Shaping client-driven business management concepts for modern construction markets

The pioneering review has revealed that various authors have designed and published 77 construction-related business management (BM) concepts during the years 1990-2016 (Huovinen, 2017). In turn, the two-fold aim of our paper is to explore the degrees to which these BM concepts have been designed along the client-driven dimension and to suggest the ways to shape future BM concepts to better accommodate client views in modern construction markets. Our focused review found that 49 (57%) authors have designed their BM concepts along the client-driven sub-dimensions, i.e., 7 to high degrees, 14 to medium degrees, and 28 to low degrees. A further scrutiny of the seven highly client-driven BM concepts revealed that the six sub-dimensions may be of particular importance to take into account when shaping future BM concepts to accommodate client perspectives. These sub-dimensions include (i) client needs, (ii) client base, (iii) buyer-seller collaboration, (iv) sellers’ strategies, (v) buyers’ strategies, and (vi) services’ use, professional, and exchange values. It is envisioned that this focus on client-driven BM will trigger a flow of collaborative R&D&I programs.
Shaping future construction-related business management: A review of 77 concepts

The aim of this paper is to shape the validity of construction-related business management (BM) concepts and the effectiveness of BM practices within firms competing in construction markets. This shaping is based on the outcomes of the 17-year reviewing process, i.e., 77 construction-related BM concepts published during the years 1990-2016, primarily via 15 journals related to management in construction. Consequently, it is suggested that researchers shape future studies on highly valid BM concepts and highly effective BM practices, reject one-way applications of generic BM knowledge to construction-related contexts, take a proper distance from the eight schools of thought on generic BM, collaborate with business managers, and innovate construction-related, high-validity BM concepts. In turn, business managers could shape insights in contextual differences in construction markets, alertness to find means for dealing with deep uncertainty, such as using experts, own judgement, wisdom from crowds, and foresights to co-produce contextual BM knowledge together with key researchers. Thus, this pioneering review serves as a response to Leiringer and Dainty’s (2017) editorial and the launching of a new section of state-of-the-art reviews of research on management in construction where published knowledge about sub-fields, one of them being construction-related BM, is analyzed and new perspectives are provided through syntheses.

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Civil Engineering
Authors: Huovinen, P.
Number of pages: 13
Pages: 817-829
Publication date: 15 Oct 2017

Host publication information
Title of host publication: International Research Conference 2017: Shaping Tomorrow’s Built Environment - Conference Proceedings
Place of publication: Salford, UK
Publisher: University of Salford
Editors: Ruddock, L., Van-Dijk, H., Houghton, C.
ISBN (Electronic): 9781912337040
Keywords: Applied Research, Business Management, Construction, Literature Review, Real
ASJC Scopus subject areas: Business, Management and Accounting(all)
Links: http://usir.salford.ac.uk/id/eprint/44058
Research output: Scientific - peer-review › Conference contribution

Yhdyskuntien vesihuolto – kehityksen ja elämän ehto

General information
State: Published
Ministry of Education publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering
Authors: Juuti, P., Katko, T. S., Rajala, R.
Number of pages: 34
Pages: 197-231
Publication date: 5 Oct 2017

Host publication information
Title of host publication: Miten Suomesta tuli tekniikan maa. Luku 4: Mikä maa, mikä tekniikka? Tekniikan Museon julkaisuja 8. : How Finland Became a Country of Technology
Volume: 8
Place of publication: Helsinki
Tempollevasta tiede- ja koulutuspolitiikasta kohti laajempaa näkemystä

General information
State: Published
Ministry of Education publication type: A3 Part of a book or another research book
Organisations: Civil Engineering
Authors: Katko, T. S., Hukka, J. J.
Number of pages: 8
Pages: 32-39
Publication date: Oct 2017

Host publication information
Title of host publication: Koulutuksen ja tutkimuksen murros yliopistoissa uuden vuosikymmenen kynnyksellä
Place of publication: Tampere
Publisher: Tampereen dosenttiyhdistys
Editors: Juuti, P., Uusi-Rasi, K.
ISBN (Print): 978-951-97614-2-8
ISBN (Electronic): 978-951-97614-3-5

Advancing the design of concepts for international business management with contexts in capital investment markets

