بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

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شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

بعض الوثائق
الاصلية تالفة

بالرسالة صفحات

لم ترد بالاصل

ALEXANDRIA UNIVERSITY
FACULTY OF ENGINEERING

A NEW DESIGN APPROACH FOR STIFFENED PLATES TOWARDS WEIGHT AND COST SAVINGS

Dissertation

Submitted in partial satisfaction of the requirements for the degree of ***DOCTOR OF PHILOSOPHY***

In

NAVAL ARCHITECTURE AND MARINE ENGINEERING

By

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NOMENCLATURE

A	:	total cross sectional area
A_w	:	cross sectional area of web stiffener
B	:	length of the panel
b	:	width of flange of a rectangular box unit
b_f	:	breadth of the flange
c	:	height of web of a rectangular box unit
C_d	:	deprecations cost of used equipment
$C_{f/hr}$	:	cost of fitter per hour
C_m	:	total cost per kg of welding metal consumables
C_o	:	overhead cost per kg of weld metal
C_p	:	electric power cost deposit one kg. of weld metal
$C_{pR/ton}$	:	cost of plate per ton.
$C_{pre/hr}$	:	cost of prefabrication man hour L.E./hr
$C_{S/R/ton}$	:	cost of stiffeners per ton.
D	:	flexural rigidity
d_w	:	depth of the web stiffener
E	:	modulus of elasticity
F_c	:	fitting cost
FEM	:	finite element method
FS_1	:	corresponding factor of safety against buckling
FS_2	:	corresponding factor of safety due to shear
FS_3	:	corresponding factor of safety due to yielding
H.T.S	:	high tensile steel
I	:	moment of inertia of the cross section about neutral axis
k	:	buckling stress factor
k_1,k_2	:	coefficients depending on boundary conditions
K_m	:	total welding cost of metal consumables

NOMENCLATURE (Cont.)

K_m	:	total welding cost per meter run
L	:	length of the stiffeners (breadth of the panel)
L_c	:	labour cost
L_{wp}	:	length of butt weld plates
L_{WS}	:	length of fillet weld stiffeners
M	:	bending moment
M_c	:	material cost
M_L, M_T	:	longitudinal and transverse bending moment
M_{LT}	:	twisting bending moment
M_{pc}	:	material plating cost
M_{sc}	:	material sections cost
M_{xy}	:	twisting moment and inplane force in shear in the x-y
N	:	number of stiffeners in length (B), (N = B/S)
N_{JP}	:	number of welding joints in (L) directions
N_{PJL}	:	number of plate welding joints in longitudinal direction (B)
N_{PJT}	:	number of plate welding joints in transverse direction (L)
N_{SJ}	:	number of corrugation stiffener joints
O_c	:	overhead cost
P	:	lateral pressure
P_L	:	longitudinal tension or compression
		plane
P_{prec}	:	prefabrication cost
P_T	:	transverse tension or compression
$R_{Ft/ton}$	:	fitting man-hours /ton
$R_{pre/ton}$	:	prefabrication man-hours per ton
S	:	pitch of a rectangular box unit
S	:	the spacing of stiffeners

NOMENCLATURE (Cont.)

SAP	:	Structural Analysis Program
S_y	:	web frame spacing in y- direction
t_{eq}	:	equivalent thickness
t_f	:	flange thickness
t_p	:	plate thickness
t_w	:	web plate thickness
V	:	maximum normal shear forces
W	:	weight of weld metal consumables in kg per meter run
w_a	:	maximum allowable elastic deflection
W_c	:	welding cost
w_e	:	elastic deflection at any point along the beam
w_{emax}	:	maximum elastic deflection
Z	:	modulus of section of stiffener with associated plating
$_{cr.}$	:	the critical allowable stresses
ρ	:	density of used material
υ	:	Poisson's ratio
σ_{act}	:	actual maximum acting stress
σ_{eq}	:	equivalent stress
σ_L	:	lower yield stresses of material
σ_T	:	transverse bending stress due to lateral pressure