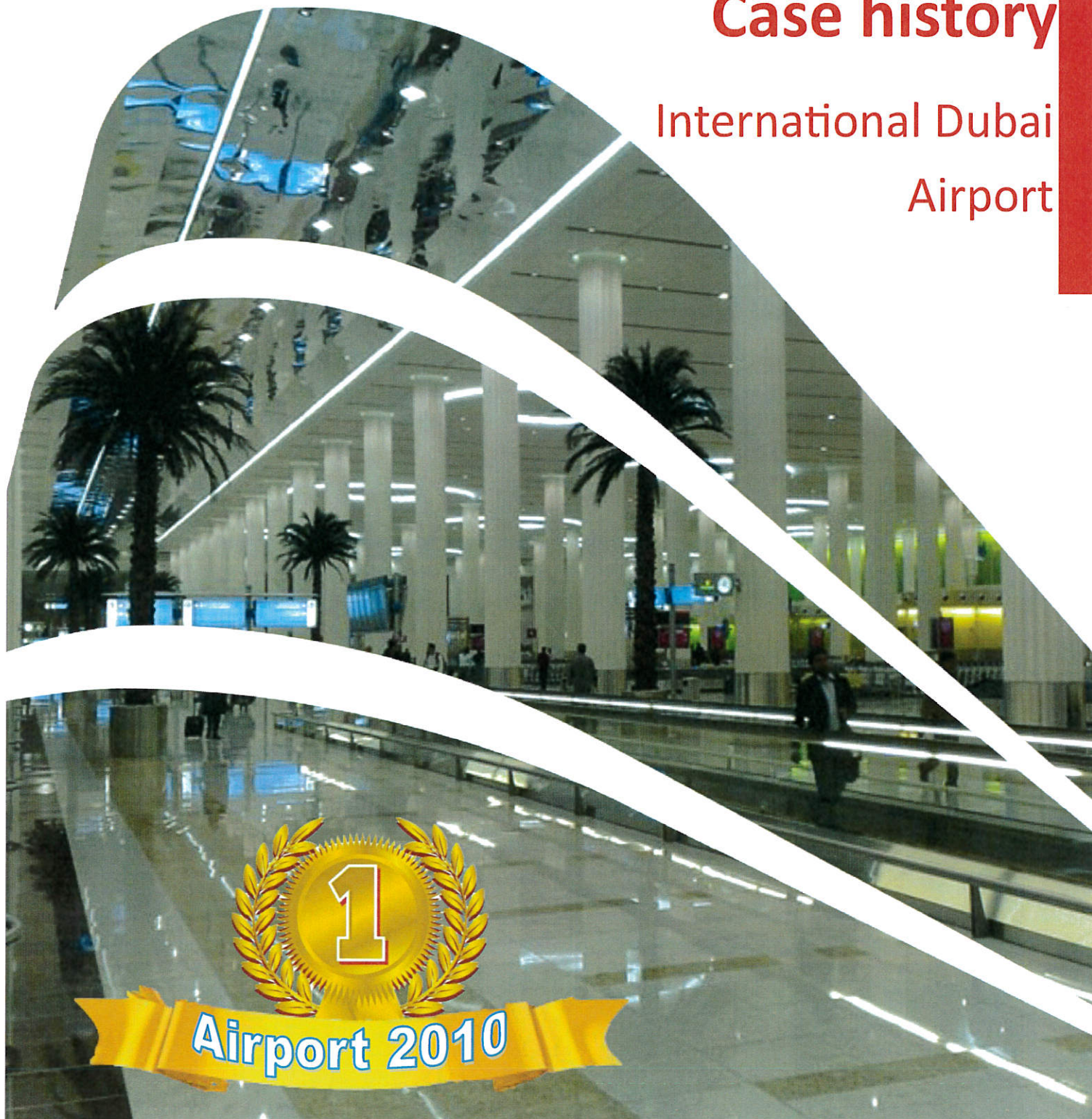




**GL LOCATELLI**  
Sistemi di ancoraggio

## Case history

International Dubai  
Airport





## Project : Dubai International Airport 2008

### Customer request

The tender required was HTA 50/30 hot rolled profile suitable for the attachment of cyclic loads 2 kN. – 0,77 Herz.  
The anchor channel was inserted in the concrete ceiling to allow air hangers plant structures handling luggage.  
The anchorage must ensure an infinite load cycles numbers

