

## Sun-Shading of Shelters in Accommodation Sites

ADVOCACY FOR IMMEDIATE RAPID IMPLEMENTATION		
<ul style="list-style-type: none"> <li>• Greek summer temperatures range 28 – 35 degrees Celsius.</li> <li>• 100% of accommodation sites currently lack sufficient private and/or communal shade for all residents.</li> <li>• Some PoC are fasting for Ramadan – reducing rehydration capacity and increasing potential health risks.</li> <li>• Certain site typologies exacerbate sun exposure; asphalt or gravelled surface, reflective white containers or light canvas tents, no vegetation within walking reach.</li> <li>• PoC sheltered in external tents within warehouse sites frequently request to be relocated inside the already overcrowded buildings. Such a move would add additional overcrowding stress, further protection, health and fire safety concerns.</li> <li>• Rising numbers of heat stroke, dehydration and fainting among site populations.</li> <li>• Risk for longer-term negative health impacts (e.g. skin damage), especially for the more vulnerable - small infants and elderly PoC.</li> </ul>		
TECHNICAL REFERENCES		
<p>1. <a href="http://www.speedkits.eu/sites/www.speedkits.eu/files/shadenets_final%20low.pdf">http://www.speedkits.eu/sites/www.speedkits.eu/files/shadenets_final%20low.pdf</a></p> <p>2. <a href="https://www.humanitarianresponse.info/system/files/documents/files/Shade%20nets.pdf">https://www.humanitarianresponse.info/system/files/documents/files/Shade%20nets.pdf</a></p> <p>3. <a href="http://procurement.ifrc.org/catalogue/detail.aspx?volume=1&amp;groupcode=111&amp;familycode=111001&amp;categorycode=SHAD&amp;productcode=HSHESHAD01#">http://procurement.ifrc.org/catalogue/detail.aspx?volume=1&amp;groupcode=111&amp;familycode=111001&amp;categorycode=SHAD&amp;productcode=HSHESHAD01#</a></p> <p><b>Note:</b> Shade net specifications in the IFRC Emergency Catalogue should be taken as MINIMUM STANDARDS for all shading projects in Greece.</p>		
RELEVANCE TO SECTOR WG STRATEGY		
Ref. No.	OUTPUT	INDICATOR
2. Shelter	2.3. Refugees and migrants live in seasonally appropriate shelters.	2.3.1 Number of shelters that have been upgraded to sufficiently withstand summer and winter conditions in Greece (summerised and winterized).
SCOPE	DESCRIPTION	ADDITIONAL DETAILS/REMARKS
Timeframe (maximum duration)	1. Design + procure prototype materials = 1 week. 2. Build prototype = 1 week. 3. Tender/Contractor + materials = 2 weeks. 4. Execution = 2 weeks.	All sites should have functional shading systems in place by the beginning of August. Shading systems needs to be operational by mid-August.
Minimum Life span	1 x summer – autumn season with easy maintenance.	With the seasonal shift in autumn, consider modifying shade structure to become reliable rain/snow protection.
Cost	<b>RANGE TO BE DETERMINED ONCE AGENCIES RECEIVE CONTRACTOR QUOTATIONS.</b>	Consider supplying only some materials when existing materials remain.
HAZARD	DESCRIPTION	MINIMUM STANDARDS
Sun	The shading structures should protect the beneficiaries from direct sunlight.	Minimum shade rate of 70-80% ( <i>as per technical reference no.3</i> )
Winds and storms	If using ground-fixing poles, they must secure the shade structure to remain in place under strong winds. The shading net should have a reinforced edge; either band or rope sewn in order withstand heavy winds.	For shades with ground-fixing poles, depending on the cohesiveness of subterranean conditions (TBD by site), the depth of the poles and pegs = 30 to 60cm.
Rain	The shade design must mitigate the risk of capturing and holding rainwater, thus over-loading the supporting structure and potentially leading to failure.	The shades should be angled on a gradient to allow for rainwater runoff towards an appropriate location or alternatively the net/fabric could incorporate a small hole (maximum

