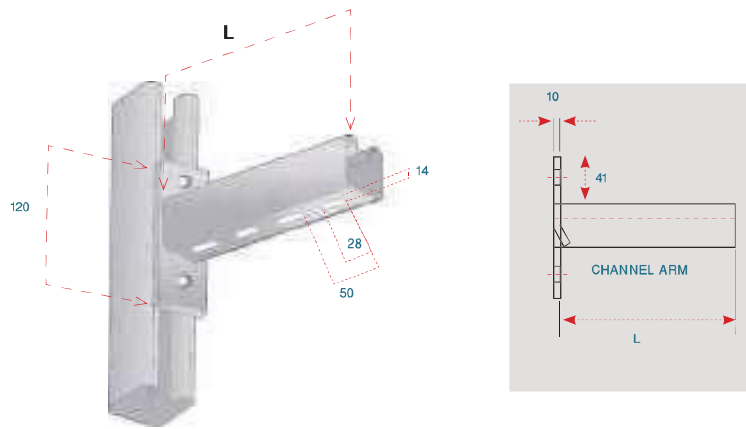
TYPE	LENGTH "L" "A"	UNIFORM LOAD kg	PART NO:
WS 56	170	1330	WS 56 - 150
WS 56	330	658	WS 56 - 300
WS 56	420	438	WS 56 - 400
WS 56	520	378	WS 56 - 500
WS 56	630	327	WS 56 - 600
WS 56	730	266	WS 56 - 700
WS 56	930	218	WS 56 - 900
WS 56	1100	170	WS 56 - 1000



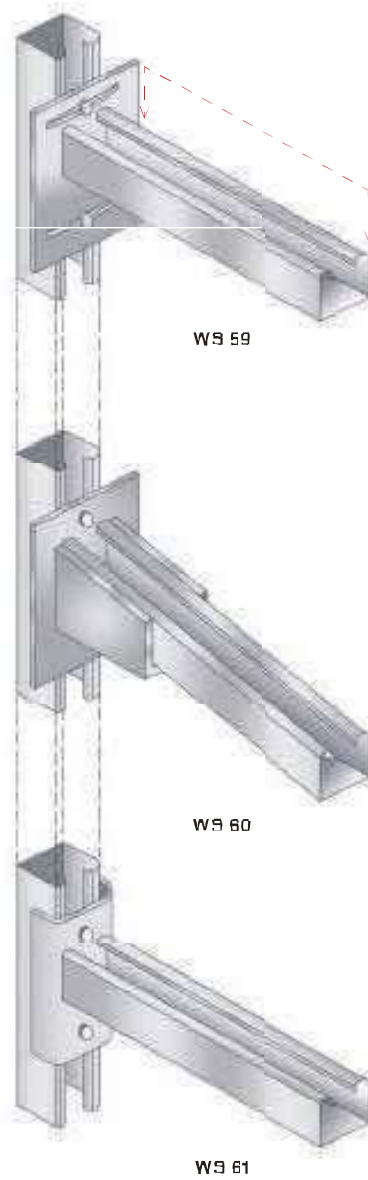
TYPE	LENGTH "L" "A"	UNIFORM LOAD kg	PART NO:
WS 57	170	480	WS 57 - 150
WS 57	220	430	WS 57 - 200
WS 57	320	235	WS 57 - 300
WS 57	630	310	WS 57 - 600
WS 57	730	266	WS 57 - 700
WS 57	930	218	WS 57 - 900
WS 57	1100	170	WS 57 - 1000



CANTILEVER ARMS



WS 55-S



WS 59

WS 60

WS 61

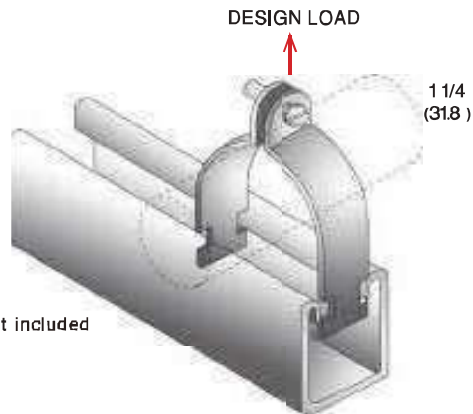


PIPE/CONDUIT CLAMPS

PIPE CLAMPS FOR STEEL CONDUIT

PART NUMBER	PAGE SIZE	OD. SIZE		THICKNESS		WEIGHT / C		DESIGN LOAD	
	IN	IN	MM	GAGE	MM	LBS	KG	LBS	KN
RR	3/8	.675	171	16	15	10	4.5	400	1.8
	1/2	.840	213	16	15	11	5.0	400	1.8
	3/4	1.050	267	14	19	15	6.8	600	2.7
	1	1.315	334	14	19	17	7.7	600	2.7
	1 1/4	1.660	42.2	14	19	19	8.6	600	2.7
	1 1/2	1.900	483	12	2.7	29	13.2	800	3.6
	2	2.375	603	12	2.7	34	15.4	800	3.6
	2 1/2	2.875	73.0	12	2.7	40	18.1	800	3.6
	3	3.500	88.9	12	2.7	47	21.3	800	3.6
	3 1/2	4.000	1016	11	3.0	62	28.1	1000	44
	4	4.500	114.3	11	3.0	67	30.4	1000	44
	5	5.563	141.3	11	3.0	80	36.3	1000	44
	6	6.625	168.3	10	3.4	102	46.3	1000	44
	8	8.625	219.1	10	3.4	130	59.0	1000	44

**HOW TO ORDER - RR - SIZE OF PIPE
CAT NO. RR1**



Slotted hex head screw and nut included

PART NO-RR

PART NUMBER	PART NUMBER
RR 1/2	RR 2
RR 3/4	RR 2 1/2
RR 1	RR 3
RR 1 1/4	RR 3 1/2
RR 1 1/2	RR 4

(OTHER SIZES AVAILABLE ON ORDER)



HARDWARES

NON DRIL ANCHOR'S



CODE	SIZE
NA 6	M 6
NA 8	M 8
NA 10	M 10
NA 12	M 12

HEXAGON HEAD SET SCREW



CODE	SIZE
NX 6	M 6
NX 8	M 8
NX 10	M 10
NX 12	M 12

HEX. NUT



CODE	SIZE
NU 6	M 6
NU 8	M 8
NU 10	M 10
NU 12	M 12

ROOFING NUT + BOLT



CODE	SIZE
NB 6	M 6
NB 8	M 8
NB 10	M 10
NB 12	M 12

WASHERS



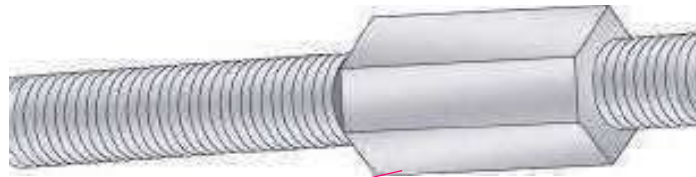
FLAT WASHER'S

LOCK WASHER'S

CODE	SIZE
NW 6	M 6
NW 8	M 8
NW 10	M 10
NW 12	M 12



THREADED COUPLER



THREADED COUPLER

CODE	SIZE
NC 6	M 6
NC 8	M 8
NC 10	M 10
NC 12	M 12
NC 16	M 16

THREADED ROD

LONG OF THREADED ROD
1 METER + 2 METER + 3 METER



CODE	SIZE
NT 6 X 1	M 6
NT 8 X 1	M 8
NT 10 X 1	M 10
NT 12 X 1	M 12
NT 16 X 1	M 16



SPRING NUT

Regular Spring Nut



CODE	SIZE mm	Weight W/C kg
LM 6	6	3.6
LM 8	8	3.6
LM 10	10	4.1
LM 12	12	4.5

SHORT SPRING NUT



CODE	SIZE mm	Weight W/C kg
NM 6	6	2.7
NM 8	8	2.7
NM 10	10	3.1
NM 12	12	3.6

FINISH, ZP, HG & S. S.