The aim of this paper is to advance the design of international business (IB) management concepts with contexts embedded within capital investment markets (CIMs) across the globe. This paper is part of the on-going reviewing of research on CIMs-based business management (BM). So far, the reviewing has resulted in the identification of 77 concepts published during the years 1990-2016. Focal firms have their home bases in the OECD countries plus in Hong Kong and Singapore due to the heritage of the British Commonwealth. Within the 77-concept platform, there are only 21 (27%) IB management concepts, i.e., the authors have designed them along the international dimension. There are 6 (8%) high-degree concepts, 10 (13%) medium-degree concepts, and 5 (6%) low-degree concepts. The high-degree concepts may serve as blocks in theory building. It is proposed that concept designers adopt the necessary Dimensions 1-4 in order to produce theoretically advanced and practically useful CIMs-based IB management concepts, i.e., (1) content-free frames of reference on managing single business, (2) schools of thought on generic BM, (3) theoretical approaches to IB (research), and (4) contexts embedded within international CIMs. Concept designers should adopt these four dimensions pairwise, via Couplings 1-5, during their respective design processes. It is envisioned that IB researchers, CIMs-focused researchers, and IB managers initiate cross-disciplinary and academia-industry research programs on CIMs-based IB management.

General information
State: Published
Ministry of Education publication type: D3 Professional conference proceedings
Organisations: Civil Engineering
Authors: Huovinen, P.
Number of pages: 25
Pages: 1-25
Publication date: 23 Aug 2017

Host publication information
Title of host publication: Proceedings of 14th Vaasa Conference on International Business : 23 - 25 August, 2017
Place of publication: Vaasa, Finland
Publisher: University of Vaasa
Editor: Larimo, J.
Keywords: Capital investments, concepts, construction, international business, management, markets
ASJC Scopus subject areas: Business, Management and Accounting(all)
Finnish water services: Experiences in global perspective

General information
State: Published
Ministry of Education publication type: C1 Separate scientific books
Organisations: Civil Engineering
Authors: Katko, T. S.
Number of pages: 288
Publication date: 7 Jul 2017

Publication information
Place of publication: London
Publisher: IWA Publishing
ISBN (Electronic): 9781780408743
Original language: English
Keywords: Water services, History, Development, Leadership, Institutions, Governance
Additional files:
Finnish Water Services_eBook_IWA

Bibliographical note
https://www.iwapublishing.com/books/finnish-water-services-experiences-global-perspective
Research output: Scientific - peer-review › Book

Global challenges and role of institutions in water services

General information
State: Published
Ministry of Education publication type: D1 Article in a trade journal
Organisations: Civil Engineering
Authors: Katko, T. S.
Number of pages: 1
Pages: 15
Publication date: 9 May 2017
Peer-reviewed: Unknown

Publication information
Journal: Econetin asakaslehti AQ
Issue number: 1
ISSN (Print): 1799-7763
Original language: English
Links:
http://digimag.econetgroup.fi/digimag/117-english/aqen0117_01-xml
Research output: Professional › Article

Vesihuollon globaalt haasteet ja instituutioiden roolit

General information
State: Published
Ministry of Education publication type: D1 Article in a trade journal
Organisations: Civil Engineering
Authors: Katko, T. S.
Number of pages: 1
Pages: 15
Publication date: 9 May 2017
Peer-reviewed: Unknown

Publication information
Journal: Econetin asakaslehti AQ
Issue number: 1
Toimiva vesihuolto ei ole itsestäänselvyys.

General information
State: Published
Ministry of Education publication type: D1 Article in a trade journal
Organisations: Civil Engineering
Authors: Katko, T. S.
Number of pages: 1
Pages: 17
Publication date: Apr 2017
Peer-reviewed: Unknown

Publication information
Journal: Promaint
Volume: 29
Issue number: 2
ISSN (Print): 1797-2000
Original language: Finnish
Keywords: good governance, aging infrastructure
Links: https://issuu.com/promaintlehti/docs/promaint_2_2017
Research output: Professional > Article

Vesihuollon koulutus on erinomaista kehitysyhteistyötä: Keskustelua.