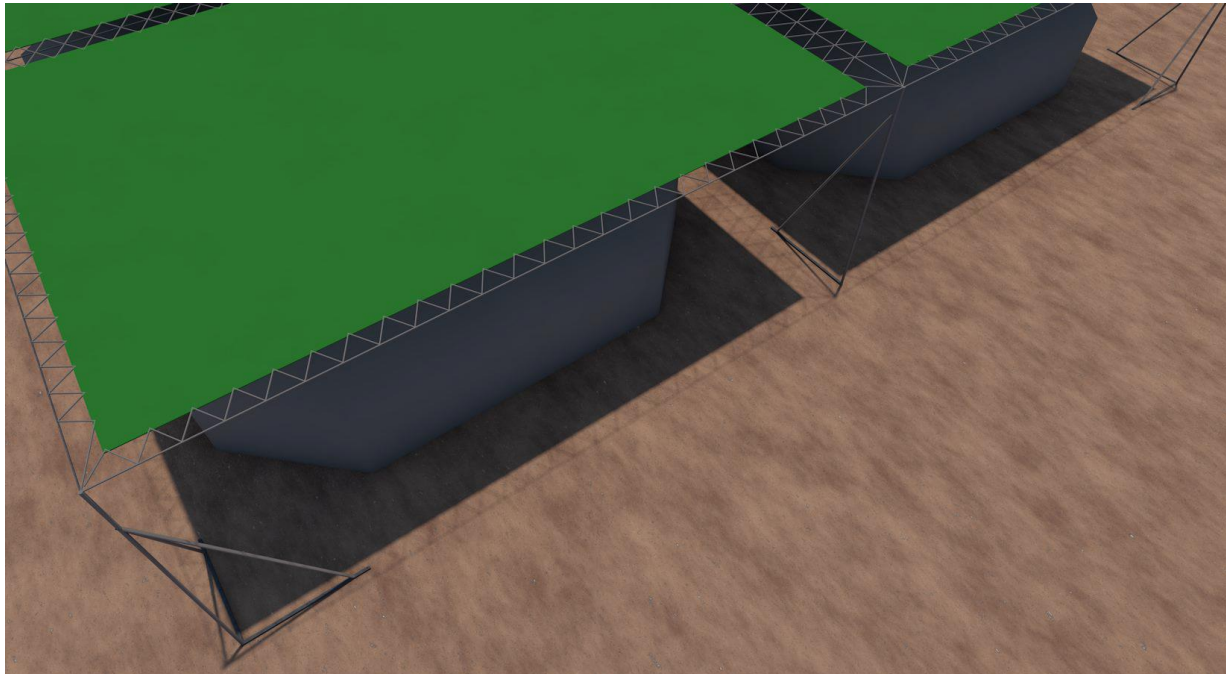
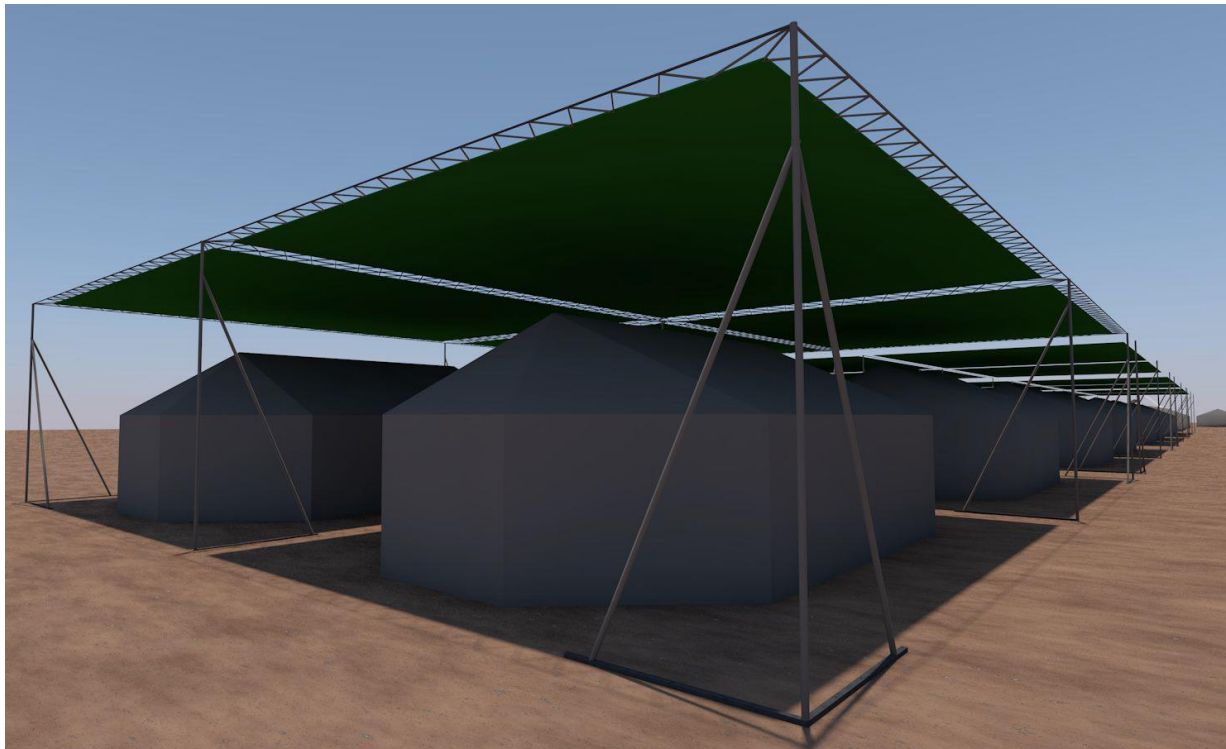
	The design must also consider where exactly the shade directs the flow of rainwater (in relation to proximity to the shelter, site drainage networks etc.).	10cm diameter) in a strategic central location to prevent accumulating a body of water.
Corrosion/Decay	Galvanized quality steel should be used to protect against corrosion and rust.	The shading net must be anti-UV treated to withstand 2 years lifespan in the strongest sun exposure.
Obstructed Passages	Main pathways and emergency exits should be kept clear of ropes and poles used to support the shading structures. Secondary or back pathways should also be kept clear of hazards (peg tips or stretching ropes).	Shade structural supports cannot be located directly in front of shelter access doors and must be offset from circulation paths.
Fire Safety	If the shade net were to catch fire, it is important that no molten or flaming debris is formed that will spread the fire.	Shade material must be a flame retardant fabric.
SHADE ISSUE	DESCRIPTION	MINIMUM STANDARDS
Suitability for relocation/reuse	The shading units may later be used to provide shadow for community, vehicle or material/supplies spaces etc. Metal frame construction can be reusable.	Shading units should be easily dismantled and relocated to another location. Materials are to be reusable.
Ventilation + thermal comfort	Adequate space between the shelter and the shading unit should be provided for air circulation.	Shade must be at a minimum of: - 0.5m above the shelter apex height. - 2.7- 2.8m from the ground.
Privacy	The additional shade structure could aid the definition of a plot site for each family unit.	If vertical poles are used for shade structure, their layout should respect/reflect the boundaries of each family shelter plot.