### GL LOCATELLI solution

GL Locatelli has provided the profile GP50 / 30 Cold profiled by combining the anchor bolt V50/30 with a special plate design.  
The theoretical calculation was followed by the approval of all the pinout of the project: Dar Al-Handasah designers, airport planners of ADPI, SD Siemens Business suppliers of handling baggage .  
The anchoring system has been tested by qualified Giordano Laboratory from Milan - Italy setting up a similar test simulating the real conditions. The trial test continue for more than 368 hours, confirming the validity for the project.

### As follow/on below

- Page 4 - Contract Authorizaton
- Page 5 - Al Naboodah main contractor document
- Page 6 - Dar Al-Handasah and Adpi engineering consultant document
- Page 7 - Siemens baggage handling document
- Page 8/9 - Trial certificate Giordano Institute—Italy





**Main Contractor :** AL Naboodah Contracting LLC  
Civil Engineering Division

**Products supply :** Anchor channel GP50/30 cold form, bars with 8 anchors/meter ,  
long 5500 mm. Hot dip galvanized.  
Anchor bolts V50/30 M16x60 electrical galvanized  
V50/30 M16x200 electrical galvanized  
Special plate PJ for dynamic load on GP50/30 anchor channel  
Grower washer M 16  
Nut M 16





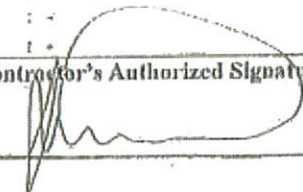
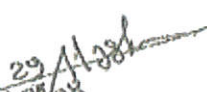
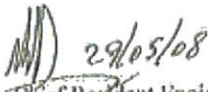
# Contract Authorization



 <b>Dubai International Airport</b> <b>Expansion Phase II</b> <b>Concourse 3</b>	 <b>Al Naboodah</b> <small>Contracting &amp; Trading</small>	<b>Contract Ref: AX124A</b> <b>Material Submittal</b> <b>MS No: 065 Rev.01</b>
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**Contract: Concourse 3 Structure up to Arrivals level.**

To the Engineer:

Date: 27.04.2008

<b>MATERIAL DESCRIPTION (One Item Only Per Form)</b> As Specification <input type="checkbox"/> Alternative <input checked="" type="checkbox"/> <b>GL LOCATELLI CHANNEL SECTION - GP 50/30</b> In lieu of Halfen Channel HTA 50/30		
<ul style="list-style-type: none"> <li>• Attach all relevant technical literature marked to identify relevant descriptions, current test certificate, samples etc.</li> <li>• Attach a certificate stating compliance with Contract requirements</li> <li>• Highlight any element of contractual non-compliance in this submittal</li> </ul>		
Drawing Ref: - AX124A-3-4-SC-0006 Rev-01 Specification Ref: - N/A BOQ Ref: - N/A International Standards Ref: -	<b>Planned Date for applicable submittal for: -</b> 1. Q & M Manual 2. DCA Training 3. Specified/recommended spare parts 4. Warranties and Guarantees	<b>Date:</b> N/A N/A N/A N/A
<b>Manufacturer / Supplier</b> Company Name: - GL Locatelli spa Address: Via Dante Alighieri 66 22078 Turate (CO) ITALY Tel 02 96480721 - 02 9682161 Fax 02 9682795 Local Agent: AL NAESAR TRADING CO. L.L.C P.O.Box -36148, Dubai, UAE. Tel: 04-3338611, Fax: 04- 3339370	Locally Manufactured : NO CGASG Manufactured : - Production Period : - Delivery Ex-works : 6 Weeks Total Delivery Time : - Overland : - Sea Freight : - Total Freight : -	<div style="border: 1px solid black; padding: 5px;">         CIVIL ENGG. DIVISION          31 MAY 2008          RECEIVED          By: _____       </div>
<b>Programme: -</b> Date required on Site: - Expected date of arrival on Site: -	<b>Contractor's Authorized Signature</b> 	
<b>Engineer's Comments :-</b> <p style="font-size: 1.2em;">- As per the attached comments.</p>		
 Signed (Engineering Manager) 29/05/08		 Signed (Deputy Chief Resident Engineer) 29/05/08