General information
State: Published
Ministry of Education publication type: E1 Popularised article, newspaper article
Organisations: Civil Engineering
Authors: Katko, T. S., Hukka, J.
Number of pages: 2
Pages: 57-58
Publication date: Apr 2017
Peer-reviewed: Unknown

Publication information
Journal: Kanava
Volume: 45
Issue number: 3
ISSN (Print): 0355-0303
Original language: Finnish
Research output: General public > Comment/debate

Energiatehokkuusinformaatio palvelurakennuksissa

General information
State: Published
Ministry of Education publication type: B3 Non-refereed article in conference proceedings
Organisations: Civil Engineering, Research group: Construction Processes
Authors: Sorri, J., Heljo, J., Uotila, U., Ruusala, A.
Number of pages: 6
Pages: 325-330
Publication date: 2017
Research output: Scientific › Conference contribution

Energiatehokkuus on entistä enemmän sähkötehon hallintaa

General information
State: Published
Ministry of Education publication type: B3 Non-referred article in conference proceedings
Organisations: Civil Engineering, Research group: Life-cycle Economics, Research group: Construction Processes
Authors: Heljo, J., Sorri, J., Harsia, P.
Number of pages: 6
Pages: 281-286
Publication date: 2017

Host publication information
Volume: 1
Publisher: Tampereen teknillinen yliopisto, Rakennustekniikka, Rakennusfysiikka

Publication series
Name: Tampereen teknillinen yliopisto. Rakennustekniikka. Rakennusfysiikka.
Links:
Research output: Scientific › Conference contribution

Features of water co-operatives: A comparative study on Finland and Kenya
There are several ways of arranging rural water supply. One of these is through water cooperatives that have been established to provide water supply, irrigation, and/or sewerage services. Water cooperatives are found in developed countries such as Finland, Denmark, Austria, Canada, and United States, and in developing countries in South America, such as Bolivia and Chile. Water cooperatives or their equivalent organizations that exist in Kenya are called self-help water projects. Yet, surprisingly little attention has been paid to this option even in countries with rich tradition of cooperatives in other sectors. In this study, Finland and Kenya were selected for a comparative analysis of the identified features of water cooperatives. Best practices observed in the features with differences could be shared between the two countries.

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Civil Engineering
Authors: Arvonen, V., Kibocha, S. N., Katko, T. S., Pietilä, P.
Number of pages: 22
Pages: 356-377
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Public Works Management and Policy
Volume: 2017
ISSN (Print): 1087-724X
Ratings:
Scopus rating (2016): CiteScore 0.35 SJR 0.171 SNIP 0.481
Scopus rating (2015): SJR 0.243 SNIP 0.423 CiteScore 0.38
Vesihuolto kaupungistuvissa yhteiskunnissa

General information
State: Published
Ministry of Education publication type: A2 Review article in a scientific journal
Organisations: Civil Engineering
Authors: Katko, T. S., Pietilä, P.
Number of pages: 8
Pages: 32-39
Publication date: 2017
Peer-reviewed: Yes

Publication Information
Journal: Alue ja Ympäristö
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ISSN (Print): 1235-4554
Original language: Finnish
Additional files:
2017 katsaus_katko_pietila_1-2017 Alue ja ymp

Bibliographical note
https://aluejaymparisto.journal.fi/article/view/64905
Research output: Scientific - peer-review › Review Article

Rakennusten energiankulutuksen perusskenaario Suomessa 2015-2050

General information
State: Published
Ministry of Education publication type: D4 Published development or research report or study
Organisations: Department of Civil Engineering, Research group: Life-cycle Economics
Authors: Mattinen, M., Heljo, J., Savolahti, M.
Number of pages: 66
Publication date: 13 Sep 2016

Publication Information
Place of publication: Helsinki
Publisher: Suomen ympäristökeskus
Original language: Finnish

Publication series
Name: Suomen ympäristökeskuksen raportteja
Publisher: Suomen ympäristökeskus
Radical programmes for developing the EU residential building sectors as exemplified by Finland and the Netherlands