Culturally appropriate	Shading unit layouts, materials and construction techniques to be used should be either familiar to beneficiaries or easily understood. It is important to get to know the profiles of the beneficiaries – perhaps they may be more experienced to determine the best design and to then implement it.	Shade beneficiaries should be engaged in full project cycle; planning, design + implementation. They should then have full responsibility for the ongoing maintenance and upkeep.
Education in Hazard Reduction	Shading units should provide practical learning examples to stakeholders of principles of good quality construction (e.g. pegs and stretching ropes should not cause stumbling hazard).	Align project implementation with the promotion of site evacuation processes; understanding the emergency exit paths and importance of circulation.
Access	Shading structure should take into account the access needs of disabled or mobility-reduced individuals.	Distances between structural supports at ground level should be at least 1.5m to allow for unobstructed thoroughfare with wheelchairs.
SITE ISSUE	DESCRIPTION	MINIMUM STANDARDS
Location	The shading units should not be built next to dangerous buildings or structures, on land liable to flood, on land at risk of landslide etc.	The shade cannot be installed in locations that expose the occupants to any safety hazards.
Plot preparation	The site needs to be clear of any physical dangers. In some cases, a tent relocation should be considered – positive contribution to decongestion.	Any physical dangers to be removed prior to commencing shade installation.
Consultation	The project should be executed in close consultation with the site's management authorities (MoMP, MOD etc.), SMS agency (if active), protection team, the Shelter Sector and the beneficiaries.	Implementing agencies should share their design with the Shelter + NFI Sector Working Group to ensure harmonised approaches across all sites.

