МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

ПОЛТАВСЬКИЙ НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ ІМЕНІ ЮРІЯ КОНДРАТЮКА

ЗБІРНИК НАУКОВИХ ПРАЦЬ

Серія: ГАЛУЗЕВЕ МАШИНОБУДУВАННЯ, БУДІВНИЦТВО

Випуск 4 (39)

Том 1

Полтава 2013 р.

УДК 69 + 69.002.5
3-41
Збірник наукових праць (галузеве машинобудування, будівництво) / Полтавський національний технічний університет імені Юрія Кондратюка.
Редколегія: С.Ф. Пічугін (головний редактор) та інші. – Вип. 4 (39). Том 1 – Полтава: ПолтНТУ, 2013. – 316 с.
Видається з 1999 р.
Свідоцтво про державну реєстрацію КВ 8974 від 15.07.2004 р.
У збірнику представлені результати сучасних наукових і науково-технічних досліджень та розробок із дослідження, проектування, експлуатації та реконструкції будівельних конструкцій, будівель і споруд; будівельної фізики та енергоефективності будівель і споруд; удосконалення й проектування сільських будівель та вулично-дорожньої інфраструктури.
Призначений для наукових й інженерно-технічних працівників, аспірантів і магістрів.
Збірник наукових праць рекомендовано до опублікування вченою радою Полтавського національного технічного університету імені Юрія Кондратюка, протокол № 2 від 01.11. 2013 р.

Збірник уключений до переліку наукових фахових видань, у яких можуть публікуватися результати дисертаційних робіт (Постанова президії ВАК України №1-05/4 від 14.10.2009 року)

Відповідальний за випуск – ректор університету, д.е.н., проф. В.О. Онищенко.

UDC 624.075:624.016

Y.A. Avramenko, PhD
Poltava National Technical Yuri Kondratyuk University

DEFORMATION FEATURES AND BEARING CAPACITY OF SHORT COMPOSITE STEEL AND CONCRETE ELEMENTS WITH DIFFERENT BOUNDARY CONDITIONS OF STEEL COMPONENTS

This publication analyzed the stress-strain state and local stability of short composite steel and concrete elements with different boundary conditions of steel components. The experimental results were compared with theoretical results.

***Keywords**: bearing capacity, local stability, composite steel and concrete structures.*

UDC 624.012.25

Y.M. Babich, ScD, Professor
V.S. Dovbenko, assistant
National University of Water Management and Nature Resources Use, Rivne

RISE OF STRENGTH OF REINFORCED CONCRETE BEAMS WITH POLYMER COMPOSITION

The results of experimental researches of reinforced concrete beams have been given in the article, which strengthened with polymer compound under the influence of one-time and few-cyclic loads.

***Keywords:** reinforced concrete beams, polymer composition, strengthening, strength, deformability.*

UDC 624.138.33

M.V. Bibik, PhD, Associate Professor
V.M. Bibik, senior lecturer
K.G. Bzhovskaya, master, MPhil
M.V. Lavrenko, master, MPhil
Poltava National Technical Yuri Kondratyuk University

CHOOSING THE BEST TYPE OF CROSS-SECTIONS FOR THE FRAME OF SPORTCOMPLEX

2 types of frames with crossbar continuous section from welded girders and crossbar lattice section from rolling profiles were calculated and analyzed in the article. The rational option of frames was obtained. Frame structure of sport complex was proposed for Poltava and established more economic version. Proposed structure's advantages and defects were indicated.

***Keywords:** frame, compare design options crossbar frame, crossbar continuous section, crossbar lattice section, weight.*

UDC 624.072.33

V.M. Bibik, senior lecturer
M.V. Bibik, PhD, Associate Professor
P.Y. Vynnykov, student
Poltava National Technical Yuri Kondratyuk University

COMPARATIVE ANALYSIS USES OF THE ROLL-FORMED AND HOT-ROLLED METAL SECTIONS OF THE ONE-STOREY INDUSTRIAL BUILDING TRANSVERSE FRAME

Article is compare uses of the roll-formed and hot-rolled metal sections in the calculation of the transverse frame to reconstruct one-storey industrial building.