The economic recession has hit especially hard the residential building sector in the EU region, e.g., the number of housing completions has decreased -49% and the total residential output has been squeezed down by -24% between 2007 and 2014 (Euroconstruct, 2015). In turn, the aim of our paper is to suggest a set of radical, novel programmes for developing the national residential building sectors within EU member countries up to 2025. We have applied the framework of strategic niche management (SNM) to the diagnoses of the current portfolios of the innovation, R&D programs in our two member country contexts. In the case of the Northern Finland, the prime example is Hiukkavaara, the largest district to be built in the City of Oulu. Homes will be constructed for 20,000 new residents. Hiukkavaara is a model for climate-conscious design in the northern hemisphere. Energy and materials are conserved, nature is valued and human beings adapt to their environment. One sub-programme involves Future Buildings and Renewable Energy Project. In the case of the Netherlands, the prime example is Energiesprong (Energy Leap), i.e., the innovation programme commissioned by the Dutch Ministry of the Interior. The aim is to make buildings energy-neutral and boost large-scale initiatives. The sub-programmes are targeting homes owned by housing associations, privately owned homes, office buildings, shops and care institutions. This programme is about ensuring new supply by encouraging companies to package a variety of technical sub-solutions, full services and financing options as well as about asking clients to put out tenders and ask for quotes in novel ways, with the government making changes to the rules and the regulations. Experiences on which the Dutch case in this paper focuses are sub-programmes for residential buildings which includes Rapids, All Lights on Green and Our Home Deserves It. Based on the emerging Finnish and Dutch evidence, we are suggesting key elements to be incorporated into future national residential programmes within EU member countries on: (1) radical direction with balanced stakeholder groups, trustworthy advocates, contextual goal-setting and barriers management, (2) radical networking with entrepreneurial roles and causal links, novel expertise, transparent choices and digital platforms and (3) radical learning processes to arrive at better informed markets on user preferences, co-innovating, new rules and regulations, higher performance/price ratios, higher quality, new roles and responsibilities assignments.
Building Codes and Demand Response of Energy Use

Buildings are an essential part of the wider energy system. A significant share of electricity consumption occurs in buildings. Traditionally, buildings have been places where electricity is consumed. Now they have a growing role also as a location where renewable energy production, such as solar power, occurs.

Demand response means the voluntary actions that are taken on the customer side as a response to something on the demand side. In practice, demand response can involve, for example, reducing the energy consumption during the peak times of the larger energy system or shifting the timing of the building’s energy consumption by synchronizing it with local renewable energy production’s profile inside the building. The building codes of Finland direct the designers’ energy-related solutions both in new construction and licenced renovations.

In this conceptual paper, the literature related to demand response and regulation is reviewed, and it is discussed what kind of a role the building codes could have in advancing the buildings’ preconditions for demand response. Demand response is currently brought out in EU directives in the regulation with relation to network operators. However, preparedness for demand response could also be advanced by giving more attention to the timing of power use in the building codes.

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering, Research group: Construction Processes, Research group: Life-cycle Economics, Department of Electrical Engineering, Research area: Power engineering
Authors: Sorri, J., Heljo, J., Järventausta, P., Honkapuro, S., Harsia, P.
Number of pages: 14
Pages: 8-21
Publication date: 2016

Host publication information
Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume IV: Understanding Impacts and Functioning of Different Solutions
Volume: 4
Publisher: Tampere University of Technology. Department of Civil Engineering
Editors: Nenonen, S., Junnonen, J.
Keywords: building codes, demand response, energy law, energy use, power
Electronic versions:
Building Codes and Demand Response of Energy Use (Paper)
Links:
http://urn.fi/URN:NBN:fi:tty-201606174283
Development of students’ multidisciplinary collaboration skills by simulation of the design process

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering, Research group: Construction Management
Authors: Salmisto, A., Keinänen, M., Kähkönen, K.
Pages: 348-360
Publication date: 2016

Host publication information
Volume: 1
Keywords: collaboration, multidisciplinary, engineering education, collaborative learning, design process
Research output: Scientific - peer-review › Conference contribution

Institutional development is the key for sustainable water services in the built environment

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering
Authors: Katko, T. S., Hukka, J. J.
Number of pages: 12
Pages: 419-430
Publication date: 2016