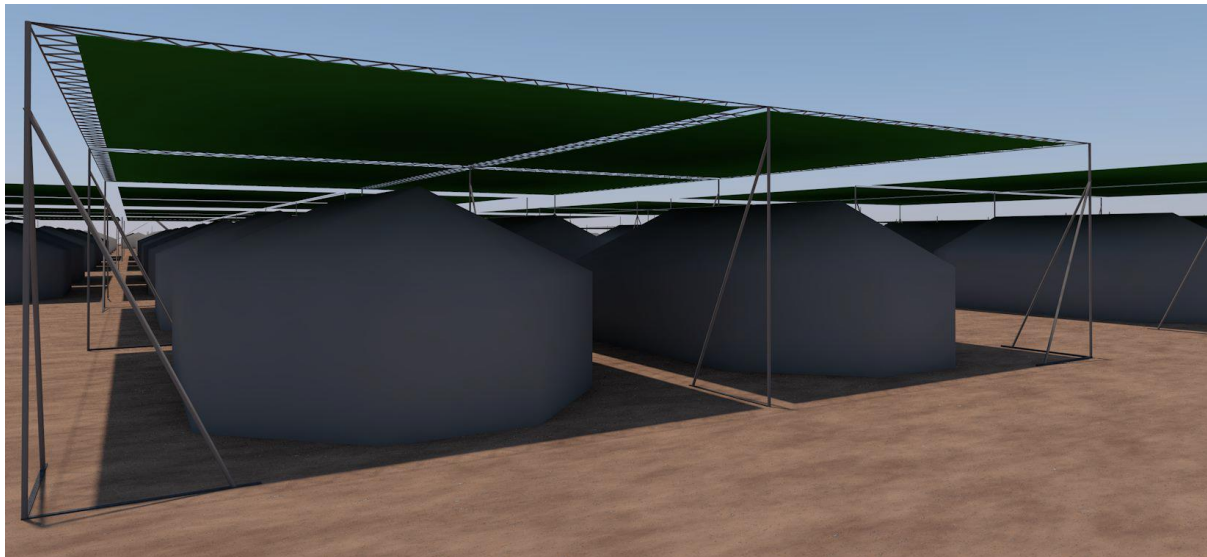
LOCAL CONTRACTORS + SUPPLIERS		
COMPANY NAME	CONTACT DETAILS	SHADE STRUCTURE PRODUCTS AVAILABLE
K. METROPOULOUS	Contact: Kostas Address: KAIRI 8, ATHENS 10551 PHONE: +30 210 321 2314 +30 210 321 2214 +30 697 731 3099 EMAIL: <a href="mailto:kairisdh@otenet.gr">kairisdh@otenet.gr</a> WEBSITE: <a href="http://www.mitropoulos1889.gr">www.mitropoulos1889.gr</a>	Fixings & Fastenings Supplier; e.g. eyebolts, nuts + screws.
ILIAS GOGAS	Contact: Sophie Address: PETRAS 85, KOLONOS PHONE: +30 210 513 8657 EMAIL: <a href="mailto:info@skiasiscenter.gr">info@skiasiscenter.gr</a> WEBSITE: <a href="http://www.skiasiscenter.gr">www.skiasiscenter.gr</a>	Shade, Blinds & Awnings
VELLIS S.A.	Contacts: Gerasimos Karampatos + Nicos Vellis ADDRESS: A. PAPADREOU PHONE: +30 210 4816 083 EMAIL: <a href="mailto:info@cvellis.gr">info@cvellis.gr</a> ; <a href="mailto:nickv@cvellis.gr">nickv@cvellis.gr</a> WEBSITE: <a href="http://www.cvellis.gr">www.cvellis.gr</a>	Shade netting supplier (as per Samaritan's Purse design)
SIA O.E	Contact: Trezos Georgios Address: Pallados 2, Athens PHONE: +30 210 321 0674 EMAIL: <a href="mailto:gtrezos@gmail.com">gtrezos@gmail.com</a>	Elasticated rope supplier (as per Samaritan's Purse design)
Perfect Shade S.A.	Contact: Vasileios Bougioukos (C.E.O.) Address: 23 Trapezountos Street, 145 65 Ag. Stefanos. PHONE: +30 210 814 5225 FAX: +30 210 814 5992 EMAIL: <a href="mailto:info@shade.gr">info@shade.gr</a> WEBSITE : <a href="http://www.shade.gr">www.shade.gr</a>	Production, Trade and Installation of Pre-Constructed Shading System (DRC contractor)