Springless Nut



CODE	SIZE mm	Weight W/C kg
SM 6	6	3.1
SM 8	8	3.1
SM 10	10	3.6
SM 12	12	4.1



LISTENING IS OUR SUCCESS

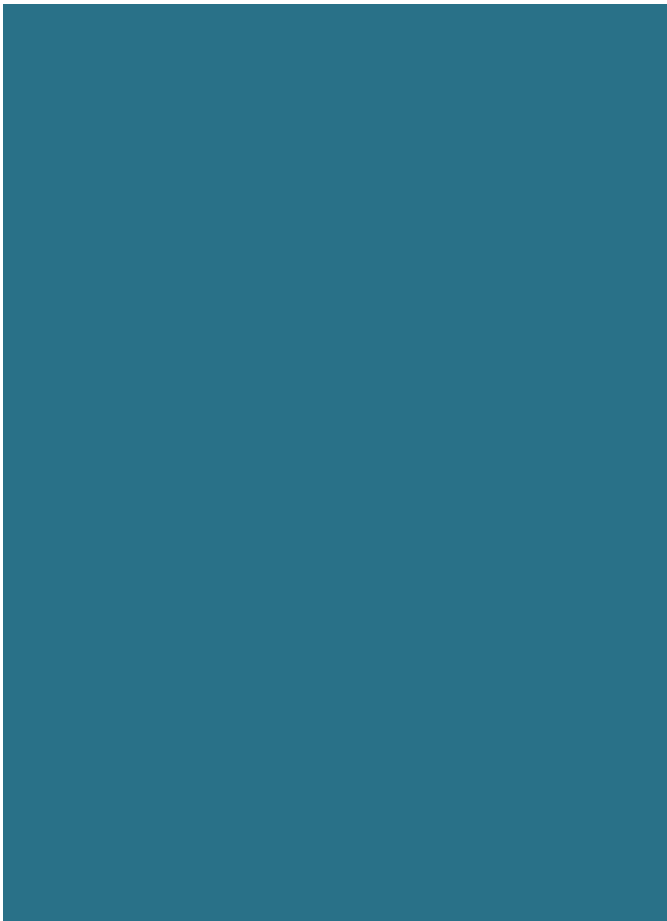
LISTENING IS OUR SUCCESS

LISTENING IS OUR SUCCESS





SUPPORT SOLUTIONS

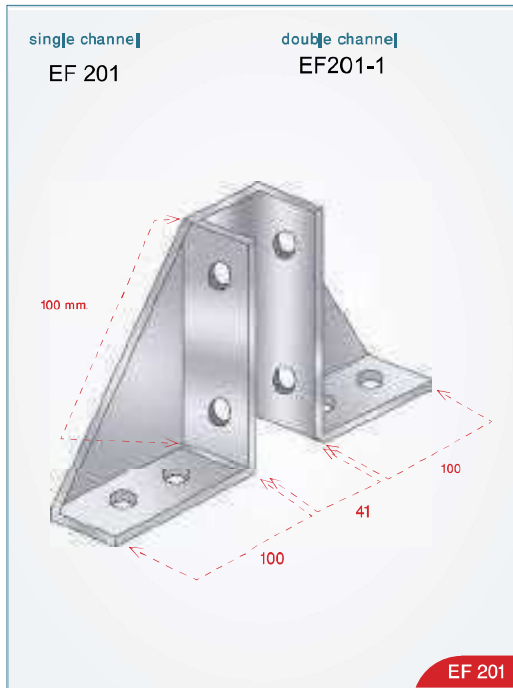


Listening Is Our Success

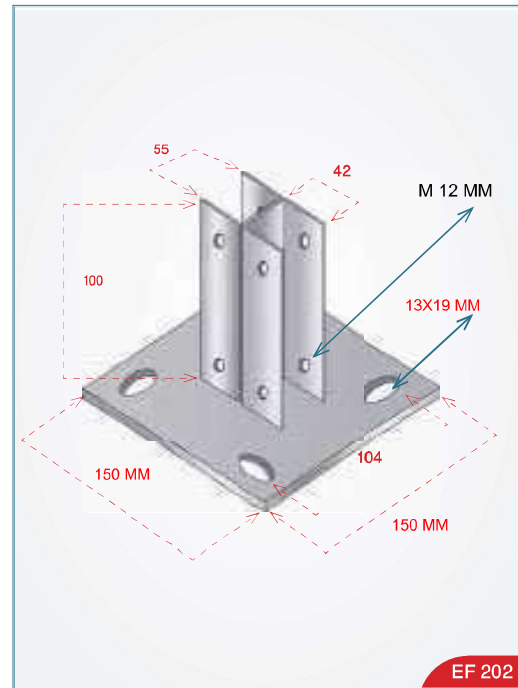




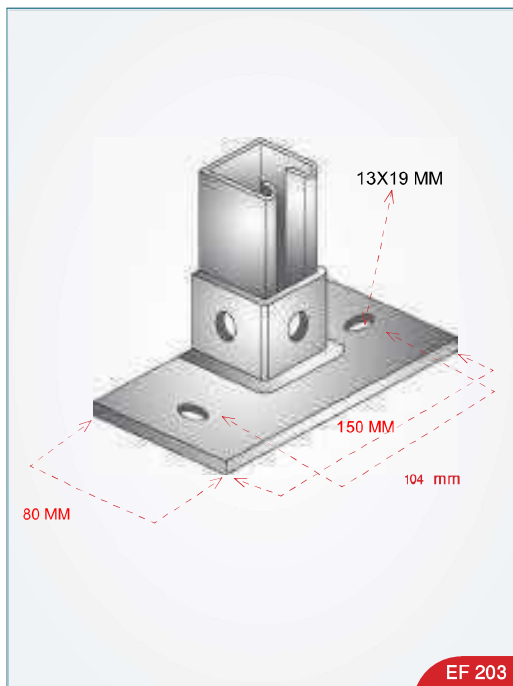
CHANNEL GUESSETED BRACKET



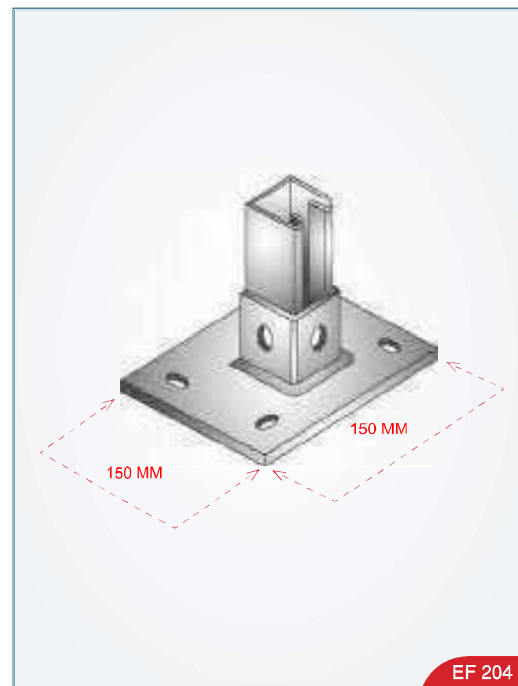
DOUBLE CHANNEL BACK TO BACK



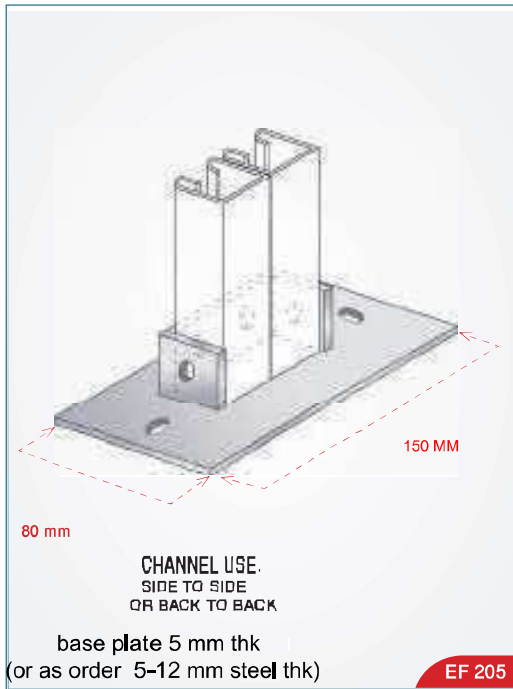
SINGLE CHANNEL
POST BASE



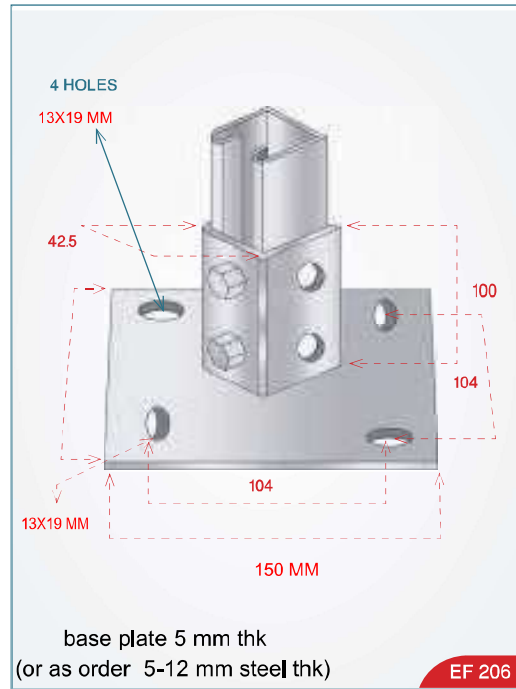
SINGLE CHANNEL
POST BASE



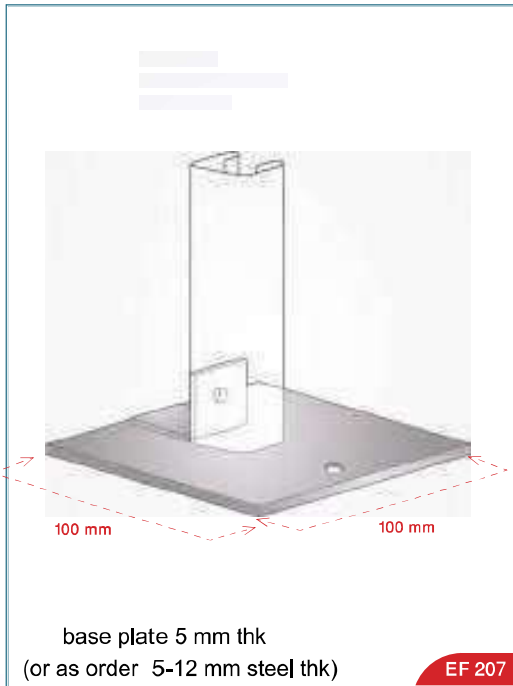
DOUBLE CHANNEL



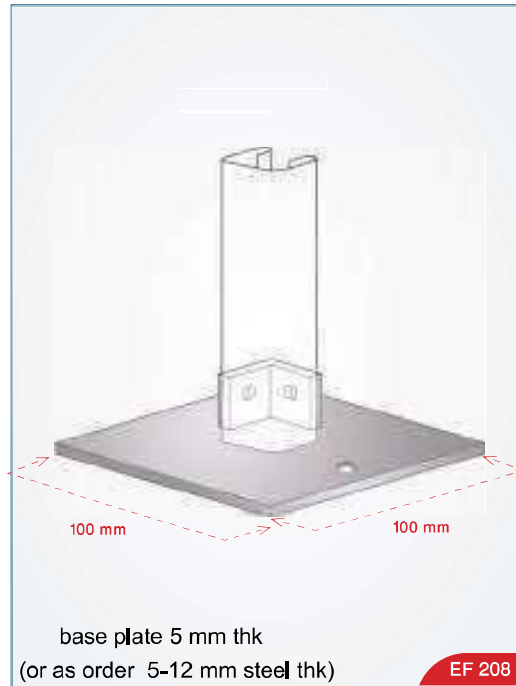
SINGLE CHANNEL BASE PLATE WEIGHT



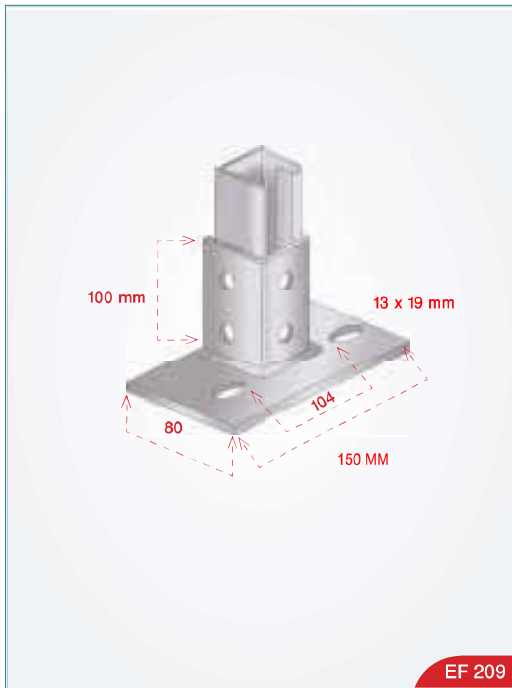
BASE PLATE WITH SINGLE 90 DEG ANGLE



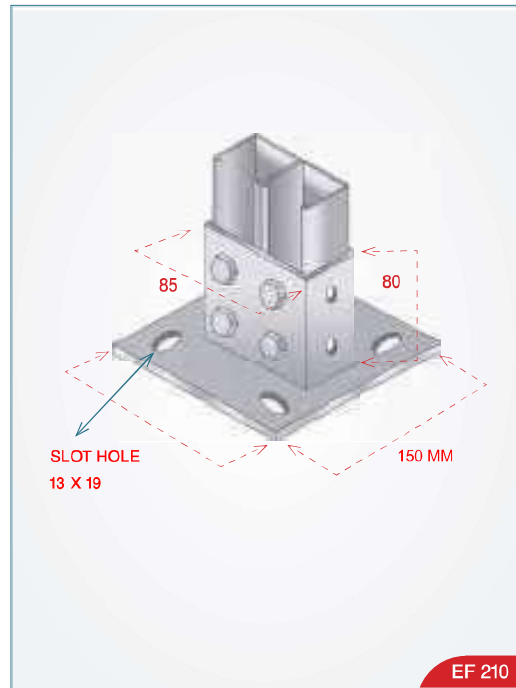
BASE PLATE WITH SINGLE 90 DEG ANGLE



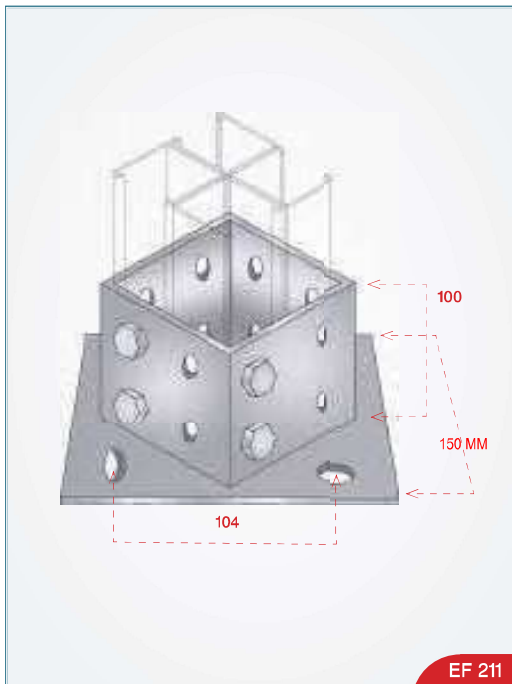
**SINGLE CHANNEL
POST BASE 6 HOLE**



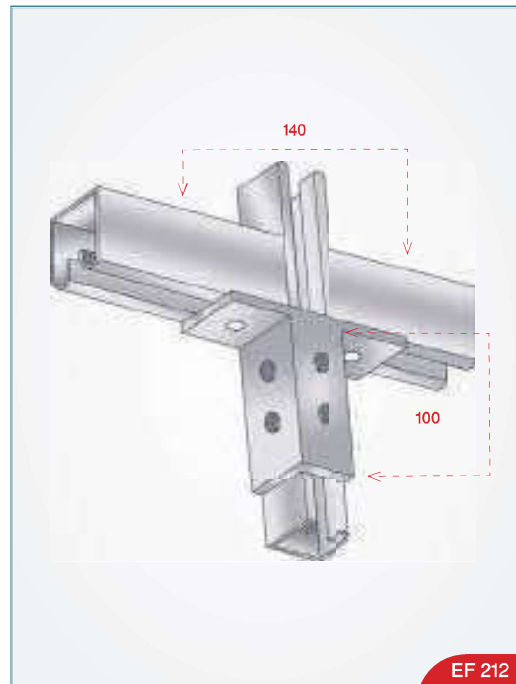
DOUBLE CHANNEL POST BASE



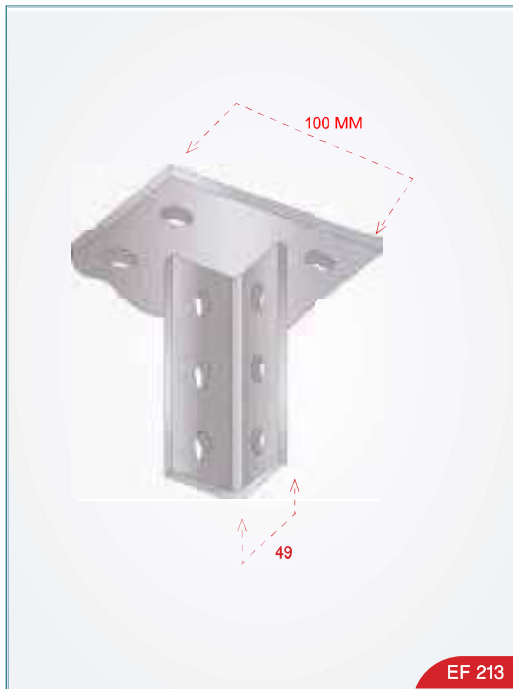
FOUR CHANNEL POST BASE



2 LUG WING BRACKET

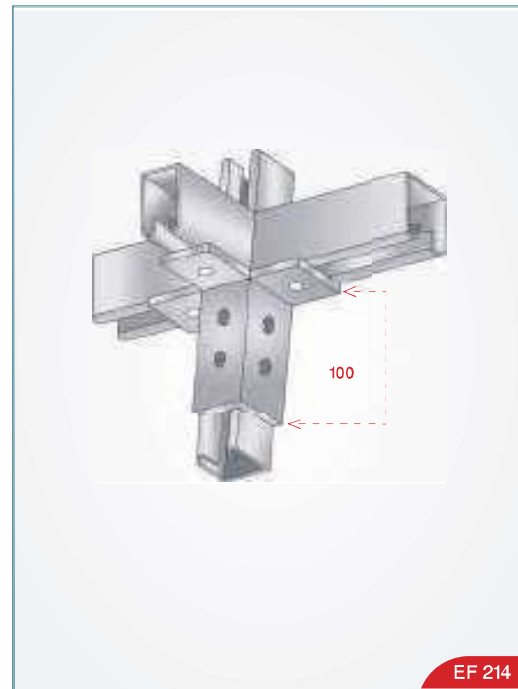


SUPPORT BRACKET



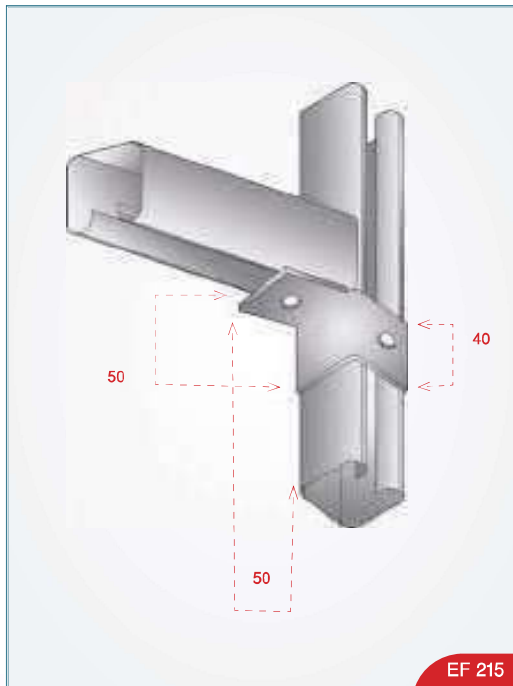
EF 213

3 WING CONNECTION



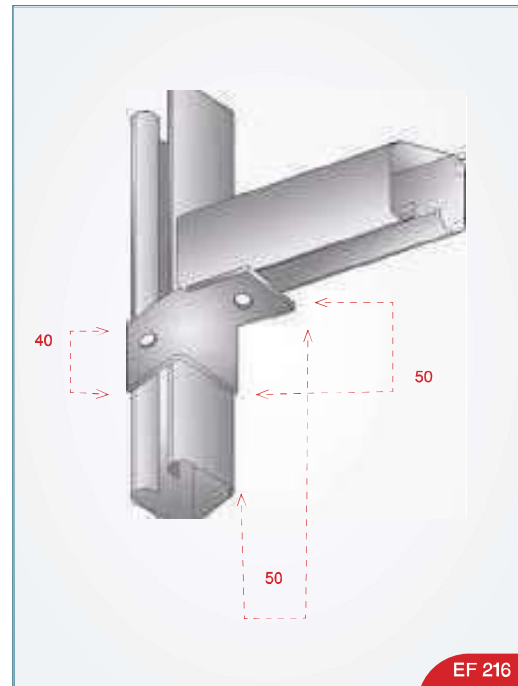
EF 214

LEFT BRACKET



EF 215

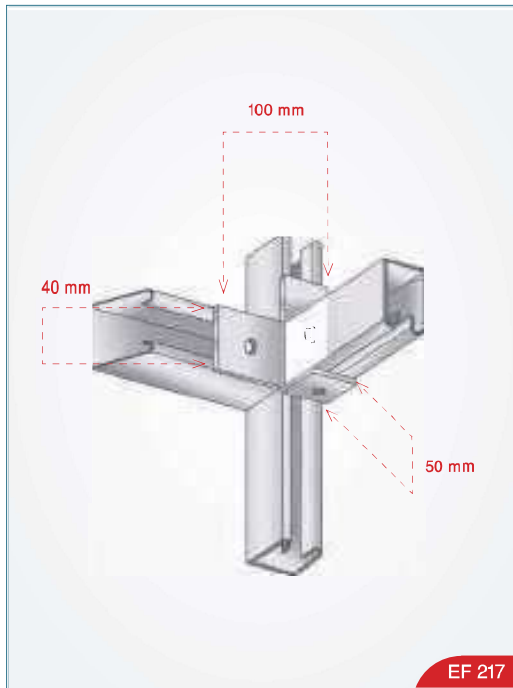
RIGHT BRACKET



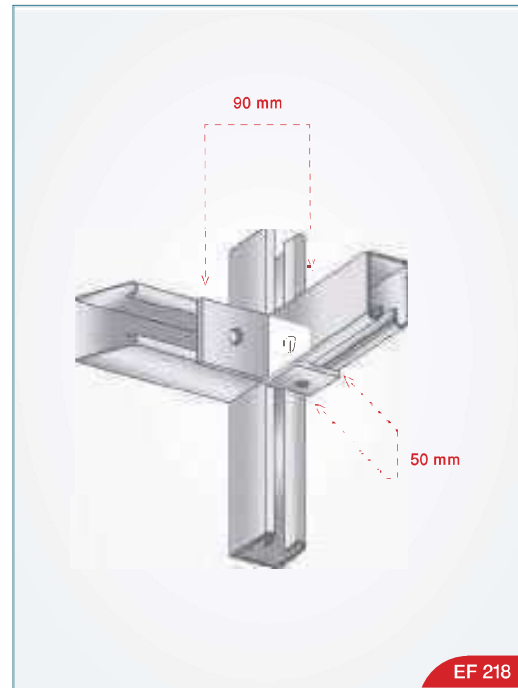
EF 216



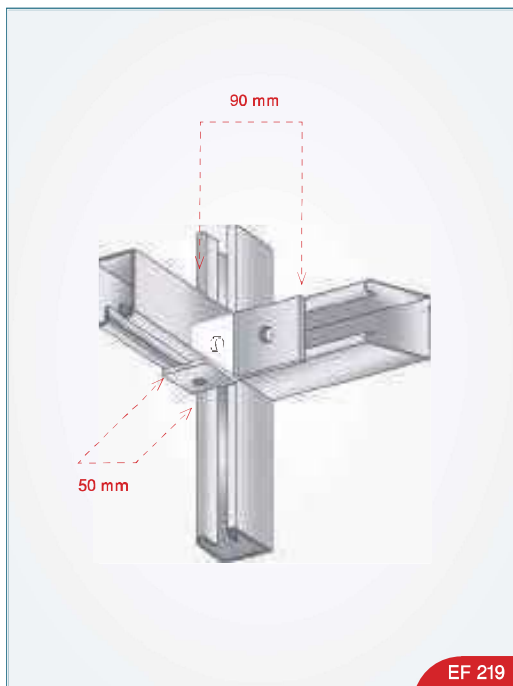
90 BRACKET



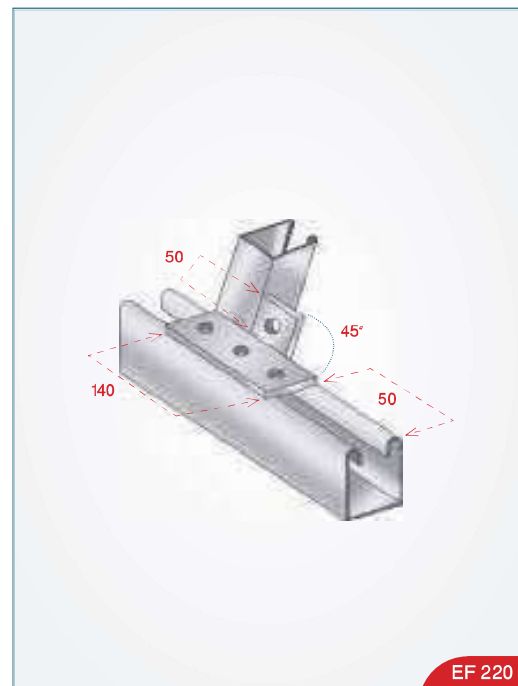
TEE CORNER
RIGHT HAND



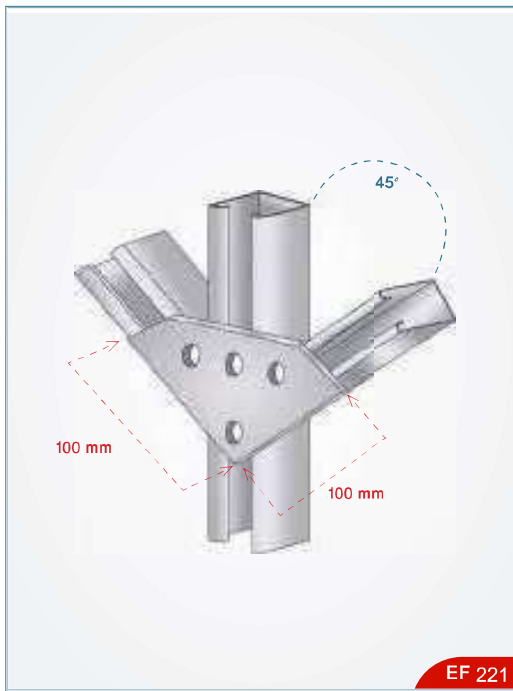
TEE CORNER