Host publication information
Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume IV - Understanding impacts and functioning of different solutions
Place of publication: Tampere
Publisher: Tampere University of Technology. Department of Civil Engineering
Editors: Nenonen, S., Junnonen, J.
Research output: Scientific - peer-review › Conference contribution

Integrated urban water management, the green economy and institutional eco-innovations

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering
Authors: Hukka, J. J., Nyanchaga, E. N., Katko, T. S.
Number of pages: 11
Pages: 260-271
Publication date: 2016

Host publication information
Title of host publication: Proceedings of the CIB World Building Congress 2016: Volume III - Building up business operations and their logic. Shaping materials and technologies
Place of publication: Tampere
Modeling of Finnish building sector energy consumption and greenhouse gas emission: specification of POLIREM policy scenario model

Monitoring needs have increased in recent years, and answers to various questions related to the energy use of the building stock are needed faster than before. POLIREM model is a calculation model that assesses the effect of different policy scenarios on the Finnish building stock. The model determines the energy consumption and greenhouse gas emissions, and its purpose is to assist in the reporting and scenario work. The model has a strong linkage with the statistical data, and a top-down approach, which makes the POLIREM different from previous bottom-up style building stock models.

The POLIREM model was originally developed at the Tampere University of Technology in MS excel environment. In this work, the model was converted into a coded version that ensures flexible scenario building, including ease of updating the input data, as well as enabling further integration of new features and/or data sources. This report provides a technical specification of the python-coded scenario model POLIREM.

This report is part of development work to establish national reporting system/evaluation scheme, and fulfills requirements for openness by describing transparently the used evaluation method for building stock modelling.
Rakennuskannan kehitys ja alueellinen sosioekonominen erityyminen

The status of socioeconomic segregation was investigated in Helsinki Metropolitan Area, City of Tampere, and City of Turku. Furthermore, the existence of statistically significant associations between changes in housing and building stock, and development of socioeconomic segregation was examined. The empirical analysis was performed in three separate phases, including spatial analysis, estimations of logit models, and finally, OLS estimations of regression models. The data was collected from grid-based monitoring system for spatial structure and urban form (YKR), spanning from 2000 to 2012. The size of one grid cell was 250 x 250 meters. For further analysis, the grid data was merged with a dataset containing locations and basic information on housing developments subsidized by the Housing Finance and Development Center of Finland (ARA).

It was found that the relative number of people living in socioeconomically segregated grid cells had increased in all areas during the study period. However, at the same time the boundary values for lower and upper quintiles of the variables indicating the status of socioeconomic segregation differentiated relatively little in the study period. Furthermore, statistically significant associations between changes in building stock and socioeconomic segregation were observed. Property types and housing tenures located in the grid cells were also found to be associated with the socioeconomic status of people living in those areas.

Resilient urban water services: Toward the Green Economy

In 2050, urbanization will reach 70 percent in the world, implying an increase of 2.8 billion people in urban areas. Major growth will take place in developing countries, particularly in urban areas that already have an aging, inadequate or non-existent sewerage infrastructure, unable to keep up with rising population. Urban settlements also are the main source of point-source pollution. It has been estimated that the urban infrastructure of the world’s cities over the next 20 years will require USD 41 trillion for investments in urban infrastructure, including USD 22.6 trillion on water and sanitation.

Although worldwide the proportion of people with access to water and sanitation gradually increases, in 2008 there were more urban dwellers without access to improved water sources (114 million more) and basic sanitation (134 million more) than in the year 2000. Moreover, water storage, treatment and distribution systems are often poorly maintained. In many developing countries, water losses due to technical leakage and water theft, often exceed 40-60 percent of the total water distribution.

Yet, access to water and sanitation services is a fundamental precondition for poverty reduction and economic progress. Provision of adequate infrastructure and basic services to the poorest urban populations in developing countries will be an essential step to protect these communities and to build resilience to external stressors. Benefit-cost ratios have been reported to be as high as 7 to 1 for basic water and sanitation services. Water is also fundamental to the green economy.
because it is interwoven with so many sustainable development issues, such as health, food security, and poverty. Therefore, the specific enabling governance and institutional conditions are needed to achieve the Sustainable Development Goal 6 "Ensure access to water and sanitation for all" by 2030 to eradicate the urban poverty in the developing world.