Keywords: *roll-formed section, hot-rolled section, transverse frame, one-storey production building.*

UDC 624.012.45:693.554

D.V. Bibik, PhD, Associate Professor
T.N. Nesterenko, PhD, assistant
N.N. Magas, PhD, senior lecturer
V.V. Leshchenko, student
Poltava National Technical Yuri Kondratyuk University

ANALYSIS OF THE STRESS-STRAIN STATE OF CONCRETE STRUCTURES WITH EXTERNAL SHEET REINFORCEMENT

The estimation of the stress-strain state of the cross section elements of reinforced concrete structures with external reinforcement sheet for deformation method.

Keywords: *the stress-strain state, reinforced concrete structures, external reinforcement.*

UDC 624.012.2

S.P. Burchenia, senior teacher
I.M. Dobrianskyi, ScD, Professor
R.A. Shmyh, PhD, Assistant Professor
Lviv National Agrarian University

WORK OF STELL CONCRETE BEAMS REINFORCED BY CUT AND STRETCHED SHEET UNDER LOADING

The article deals with some work of steel concrete beams reinforced by cut and stretched sheet under loading and experimental data of such elements are suggested.

Keywords*: steel concrete beams, cut and stretched sheet, deformation, carrying capacity, moment of crack formation.*

UDC 624.042.1

A.I. Valovoj, PhD, Professor
A.U. Eremenko, PhD, Associate Professor
M.A. Valovoj, PhD, senior lecturer
Kryvyi Rih National University

THE CRITERIA FOR THE OVERALL STRENGTH OF THE CONCRETE CASE OF THE STRESS STATE

Given the existing theory, by definition, the criterion of concrete strength. An experimental method for determining the strength of the concrete criterion for any occasion stressed state. Made a comparison of theoretical and experimental data.

Keywords: *strength, stress state, the theory.*

UDC 624.074.5

S.A. Gapchenko, post-graduate
Poltava National Technical Yuri Kondratyuk University

CALCULATION OF STRUCTURAL-GUY ROPE CONSTRUCTION OF NUMERICAL METHOD

Theoretical studies of structural-guy rope shell of double curvature of the numerical method.

Keywords: *structural-guy rope construction, numerical method.*

UDC 624.012.45:624.072.2:624.046.2

O.V. Garkava, PhD, senior lecturer
Poltava National Technical Yuri Kondratyuk University

SIMPLIFIED METHOD OF STRENGTH PROBLEMS SOLUTION OF ECCENTRIC-COMPRESSED ELEMENTS ON THE BASIS OF TWO-LINEAR STRESS-STRAIN DIAGRAMS OF CONCRETE AND REINFORCEMENT

The simplified method of solution problems of strength examination and calculation of principal reinforcement area of reinforced concrete eccentric-compressed elements is offered on the basis of deformation model with use of two-linear stress-strain diagrams of materials.

Keywords*: reinforced concrete, compression, strength, calculation.*

UDC 004.942:624.015

A. Gasenko, PhD, Associate Professor
V. Kyrychenko, PhD, Associate Professor
A. Krupchenko, PhD, Associate Professor
Poltava National Technical Yuri Kondratyuk University

NUMERICAL RESEARCHES OF STRESS-STRAIN STATE OF THE DAMAGED REINFORCE-CONCRETE RIDGE PLATES OF COVERINGS

Results of numerical research intense the stress-strain state of the damaged reinforce-concrete ridge plates of a covering of the industrial building are given. Influence of a damage rate of concrete of the main longitudinal edge and cross edges on bearing ability of designs is investigated. It is made conclusions about expediency of strengthening of plates steel profiles.

Keywords: *concrete, armature, plates of a covering, damages, strengthening.*

UDC 624.072.2.014.2-413:624.072.9

S.A. Guds, PhD, senior lecturer
Poltava National Technical Yuri Kondratyuk University

ENSURING OF STABILITY OF STEEL BEAMS-TRANSOMS ON ACCOUNT OF STIFFNESS OF PURLINS AND CROSS BRACES

Methodology over of determination and verification of sufficient stiffness of discrete braces (purlins and cross braces) is brought, and also their maximal steps, which general stability of steel beams, which carry out the role of transoms of transversal frame of framework building, is unchecked at, are investigational on different norms.