LEFT HAND



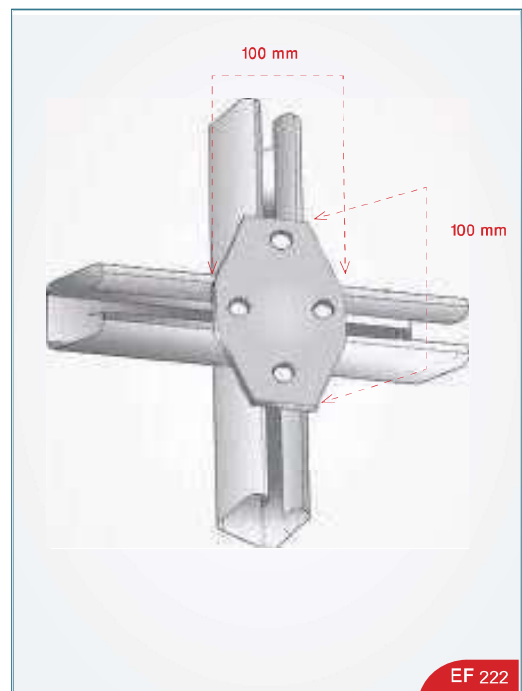
45 BRACKET



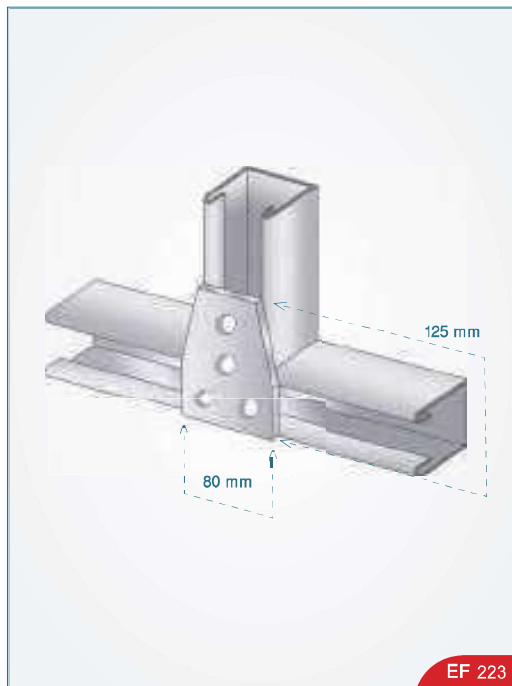
4 HOLE GUSSET PLATE



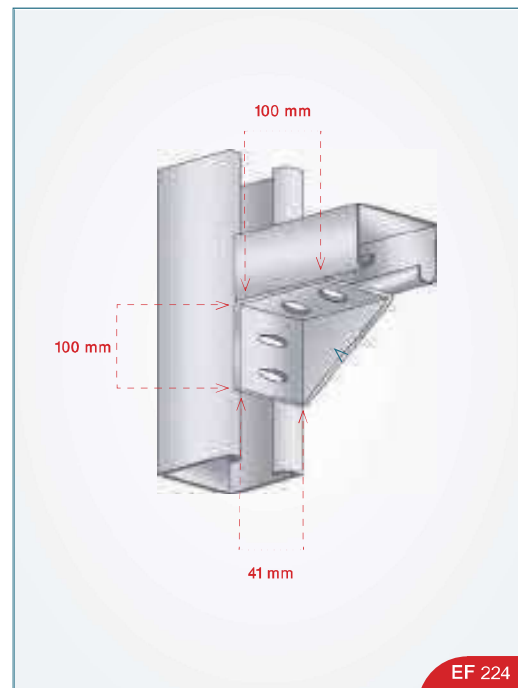
* CROSS * BRACKET



FISH PLATE/JOINER
4 HOLE GUSSET PLATE

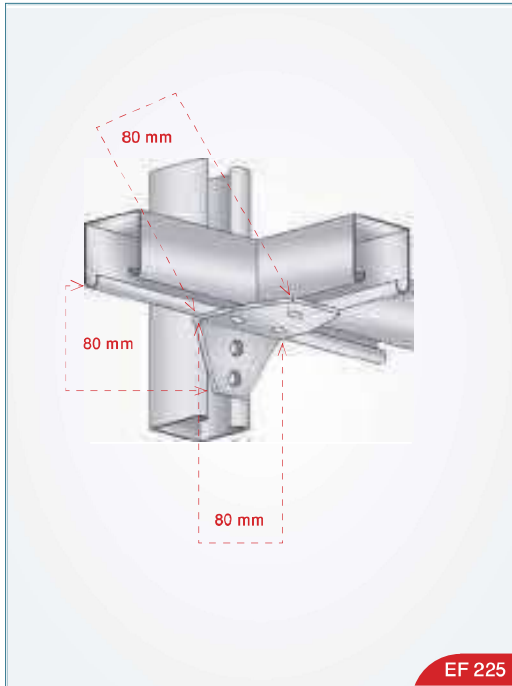


SHELF BRACKET



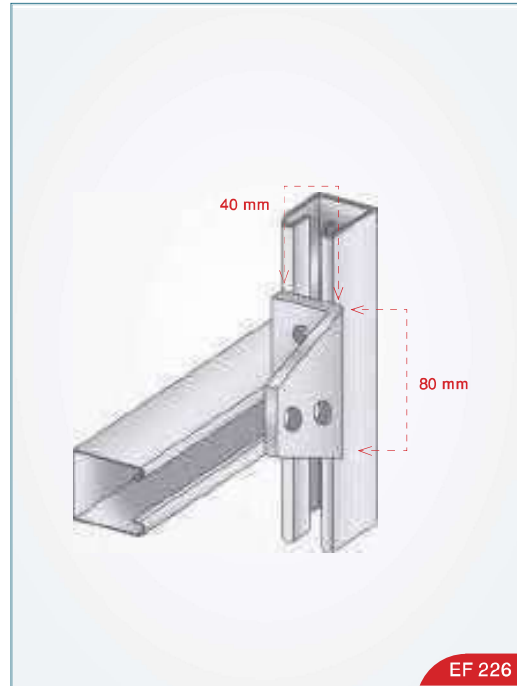
90 BRACKET

5 HOLE 2 WAY GUSSETED SHELF ANGLE



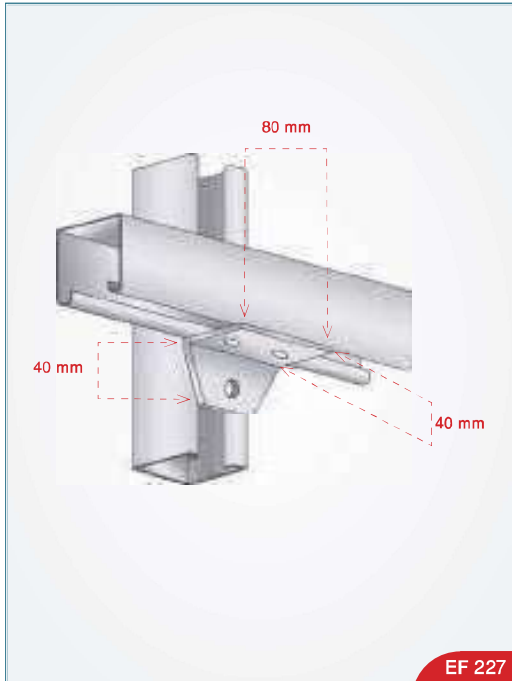
ANGLE BRACKET

4 HOLE 2 WAY GUSSETED SHELF ANGLE



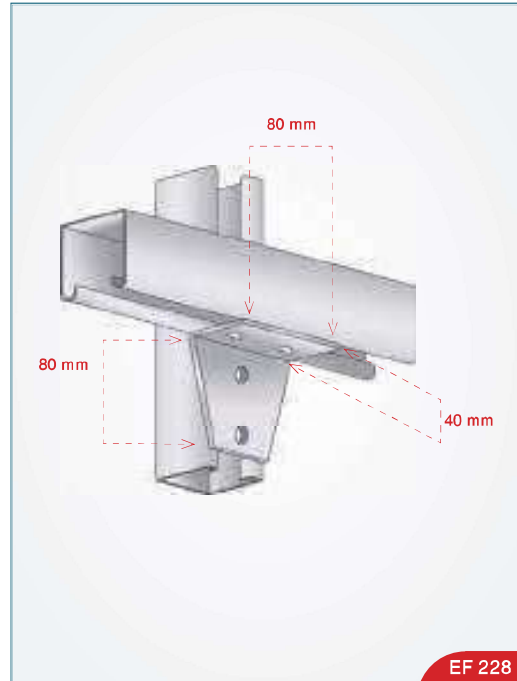
90 BRACKET

3 HOLE 2 WAY GUSSETED SHELF ANGLE



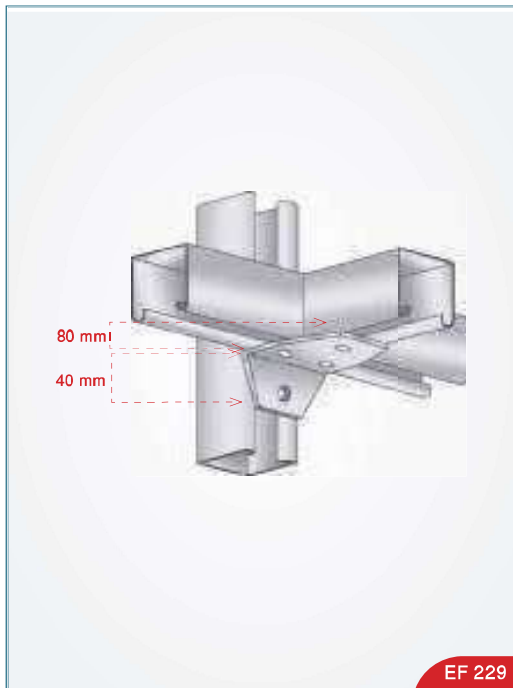
90 BRACKET

4 HOLE 2 WAY GUSSETED SHELF ANGLE

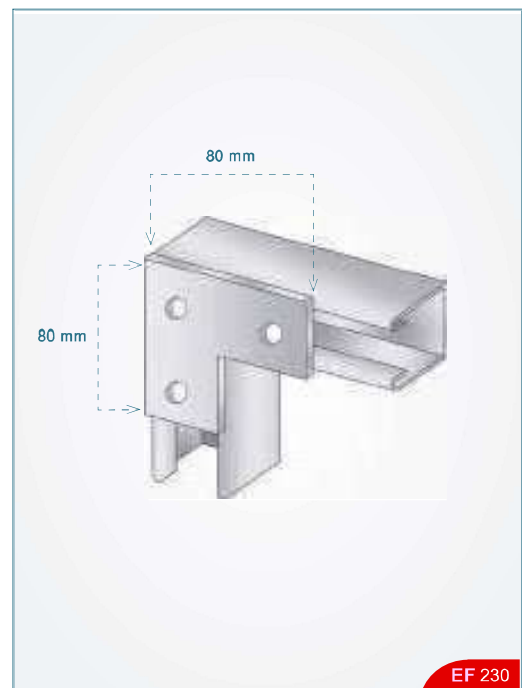


90 BRACKET

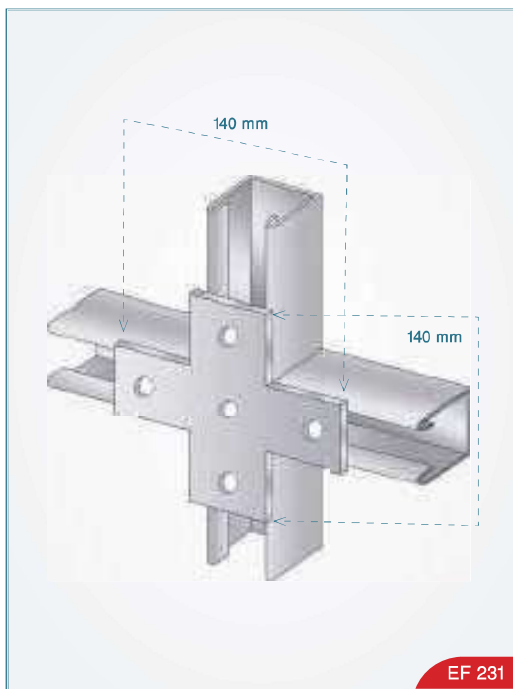
4 HOLE GUSSETT SHELF ANGLE



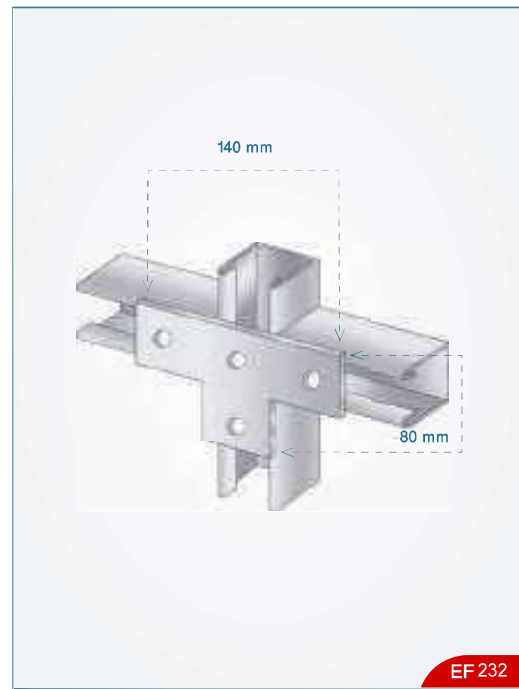
'L' BRACKET



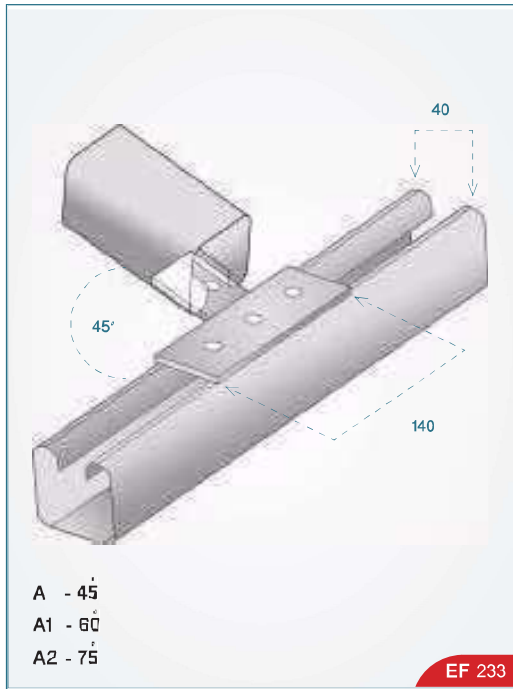
'CROSS' BRACKET



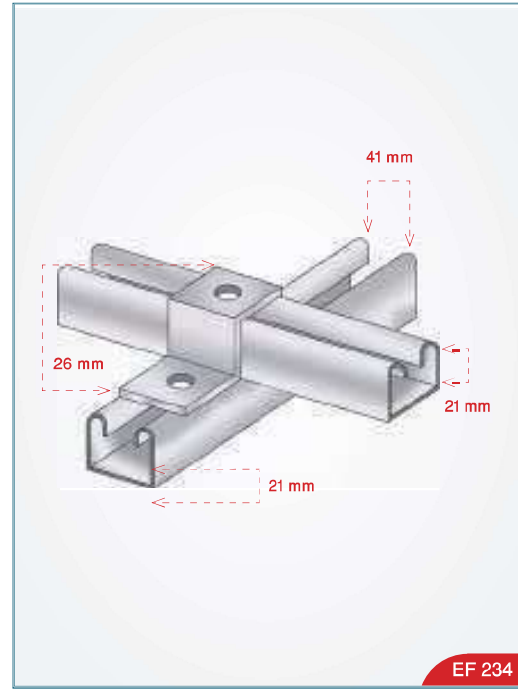
'T' BRACKET



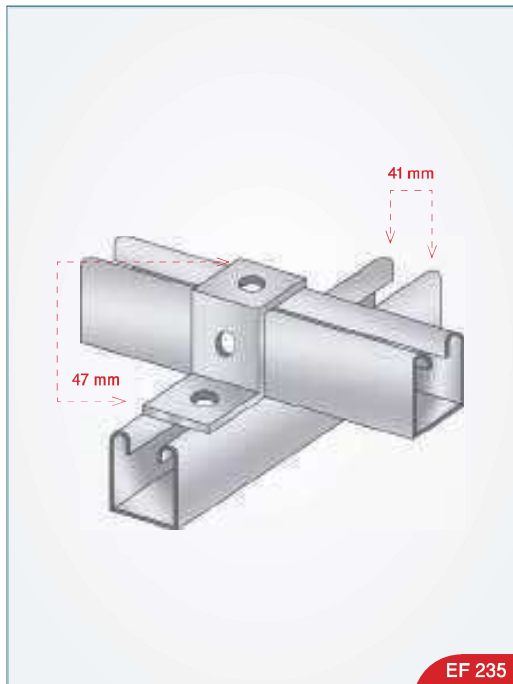
OPEN ANGLE



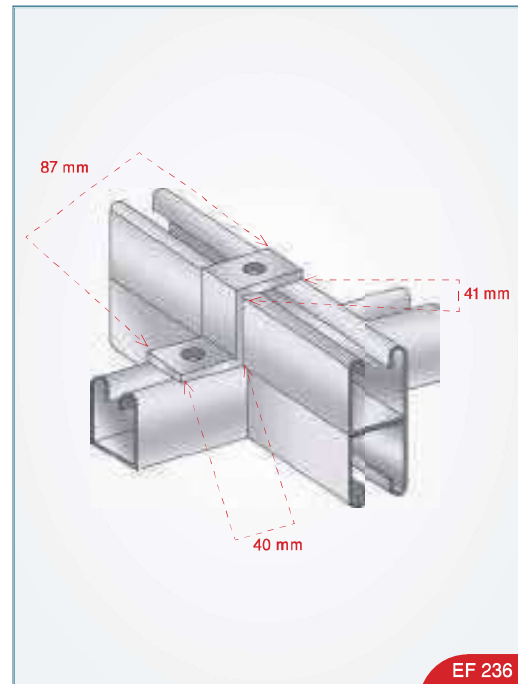
2 HOLE Z SUPPORT
FOR CHANNEL 41X21



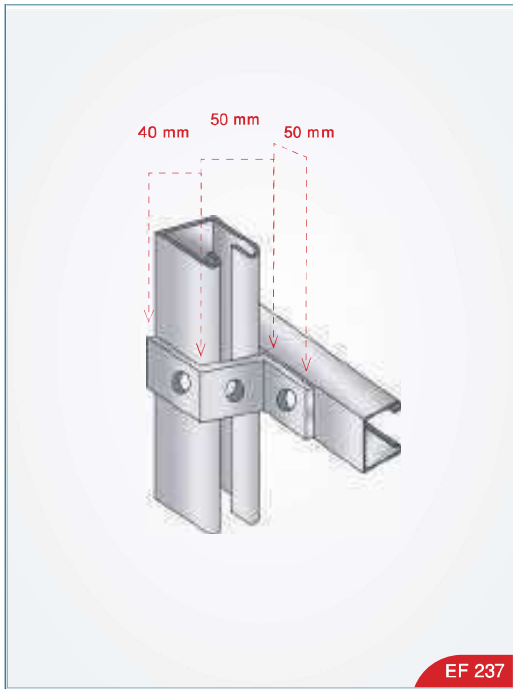
2 HOLE Z SUPPORT
FOR CHANNEL 41X41



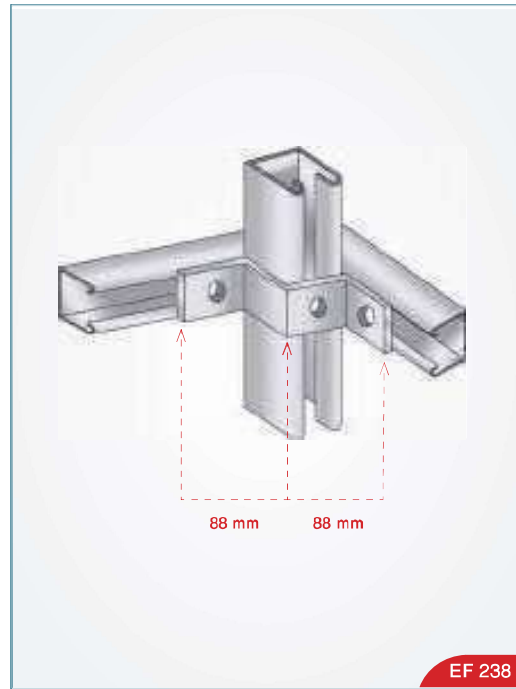
2 HOLE Z SUPPORT
FOR CHANNEL 41X41



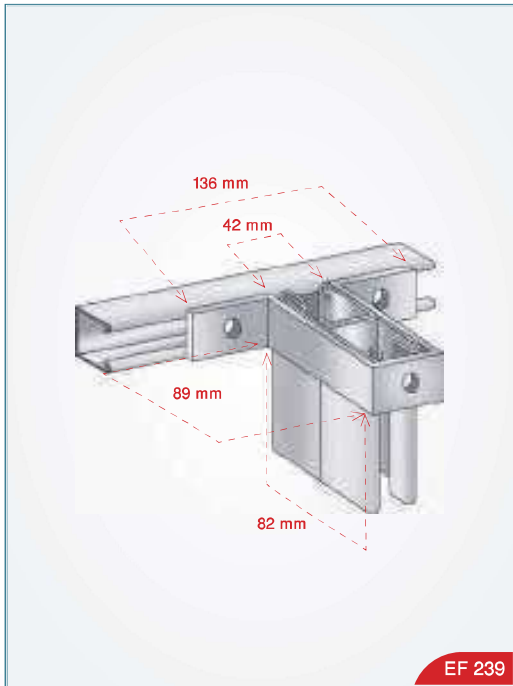
3 HOLE Z SUPPORT
FOR CHANNEL 41X41



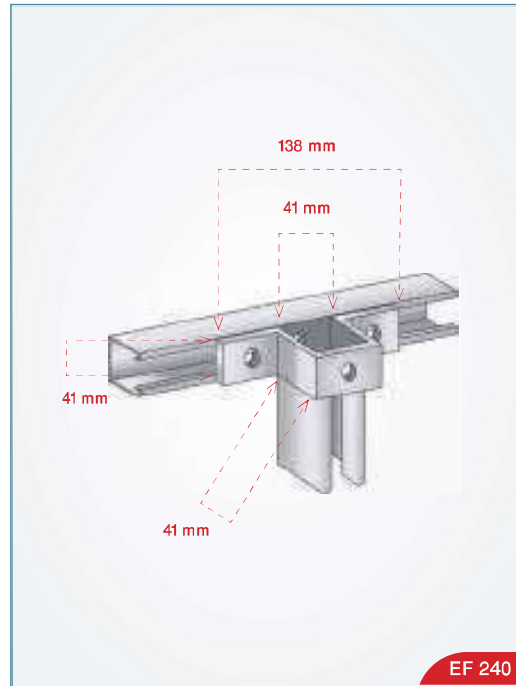
3 HOLE Z SUPPORT
FOR CHANNEL 41X41



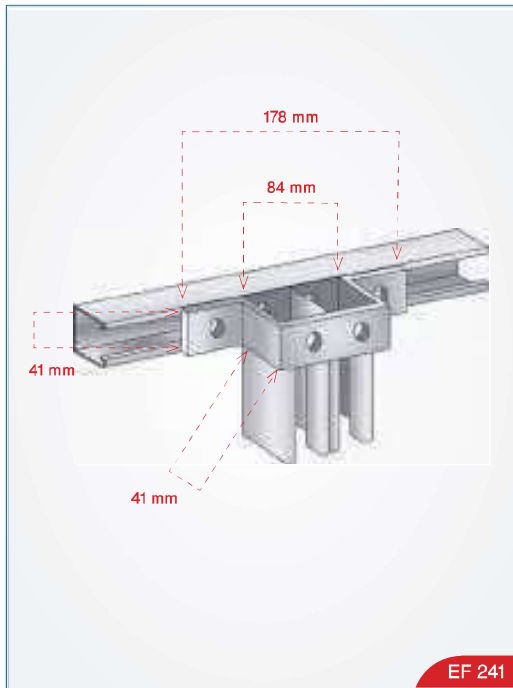
3 HOLE U SUPPORT
FOR CHANNEL 41X82



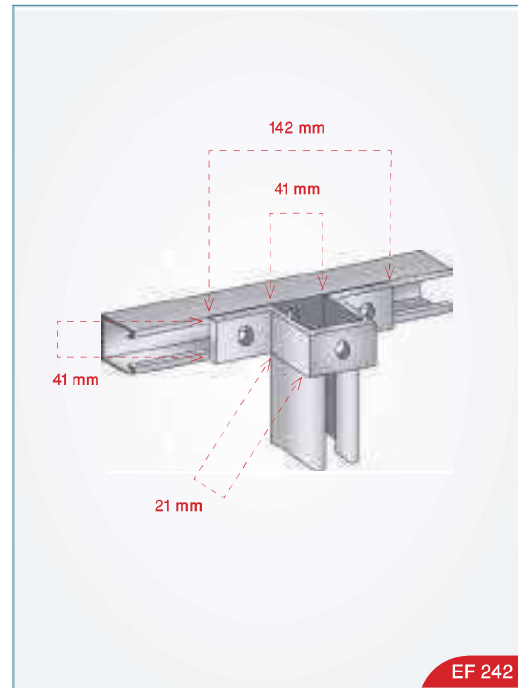
3 HOLE U SUPPORT
FOR CHANNEL 41X41



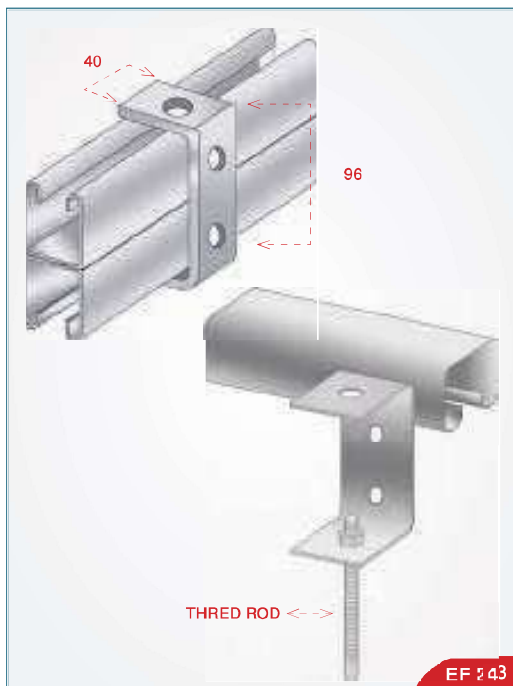
**SIDE BY SIDE U SUPPORT
FOR CHANNEL 41X82**