	<b>Status</b> 2	<b>Code 1</b> Work may proceed	<b>Code 2</b> Review and Resubmit Work may proceed	<b>Code 3</b> Review & Resubmit. Work may not proceed	<b>Code 4</b> Review not required. Work may proceed
	<b>Chief Resident Engineer</b>  R. Khawli CC: DCA (RP), TTS - PKP				<b>Date: -</b> 29-5-08
	<small>Code 1 - Review and Resubmit. Work may proceed, subject to incorporation of comments indicated</small> <small>Code 2 - Review and Resubmit. Work may proceed, subject to incorporation of comments indicated</small> <small>Important: Permission to proceed does not relieve contractor from full compliance with contractual obligations</small>		<small>Code 3 - Review &amp; Resubmit. Work may not proceed</small> <small>Code 4 - Work may proceed</small>		



**GL LOCATELLI**  
Sistemi di ancoraggio

# Al Naboodah main contractor document



النابوداه  
**Al Naboodah**

Ref, P07AX124A/14.0/JF/669/L  
13<sup>th</sup> May 2008

Siemens' Deltmatic Middle East (AX064)  
P.O. Box 33734  
Dubai, U.A.E.  
Fax no.: 04-3346676 Tel no. : 04-3344046

شركة النابوداه للمقاولات  
**AL NABOODAH CONTRACTING I**  
CIVIL ENGINEERING DIVISION



Attention : Mr. Klaus L.J. Jenthal  
Engineering Manager

Dear Sirs,

Project : Dubai International Airport Expansion Project (Phase II)  
AX124A - Concourse 3 Structure up to Arrivals Level

Subject : BHS Rails

Further to our previous letters ref. no. P07AX124A/14.0/KN/500/L dated 18<sup>th</sup> March 2008 and P07AX124A/14.0/RP/818/L dated 27<sup>th</sup> April 2008 (copies enclosed), please find enclosed a copy of the verification under cyclic load calculation.

Please confirm the load assumptions for the attached calculation provided by Locatelli. Your urgent response would be highly appreciated.

Yours faithfully,  
For Al Naboodah Contracting LLC  
(Civil Engineering Division)

Mark Stephen Hunt  
Contracts Manager

Encl : As stated above

Copy : Main Office / File  
/sp

AX064 - 0113 - T3, C2, C3	Item	Issue Code
01	Calculation	
02	Check	
03	Design	
04	Review	
05	Approval	
06	Construction	
07	Operation	
08	Maintenance	
09	Disposal	
10	Archiving	
11	Final Review	
12	Final Approval	
13	Final Issue	
14	Final Close	
15	Final Sign-off	
16	Final Handover	
17	Final Acceptance	
18	Final Completion	
19	Final Release	
20	Final Handover	
21	Final Sign-off	
22	Final Handover	
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100	Final Handover	

FILE COPY		
Scanned	Entered	DB Updated



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A member of AL NABOODAH CONSTRUCTION GROUP LLC

## Dar Al-Handasah and Adpi engineering consultant



DUBAI INTERNATIONAL AIRPORT EXPANSION - PHASE II  
TERMINAL 3, CONCOURSE 3  
AX124A - CONCOURSE 3 STRUCTURE UP TO ARRIVAL LEVEL

ENGINEER'S COMMENTS ON MATERIAL SUBMITTAL # 065 REV. 1

### General Comments:

The material submittal is approved subject to the following:

- Complying statement signed by M/s. GL - LOCATELLI stating that the section properties (Cross section area, moment of inertia and section modulus) and steel grade GP 50/30 channel is complying with HTA 50/30 Heften channel.
- The cycle load (2 KN – 0.77 Hertz – number of cycles  $> 2 \times 10^8$ ) used in the attached calculations of the cold formed GP 50/30 channel should be confirmed by Siemens.
- The steel grade of the GP 50/30 channel is ASFORM 420 with yield stress 420  $\text{kn/mm}^2$  as mentioned in the attached calculation sheet. Mill test certificates for the steel plates to be submitted for Engineer's approval.
- The spacing between the 10mm anchor studs used with the GP 50/30 channel shall be 125mm as per the attached calculation sheet description.