Keywords: *stability, steel beams, stiffness, purlins, cross braces.*

УДК 624.073

A. Dovzhenko, PhD, Associate Professor
V. Pogrebnoy, PhD, Associate Professor
L. Karabash, PhD, senior lekturer
A. Bigdan, master student, N. Dakalo, master student
Poltava National Technical Yuri Kondratyuk University

THE METHOD OF CALCULATION OF THE JOINT KEYS OF COLLAPSIBLE-MONOLITHIC CONSTRUCTION SYSTEMS UNDER AFFORDABLE HOUSING IN UKRAINE

Collapsible-monolithic constraction systems of multistory buildings have been considered. The method of calculating the strength of reinforce-concrete (concrete) of the joints of the key its elements, based on consideration of the specific stress state and fracture zones taking into account the determining factors. Tables for practical application of the method have been presented.

Keywords: *joint, connection, cut, strength, plasticity, concrete.*

UDC 624.046.3:624.078.34

O.A.Dovzhenko, PhD, Associate Professor
V.V.Pogrebnoy, PhD, Associate Professor
Yu.V.Chursa, master of science
A.G. Gritsenko, master of science
Poltava National Technical Yuri Kondratyuk University

THE JOINTS OF THE KEY OF COLLAPSIBLE GIRDERLESS CEILING: CAPITELS AND WITHOUT CAPITELS OF SYSTEM «CUBE-2,5»

Combined collapsible girderless ceiling are considered, calculation of joints of a capital from a columned and plate with a column a variation method on the basis of the theory of plasticity of concrete is executed.

Keywords: *girderless ceiling, key, joint, strength.*

UDC 693.5:624.078.43

N.M. Zolotova, PhD, Associate Professor
A.O. Garbuz, PhD, Associate Professor
V.A. Sklyarov, PhD, Associate Professor
Kharkiv National O.M. Beketov University of Urban Economy

THE INFLUENCE OF TECHNOLOGICAL FACTORS AND THE TYPE OF LOADING ON CONNECTION DURABILITY OF CONCRETE ELEMENTS USING ACRYLIC GLUES

Results of experimental researches of durability of connection of old concrete with new acryl glues at different types of loading, thickness of glue layer, and also the process of cracksformation at loading are presented in the article.

Keywords: *concrete, acrylic glue, durability of connection, crack formation, thickness of glue layer, age of new concrete.*

UDC 691.3:620.197.6

M.S. Zolotov, PhD, Professor
M.A. Liubchenko, assistant
Kharkiv National O.M. Beketov University of Urban Economy

THE INCREASE OF ADHESIVE STRENGTH AND DURABILITY OF THE MODIFIED PROTECTIVE AND DECORATIVE ACRYLIC COATINGS

The results of the research of adhesive strength of protective and decorative acrylic coatings modified additive compositions are presented.

Keywords: *adhesive strength, protective and decorative coatings, durability.*

UDC 691.58.688.2

S.M. Zolotov, PhD, Associate Professor
Kharkiv National O.M. Beketov University of Urban Economy

DEPENDENCE OF STRENDTH, DEGORMATION AND THE TYPE OF ACRYLIC GLUES DESTRUCTION ON THE TYPE OF LOADING

Experimental results determination of strength and deformation properties of acrylic glues of different compositions at short term, long term and cycle loading, as well as the character of their destruction are given in the article.
Keywords: *acrylic glue, strength, deformation, creeping, the character of destruction.*

UDC 624.012.045

Vl.I. Kolchunov, ScD, Professor
I.A. Yakovenko, PhD
N. V. Usenko, engineer
National Aviation University

TO THE EMERGENCE OF INCLINED NEXT LEVEL CRACKS IN THE REINFORCED CONCRETE COMPOSITE CONSTRUCTIONS

The article is devoted to the definition of complete picture cracking of the inclined cracks adjacent to the cargo, which allows to specify the actual stress-strain state of reinforced concrete composite constructions in the process of loading. The calculation model for of cracking, inclined cracks, calculation model, design scheme, stress-strain state, reinforced determining the forces applied in the longitudinal and transverse reinforcement in the inclined cracks of the first and second type for fracturing different levels and calculation circuit for determining the deformations of concrete in tension $\varepsilon_{bt}(y)$ *between the cracks.*