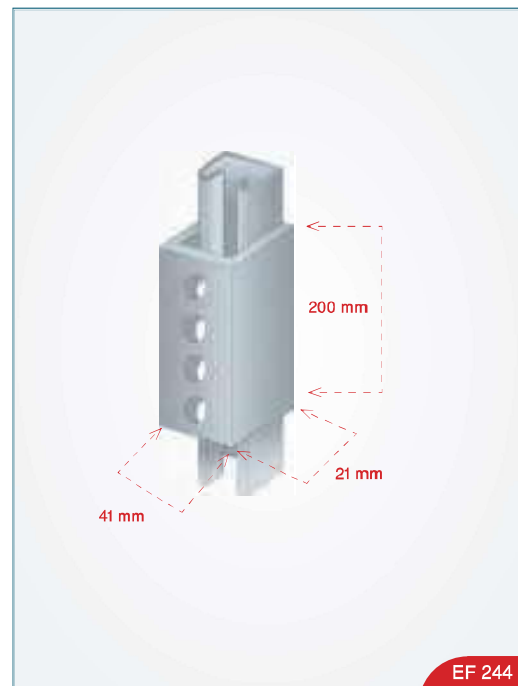
**4 HOLE U SUPPORT
FOR CHANNEL 41X21**



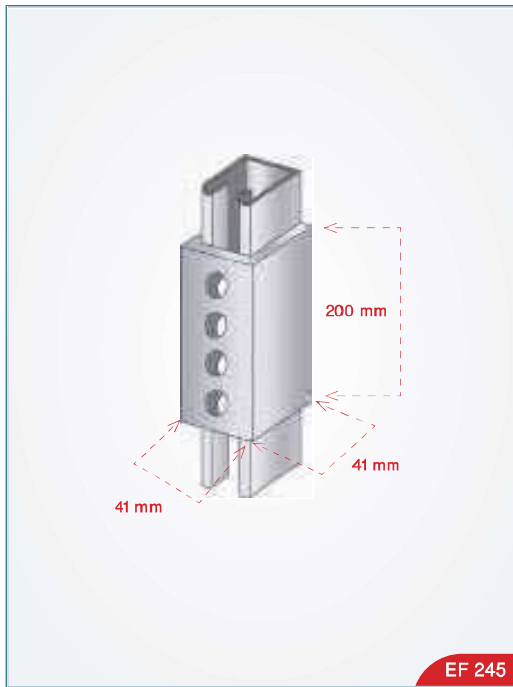
DOUBLE CHANNEL U SUPPORT



**21 MM EXTERNAL CONNECTOR
TO JOINT 2 CHANNEL 41X21**



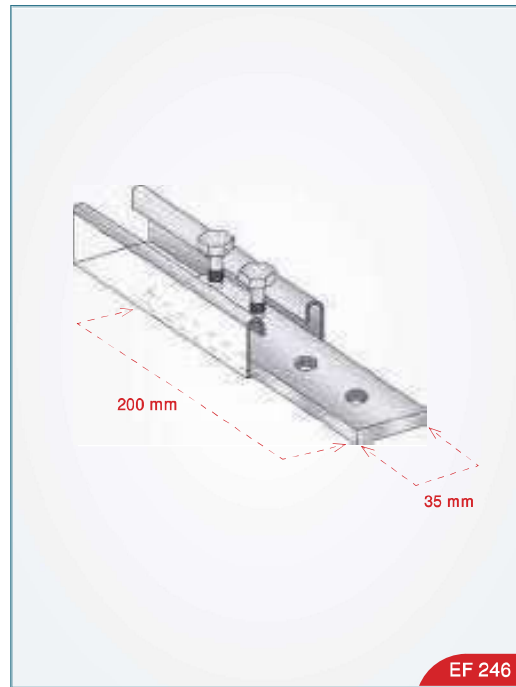
41 MM EXTERNAL CONNECTOR
TO JOINT 2 CHANNEL 41X41



EF 245

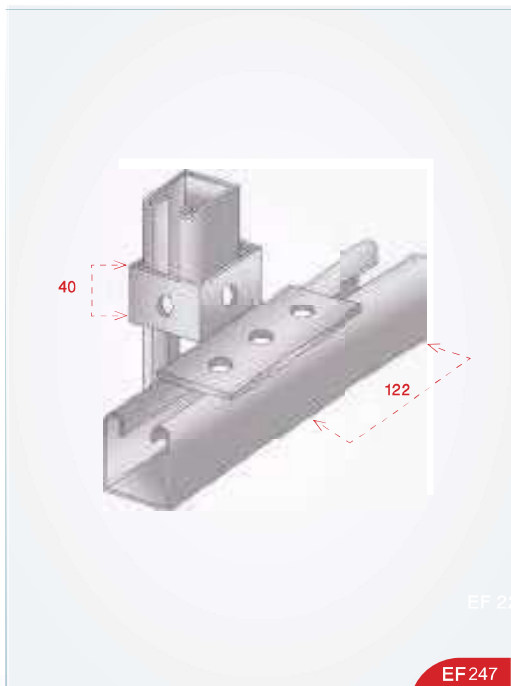
41 CHANNEL

INTERNAL CONNECTOR PLATE



EF 246

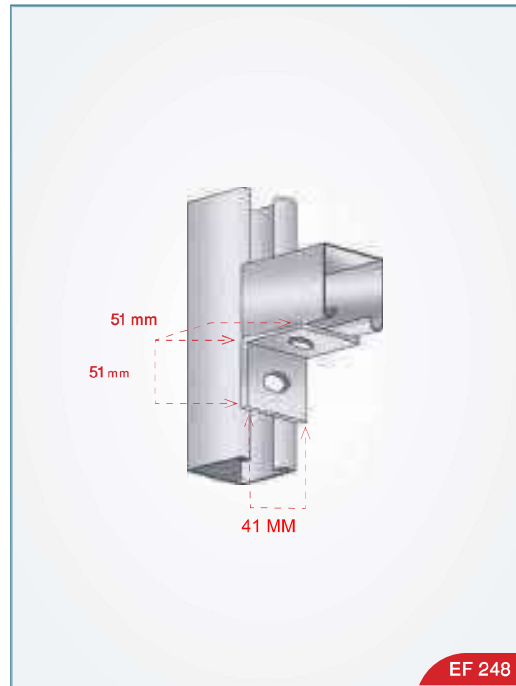
LAY - STAND CHANNEL BRACKET



EF 247

EF 247

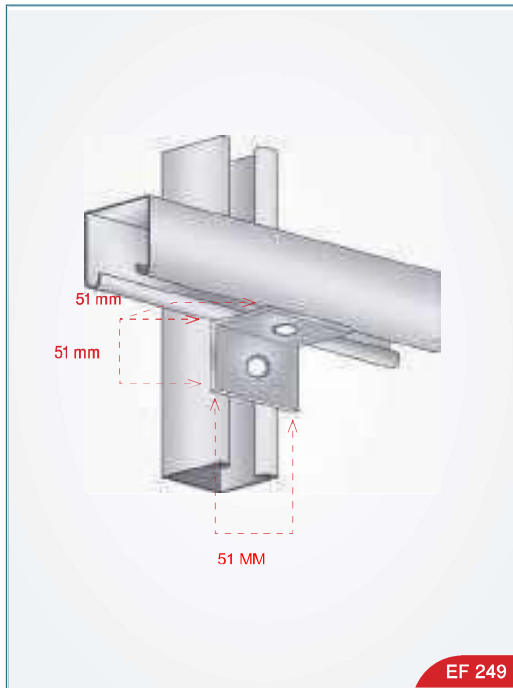
2 HOLE ANGLE 41 MM



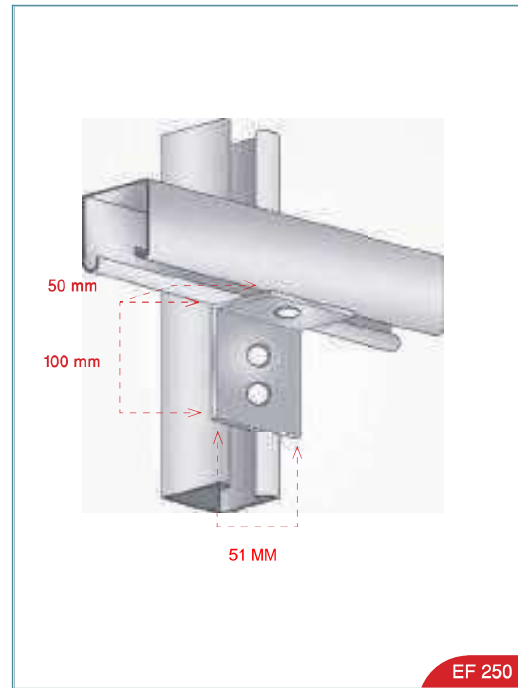
EF 248



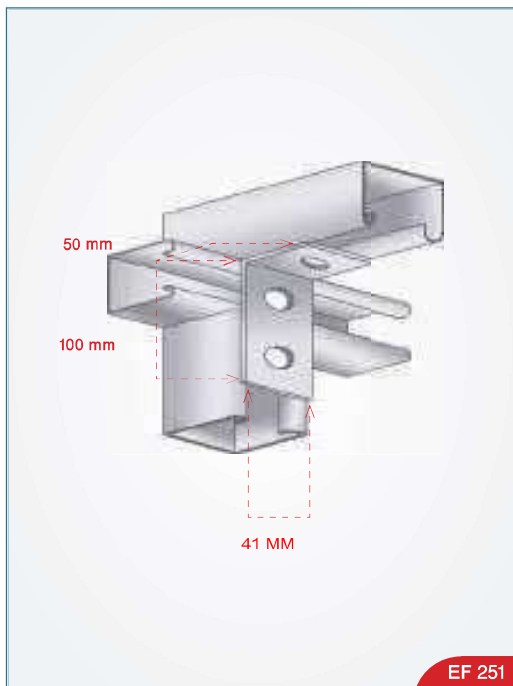
2 HOLE ANGLE 51 MM



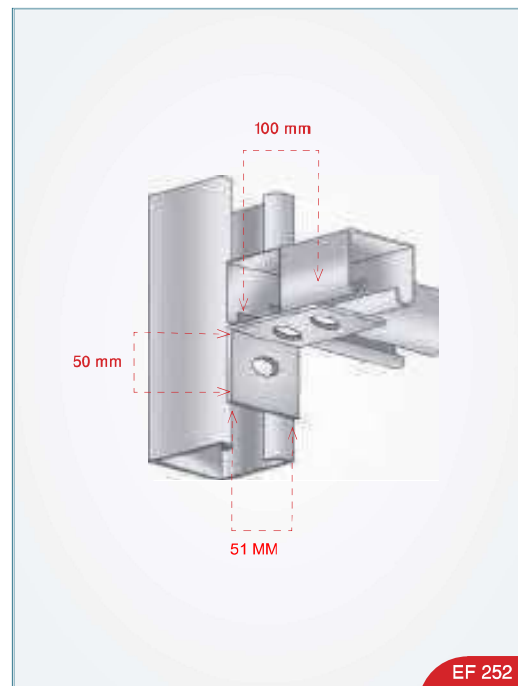
3 HOLE ANGLE 51 MM



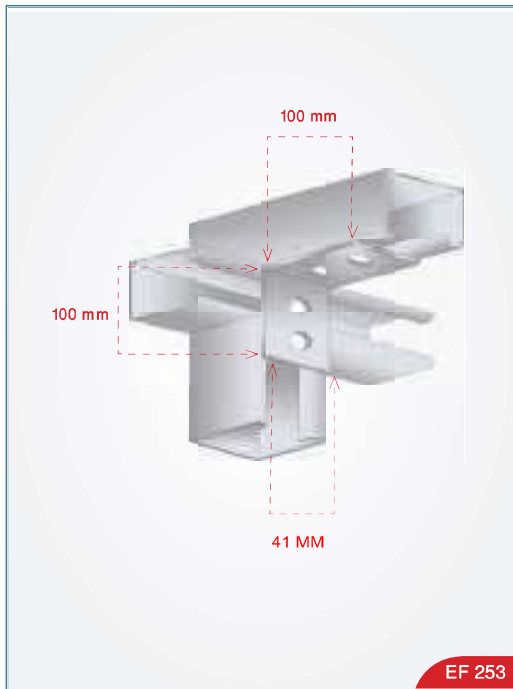
3 HOLE ANGLE 41 MM



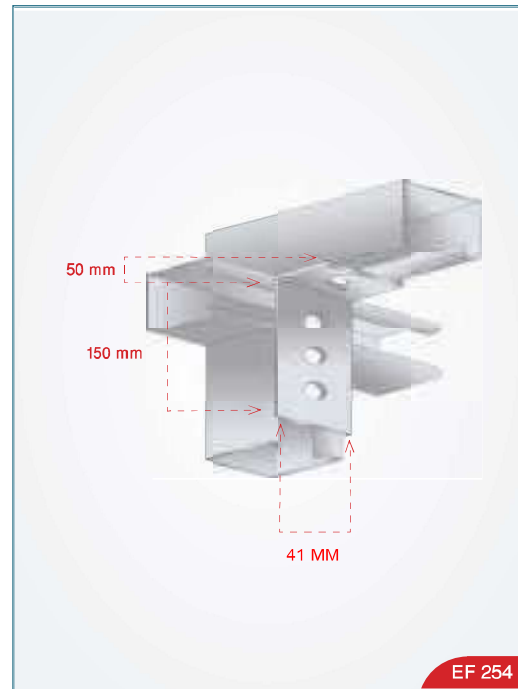
3 HOLE ANGLE 51 MM



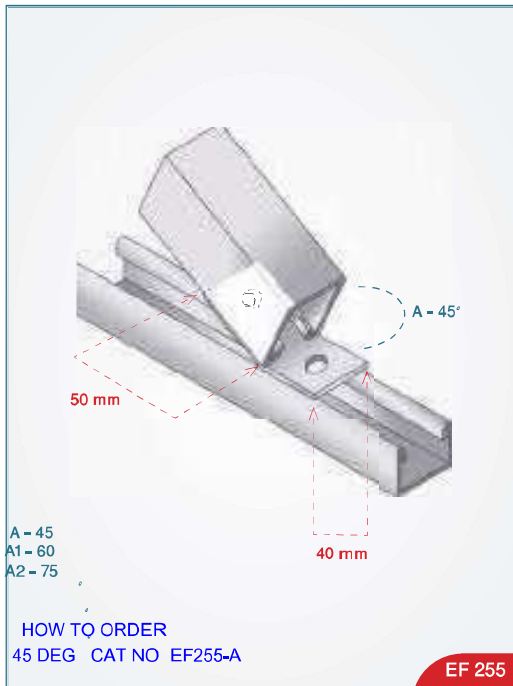
4 HOLE ANGLE 41 MM



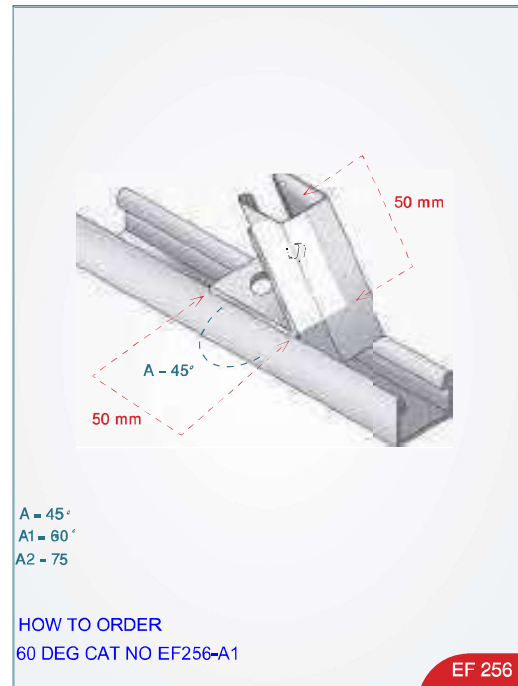
4 HOLE ANGLE 41 MM



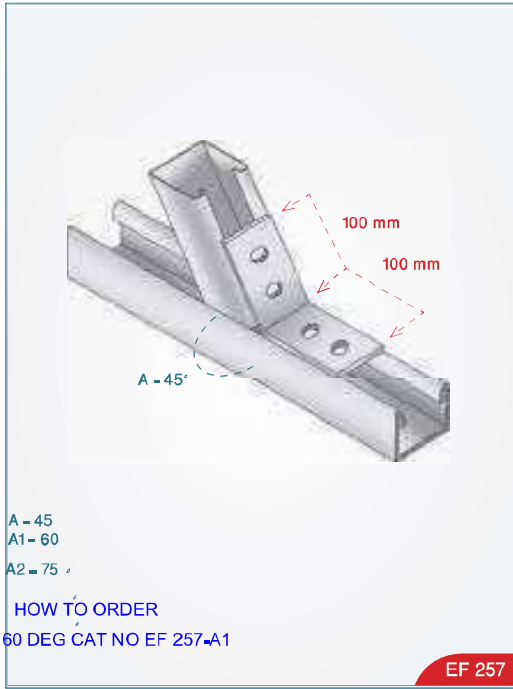
2 HOLE OPEN ANGLE BRACKET



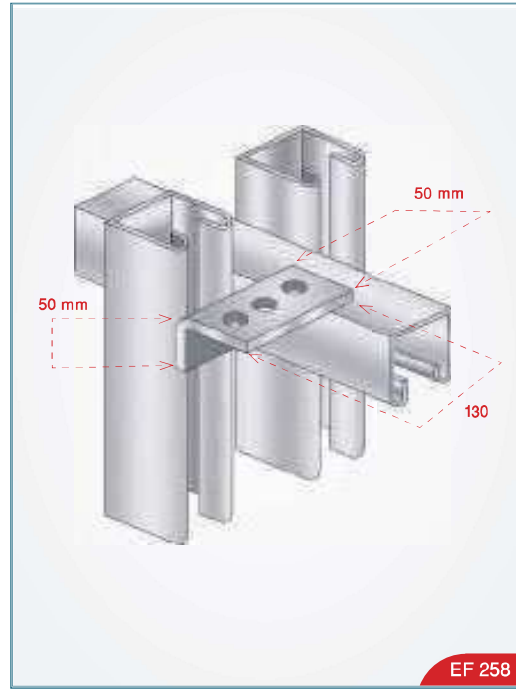
2 HOLE CLOSE ANGLE BRACKET



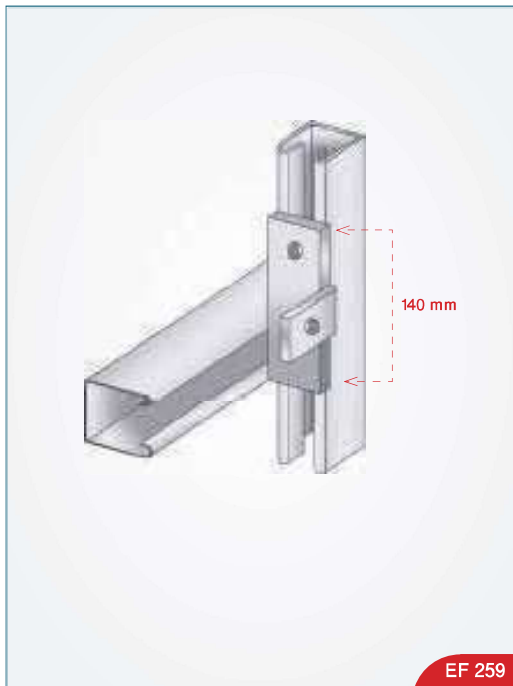
4 HOLE OPEN ANGLE BRACKET



CROSS SUPPORT BRACKET



90 BRACKET



2 LUG WING BRACKET

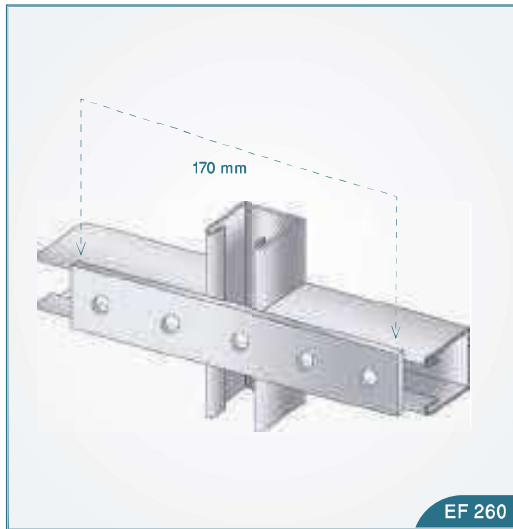


BRACKETS AND FITTING

FIXING BRACKETS & FITTING MANUFACTURING FROM FLAT BAR 5 MM THK

& AND HOT DIP GALVANIZED

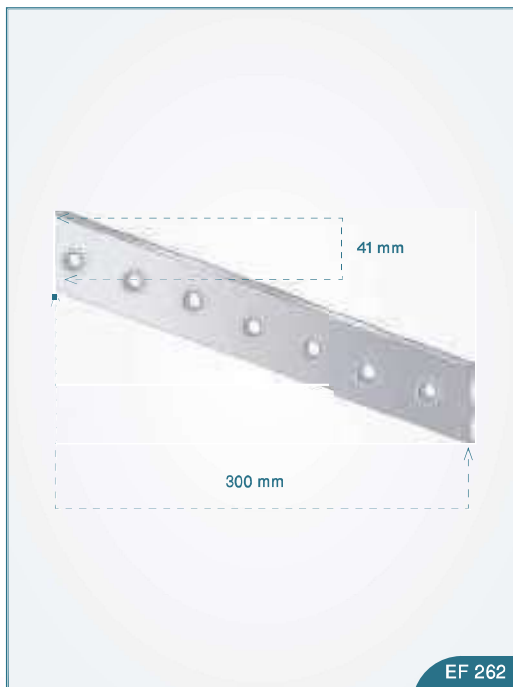
FIVE HOLE PLATE



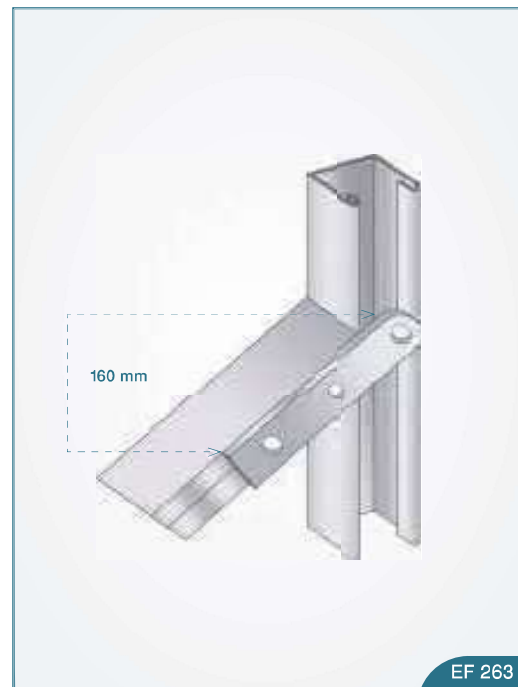
SIX HOLE PLATE



SEVEN HOLE PLATE

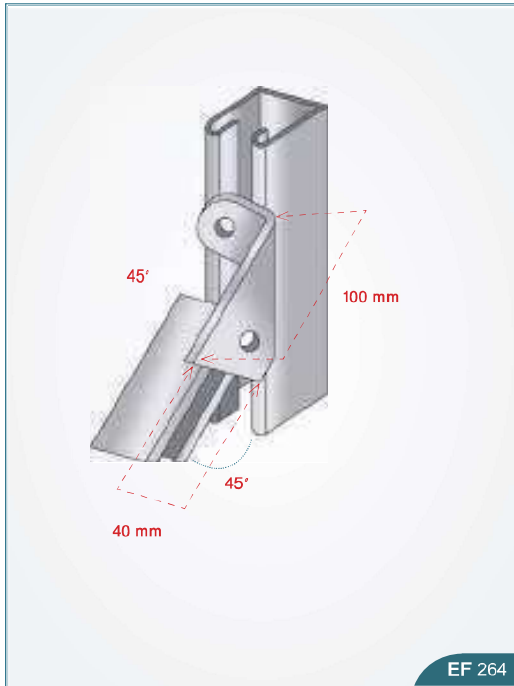


ADJUSTABLE ANGLE PLATE



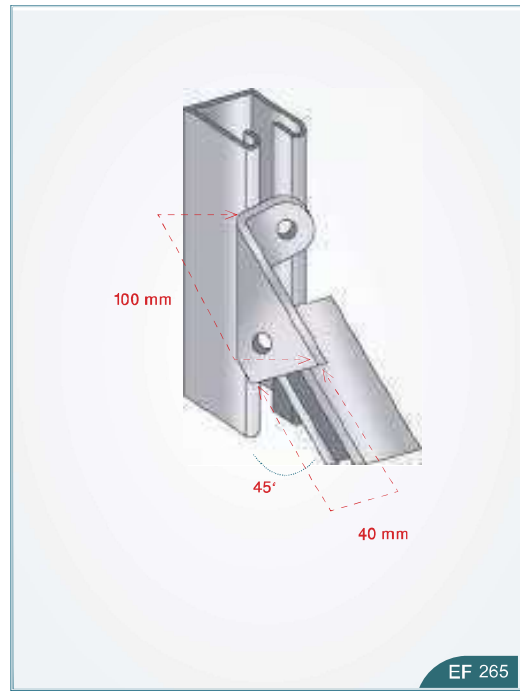
ANGLE BRACKET

LEFT HAND

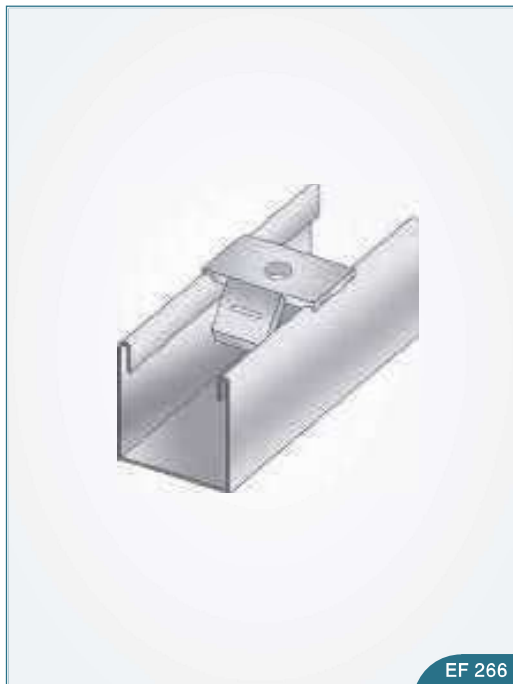


ANGLE BRACKET

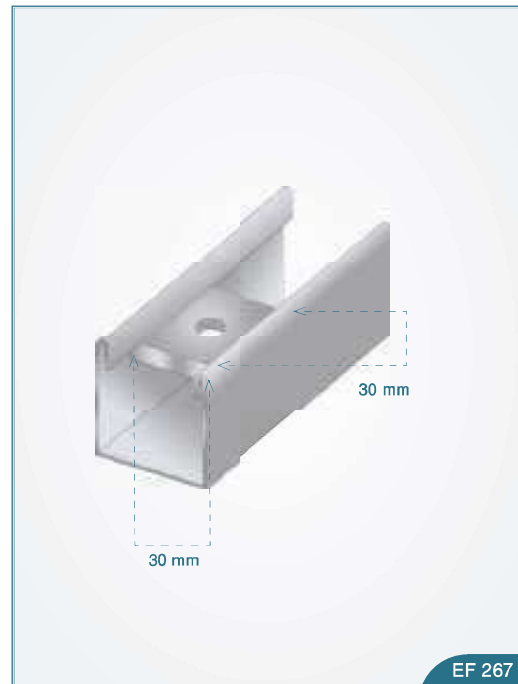
RIGHT HAND



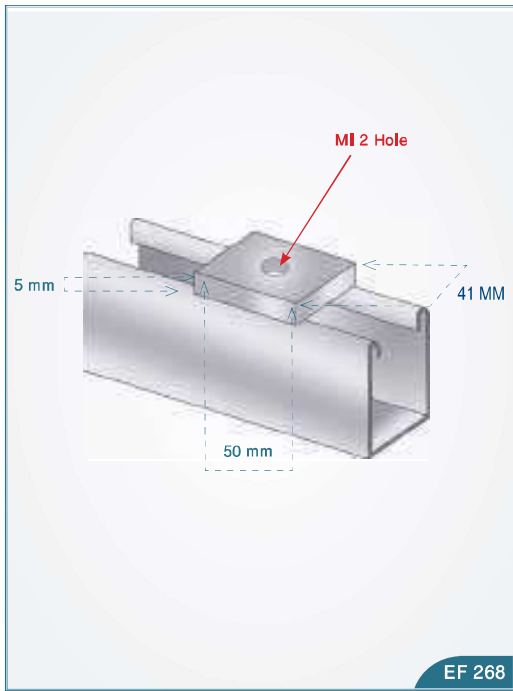
SADDLE



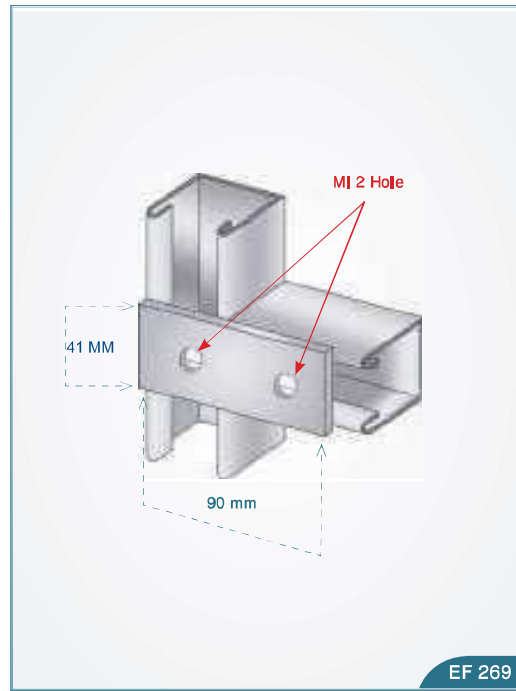
INTERNAL WASHER



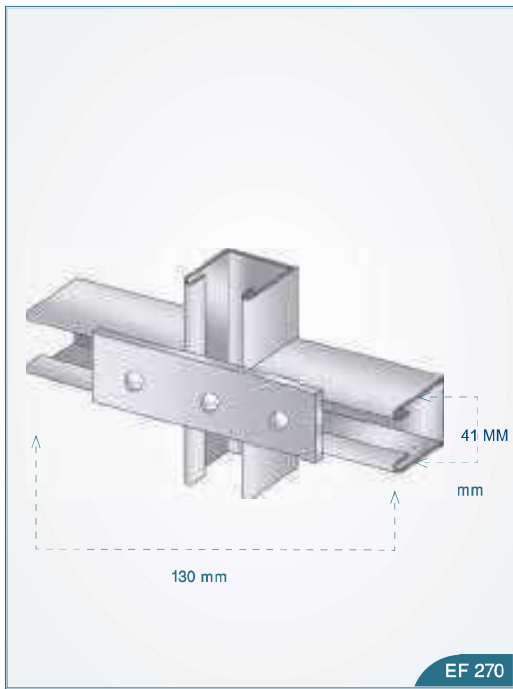
SQUARE WASHER



TWO HOLE PLATE



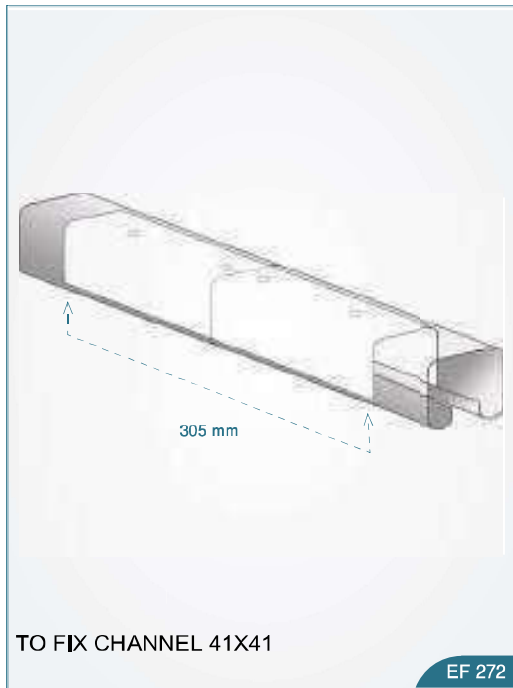
THREE HOLE PLATE



FOUR HOLE PLATE



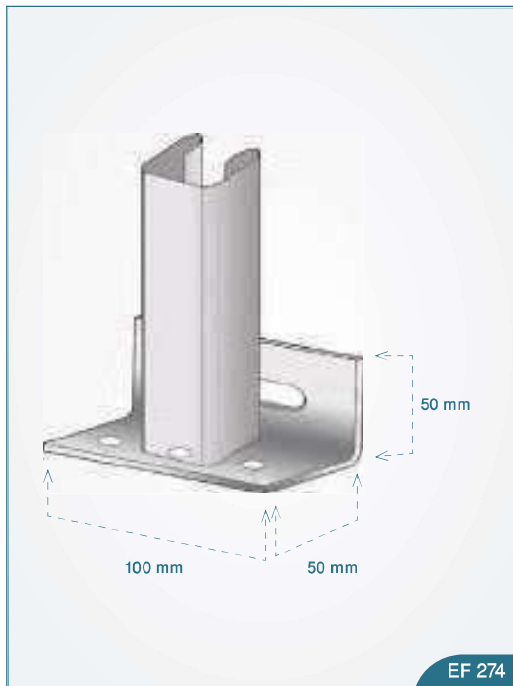
INTERNAL SPLICE



INTERNAL SPLICE



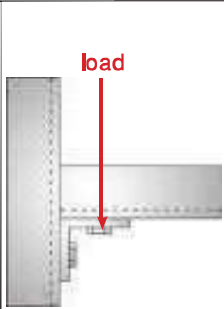
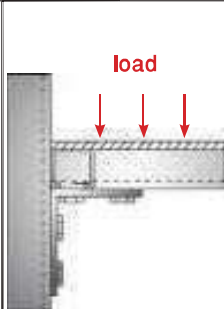
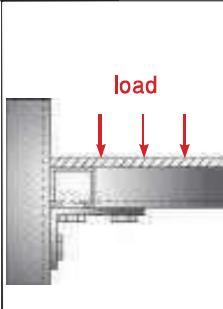
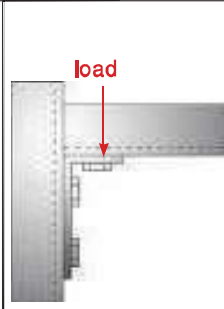
SLOT HOLE
65 mm

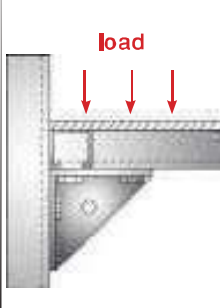
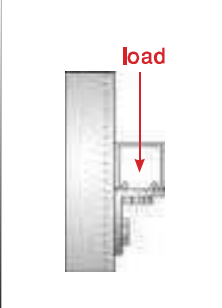
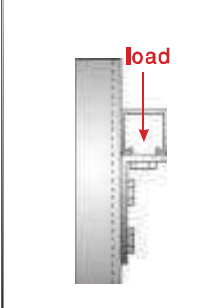
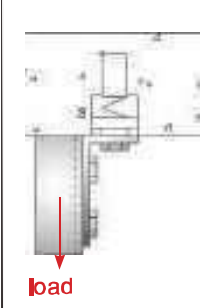
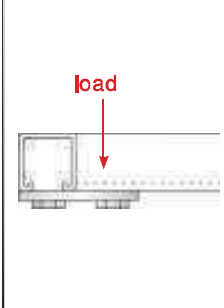