Code 2  
  
29/05/08

29/05/08  


Elatif  
12/05/08



# Siemens baggage handling document

**SD (Middle East) LLC**  
A Siemens Business

إس دي (ميدل ايست) ش.ذ.م.م

SD (Middle East) LLC, Al Moosa Business Center,  
P.O. Box 33734, Dubai, UAE

Fax: 04 220 0639

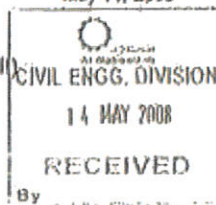
Dar-ADPI  
Gulf Towers  
Office Nos B1/501-02-04  
P.O. Box 55624  
Dubai, UAE

Attention: **Mr. Rajai Khouli**  
Chief Resident Engineer

Reference: **Dubai International Airport Expansion (Phase II)**  
**AX064 - Baggage Handling System**

Subject: **BHS Rails**

Name	Michael H. Lampen
Division	Industry Infrastructure Logistics
Department	I&S IL PE PM
Telephone	+971 (04) 22 00 622
Fax	+971 (04) 22 00 613
E-mail	michael.lampen@siemens.com
Our reference	AX064-XPD-DAR-LL-03619
Date	May 14, 2008



Dear Mr. Khouli,

With reference to attached letter from Al Naboodah - Ref. P07AX124A/14.0/JF/659/L - dated 13<sup>th</sup> May 2008 and received by SDME 13<sup>th</sup> May 2008 we herewith would like to comment that the load assumptions as provided by Al Naboodah within above referenced letter are meeting our requirements.

Yours faithfully,

SD (Middle East) LLC

Michael H. Lampen  
Senior Project Director  
(Contractor's Representative)

  
Gunther Golsor  
Commercial Project Director

cc: Ms. Suzanne Al Anani - Al Naboodah Projects - Fax: 04-218 62 83  
Mr. Bill Christie - TTS Page Packets - Fax: 04-220 06 88  
Mr. Mark Stephen Hunt - Al Naboodah Contracts Manager - Fax: 04-2244337

Attachment: Letter from Al Naboodah Ref. P07AX124A/14.0/JF/659/L



SD (Middle East) LLC  
Management: Viktor Miltosch, Bernd Luschka  
Capital: AED 1,000,000  
C.R. No. 50935

Postal address:  
SD (Middle East) LLC  
P.O. Box 33734  
Dubai  
United Arab Emirates

Office address:  
Al Moosa Business Center  
Mezzanine Floor, Office No. 1107  
Units Havel Road  
Dubai  
United Arab Emirates

## Trial certificate Giordano Institute—Italy



**Istituto Giordano S.p.A.**  
Cod. Fis.P: Iva 00 549 540 409 - Cap. Soc. € 880.000 i.v.  
R.E.A. c/o C.C.I.A.A. (RN) 156766  
Registro Imprese di Rimini n. 00 549 540 409  
Organismo Europeo notificato n. 0407  
Accreditamenti SINCERT (057A e 082B) - SINAI (0021) - SIT (multisede 20)

### ABSTRACT OF TEST REPORT No. 248112

**Customer:** GL Locatelli S.r.l. – Via Dante Alighieri, 66 – 22078 TURATE (CO) – Italy.

**Pur pose of test:** Fatigue tensile test and tensile test on anchorage system.

#### Description and name of specimen.

The tested specimen is a channel for anchorage named "GP50/30" channel. It consist of a channel partially buried in concrete and binded to it by 13 steel studs with the following characteristics: 10 mm diameter, 35 mm length and 125 mm distance between studs. Five anchorages for building applications are installed on the channel. Each anchorage is made of:

- V50/30 M16x60 hammer-shaped screw, 8.8 class;
- PZPJ6-SP accessory, 16 mm diameter;
- 16 mm diameter grower washer;
- M16 nut.

Please refer to the technical drawings shown on the annex of test report no. 248112 issued in date 18/11/2008.