Keywords*: concrete composite constructions*

UDC 624.075

O.I. Lapenko, ScD
P.S. Bilokurov, post-graduate
G.I. Grischko, post-graduate
National Aviation University, Kyiv

COMPUTER MODELLING OF MONOLITHIC PLANE OVERLAPPING WHICH IS STRENGTHENED WITH STEEL PLATE IN THE TENSILE REGION

There was proposed the procedure of plane overlapping calculation strengthened with steel plate in the tensile region by means of modern software package.
Keywords: *reinforced concrete plane plate, modeling, structures strengthening, stress-strain state.*

UDC 624:725/728

E.I. Lugchenko, PhD, Associate Professor
Kharkiv National O.M. Beketov University of urban economy

RATIONALIZATION OF PARAMETERS OF PERFORATED BEAMS

The numerical analysis of the tensely-deformed state of pre-production models is conducted. Corresponding certainly-element charts are made and their decision is executed in the resilient raising with the use of programmatic complex SCAD.

Keywords: *girder truss, tensely-deformed state, closeness of potential energy of deformations, method of adaptive evolution, the element planning is eventual.*

UDC 691.81: 621.791.052

A. Malushytskyy, PhD
V. Penz, PhD, Associate Professor
Poltava National Technical Yuri Kondratyuk University
V. Bilyarchik,
official representative of the company «Nelson» in Ukraine, Dnepropetrovsk

THE INFLUENCE OF INNOVATION WELDING TECHNIQUES ON THE CONCRETE INSERTS MANUFACTURING AND ON THE ERECTION PROCEDURE OF BUILDING STRUCTURES NODES

Drawing on the example of concrete inserts manufacturing we have considered the influence of a new welding technique on the manufacturing cost of the products and the examples of its usage in homeland construction.

Keywords: *innovation welding techniques, embedded parts, manufacturing cost.*

UDC 624.012.35:624.046.2

S.N. Mykytenko, PhD, post-doctoral
Poltava National Technical Yuri Kondratyuk University

ANALYSIS OF SUBSTANTIVE CALCULATION PROVISIONS OF PRECAST IN-SITU STRUCTURE GIRDERLESS CAPERLESS FRAMEWORK

Going is analysed near the calculation of precast in-situ girderless caperless framework of the system «CUBE». A calculation model is offered on the basis of the connection structural system.

Keywords: precast in-situ structure, girderless caperless structural system, method of replacing frames, connections.

UDC 624.012.45.044

V.P. Mitrofanov, PhD, Head of the Center for ADMCS
Center for Advanced Design Methods of Concrete Structures, Poltava, Ukraine
N.M. Pinchuk, PhD, senior lecturer
P.B. Mitrofanov, PhD, senior lecturer
Poltava National Technical Yuri Kondratyuk University, Ukraine

ABOUT NECESSITY OF THE GENERAL THEORY OF REINFORCED CONCRETE AND ITS ROLE IN THE ADM MODEL CODE

The system Analysis of the Eurocode 2 and fib Model Code 2010 show their common radical demerit: the absence or incompleteness of links between partial and general designs (empirical usually), that leads to the derivation impossibility of reinforced concrete (RC) elements (RCE) design with partial stress-strain state (SSS) from RCE designs with more general SSS. The shown demerit in accordance with the system Approach means the necessity of more high development level of the noted code designs what is caused by the empirical designs dominance that is by absence of the enough General Theory of RC (GTRC). It is stated the essence of the GTRC taken as a principle of the more perfect ADM Model Code, being worked out by the Center for Advanced Design Methods of Concrete Structures (Poltava, Ukraine, E-mail: vpm.admcs@mail.ru).