General information
State: Published
Organisations: Department of Civil Engineering
Authors: Hukka, J.
Number of pages: 1
Pages: 23
Publication date: 2016
Peer-reviewed: Unknown
Links:
https://drive.google.com/file/d/0B5cSnxN-aDjVV0FRX01qZDBBeK/view
Research output: Scientific › Paper, poster or abstract

Vesihuollon strateginen kehittäminen haltuun: Ydin- ja tukitoiminnon tarpeen hahmottaa selkeästi

General information
State: Published
Ministry of Education publication type: D1 Article in a trade journal
Organisations: Department of Civil Engineering
Authors: Katko, T. S., Hukka, J. J.
Number of pages: 2
Pages: 12-13
Publication date: 2016
Peer-reviewed: Unknown
Publication information
Journal: Kuntatekniki
Volume: 70
Issue number: 2
ISSN (Print): 1238-125X
Original language: Finnish
Links:
http://kuntatekniki.fi/lehtiarkisto/022016/kansi-6
Links:
Water is a human right, but the services are not

The aim of this paper is to discuss specific enabling governance and institutional conditions, how to achieve the Sustainable Development Goal 6 “Ensure access to water and sanitation for all” (SDG6) by 2030. The authors argue that due to obsolete policies concerning water services pricing and cost recovery, the developing countries are facing an ignored problem of aging and decaying water infrastructures. This makes the SDG6 only a vanishing dream.

Although water and sanitation are explicitly recognized as a human right, 663 million people lacked improved drinking water sources and 2.4 billion people lacked improved sanitation facilities in 2015. The United Nations Secretary-General’s Advisory Board on Water and Sanitation warns that today’s institutional framework requires a major upgrade for the world to possibly meet water and sanitation-related objectives in the 2030 Agenda. For example, underpricing of water is widespread across Africa. Therefore the sector will forgo at least USD 1.8 billion a year in revenues (0.3 percent of GDP). Underpricing has also contributed to the situation, where on average 35 percent of African water services infrastructure assets need rehabilitation.

This wicked “Problematique” requires a new systemic and systematic participatory approach involving also substantive participation by citizens and water users in the actual definition of the goals and direction of water policy, and raising awareness of the importance of water services among policy-makers, water service users and the citizens. Benefit-to-cost ratios have been reported to be as high as 7 to 1 for basic water and sanitation services. We should also be aware that the human rights framework as such does not provide for a right to free water services.
Ministry of Education publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Civil Engineering, Research group: Construction Processes
Authors: Teriö, O., Sorri, J.
Number of pages: 6
Pages: 97-102
Publication date: 20 Oct 2015

Host publication information
Title of host publication: Rakennusfysiikka 2015. Uusimmat tutkimustulokset ja hyvät käytännön ratkaisut. 20.-22.10.2015, Tampere
Place of publication: Tampere
Publisher: Tampereen teknillinen yliopisto, rakennustekniikan laitos, rakennetekniikka
Editors: Vinha, J., Ruuska, T.
Keywords: Double skin facade, Energy efficiency, New renovation concepts, Innovative HVAC, Earth to air heat exchanger
Research output: Scientific > Conference contribution

Lasitetun parvekkeen lämpötilan ja lämpöhäviöiden laskenta
General information
State: Published
Ministry of Education publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Civil Engineering, Research group: Service Life Engineering of Structures, Lund University
Authors: Hilliaho, K., Nordquist, B., Wallentén, P.
Number of pages: 8
Pages: 509-516
Publication date: 20 Oct 2015

Host publication information
Title of host publication: Rakennusfysiikka 2015. Uusimmat tutkimustulokset ja hyvät käytännön ratkaisut. 20.-22.10.2015, Tampere
Place of publication: Tampere
Publisher: Tampereen teknillinen yliopisto, rakennustekniikan laitos, rakennetekniikka
Editors: Vinha, J., Ruuska, T.