## AGENCY PROTOTYPES:

### 1. Danish Refugee Council

Sun shading for 144 tents in Elliniko III, Athens + 193 tents in Lagkadikia, Thessaloniki.



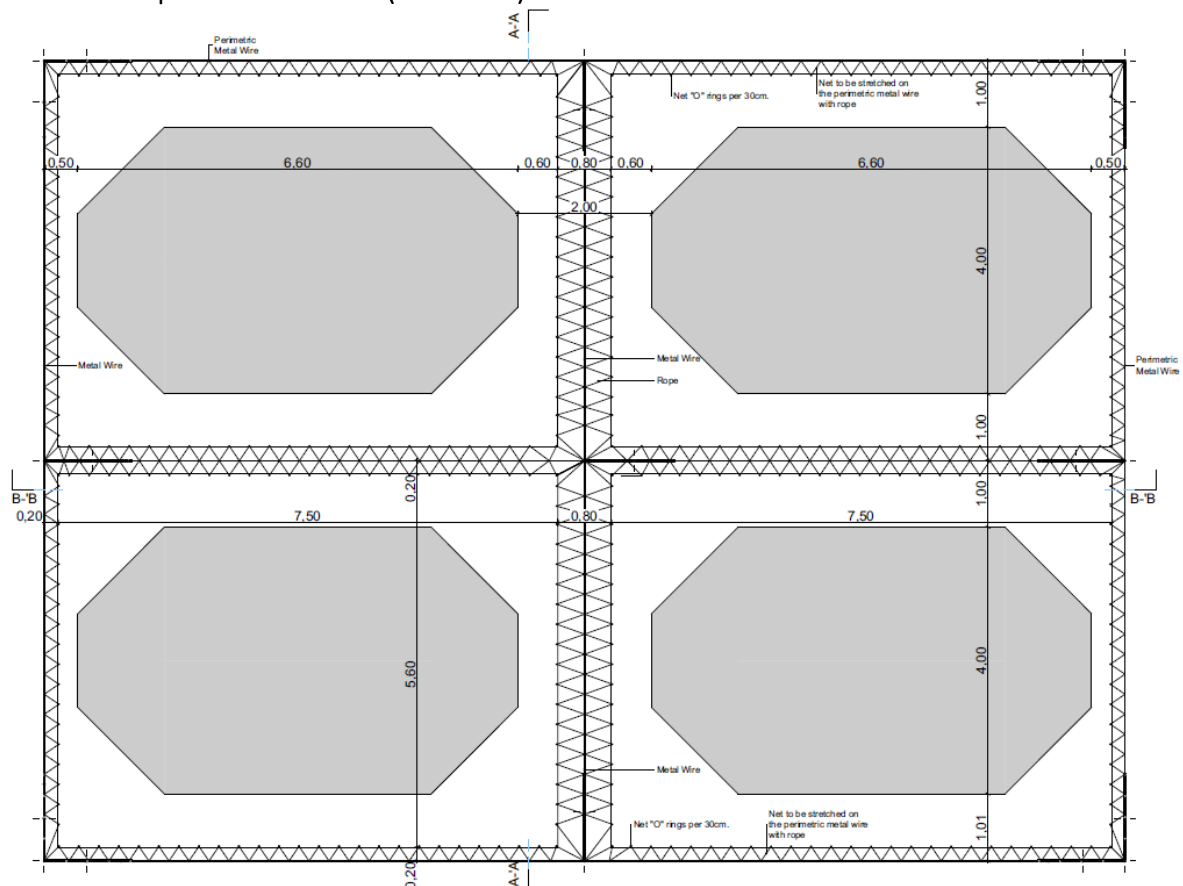


#	Material	Material Type	Specification	Required Properties
1	Steel 1	Cold formed galvanized steel	Cold formed, hot dip galvanized steel. Steel quality ST 37-2 DIN 17100. Galvan quality DIN 2444 of min 400 g/m2.	diameter $\Phi 42(5/4")$ 2mm thickness.
3	Steel 2	Steel reinforced bar	s325 steel quality	diameter $\Phi 22$ or $\Phi 25$
4	Steel 3	Cold formed galv. plate steel	Cold formed, hot dip galvanized steel U-profile. Steel quality ST 37-2 DIN 17100. Galvan quality DIN 2444 of min 400 g/m2.	4x25x50 mm
4	Wire	Steel Wire	Galvanized steel wire	6 mm diam.
5	Metal clip	Metal wire lock clip	Galvanized lock clip for 8mm metal wire.	
6	Fabric	Shading Net	Tape knitted, any color except from red and white, sun block factor min of 70-80%, min weight of 140gr/m2, anti-UV treated. The shading net shall be reinforced with a sewing rope edge and metal eyelets per 30 cm.	Parametric reinforced band or rope/wire sewn.
7	Rope	Plastic Rope	Polyester or PET woven rope, 8 or 10mm diameter	Rope endings should be applied.
8	Bolts	Galvanized Steel Bolts	M10 diameter	
9	Screws	Galvanized Steel Screws	M10 diameter, butterfly screw	

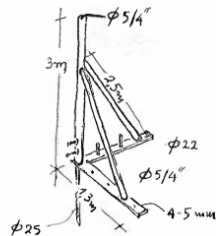
COST: DRC SUNSHADE FOR ONE FAMILY TENT = 480 EUROS



Shade structure plan of 4 x tent units: (not to scale)