#### Fatigue tensile test.

Fatigue tensile test has been carried out on five anchorages with cyclic loads between 12 kN and 14 kN at 1 Hz frequency for 2000000 cycles. The anchorages were tightened with a torque of 225 Nm before starting the test. At the end of the fatigue tensile test visual examination did not show evidence of any breakage of the anchorages and concrete blocks.

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47814 Bellaria (RN) Italy  
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Fax +39 0541 345540  
istituto@giordano.it  
www.giordano.it

Distaccamento Bellaria  
Via del Lavoro, 1/3  
47814 Bellaria (RN) Italy  
Tel. +39 0541 343030  
Fax +39 0541 340659

Distaccamento Gatteo  
Via Verga, 6/10/19  
47043 Gatteo (FC) Italy  
Tel. +39 0541 818582  
Fax +39 0541 818074

Distaccamento Pomezia  
Via Honduras, s.n.c.  
00040 Pomezia (RM) Italy  
Tel. +39 06 91602332  
Fax +39 06 91602074  
sede.pomezia@giordano.it



#### Tensile test.

Tensile test has been carried out on one anchorage. The fatigue test equipment was removed and the specimen was examined to check any possible breakage or damage. Then the anchorage was tightened with a torque of 225 Nm before starting the tensile test.

Tensile failure occurred at a maximum load of 59509 N.

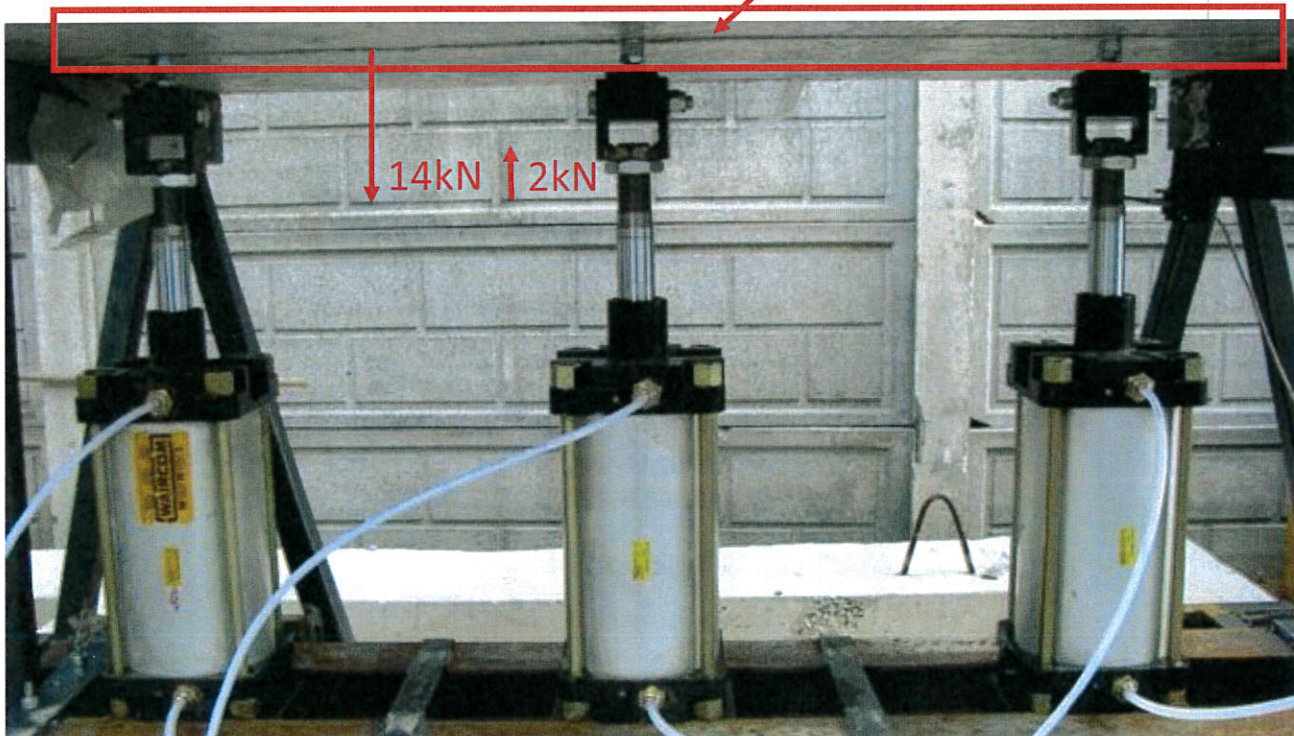
During the test the following was observed:

- start of plastic deformation of the "GP 50/30" channel wings at 25000 N;
- deformation increase of the "GP 50/30" channel wings due to increase of the load;
- start of concrete cracks at 33000 N;
- separation of concrete pieces at the maximum load;
- start of cracks and increase of deformation of "GP 50/30" channel wings at the maximum load;
- disengagement of one wing of "GP 50/30" channel from the anchorage and breakage of the other wing.

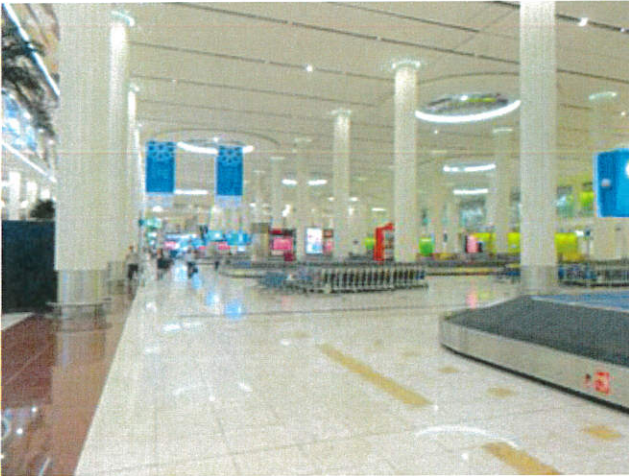
Visual examination did not show any cracks or breakage on the anchorage. During the test the load-deformation chart was recorded. Please refer to the technical chart shown on test report no. 248112 issued in date 18/11/2008.

## Trial Test 2.000.000 cycles in 368 hours in continuous

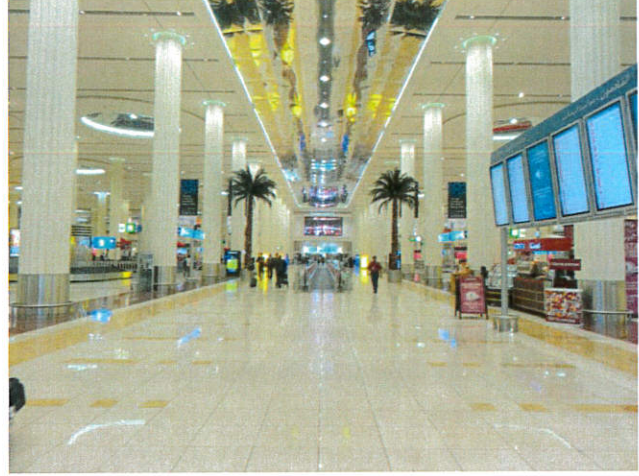
Anchor channel GP50/30 inside concrete



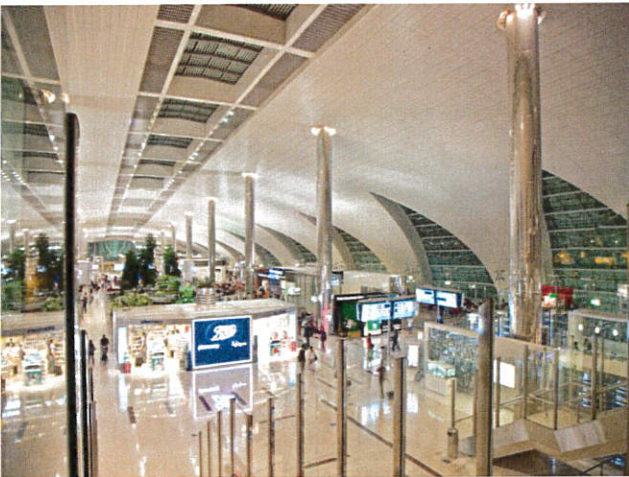




Landing baggage area



Landing baggage area



Gate area



Dubai International Airport



**adermalocatelli** GROUP

ANCORIAMO L'EDILIZIA AL FUTURO

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