Keywords: *reinforced concrete structures, designs, disadvantages, links, General Theory of RC.*

UDC 624.012

A.M. Pavlikov, ScD, Professor
A.B. Batig, master student
S.I. Pasishnyuk, master student
Poltava National Technical Yuri Kondratyuk University

INTRODUCTION OFUNCAPITAL-UNGRIDER STRUCTURAL SYSTEM INCONSTRUCTIONOF BUILDINGS IN POLTAVA

The examples of the construction of buildings on the basis of uncapital-ungrider structural system in Poltava are represented. The comparative analysis of the system with other structural systems is done.

Key words: uncapital-ungrider structural system, affordable housing, comparative characteristics of systems.

UDC 624.012.35:624.073.136

A.M. Pavlikov, ScD, Professor
D.F. Fedorov, PhD, senior lecturer
A.V. Batig, master student
Poltava National Technical Yuri Kondratyuk University

KINEMATIC METHOD OF STRENGTH ANALISYS OF MID-SPAN SLAB OF UNCAPITEL UNGRIDER FRAME SRUCTURE

The method of mid-span slab strength design of precast reinforced concrete uncapitel ungrider ceiling structure is given. The extreme criterion is used.

Keywords: *reinforced concrete, strength, precast uncapitel ungrider ceiling structure, mid-span slab.*

UDC 624.042.42

S.F. Pichugin, ScD, Professor
A.V. Makhinko, ScD, senior researcher
Yu.V. Dryzhyruk, PhD, Associate Professor
Poltava National Technical Yuri Kondratyuk University

PREPARATION OF NATIONAL ANNEXES TO NORMS EUROCODE ON LOADS AND INFLUENCES

The article gives actuality of harmonization of the Ukrainian and European build norms On an example Eurocode 1-3 «General actions. Snow loadings» an analysis alteration in them was made by development of National application.

Keywords: *national annex, snow load, wind load, harmonization.*

UDC 622.691.4

S. Pichugin, ScD, Professor
O. Semko, ScD, Professor
Zh. Beskrovna, post-graduate
Poltava National Technical Yuri Kondratyuk University

THE INVESTIGATION OF CORROSION DAMAGES INFLUENCE ON STRESS-STRAIN STATE OF STEEL PIPES OF MAIN OIL PIPELINE THROUGH THE FINITE ELEMENT MODELING

The influence of the main geometrical parameters of corrosion damages on the stress-strain state of the steel pipes of main oil pipeline through the finite element modeling was considered.

Keywords: *steel pipe, the main oil pipeline, the stress-strain state, corrosion damage.*

UDC 624.071.34

S.F. Pichugin, ScD, Professor
V.P. Chichulin, PhD, Associate Professor
K.V. Chichulina, PhD, senior lecturer
Poltava National Technical Yuri Kondratyuk University

ANALYSIS OF PROFILED WEBS' WORK OF THECOMPOUND BEAM

In the articles there have been offered practical recommendations and has been formulated a new approach to proportioning of compound beams' structures with profiled webs. There has also been made a detailed analysis of trapezoid profiled webs' work. The author of the article has made a comparison of suggestions of calculation with the project of national norms.

Keywords: *steel beam, profiled web, box-shaped section, method of calculation.*

UDC 624.016:69.059

O.V. Semko, ScD, Professor
O.P. Voskobiinyk, PhD, senior researcher, post-doctoral
I.O. Parhomenko, post-graduate
Poltava National Technical Yuri Kondratyuk University

ANALYSIS OF INFLUENCE OF DAMAGES PIPE-SHELL ON THE TENSELY-DEFORMED STATE AND BEARING STRENGTH OF FILLED STEEL TUBES MEMBERS ELEMENTS

The influence of types and parameters of artificially created damages of pipe-membrane of experimental concrete filled steel tubes samples on their character of work are analyzed in the article. The minimum parameters of damages of membrane, which practically aren't influencing of bearing ability of concrete filled steel tubes element as a whole are determined in the article.

Keywords: Concrete filled steel tubes, damages, exploitation, behavior specifics.

UDC 004.942:624.01

A.V. Semko, ScD, Professor
A.A. Dmitrenko, PhD, Associate Professor
T.A. Dmitrenko, PhD, senior lecturer
Poltava National Technical Yuri Kondratyuk University

AUTOMATION OF ENGINEERING CALCULATIONS OF KNOTS OF CONNECTION OF THE MONOLITHIC NO-BLOCKINGS CEILING ON A CUT ALONG THE BODY OF COLUMN

The paper provided the results of the study compound monolithic reinforced concrete slab with steel reinforced concrete column on a cut along the body of the column and conduct automated calculations using the latest computer technology.