Publication series
Name: Rakennustekniikan laitos. Rakennetekniikka. Seminaarijulkaisu 4
No.: 4
ASJC Scopus subject areas: Civil and Structural Engineering, Building and Construction
Keywords: Double skin facade, Energy efficiency, New renovation concepts, Innovative HVAC, Earth to air heat exchanger
Links:
Research output: Scientific > Conference contribution

Koko Julkisivuapeltävän lasijulkisivun vaikutus Etelä-Ruotsissa sijaitsevan rakennuksen energiatehokkuuteen
Article discuss the effect of the added façade glazing on the building energy consumption in one case building in Malmö, Sweden

General information
State: Published
Ministry of Education publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Civil Engineering, Research group: Building Physics and Acoustics, Research group: Service Life Engineering of Structures
Authors: Laukkarinen, A., Hilliaho, K.
Number of pages: 6
Pages: 181-186
Publication date: 20 Oct 2015

Host publication information
Title of host publication: Rakennusfysiikka 2015. Uusimmat tutkimustulokset ja hyvät käytännön ratkaisut. 20.-22.10.2015, Tampere
Place of publication: Tampere
Publisher: Tampereen teknillinen yliopisto, rakennustekniikan laitos, rakennetekniikka
Editors: Vinha, J., Ruuska, T.
Onnistumistekijät valtion tukemissa homekorjaushankkeissa

Middle-Aged and Elderly Finnish Households Considering Moving, Their Preferences, and Potential Downsizing Amidst Changing Life Course and Housing Career

We examine the moving and housing preferences of middle-aged and older in Finland, a country where population composition and movement through the life course are changing. A logistic regression reveals that middle-aged, moderate income residents, renters, those who have lived in their houses only a short time, and residents who are generally dissatisfied are most likely to consider moving. Downsizing appeals to residents with lower incomes who live alone, and who have been in their current houses longer. All potential movers agree on the importance of transportation access and a neighborhood grocery store; however, those preferring to downsize are also interested in house and neighborhood design as well as services that will allow aging in place. Income limitations may create affordability problems for some potential movers.
The effect of ground leases on house prices in Helsinki

One imperfection in housing markets is imperfect knowledge about legal interests such as ground leases. Both actual reduced legal interest as well as uncertainty surrounding rights and future lease payments for houses constructed on leased land may affect prices relative to houses built on freehold land. We use regression analysis of sales prices of condominium transactions in Helsinki to examine the effect ground leases have on house prices. We find that prices on condominiums constructed on leased lots are discounted at least 5%, on average. In addition, we see that the announcement of potentially large increases in base rents upon renewal contributes to the discount.

General information

State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Construction Management, The University of Georgia, Department of Real Estate, Georgia State University, Department of Financial Planning, Housing and Consumer Economics
Authors: Tyvimaa, T., Gibler, K. M., Zahirovic-Herbert, V.
Number of pages: 20
Pages: 451-470
Publication date: 11 Sep 2015
Peer-reviewed: Yes

Publication information
Journal: Journal of Housing and the Built Environment
Volume: 30
Issue number: 3
ISSN (Print): 1566-4910
Ratings:
Scopus rating (2016): SJR 0.866 SNIP 1.107 CiteScore 1.16
Scopus rating (2015): SJR 0.649 SNIP 1.121 CiteScore 1.01
Scopus rating (2014): SJR 0.492 SNIP 1.003 CiteScore 1.02
Scopus rating (2013): SJR 0.561 SNIP 0.855 CiteScore 1.02
Scopus rating (2012): SJR 0.606 SNIP 0.886 CiteScore 0.95
Scopus rating (2011): SJR 0.508 SNIP 0.861 CiteScore 0.95
Scopus rating (2010): SJR 0.572 SNIP 0.762
Scopus rating (2009): SJR 0.496 SNIP 0.773
Scopus rating (2008): SJR 0.527 SNIP 0.789
Scopus rating (2007): SJR 0.553 SNIP 0.854
Reusing concrete panels from buildings for building: Potential in Finnish 1970s mass housing