DESIGN LOAD DATA

FOR (41 mm) WIDTH SERIES CHANNEL

Design load data for typical slotted channel connections

CHANNEL THICKNESS										
	LBS	KN	LBS	KN	LBS	KN	LBS	KN	LBS	KN
15	1500	6.7	1000	44	2000	89	1500	6.7	2000	89
2	1000	44	650	2.9	2000	89	1000	44	1500	6.7
2.5	750	3.3	500	2.2	1500	6.7	1000	44	900	4.0

90° Fitting (when used in position shown)							Plate plate fittings			
CHANNEL THICKNESS										
	LBS	KN	LBS	KN	LBS	KN	LBS	KN	LBS	KN
15	3000	13.3	500	2.2	500	2.2	1200	5.3	1000	44
2	2000	8.9	500	2.2	500	2.2	1200	5.3	800	3.6
2.5	1500	6.7	500	2.2	500	2.2	1000	4.4	600	2.7

Both ends of beams supported.

Load diagrams indicate up to three design loads, one for 15 gage sections (41 x 41), one for 2 mm sections and one for 2.5 gage sections (41 x 41)

Load data based on (41 x 41) nut and 1/2 bolt.

Safety factor = 2 1/2 based on ultimate strength of connection.



BEARING LOADS FOR CHANNEL & COMBINATIONS

FOR (41 mm) WIDTH SERIES CHANNEL

bearing loads on

channels

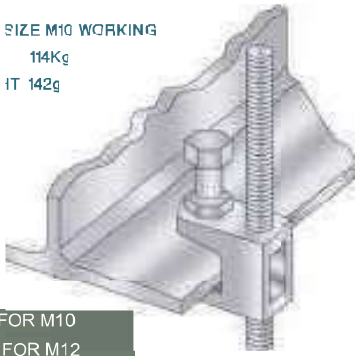
CHANNEL	BEARING LENGTH 41 mm		BEARING LENGTH 41 mm		BEARING LENGTH 82.6 mm	
	MAXIMUM ALLOWABLE LOADS		MAXIMUM ALLOWABLE LOADS		MAXIMUM ALLOWABLE LOADS	
	LBS	KN	LBS	KN	LBS	KN
CM1-41	5000	22.2	3500	15.6	8000	35.6
CM1-41	3500	15.6	2500	11.1	5500	24.5
CM1-41	2000	8.9	1500	6.7	3000	13.3
CM1-41	5000	22.2	3500	15.36	8000	35.6
CM1-41	6000	26.7	4000	17.8	9000	40.0
CM1-21	2200	9.8	1700	7.6	3500	15.6
CM1-21	3400	15.1	2600	11.6	4800	21.4



BEAM FIXING AND SUSPENSIONS

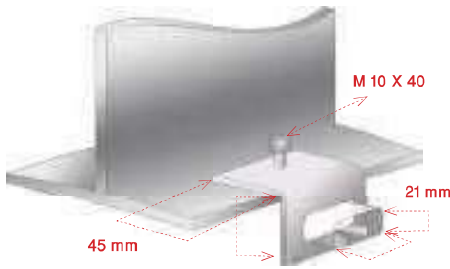
BEAM CLAMP

HOLE SIZE M10 WORKING
LOAD 114Kg
WEIGHT 142g



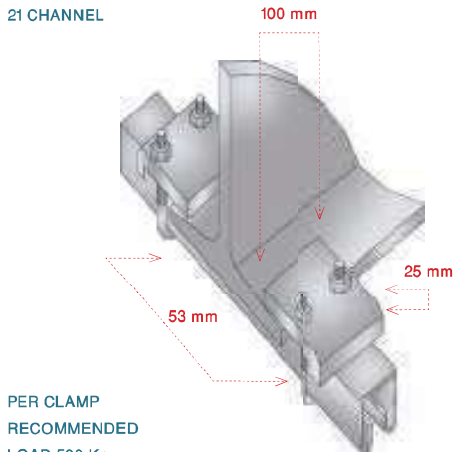
YA - 50 - FOR M10
YA - 51 - FOR M12

BEAM CLAMP



FOR CHANNEL 41X21
YA 53

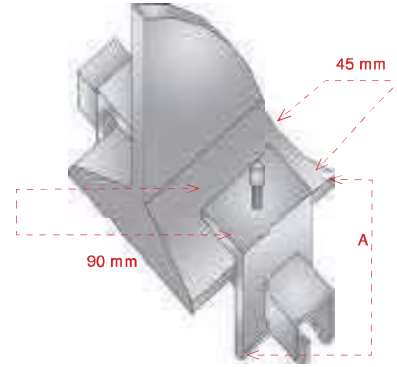
BEAM CLAMP



PER CLAMP
RECOMMENDED
LOAD 500 Kg
WEIGHT 260g

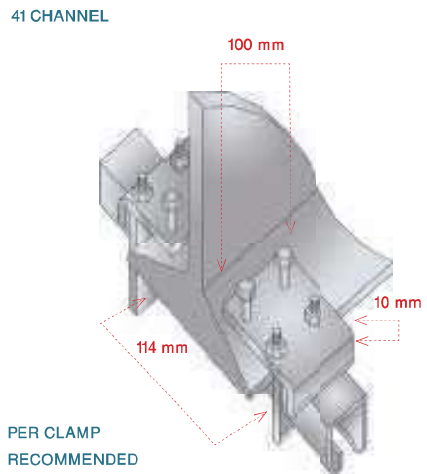
41 X 41 CHANNEL YA - 54
41 X 21 CHANNEL YA - 55
41 X 82 CHANNEL YA - 56

BEAM CLAMP



FOR CHANNEL 41X41
YA - 52

BEAM CLAMP



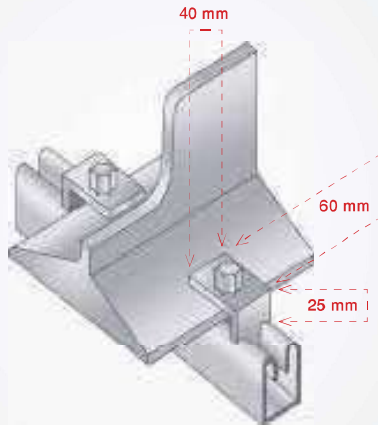
PER CLAMP
RECOMMENDED
LOAD 625 Kg
WEIGHT 810g

YA - 57 (41 X 21) YA - 58 (41 X 41)



BEAM CLAMP

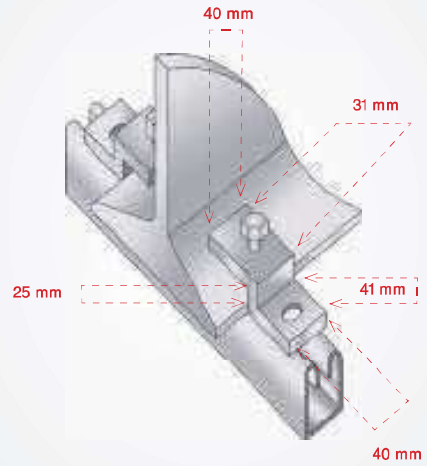
RECOMMENDED LOAD PER
CLAMP 325 Kg WEIGHT 110g



YA - 59

BEAM CLAMP

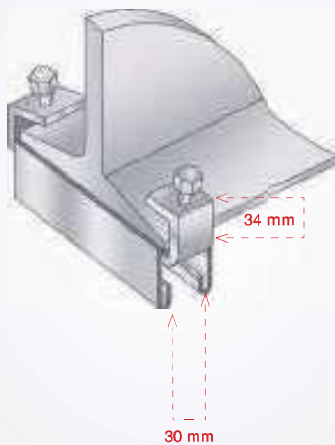
RECOMMENDED LOAD PER
CLAMP 225 Kg WEIGHT 150g



YA - 60

BEAM CLAMP

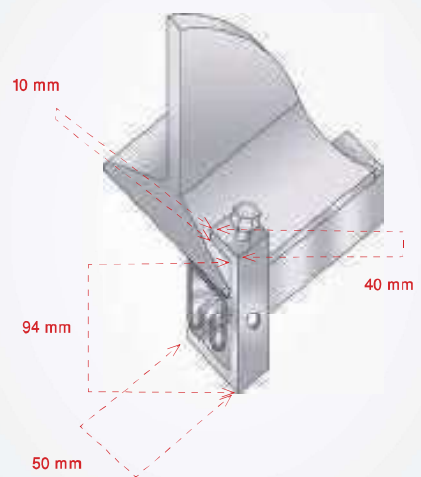
RECOMMENDED LOAD PER
CLAMP 225 Kg WEIGHT 140g



YA - 61

BEAM CLAMP

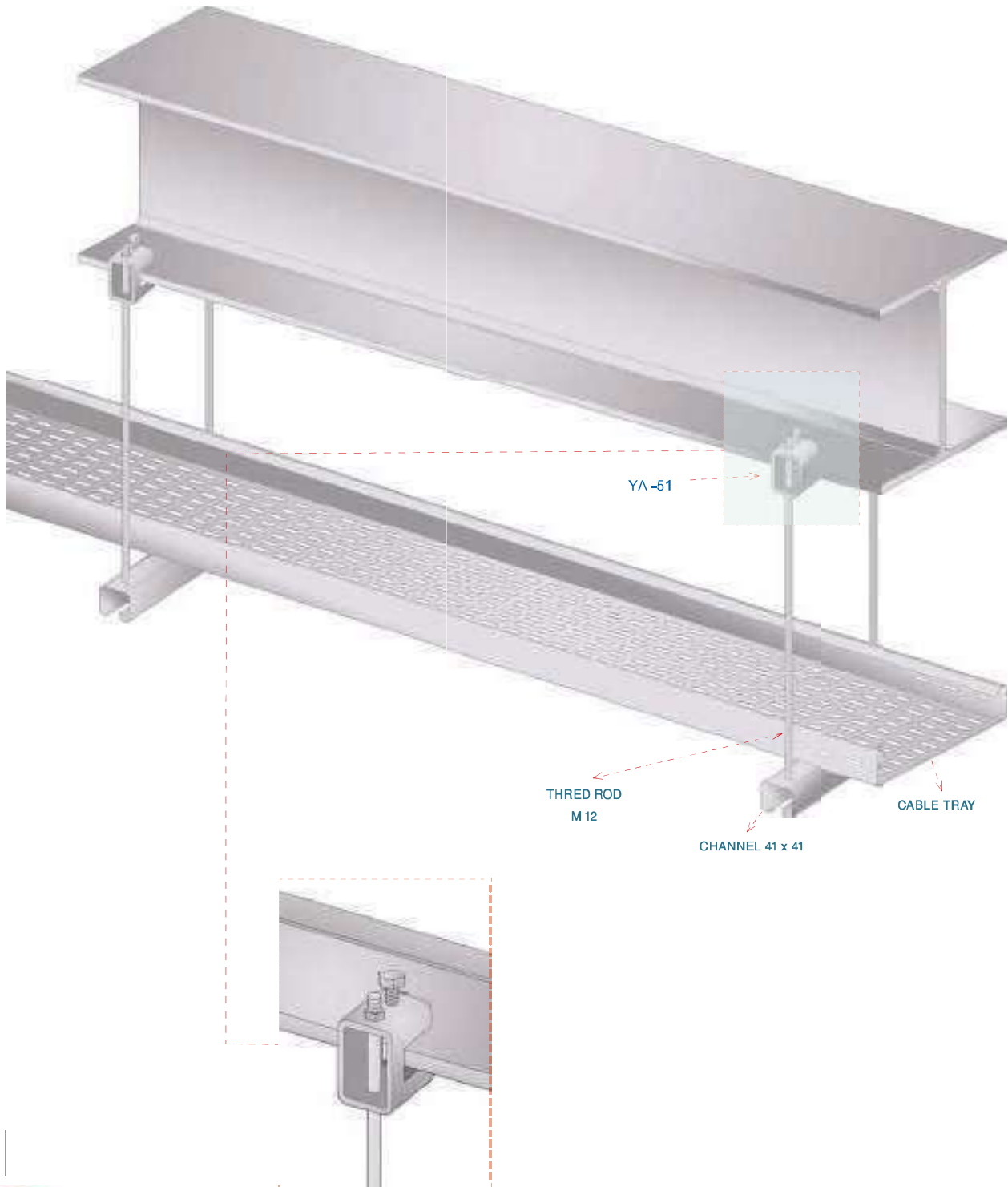
RECOMMENDED LOAD PER
CLAMP 250 Kg WEIGHT 400g