Keywords: *computer technologies, monolithic beamless overlap slice.*

UDC 624.012

L.I. Storozhenko, ScD, Professor
Poltava National Technical Yuri Kondratyuk University

PROBLEMS OF RESEARCH, DESIGN AND CONSTRUCTION STEEL REINFORCED CONCRETE STRUCTURES

The problems associated with the research, design and construction of steel reinforced concrete structures, the conclusion of the feasibility of their widespread use.

Keywords: *steel reinforced concrete, concrete filled steel tube structures, research, design, construction.*

UDC 624.012.45:691.792

L.I. Storozhenko, ScD, Professor
O.G. Gorb, post-graduate
Poltava National Technical Yuri Kondratyuk University

EXPERIMENTAL RESEARCH OF ADHESIVE JOINTS OF CONCRETE AND STEEL ON STRETCHING

The article presents program and results of experimental research on the composite steel and concrete elements in which joint work of steel and concrete is provided with gluing. Tests conducted to determine the features of work, breaking and bearing capacity elements. Comparison of structures with ensuring of joint work of steel and concrete by gluing and without it was done.

***Keywords**: composite steel and concrete element, glutinous connection, loading, bearing capacity, deformations.*

UDC 624.016 : 69.059

L.I. Storozhenko, ScD, Professor
V.V. Muravlov, PhD
S.O. Murza, PhD
F.S. Shkolyar, post-graduate
Poltava National Technical Yuri Kondratyuk University

EXPERIMENTAL RESULTS OF REINFORCED CONCRETE STRUCTURES WITH EXTERNAL REINFORCEMENT

The article presents the results of experimental research concrete elements reinforced with the Examination, the technique of the experiment, the data on bearing capacity, deformation and fracture behavior of samples.

***Keywords: concrete**, beam, rendered reinforcement, experimental study.*

UDC 624.016 : 69.059

L.I. Storozhenko, ScD, Professor
V.V. Muravlov, PhD
S.O. Murza, PhD
F.S. Shkolyar, post-graduate
Poltava National Technical Yuri Kondratyuk University

EXPERIMENTAL RESULTS OF REINFORCED CONCRETE STRUCTURES WITH EXTERNAL REINFORCEMENT

The article presents the results of experimental research concrete elements reinforced with the Examination, the technique of the experiment, the data on bearing capacity, deformation and fracture behavior of samples.

***Keywords:** concrete, **beam**, rendered reinforcement, experimental study.*

UDC 624.046 : 624.012.82

O.V. Fedorova, post-graduate
Poltava National Technical Yuri Kondratuk University

EXPERIMENTAL RESEARCH OF LONGITUDINAL REINFORCED MASONRY COLUMNS UNDER COMPRESSION

A method of experimental research of compressive strength of longitudinal reinforced masonry columns.
Keywords: *strength, compression, strain, masonry elements.*

UDC 697.133:692.53

H. Filonenko, PhD, Associate Professor
Poltava National Technical Yuri Kondratyuk University

INFLUENCE OF VENTILENESS OF CONSTRUCTION ON HEATCOVER PROPERTIES

The study of the use of blocks is continued from a straw in the constructions of walls and research of influence of filtration of air on properties of heat-insulation materials with considerable ventileness.
Keywords: a thermal protection, coefficient of heat-conducting, ventileness.

UDC 624.151.6

V.N. Chirva, PhD, Associate Professor
A.I. Valovoy, PhD, Professor
K.N. Romanenko, assistant
Kryvyi Rih National University

RESEARCH OF STRAIN-STRESS STATE OF FOUNDATION PLATE OF HOTEL-RESIDENTIAL COMPLEX AND CALCULATION OF NONUNIFORM SETTLEMENT OF ITS BASEMENT IN PROGRAM COMPLEX “LIRA”

The results of inspection of hotel-residential complex in Kyiv are given. The calculation of nonuniform settlement of its basement is carried out. Calculation results are compared with the results of inspection.
Keywords: results of inspection, mathematical modeling, calculation, strain-stress state.