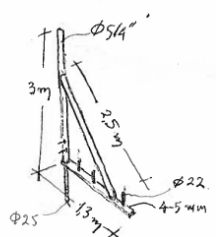


Tripod pole — ground fixe



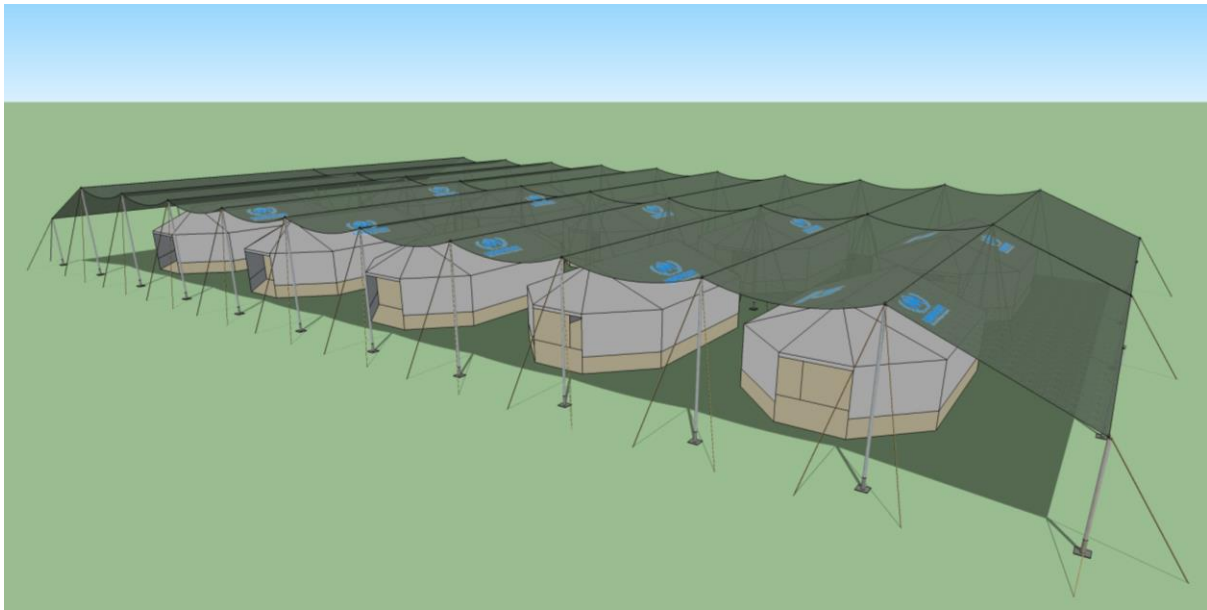
Material	Unit	Qty	Total
5/4Ø inch galv. pole	m	3	3
5/4Ø inch galv. pole	m	2x2.85	5.7
25x50x4 galvanized steel U-profile	m	2x1.3	2.6
25Ø reinforcing steel bar	m	1	1
22Ø reinforcing steel bar	m	0.6x6	3.6
Steel screws M10, "butterfly" type	Pcs.	2	2
Steel bolts M10	Pcs.	2	2

Triangle pole — ground fixe



Material	Unit	Qty	Total
5/4Ø inch galv. pole	m	3	3
5/4Ø inch galv. pole	m	2.85	2.85
25x50x4 galvanized steel U-profile	m	1.3	1.3
25Ø reinforcing steel bar	m	1	1
22Ø reinforcing steel bar	m	0.6x3	1.8
Steel screws M10, "butterfly" type	Pcs.	2	2
Steel bolts M10	Pcs.	2	2

## 2. Norwegian Refugee Council



### Specifications:

1. Black Shade net;
  - 6m x 9m dense aluminised (high reflectivity)
  - UV-stabilisers
  - Flame retardant
  - Shading factor 70-80%.
2. Fabric = Knitted is preferred option. If woven, will use a 'full-lockstitch'.
3. Fixing holes or eyelets along reinforced bands, spaced approximately every 2m. This allows the net to be cut between the reinforcing bands and divided, to be used in 2m wide length.

## 3. Samaritan's Purse

Sun shading for corridors between 203 prefabricated containers at Skaramagas Port, Athens.



### Specifications:

1. Size of shade = 2.8 x 8m
2. Shade net = High grade woven fabric with shading factor of 90%.
3. Vinyl reinforcement stitched to all edges of netting. The vinyl edging will overlap 40mm (top/bottom) and have a 10mm rope at the internal fold for added strength/rigidity.
4. 1 x reinforced steel eyelet every 1m around the edge of the netting.
5. The shade will be attached to the containers via eyebolts (M8 with washer and 2 nuts - 1 will be locking) that are fixed to the 2 outer corners of each container, and 1 point at the centre (6 points of connection in

total). Where pre-existing attachment points are not available, another eyebolt will be fixed to the container to attach the shade in the middle. 10mm elasticated rope will be used to tie the shade to the eyebolts.

**Prototype testing:**



**Final implementation at Skaramagas**







#### OTHER SHADING EXAMPLES IN SITES:

##### 1. Red Cross containers at Skaramagas Port, Athens





## 2. ACTIONAID Container at Skaramagas Port, Athens.



## 3. Shade net at Malakasa Site, Attica (implementing agency unknown)



## NEXT STEPS:

1. LESSONS LEARNT – monitoring and evaluation of shade projects implemented in sites in Greece.
2. TRANSITION TO WINTERIZATION – remove the shade structures or transform them to adapt to winter protection needs?