YA - 62



STRUCTURAL CONNECTION





CLEAT



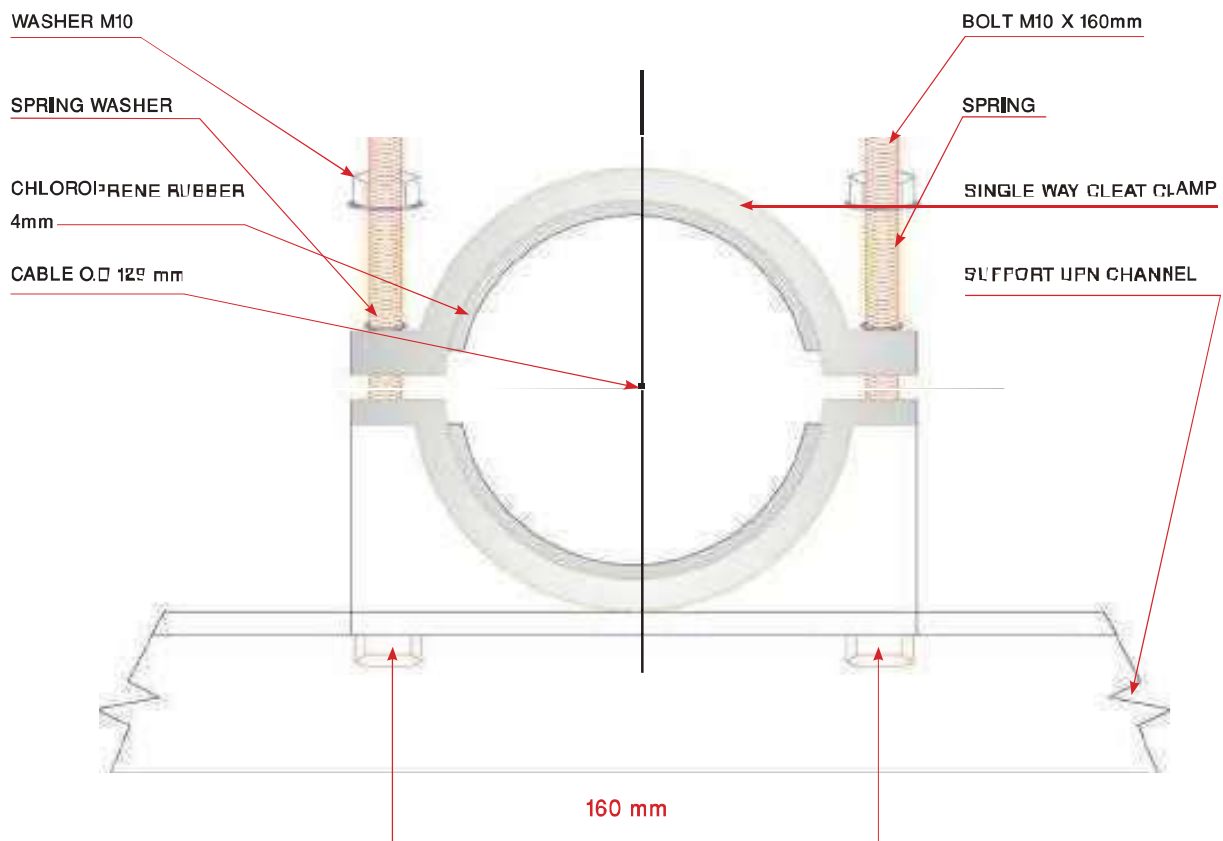
Listening Is Our Success





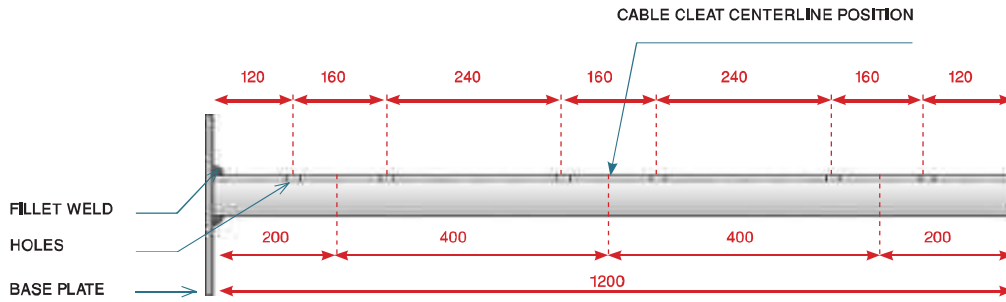
SINGLE WAY CABLE CLEAT

FOR CABLE (O.D 129 mm & 94 & 104 mm.

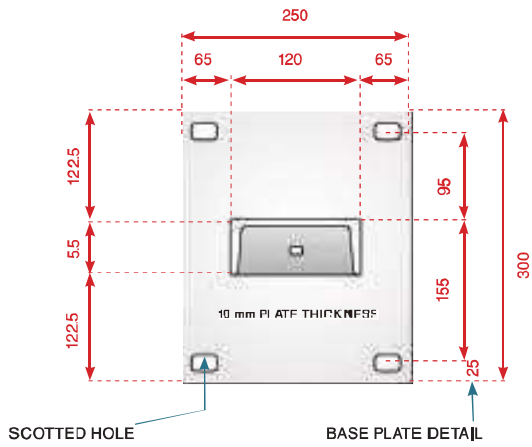


DIE CAST ALLUMINUM CABLE CLEATS FOR 132 kv
 USE FOR CABLE 1 X 635 mm CABLES, APPRO X DIA 94 mm
 AND FOR CABLE 1 X 1200 mm CABLES, APPRO X DIA 1044 mm

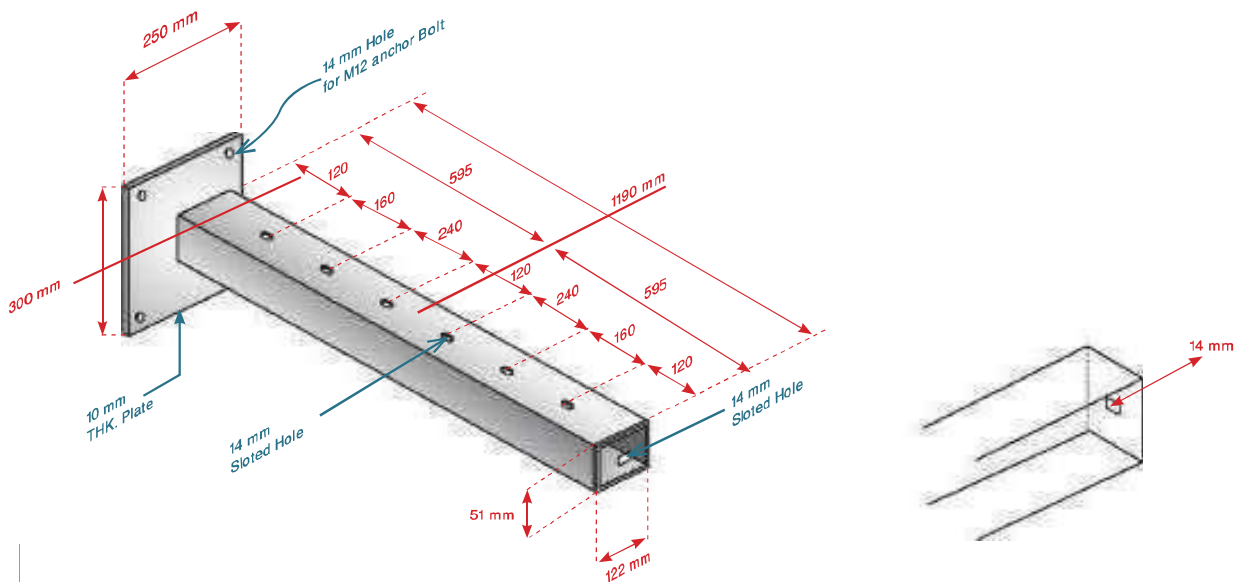
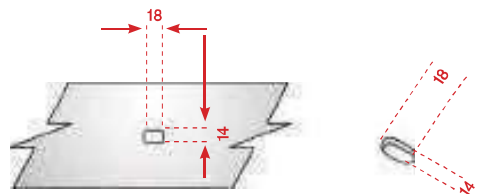




HDGAF UPN CHANNEL BRACKET (FOR 800 Sq mm 380 KV cable) AND 1200 Sq mm 380 KV CABLE AND 630 Sq mm 380 KV CABLE



UPN CHANNEL HOLE DETAIL



ISOMETRIC VIEW

NOTE: COMPLETE CHANNEL BRACKET WILL BE FIXED TO TUNNEL WALL AT EVERY 1 METER BY 4 NO'S 12 mm /120 mm LONG ANCHOR BOLT



AL HOTY-STANGER



ELECTRICAL WAYS FABRICATORS

RIYADH

Our Ref.: RD-11716

CHEMICAL ANALYSIS REPORT
ON CABLE CLAMP SAMPLES

Date: 03 Jan. 2007

Page: 1 of 1

SAMPLE REFERENCE : Cable Clamps Aluminium 240
DATE SAMPLE RECEIVED : 04 December 2008

TEST METHOD:

- i) ASTM E - 34
- ii) ICP - OES

RESULTS:

COPPER	(Cu)	%	=	3.25
MANGANESE	(Mn)	%	=	0.10
ZINC	(Zn)	%	=	1.40
IRON	(Fe)	%	=	1.05
LEAD	(Pb)	%	=	0.07
CHROMIUM	(Cr)	%	=	0.03
TITANIUM	(Ti)	%	=	< 0.01
NICKEL	(Ni)	%	=	0.10
SILICON	(Si)	%	=	8.32
MAGNESIUM	(Mg)	%	=	< 0.01
ALUMINIUM	(Al)	%	=	85.6

< = Less Than

NOTE:

Test Method Variation: Nil

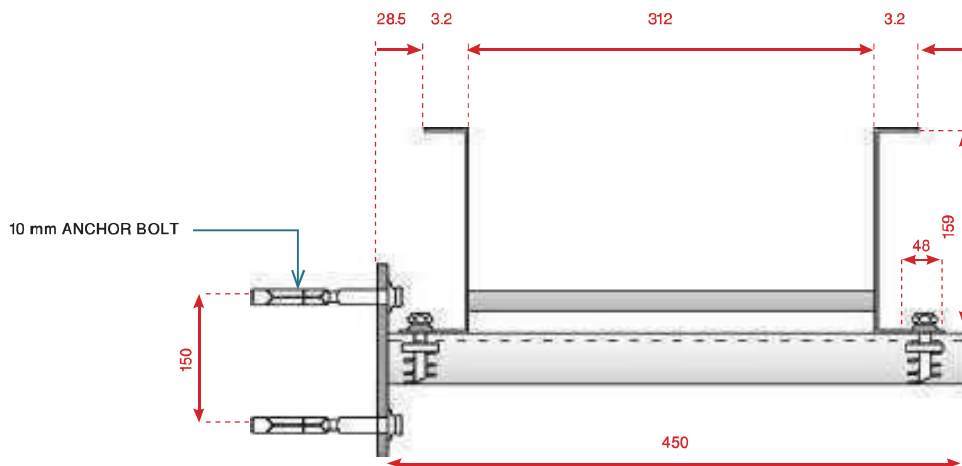
TEOFILO D. CABAL JR.
Assistant Regional Manager - Riyadh
For AL HOTY-STANGER LTD.



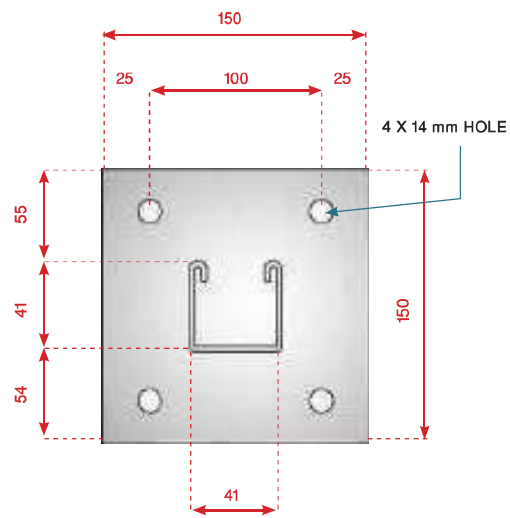
NAEEM ZAIDI
Materials Analysis Dept. - Manager
For AL HOTY-STANGER LTD.

This report relates only to the sample tested and shall only be reproduced in full with the written approval of Al Hoty Stanger Ltd. Co. Laboratory

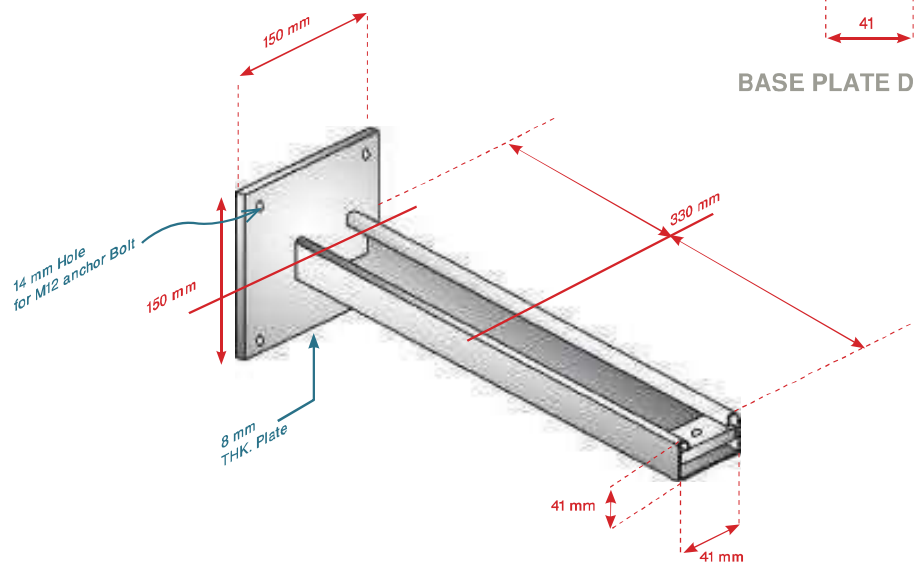




H D G UNISTRUT CHANNEL BRACKET FOR CABLE LADDER 300 MM WIDTH



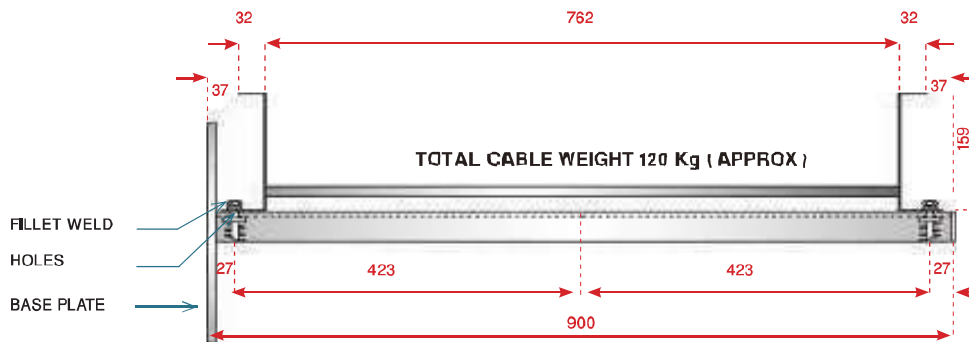
BASE PLATE DETAIL



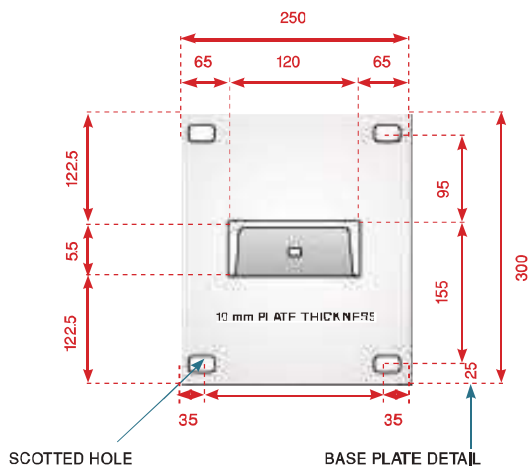
ISOMETRIC VIEW

NOTE: COMPLETE CHANNEL BRACKET WILL BE FIXED TO TUNNEL WALL AT EVERY 1 METER INTERVAL BY 4 NO'S 12 mm /120 mm LONG ANCHOR BOLT

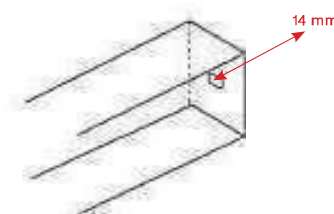
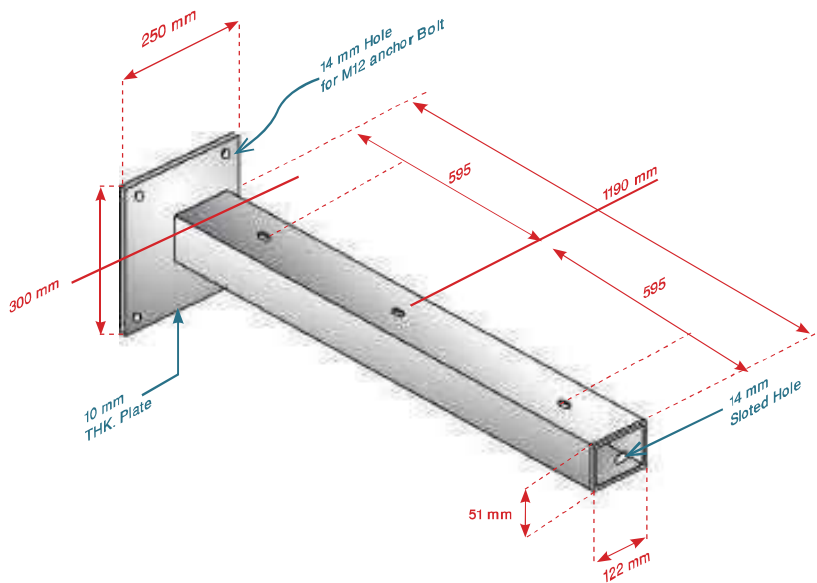
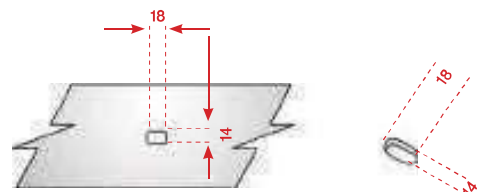




**HDGAF UPN CHANNEL BRACKET
(FOR 900 mm LONG)**



UPN CHANNEL HOLE DETAIL



ISOMETRIC VIEW

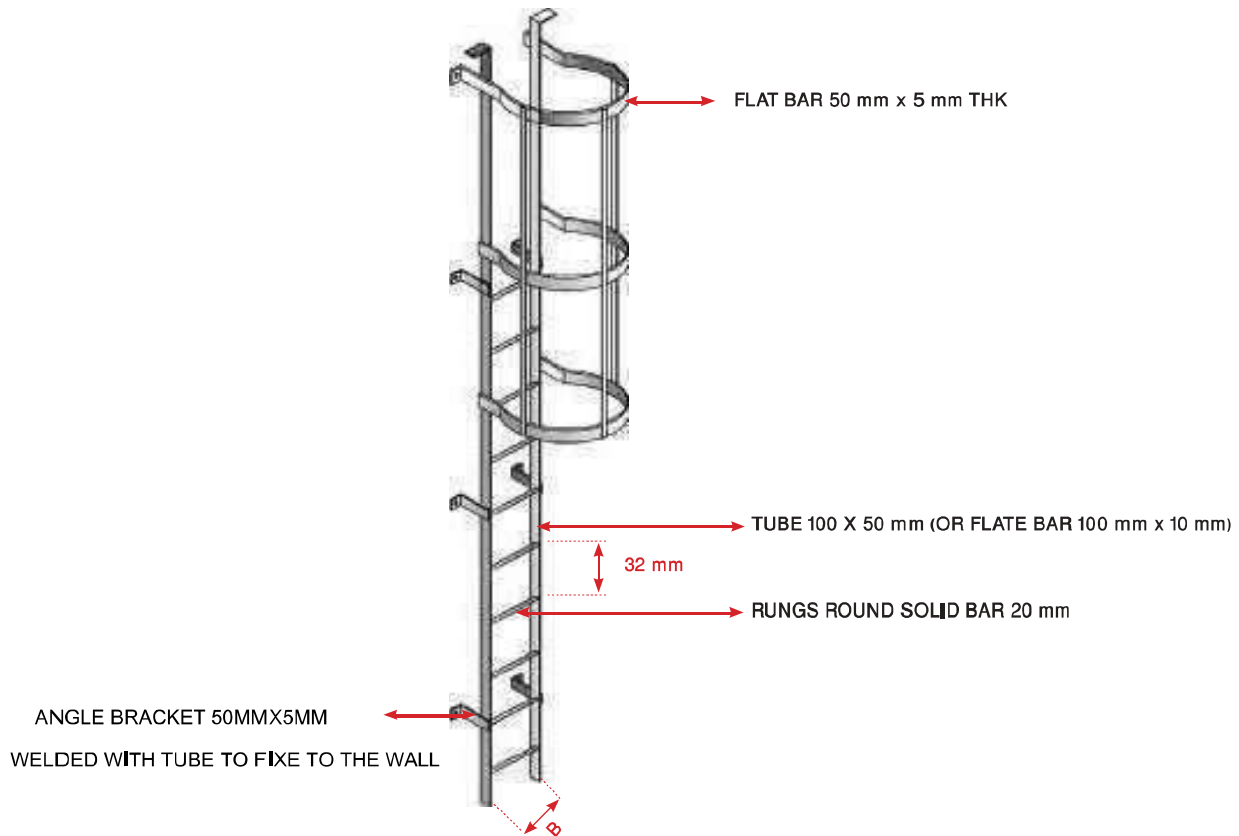
**NOTE: COMPLETE CHANNEL BRACKET WILL BE FIXED TO TUNNEL WALL AT EVERY 1 METER
4 NOS 12 mm /120 mm LONG ANCHOR BOLT**