UDC 624

V.M. Chirva, PhD, Associate Professor
A.A. Savchenko, senior lecturer
A.P. Suhan, senior lecturer
T.Y. Grishkovets, student
Krivoy Rog National University

BEARING CAPACITY EXPERIMENTAL RESEARCH OF CONCRETE BEAMS REINFORCED BY FRP-MATERIALS AND ECONOMIC FEASIBILITY JUSTIFICATION OF THEIR USING IN THE PRACTICE OF CONSTRUCTION AND RECONSTRUCTION

The work presents the results of experimental research of testing concrete structures reinforced by FRP-materials and demonstrated the feasibility of their rational use.

Keywords: *FRP-materials, concrete, lamella, amplification, load-bearing capacity.*

UDC 624.012.45.001

O.A. Shkurupiy, PhD, Associate Professor
Poltava National Technical Yuri Kondratyuk University

EXPERIMENTAL AND THEORETICAL STUDIES OF BEARING CAPACITY OF COTINUOUS REINFORCED CONCRETE BEAMS

Experimental and theoretical studies of bearing capacity calculation of reinforced concrete continuous beams has been carried out on the basis of deformation model with extreme criterion and application of optimization and numerical methods and the method of maximum equilibrium. The results of the given above theoretical calculations of such designs have been compared with the experimental data obtained by the author of the article and given in the works of other researchers.

Keywords: *concrete, armature, strength, load bearing capacity, continuous beams, deformation, tension, module modulus of elasticity, concrete class.*

UDC 624.012.44

O. Shkurupiy, PhD, Asistent Professor
D. Lazariev, PhD, Asistent Professor
Yu. Avramenko, PhD, senior lecturer
O. Lazarieva, post-graduate
Poltava National Technical Yuri Kondratyuk University

EXPERIMENTAL RESEARCHES OF THE ULTIMATE STRESS-STRAIN STATE OF CONTINUOUS REINFORCED CONCRETE BEAMS TO TRANSIENT LOAD

The results of experimental research work of continuous reinforced concrete beams in short-term load are presented. The influence of the normal section of the reinforcement ratio and concrete class in the maximum deformation of the most compressed edge of concrete and strength of continuous reinforced concrete beams is set.

Keywords: *strength, the stress strain state, the maximum deformation of compressed concrete, deformation model, extreme criterion.*

UDC 624.012.45.044

O.A. Shkurupiy, PhD, Associate Professor
P.B. Mitrofanov, senior lecturer
Poltava National Technical Yuri Kondratyuk University

ANALYSIS OF CALCULATION STRENGTH REINFORCED CONCRETE ELEMENTS BASED ON EXISTING DEFORMATION MODELS

The comparative calculation of durability of the compressed reinforce-concrete elements in normal sections is executed on the basis of existent deformation models of EN-2, ДБН В. 2.6. 98:2009 and ДСТУ Б В. 2.6 156: 2010 and also to the deformation model with the extreme criterion of durability . The results of calculations in the above deformation models are compared with the experimental researches.

Keywords: *concrete, armature, deformation model, durability, deformation, normal section, reinforce-concrete element, extreme criterion*

Збірник наукових праць
Полтавського національного технічного
університету імені Юрія Кондратюка.
Серія: Галузеве машинобудування, будівництво.
Випуск 4 (39)
Том 1

Комп'ютерна верстка В.В. Ільченко

Коректор Я.В. Новічкова

Підп. до друку 01.11.2013 р. Папір ксерокс.
Друк різограф. Формат 60х80 1/8. Ум. друк. арк. – 36,74.
Тираж 300 прим.

Макет та тиражування виконано у поліграфічному центрі
Полтавського національного технічного університету
імені Юрія Кондратюка
36011, Полтава, Першотравневий проспект, 24
Свідоцтво про внесення суб'єкта видавничої справи
до державного реєстру видавців, виготівників
і розповсюджувачів видавничої продукції
Серія ДК, № 3130 від 06.03.2008 р.