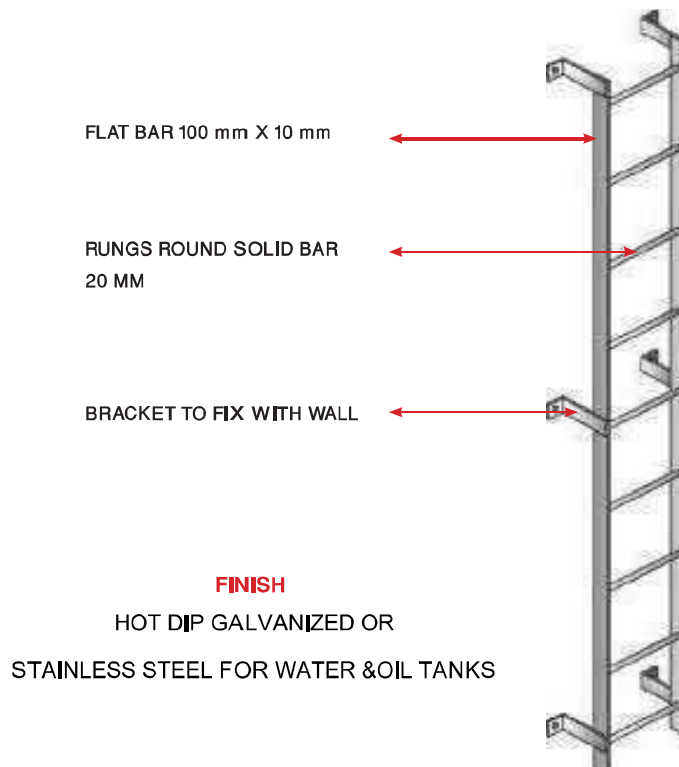


CAGE LADDER

SAFETY CAGE LADDER

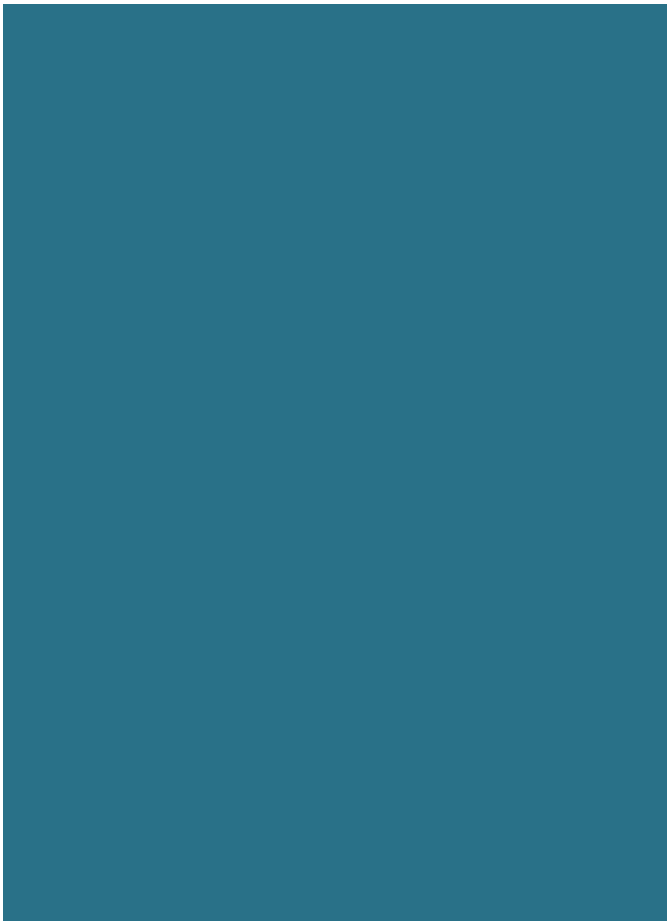


LADDER





ORDINARY STRUCTURAL APPLICATIONS



Listening Is Our Success

EQUAL ANGLES

size	Kg / Mtr	Kg / Pc (6Mtr)	No. of Pcs / Ton
20 x 20 x 3,0 mm	0,88	5,280	189,390
25 x 25 x 2,5 mm	0,94	5,640	177,300
25 x 25 x 3,0 mm	1,12	6,720	148,809
30 x 30 x 2,5 mm	1,13	6,780	147,493
30 x 30 x 3,0 mm	1,36	8,160	122,550
38 x 38 x 2,5 mm	1,49	8,940	111,857
40 x 40 x 3,0 mm	1,84	11,040	90,580
40 x 40 x 4,0 mm	2,42	17,520	68,871
40 x 40 x 5,0 mm	2,97	17,820	56,117
40 x 40 x 6,0 mm	3,52	21,120	47,348
50 x 50 x 4,0 mm	3,06	18,360	54,466
50 x 50 x 5,0 mm	3,77	22,620	44,209
50 x 50 x 6,0 mm	4,47	26,820	37,285
60 x 60 x 5,0 mm	4,57	27,420	36,469
60 x 60 x 6,0 mm	4,42	32,520	30,750
63 x 63 x 6,0 mm	5,72	34,320	29,137
65 x 65 x 6,0 mm	5,80	34,800	28,736
65 x 65 x 8,0 mm	7,70	46,200	21,645
70 x 70 x 6,0 mm	6,38	38,280	26,123
70 x 70 x 7,0 mm	7,38	44,280	22,584
75 x 75 x 6,0 mm	7,06	42,390	23,590
80 x 80 x 6,0 mm	7,34	44,040	22,707
80 x 80 x 7,0 mm	8,49	50,940	19,631
80 x 80 x 8,0 mm	9,63	57,780	17,307
80 x 80 x 10 mm	11,90	71,400	14,006
90 x 90 x 6,0 mm	8,30	49,800	20,080
90 x 90 x 7,0 mm	9,61	57,660	17,343
90 x 90 x 8,0 mm	10,90	65,400	15,291
90 x 90 x 9,0 mm	12,20	73,200	13,661
100 x 100 x 7,0 mm	10,70	64,200	15,576
100 x 100 x 8,0 mm	12,20	73,200	13,661
100 x 100 x 9,0 mm	13,60	81,600	12,255
100 x 100 x 10 mm	15,00	90,000	11,111
100 x 100 x 12 mm	17,82	106,920	9,352
120 x 120 x 10 mm	18,20	109,200	9,158
120 x 120 x 12 mm	21,60	129,600	7,716
150 x 150 x 12 mm	27,30	163,800	6,105
150 x 150 x 15 mm	33,80	202,800	4,931
200 x 200 x 16 mm	48,50	291,000	3,436



FLAT BARS

FLAT BARS

size (mm)	Weight in Kg/mtr						
	3mm	5mm	6mm	8mm	10mm	12mm	15mm
10	0.24	0.39					
12	0.28	0.47	0.57	0.75	0.94		
16	0.38	1.63	0.75				
20	0.47	0.78	0.94	1.26	1.57	1.89	
25	0.59	0.98	1.18	1.57	1.96	2.36	2.94
30	0.71	1.18	1.41	1.88	2.36	2.83	3.53
35		1.37	1.65	2.20	2.75	3.30	4.12
40	0.94	1.57	1.88	2.51	3.14	3.77	4.71
45	1.06	1.77	2.12	2.83	3.53	4.24	5.30
50	1.18	1.96	2.36	3.14	3.93	4.71	5.89
55		2.16	2.59	3.45	4.32	5.18	6.48
60	1.41	2.36	2.83	3.77	4.71	5.65	5.07
65	1.53	2.55	3.06	4.08	5.10	6.12	7.65
70	1.65	2.75	3.30	4.40	5.50	6.59	8.24
75		2.94	3.53	4.71	5.89	7.07	8.83
80	1.88	3.14	3.77	5.02	6.28	7.54	9.42
90		3.53	4.24	5.65	7.07	8.48	10.6
100	2.36	3.93	4.71	6.28	7.85	9.42	11.8
110		4.32	4.18	6.91	8.64	10.4	13.0
120		4.71	5.65	7.54	9.42	11.3	14.1
130	3.06	5.10	6.12	8.16	10.20	12.2	15.3
140		5.50	6.60	8.79	11.00	13.2	16.5
150	3.53	5.89	7.05	9.42	11.80	14.1	17.7



ROUND BARS

ROUND BARS

Size (mm)	Length (m)	Weight (Kg) Per Piece	No. of Pcs Per Ton
10	12	7.392	135.281
12	12	10.644	93.949
14	12	14.496	68.984
15	12	16.644	60.081
16	12	18.936	52.809
18	12	23.964	41.729
20	12	29.592	33.792
22	12	35.808	27.926
24	12	42.612	23.467
25	12	46.236	21.628
26	12	50.040	19.984
28	12	57.960	17.253
30	12	66.576	15.020



SHAFTING BARS

SHAFTING BARS

Size (mm)	Kg / Mtr	Kg / 6Mtr	No. of Pcs./Ton	Size (mm)	Kg / Mtr	Kg / 6Mtr	No of Pcs./Ton
6.00	0.2219	1.3314	751,089	30.00	5.5488	33,293	30,037
6.35	0.2486	1,4916	670,421	31.75	6.2151	37,291	26,816
7.00	0.3021	1,8126	551,694	32.00	6.3133	37,880	26,399
7.14	0.3143	1,8858	530,279	33.00	6,7141	40,285	24,823
7.94	0.3884	2,3304	429,111	34.92	7,5202	45,121	22,163
8.00	0.3946	2,3676	422,369	35.00	7.5526	45,316	22,067
9.00	0.4994	2,9964	333,734	36.00	7.9903	47,942	20,859
9.52	0.5593	3,3558	297,992	38.00	8.9028	53,417	18,721
10.00	0.6165	3,699	270,343	38.10	8.9497	53,698	18,623
11.00	0.746	4,476	223,414	40.00	9,8646	59,188	16,895
11.11	0.761	4,566	219,010	41.27	10,5035	63,021	15,868
12.00	0.8878	5,3268	187,730	42.00	10,8757	65,254	15,325
12.70	0.9944	5,9664	167,605	44.45	12,1815	73,089	13,682
13.00	1,0419	6,2514	159,964	45.00	12,4849	74,909	13,349
14.00	1,2084	7,2504	137,923	47.62	13,9839	83,903	11,918
14.29	1,2584	7,5504	132,443	48.00	14,1945	85,167	11,742
15.00	1,3872	8,3232	120,146	50.00	15,4143	92,486	10,812
15.88	1,5538	9,3228	107,264	50.80	15,9106	95,464	10,475
16.00	1,5783	9,4698	105,599	53.97	17,9616	107,770	9,279
17.00	1,7818	10,6908	93,538	55.00	18,6503	111,902	8,936
18.00	1,9976	11,9856	83,433	57.15	20,1369	120,821	8,277
19.00	2,2257	13,3542	74,883	60.00	22,1954	133,172	7,509
19.05	2,2374	13,4244	74,491	60.32	22,4328	134,597	7,430
20.00	2,4661	14,7966	67,583	63.50	24,8604	149,162	6,704
21.00	2,7189	16,3134	61,299	65.00	26,0488	156,293	6,398
22.00	2,984	17,904	55,853	66.67	27,4044	164,426	6,082
22.22	3,0453	18,2718	54,729	69.85	30,081	180,486	5,541
23.00	3,2615	19,569	51,101	70.00	30,2104	181,262	5,517
23.81	3,4958	20,9748	47,676	73.03	32,8778	197,267	5,069
24.00	3,5513	21,3078	46,931	75.00	34,6803	208,082	4,806
25.00	3,8533	23,1198	43,253	76.20	35,7989	214,793	4,656
25.40	3,9776	23,8656	41,901	80.00	39,4584	236,750	4,224
26.00	4,1678	25,0068	39,989	82.55	42,014	252,084	3,967
27.00	4,4946	26,9676	37,082	88.90	48,7263	292,358	3,420
28.00	4,8336	29,0016	34,481	90.00	49,9396	299,638	3,337
28.58	5,0342	30,205	33,107	100.00	61,610	369,660	2,705



SHEETS

ELECTRO GALVANIZED SHEET

Width	Length	Thickness	Weight / Sht (Kg)	No. of Sheets /Ton
(m)	(m)	(m)		
1,22	2,44	1,00	23,546	42,469
1,22	2,44	1,50	35,320	28,313
1,22	2,44	2,00	47,093	21,235
1,22	2,44	3,00	70,639	14,156
1,00	2,00	1,00	15,820	63,211
1,00	2,00	1,50	23,730	42,141
1,00	2,00	2,00	31,640	31,606
1,00	2,00	3,00	47,460	21,070

STAINLESS STEEL SHEETS

Description	Kg / Pc	No. of Pcs. / Ton
S.S. 304, 2B Finish		
4' x 8' x 0,4 mm	9,42	106,15
4' x 8' x 0,5 mm	11,820	84,61
4' x 8' x 0,6 mm	14,190	70,48
4' x 8' x 0,7 mm	16,524	60,52
4' x 8' x 0,9 mm	21,204	47,00
4' x 8' x 1,0 mm	23,606	42,36
4' x 8' x 1,20 mm	28,360	35,26
4' x 8' x 1,25 mm	29,507	33,89
4' x 8' x 1,50 mm	35,409	28,21
4' x 8' x 2,0 mm	47,270	21,16
4' x 8' x 3,0 mm	70,900	14,11



SHEETS

HOT DIP GALVANIZED SHEET

Width (m)	Length (m)	Thickness (mm)	G-90		G-60	
			Kg/Sheet	Pcs/Ton	Kg/Sheet	Pcs/Ton
1,22	2,44	0,50	12,503	79,984	12,2198	81,8346
1,22	2,44	0,70	17,176	58,220	16,8933	59,1949
1,22	2,44	0,80	19,513	51,248	19,2301	52,0017
1,22	2,44	0,90	21,850	45,769	21,5669	46,3673
1,22	2,44	1,00	24,187	41,345	23,9037	41,8345
1,22	2,44	1,20	28,860	34,650	28,5773	34,9928
1,22	2,44	1,50	35,870	27,878	35,5876	28,0996
1,22	2,44	2,00	47,554	21,029	47,2716	21,1544
1,22	2,44	2,50	59,238	16,881	58,9555	16,9619
1,22	2,44	3,00	70,922	14,100	70,6395	14,1564
1,22	2,44	4,00	94,290	10,606	94,0073	10,6375
1,22	2,44	0,89	21,616	46,262	21,3332	46,8752
1,22	2,44	0,71	17,410	57,439	17,1270	58,3873
1,22	2,44	0,56	13,905	71,918	13,6218	73,4115
1,22	2,44	0,46	11,568	86,447	11,2850	88,6128
1,00	2,00	0,50	8,400	119,048	8,2100	121,8027
1,00	2,00	0,70	11,540	86,655	11,3500	88,1057
1,00	2,00	0,80	13,110	76,278	12,9200	77,3994
1,00	2,00	1,00	16,250	61,538	16,0600	62,2665
1,00	2,00	1,20	19,390	51,573	19,2000	52,0833
1,00	2,00	1,50	24,100	41,494	23,9100	41,8235
1,00	2,00	2,00	31,950	31,299	31,7600	31,4861
1,00	2,00	2,50	39,800	25,126	39,6100	25,2461
1,00	2,00	3,00	47,650	20,986	47,4600	21,0704
1,00	2,00	4,00	63,350	15,785	63,1600	15,8328
1,00	2,00	0,89	14,523	68,856	14,3330	69,7691
1,00	2,00	0,71	11,697	85,492	11,5070	86,9036
1,00	2,00	0,56	9,342	107,043	9,1520	109,2657
1,00	2,00	0,46	7,772	128,667	7,5820	131,8913



HOT ROLLED STEEL SHEET

Thickness (mm)	Size (Kg/Sheet) (1000 x 2000 mm)	Size (Kg/Sheet) 1220 x 2440 mm)	Size (Kg/Sheet) (2000 x 6000 mm)
1,2	18,840	28,041	0,000
1,5	23,550	35,052	0,000
2	31,400	46,736	0,000
2,5	39,250	58,420	0,000
3	47,100	70,104	0,000
4	62,800	93,472	376,800
5	78,500	116,839	471,000
6	94,200	140,207	565,200
7	109,900	163,575	659,400
8	125,600	186,943	753,600
9	141,300	210,311	847,800
10	157,000	233,679	942,000
11	172,700	257,047	1036,200
12	188,400	280,415	1130,400
14	219,800	327,150	1318,800
16	251,200	373,886	1507,200
20	314,000	467,358	1884,000
25	392,500	584,197	2355,000
30	471,000	701,036	2826,000
35	549,500	817,876	329,000
40	628,000	934,715	3768,000
45	706,500	1051,555	4239,000
50	785,000	1168,394	4710,000
60	942,000	1402,073	5652,000
70	1099,000	1635,752	6594,000
80	1256,000	1869,430	7536,000
90	1413,000	2103,109	8478,000
100	1570,000	2336,788	9420,000



CHECKED PLATE

CHECKED PLATE

Thickness	Weight / Sheet (Kg)	Weight / Sheet (Kg)
(mm)	Size (1000 x 2000 mm)	Size (1219 x 2438 mm)
1.6	28,32	42,06
1,8	31,46	46,75
2	34,60	51,41
2,3	39,31	58,41
2,5	42,45	63,08
2,8	47,16	70,08
3	50,30	74,74
3,8	62,86	93,41
4	66,00	98,07
4,8	78,56	116,74
5	81,70	121,40
6	97,40	144,73
7	113,10	168,98
7,8	125,86	186,73
8	128,80	191,39
9	144,5	214,72
9,8	157,06	233,39
10	180,20	238,05
10,8	172,76	258,71
11	175,90	261,38
11,8	188,46	280,04
12	191,60	284,71

SQUARE BARS

SQUARE BARS

Width	Thickness	Length	Weight (Kg)	No. of Pcs
(mm)	(mm)	(m)	Per Piece	Per Ton
10	10	6	4,710	212,314
12	12	6	6,782	147,440
14	14	6	9,232	108,324
16	16	6	12,058	82,935
18	18	6	15,260	65,529
20	20	6	18,840	53,079
25	25	6	29,438	33,970
30	30	6	42,390	23,590



U P N

STEEL PROFILES - UPN

Size	KG/M	KG/6M	NOS./TON	KG/12M	NOS./TON	WEB THK	FLANGE THK
80x45x6,0x8	8,64	51,84	19,290	103,68	9,645	6,0	8,00
100x50x6,0x8,5	10,60	63,60	15,723	127,20	7,862	6,0	8,50
120x55x7,0x9	13,40	80,40	12,438	160,80	6,219	7,0	9,00
140x60x7,0x10	16,00	96,00	10,417	192,00	5,208	7,0	10,00
160x65x7,5x10,5	18,80	112,80	8,865	225,60	4,433	7,5	10,50
180x70x8,0x11	22,00	132,00	7,576	264,00	3,788	8,0	11,00
200x75x8,5x11,5	25,30	151,80	6,587	303,60	3,294	8,5	11,50
220x80x9x12,5	29,40	176,40	5,669	352,80	2,834	9,0	12,50
240x85x9,5x13	33,20	199,20	5,020	398,40	2,510	9,5	13,00
250x80x10	32,50	195,00	5,128	390,00	2,564		
250x105x15	52,00	312,00	3,205	624,00	1,602		
250x100x10	42,20	253,20	3,949	506,40	1,974		
260x90x10x14	37,90	227,40	4,397	454,80	2,198	10,0	14,00
280x95x10x15	41,80	250,80	3,988	501,60	1,994	10	15,00
300x100x10x16	46,20	277,20	3,607	554,40	1,804	10,0	16,00
320x100x14x17,5	59,50	357,00	2,801	714,00	1,400	14,0	17,50



U - CHANNEL							
Size	KG/M	KG/6M	NOS./TON	KG/12M	NOS./TON	WEB THK	FLANGE THK
20x10x3	4.50	27.00	37,000	54.00	74.00	5.0	5.50
40x20x5x5.5	2.87	17.22	58,070	34.44	29,030	5.0	6.00
50x25x5x6.0	3.86	23.16	43,170	46.32	21,580	5.0	7.00
50x38x5x7.0	5.59	33.54	29,810	67.08	14,910	6.0	6.00
60x30x6x6.0	5.07	30.42	32,870	60.84	16,430	5.5	7.50
65x42x5x7.5	7.09	42.54	23,507	85.08	11,754	6.0	6.50
70x40x6x6.5	6.77	40.62	24,620	81.24	12,310	7.5	11.00
200x80x7.5x11	24.60	147.60	6,775	295.20	3,388		
100x50x5	9.56	57.36	17,434	114.72	8,717	5.0	70.00
75x40x5x7	6.92	41.52	24,080	83.04	12,040	5.0	7.50
100x50x5x7.5	9.36	56.16	17,800	112.32	8,900	6.0	8.00
125x65x6x8	13.40	80.40	12,430	160.80	6,210	6.5	10.00
150x75x5.7x10	16.80	100.80	9,920	201.60	4,960	6.5	10.00
150x75x6.5x10	18.60	111.60	8,960	232.20	4,300	5.7	9.00
150x75x5.7x9	16.70	100.20	9,980	200.40	4,990		

STEEL PROFILES-UPE							
Size	KG/M	KG/6M	NOS./TON	KG/12M	NOS./TON	WEB THK	FLANGE THK
80x40x4.5x7.4	7.10	42.60	23,470	85.20	11,730	4.5	7.40
100x46x4.5x7.6	8.60	51.60	19,370	103.20	9,689	4.5	7.60
120x52x4.8x7.8	10.40	62.40	16,020	124.80	8,012	4.8	7.80
140x58x4.8x8.1	12.30	73.80	13,550	147.60	6,775	4.8	8.10
160x64x5.0x8.4	14.20	85.20	11,730	170.40	5,868	5.0	8.40
180x70x5.1x8.7	16.30	97.80	10,220	195.60	5,112	5.1	8.70
200x76x5.2x9.0	18.40	110.40	9,057	220.80	4,528	5.2	9.00



IPE

STEEL PROFILES - IPE

Size	Kg / M	Kg / 6M	Nos./Ton	Kg / 12M	Nos./Ton	Web Thk	Flange Thk.
80x46	6,00	36,00	27,778	72,00	13,888	3,8	5,20
100x55	8,10	48,60	20,576	97,20	10,288	4,1	5,70
120x64	10,40	62,40	16,025	124,80	8,012	4,4	6,30
140x73	12,90	77,40	12,919	154,80	6,459	4,7	6,90
160x82	15,80	94,80	10,548	189,60	5,274	5,0	7,40
180x91	18,80	112,80	8,865	225,60	4,432	5,3	8,00
200x100	22,40	134,40	7,440	268,80	3,720	5,6	8,50
220x110	26,20	157,20	6,361	314,40	3,181	5,9	9,20
240x120	30,70	184,20	5,428	368,40	2,714	6,2	9,80
270x135	36,10	216,60	4,617	433,20	2,308	6,6	10,20
300x150	42,20	253,20	3,949	506,40	1,975	7,1	10,70
330x160	49,10	294,60	3,394	589,20	1,697	7,5	11,50
360x170	57,10	342,60	2,918	685,20	1,459	8,0	12,70
400x180	66,30	397,80	2,514	795,60	1,257	8,6	13,50
450x190	77,60	465,60	2,147	931,20	1,073	9,4	14,60
500x200	90,70	544,20	1,837	1088,40	0,919	10,2	16,00
600x220	122,00	732,00	1,366	1464,00	0,683	12,0	19,00

IPE AA

STEEL PROFILES - IPE AA

Size	Kg / M	Kg / 6M	Nos./Ton	Kg / 12M	Nos./Ton	Web Thk	Flange Thk.
8x46	4,85	29,10	34,364	58,20	17,182	3,2	4,60
100x55	6,72	40,32	24,802	80,64	12,400	3,5	4,80
120x64	8,36	50,16	19,936	100,32	9,968	3,7	5,00
140x73	10,05	60,30	16,583	120,60	8,292	3,8	5,20
160x82	12,31	73,86	13,539	147,72	6,769	4,0	5,60
180x91	14,94	89,64	11,156	179,28	5,578	4,3	6,20
200x100	17,95	107,70	9,285	215,40	4,643	4,5	6,70
220x110	21,00	126,00	7,937	252,00	3,968	4,8	7,20
240x120	24,80	148,80	6,720	297,60	3,360	5,0	7,80



JIS

STEEL PROFILES - JIS (H) & (I)

Size	Kg / M	Kg / 6M	Nos./Ton	Kg / 12M	Nos./Ton	Web Thk	Flange Thk.
100x100x6x8	17.20	103.20	9,689	206.40	4,845	6.0	8.00
125x125x6,5x9	23.80	142.80	7,002	285.60	3,501	6.5	9.00
150x75x5x7	14.00	84.00	11,904	168.00	5,952	5.0	7.00
150x150x7x10	31.50	189.00	5,291	378.00	2,645	7.0	10.00
198x99x4,5x7	18.20	109.20	9,157	218.40	4,579	4.5	7.00
200x100x5,5x8	21.30	127.80	7,824	255.60	3,912	5.5	8.00
200x200x8x12	49.90	299.40	3,340	598.80	1,670	8.0	12.00
200x204x12x12	56.20	337.20	2,965	674.40	1,483	12.0	12.00
208x202x10x6	65.70	394.20	2,537	788.40	1,268	10.0	16.00
244x252x11x11	64.40	386.40	2,588	772.80	1,294	11.0	11.00
248x249x8x13	66.50	399.00	2,506	798.00	1,253	8.0	13.00
248x124x5x8	25.70	154.20	6,485	308.40	3,243	5.0	8.00
250x250x9x14	72.40	434.40	2,302	868.80	1,151	9.0	14.00
250x125x12	29.60	177.60	5,630	355.20	2,815	12.0	
298x149x5,5x8	32.00	192.00	5,208	384.40	2,604	5.5	8.00
300x150x6,5x9	36.70	220.20	4,541	440.40	2,271	6.5	9.00
304x301x11x7	106.00	636.00	1,572	1272.00	0,786	11.0	17.00
294x200x8x12	56.80	340.80	2,934	681.60	1,467	8.0	12.00
294x302x12x12	84.50	507.00	1,972	1014.00	0,986	12.0	12.00
298x299x9x14	87.00	522.00	1,916	1044.00	0,957	9.0	14.00
300x300x10x15	94.00	564.00	1,773	1128.00	0,886	10.0	15.00
300x305x15x15	106.00	636.00	1,572	1272.00	0,786	15.0	15.00
350x350x12x19	137.80	826.80	1,209	1653.60	0,604	12.0	19.00
350x175x7x11	49.60	297.60	3,360	595.20	1,680	7.0	11.00
396x199x7x11	56.60	339.00	2,949	672.00	1,263	7.0	11.00
400x200x8x13	66.00	396.00	2,525	792.00	1,048	8.0	13.00
496x199x9x14	79.50	477.00	2,096	954.00	1,048	9.0	14.00
500x200x10x16	89.60	537.60	1,860	1075.20	0,930	10.0	16.00



HEB

STEEL PROFILES - HEB

Size	Kg / M	Kg / 6M	Nos./Ton	Kg / 12M	Nos./Ton	Web Thk	Flange Thk.
100x100	20,40	122,40	8,170	244,80	4,085	6,0	10,00
120x120	26,70	160,20	6,242	320,40	3,121	6,5	11,00
140x140	33,70	202,20	4,946	404,40	2,473	7,0	12,00
160x160	42,60	255,60	3,912	511,20	1,956	8,0	13,00
180x180	51,20	307,20	3,255	614,40	1,627	8,5	14,00
200x200	61,30	367,80	2,719	735,60	1,359	9,0	15,00
220x220	71,50	429,00	2,331	858,00	1,165	9,5	16,00
240x240	83,20	499,20	2,003	998,40	1,002	10,0	17,00
260x260	93,00	558,00	1,792	1116,00	0,896	10,0	17,50
280x280	103,00	618,00	1,618	1236,00	0,809	10,5	18,00
300x300	117,00	702,00	1,414	1404,00	0,712	11,5	19,00
320x300	127,00	762,00	1,312	1524,00	0,656	11,5	20,50
340x300	134,00	804,00	1,244	1608,00	0,622	12,0	21,50
360x300	142,00	852,00	1,174	1704,00	0,586	12,5	22,50
400x300	155,00	930,00	1,075	1860,00	0,537	13,5	24,00
450x300	171,00	1026,00	0,975	2052,00	0,487	11,5	21,00
500x300	187,00	1122,00	0,891	2244,00	0,446	11,5	23,00



HEA

STEEL PROFILES - HEA

Size	Kg / M	Kg / 6M	Nos./Ton	Kg / 12M	Nos./Ton	Web Thk	Flange Thk,
100x96	16,70	100,20	9,980	200,40	4,990	5,0	8,00
120x114	19,90	119,40	8,375	238,80	4,187	5,0	8,00
140x133	24,70	148,20	6,747	292,40	3,374	5,5	8,50
160x152	30,40	182,40	5,482	364,80	2,741	6,0	9,00
180x171	35,50	213,00	4,694	426,00	2,377	6,0	9,50
200x190	42,30	253,80	3,940	507,60	1,970	6,5	10,00
220x210	50,50	303,00	3,300	606,00	1,650	7,0	11,00
240x230	60,30	361,80	2,763	723,60	1,382	7,5	12,00
260x250	68,20	409,20	2,443	818,40	1,223	7,5	12,50
280x270	76,40	458,40	2,182	916,80	1,091	8,0	13,00
300x290	88,30	529,80	1,887	1059,60	0,944	8,5	14,00
320x310	97,60	585,60	1,707	1171,20	0,853	9,0	15,50
340x330	105,00	630,00	1,587	1260,00	0,793	9,5	16,50
360x350	112,00	672,00	1,488	1344,00	0,744	10,0	17,50
400x390	125,00	750,00	1,333	1500,00	0,666	11,0	19,00
450x440	140,00	840,00	1,190	1680,00	0,595	11,5	21,00
500x490	155,00	930,00	1,075	1860,00	0,538	12,0	23,00



BLACK ROUND TUBES

FOR ORDERY STRUCTURAL APPLICATIONS

Table 7. METRIC DIMENSION, WEIGHT & PACKING DATA:

Nominal Size (inch)	Wall Thickness (mm)		Calculated Weights (kg/m)														No. Of pieces Per standard Lift bundle*
	Nominal Size (mm)		1.2	1.5	2.0	2.5	3.2	4.0	4.5	5.5	6.0	6.5	7.2				
1/2	21.3		0.59	0.73	0.96	1.29	1.5										64
3/4	26.7		0.75	0.93	1.23	1.53	1.95										36
1	33.4		0.95	1.18	1.55	1.96	2.42										36
1.1/4	42.2		1.22	1.53	1.98	2.5	3.09										36
1.1/2	48.2		1.32	1.74	2.28	2.9	3.57	4.41									36
2	60.2		1.72	2.18	2.88	3.6	4.49	5.56									25
2.1/2	76.2		2.19	2.76	3.65	5.54	5.73	7.11									25
3	88.9		2.63	3.233	4.286	5.4	6.88	8.5	9.57								16
4	114.3		3.39	5.54	5.6	6.98	8.88	11	12.38	14.47							16
5	141.3		6.77	6.96	10.07	13.1	15.10	18.83	21.14	25.75	28.04	30.32					
6	168.3																
7	197.3																

(Standard Length: 6 meters)

BLACK ROUND TUBES

Outside Dimension Measured Across Flats:

Largest Nominal

Outside Dimension

Under 30 mm

30 mm and over

Tolerances

± 0.25 mm

± 1.5%

Wall thickness

Under 3.0 mm

30 mm and over

Tolerances

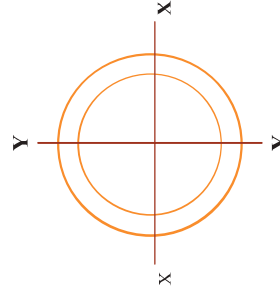
± 0.3 mm

± 0.3%

Length:

Plus 50 mm and minus zero.

*Applicable to 6-meter length tube



ROUND TUBES

FOR ORNAMENTAL APPLICATIONS

Table 4. METRIC DIMENSION, WEIGHT & PACKING DATA:

Wall Thickness (mm) Nominal Size (mm)	Calculated Weights (kg/m)							No. Of pieces Per Standard Lift bundle*
	0,8	1,0	1,2	1,5	1,6	2,0	2,5	
15,9	0,296	0,367	0,435	0,539	0,564			150
19,1	0,356	0,446	0,530	0,655	0,690			135
22,2	0,419	0,523	0,621	0,768	0,813			127
25,4	0,481	0,602	0,716	0,884	0,939	1,15		90
28,6	0,543	0,681	0,811	1,010	1,07	1,31	1,63	70
30,0	0,570	0,710	0,850	1,050	1,120	1,39	1,71	70
31,8	0,600	0,750	0,890	1,110	1,180	1,46	1,82	70
32,0	0,605	0,761	0,901	1,120	1,190	1,47	1,84	70
34,0	0,647	0,814	0,971	1,22	1,28	1,58	1,95	70
35,0	0,667	0,838	1,00	1,232	1,32	1,63	2,01	60
38,1	0,727	0,915	1,09	1,345	1,44	1,78	2,20	60
41,0	0,783	0,986	1,18	1,45	1,55	1,92	2,37	60
42,7	0,816	1,03	1,24	1,51	1,62	2,01	2,48	60
45,0	0,860	1,09	1,30	1,59	1,71	2,12	2,62	40
48,6	0,930	1,17	1,40	1,73	1,85	2,30	2,83	40
50,0	0,96	1,21	1,44	1,78	1,91	2,37	2,92	40
50,8	0,97	1,24	1,47	1,81	1,94	2,41	2,92	40
54,0	1,03	1,31	1,56	1,92	2,07	2,56	3,16	40
57,2	1,10	1,39	1,66	2,04	2,19	2,72	3,35	30
60,5	1,16	1,47	1,75	2,16	2,32	2,89	3,58	30
63,5	1,22	1,53	1,82	2,27	2,44	3,03	3,74	30
76,3			2,19	2,73	2,95	3,66	4,51	30

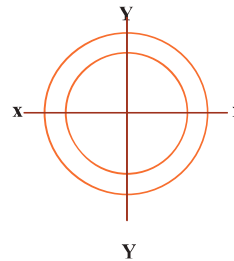
(Standard Length: 6 meters)

ROUND TUBES
FOR ORNAMENTAL APPLICATIONS

ORNAMENTAL ROUND TUBE TOLERANCES:

Outside Diameter	
<u>Diameter</u>	Tolerances
Under 30 mm	± 0.20 mm
30 mm and over	± 0.5%
<u>Wall thickness</u>	Tolerances
Under 3.0 mm	± 0.30 mm
3.0 mm and over	± 10%

Length:
Plus 50 mm and minus zero.
*Applicable to 6-meter length tube



BLACK RECTANGULAR TUBES

FOR ORDERLY STRUCTURAL APPLICATIONS

Table 6. METRIC DIMENSION, WEIGHT & PACKING DATA:

Nominal Size (mm)	Calculated Weights (kg/m)												No. Of pieces Per standard Lift bundle*
	1,5	1,6	1,8	2,0	2,5	3,0	3,2	4,0	5,0	6,0			
30x60	2,05	2,13	2,46	2,714	3,39	4,111							64
40x80	2,76	2,94	3,29	3,416	4,60	5,65	5,83	7,1	8,90				50
40x100	3,21	3,42	3,84	4,26	5,32	6,36	6,78	8,44	10,44				32
50x100	3,483	3,64	4,12	4,60	5,70	6,934	7,01	9,18	11,23				32
75x125			5,50	6,11	7,63	9,14	9,52	12,00	15,11	17,81			30
100x150			6,88	7,65	9,55	11,44	12,00	15,19	18,30	21,99			16
100x200			8,27	9,19	11,48	13,75	14,67	18,29	22,34	26,61			15

(Standard Length: 6 meters)

STRUCTURAL RECTANGULAR TUBES TOLERANCES:
OUTSIDE DIMENSIONS MEASURED ACROSS FLATS:

Largest Nominal
Outside Dimension

Under 30 mm
30 mm and over

Tolerances

± 1.5 mm
± 1.5%

Wall thickness

Under 3.0 mm
30 mm and over

Tolerances

± 0.3 mm
± 10%

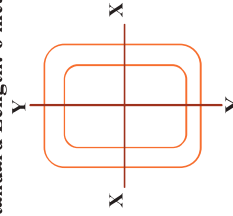
Straightness:

Deviation not to exceed 0.3% of total tube length.

Length:

Plus 50 mm and minus zero.

*Applicable to 6-meter length tube





RECTANGULAR TUBES

FOR ORNAMENTAL APPLICATIONS

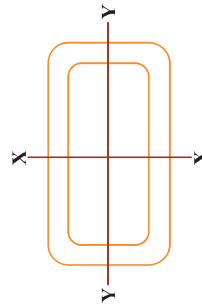
Table 2. METRIC DIMENSION, WEIGHT & PACKING DATA:

Wall Thickness (mm)	Calculated Weights (kg/m)								No. Of pieces Per Standard Lift bundle*
	0,8	1,0	1,2	1,5	1,6	2,0	2,5		
10x25	0,42	0,53	0,63	0,78	0,83			150	
10x30	0,48	0,60	0,72	1,12	0,96			150	
10x40	0,61	0,76	0,91	1,12	1,20			150	
15x30	0,55	0,68	0,81	1,00	1,08			150	
15x40	0,67	0,83	0,99	1,24	1,32			100	
16x40	0,68	0,845	1,011	1,26	1,34			100	
20x30	0,61	0,76	0,91	1,12	1,15			100	
20x40	0,73	0,92	1,09	1,36	1,45	1,78		100	
20x50	0,85	1,06	1,27	1,59	1,69	2,10		100	
25x50	0,92	1,14	1,38	1,71	1,82	2,25		100	
26x50	0,93	1,16	1,39	1,73	1,84	2,29		100	
30x60	1,10	1,37	1,66	1,05	2,13	2,72	3,39	64	
40x80			2,20	2,76	2,94	3,65	4,60	50	

(Standard Length: 6 meters)

OUTSIDE DIMENSIONS MEASURED ACROSS FLATS:

Largest Nominal Outside Dimension	Tolerances
Under 30 mm	± 0.20 mm
30 mm and over	± 0.5%
Wall thickness	Tolerances
Under 2.0 mm	± 0.20 mm
2.0 mm and over	± 10%



Straightness:
Deviation not to exceed 0.2% of total tube length.

Length:
Plus 50 mm and minus zero.
* Applicable to 6-meter length tube

BLACK SQUARE TUBES

FOR ORDERLY STRUCTURAL APPLICATIONS

Table 5. METRIC DIMENSION, WEIGHT & PACKING DATA:

Wall Thickness (mm)	Calculated Weights (kg/m)											No. Of pieces Per standard Lift bundle*	
	1.5	1.6	1.8	2.0	2.5	3.0	3.2	4.0	5.0	6.0			
Nominal Size (mm) 40X40	1.82	1.88	2.18	2.41	2.68								64
50X50	2.329	2.43	2.74	3.03	3.77	4.582							36
60X60	3.8	2.92	3.29	3.65	4.55								36
70X70	3.21	3.42	3.84	4.26	5.32	6.36	6.78	8.44					36
75X75	3.44	3.64	4.12	4.50	5.70	6.48	7.01	9.05					36
80X80	3.67	3.91	4.39	4.972	6.19	7.408	7.51	9.87					25
100X100			5.50	6.228	7.63	9.292	9.52	12.322	15.11	17.40			25
125X125			6.88	7.65	9.55	11.647	12.00	15.19	19.249	22.942			16
150X150			8.27	9.19	11.48	13.75	14.67	18.29	22.34	26.61			16

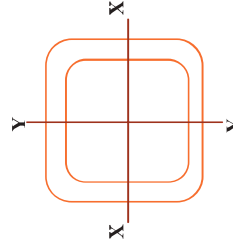
(Standard Length: 6 meters)

**ORNAMENTAL SQUARE TUBE TOLERANCES:
OUTSIDE DIMENSIONS MEASURED ACROSS FLATS:**

<u>Largest Nominal Outside Dimension</u>	<u>Tolerances</u>
Under 30 mm	± 1.5 mm
30 mm and over	± 1.5%
<u>Wall thickness</u>	<u>Tolerances</u>
Under 3 mm	± 0.3 mm
3 mm and over	± 10%

Straightness:
Deviation not to exceed 0.3% of total tube length.

Length:
Plus 50 mm and minus zero.
* Applicable to 6-meter length tube



SQUARE TUBES

FOR ORNAMENTAL APPLICATIONS

Table 1. METRIC DIMENSION, WEIGHT & PACKING DATA:

Wall Thickness (mm) Nominal Size (mm)	Calculated Weights (kg/m)							No. Of pieces Per Standard Lift bundle*
	0,8	1,0	1,2	1,5	1,6	2,0	2,5	
12x12	0,29	0,36	0,43					100
16x16	0,38	0,48	0,55	0,69	0,77			100
19x19	0,46	0,57	0,66	0,85	0,94	1,12		100
20x20	0,48	0,60	0,72	0,87	0,95	1,18		100
21x21	0,51	0,62	0,74	0,94	0,99	1,25		100
24x24	0,58	0,73	0,85	1,08	1,11	1,43		100
25x25	0,61	0,76	0,91	1,12	1,15	1,47		100
26x26	0,63	0,79	0,89	1,17	1,18	1,55		100
28x28	0,68	0,851	1,02	1,27	1,35	1,68		100
30x30	0,73	0,91	1,09	1,36	1,45	1,78		100
31x31	0,76	0,94	1,13	1,40	1,49	1,86		100
32x32	0,78	0,97	1,17	1,45	1,6	1,92		100
40x40	0,98	0,22	1,42	1,82	1,88	2,41	2,98	64
41x41	1,00	1,25	1,49	1,87	1,99	2,48	3,08	64
50x50			1,84	2,28	2,43	3,03	3,77	36
60x60				2,76	2,92	3,65	4,41	36
70x70				2,21	3,42	4,26	5,32	36
75x75				3,44	3,64	4,50	5,70	36
80x80				3,67	3,91	4,88	6,09	25

(Standard Length: 6 meters)

ORNAMENTAL SQUARE TUBE TOLERANCES:

Outside dimensions measured across flats

Largest Nominal

Outside Dimension

Tolerances

Under 30 mm

± 0.20 mm

30 mm and over

± 0.5%

Wall thickness

Tolerances

Under 2.0 mm

± 0.20 mm

2.0 mm and over

± 10%

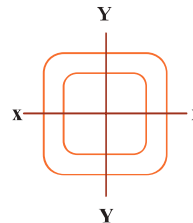
Straightness:

Deviation not to exceed 0.2% of total tube length.

Length:

Plus 50 mm and minus zero.

*Applicable to 6-meter length tube



OVAL TUBES

FOR ORNAMENTAL APPLICATIONS

Table 4. METRIC DIMENSION, WEIGHT & PACKING DATA:

Wall Thickness (mm)	Calculated Weights (kg/m)				No. Of pieces Per standard Lift bundle*
	1,2	1,5	1,6	2,0	
Nominal Size (mm)					
15x30	0,812	1,034	1,08	1,32	100
15x35	0,90	1,10	1,19	1,47	100
16x35	0,930	1,16	1,20	1,51	
14x36,5	0,920	1,150	1,21	1,50	100
15x40	0,995	1,245	1,31	1,60	80
16x40	1,00	1,24	1,34	1,67	
20x40	1,080	1,340	1,456	1,832	80
21x40	1,10	1,4	1,48	1,81	80

(Standard Length: 6 meters)

OUTSIDE DIMENSIONS MEASURED

Outside Dimension

Under 30 mm
30 mm and over

Tolerances

± 0.20 mm
± 0.5%

Wall thickness

Under 3.0 mm
3.0 mm and over

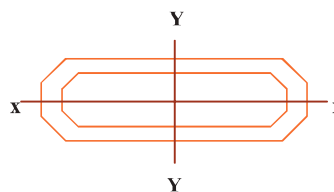
Tolerances

± 0.20 mm
± 10%

Length:

Plus 50 mm and minus zero.

*Applicable to 6-meter length tube



WEIGHTS & MEASURES

To convert to Metric measure, multiply by the factor shown.

To convert to imperial measure, divide by the factor shown.

LENGTH

Inches to Millimeters	25.40
Inches to Centimeters	2.540
Feet to Meters	0.3048
Yards to Meters	0.9144
Miles to Kilometers	1.6093

WEIGHT

Long Tons To Metric Tonnes	1.0161
Short Tons to Metric Tonnes	0.9072
UK Quarters to Kilograms	12.7006
Stones to Kilograms	6.3504
Ounces to Grams	28.35
Pounds to Grams	453.6
Pounds to Kilograms	0.4536

VOLUME

Cu. Inches to Cu. Centimeters	16.387
Cu. Feet to Cu. Meters	0.02832
Cu. Yards to Cu. Meters	0.7646

AREA

Sq. Inches to Sq. Centimeters	6.4516
Sq. Feet to Sq. Centimeters	929.0304
Sq. Feet to Sq. meters	0.0929
Sq. Yards to Sq. meters	0.8361
Sq. Miles to Sq. Kilometers	2.590
Acres to Hectares	

TEMPERATURE

To convert Degrees Celsius or Centigrade to Degrees Fahrenheit:
multiply by 9, divide by 5, then add 32.

To convert Degrees Fahrenheit to Degrees Celsius or Centigrade:
subtrah 32, multiply by 5, then divide by 9

-10° C	=	14° F
0° C	=	32° F
5° C	=	41° F
10° C	=	50° F
20° C	=	68° F
30° C	=	86° F
40° C	=	104° F
100° C	=	212° F