A remarkable share of European mass housing was built with large-panel systems during the 1960s and 1970s. In many countries, this stock is already being demolished or demolition is discussed due to vacancies or social problems. This trend may result in the creation of an unforeseeable amount of concrete waste. Simultaneously, EU has issued the Waste Framework Directive aiming at reuse instead of recycling. Unlike in situ cast concrete, reclaimed prefabricated concrete panels from mass housing carry the potential for reuse. The purpose of this study is to review the reuse potential embedded in Finland's mass housing stock from the perspective of the dimensions of the panels and spaces, i.e., their suitability for architectural (plan) design. The research material consists of architectural drawings of 276 blocks of flats that contain over 26,000 prefabricated wall panels and nearly 14,000 hollow-core slabs, the dimensions of which are compared to current norms and guidelines for dimensioning living spaces. The technical prerequisites for reuse are reviewed with the help of literature. The study results in identifying an inventory of panels typical to Finnish precast concrete construction, which, in principle, should not exist because the building plans were not standardized but were supposed to be unique. The panels are found to be still usable in architectural (plan) design of detached houses, which form one third of annual residential production in Finland.
High indoor CO2 concentrations in an Office Environment Increases the Transcutaneous CO2 Level and Sleepiness during Cognitive Work

The purpose of this study is to perform a multiparametric analysis on the environmental factors, the physiological stress reactions in the body, the measured alertness, and the subjective symptoms during simulated office work. Volunteer male subjects were monitored during three four-hour work meetings in an office room, both in a ventilated and a non-ventilated environment. The environmental parameters measured included CO2, temperature and relative humidity. The physiological test battery consisted of measuring autonomic nervous system functions, salivary stress hormones, blood's CO2-content and oxygen saturation, skin temperatures, thermal sensations, vigilance, and sleepiness. The study shows that we can see physiological changes caused by high CO2 concentration. The findings support the view that low or moderate level increases in concentration of CO2 in indoor air might cause elevation in the blood's transcutaneously assessed CO2. The observed findings are higher CO2 concentrations in tissues, changes in heart rate variation, and an increase of peripheral blood circulation during exposure to elevated CO2 concentration. The subjective parameters and symptoms support the physiological findings. This study shows that a high concentration of CO2 in indoor air seem to be one parameter causing physiological effects, which can decrease the facility user's functional ability. The correct amount of ventilation with relation to the number of people using the facility, functional air distribution, and regular breaks can counteract the decrease in functional ability. The findings of the study suggest that merely increasing ventilation is not necessarily a rational solution from a technical-economical viewpoint. Instead or in addition, more comprehensive, anthropocentric planning of space is needed as well as instructions and new kinds of reference values for the design and realization of office environments.

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Construction Management, Research group: Building Physics and Acoustics
Authors: Vehviläinen, T., Lindholm, H., Rintamäki, H., Pääkkönen, R., Hirvonen, A., Niemi, O., Vinha, J.
Pages: 19-29
Publication date: 14 Aug 2015
Peer-reviewed: Yes

Publication information
Journal: Journal of Occupational and Environmental Hygiene
Volume: 13
Issue number: 1
ISSN (Print): 1545-9624
Energy saving potential of glazed space: Sensitivity analysis

This study focuses on the impact of different types of glazed balconies on the energy consumption of buildings in northern climatic conditions. The starting point was a glazed balcony in a typical Finnish block of flats of the 1970s, whose impact on the energy consumption of the building was analysed with the IDA-ICE 4.6.1 software based on 156 different calculation cases. In light of the results of the sensitivity analysis, the five key factors affecting the energy engineering design of a glazed space are the integration of the space to the building's ventilation system, heat losses from the building to the balcony and from the balcony to outdoor air, the air tightness of the balcony and the absorption coefficients of its surfaces. Research has shown that higher energy savings in kilowatt hours can be achieved in a northern than a southern climate although percentage-wise savings are higher, for example, in Central Europe than in Finland. Thus, the determination of energy savings by kilowatt hour gives a better idea of the true significance of balcony glazing in a building than a percentage-wise analysis. (C) 2015 Elsevier B.V. All rights reserved.

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Service Life Engineering of Structures, Life Cycle Effectiveness of the Built Environment (LCE@BE), Ramboll Finland Oy Tampere
Authors: Hilliaho, K., Mäkitalo, E., Lahdensivu, J.
Number of pages: 11
Pages: 87-97
Publication date: 15 Jul 2015
Peer-reviewed: Yes

Publication information
Journal: Energy and Buildings
Volume: 99
ISSN (Print): 0378-7788
Ratings:
Scopus rating (2016): CiteScore 4.64 SJR 2.093 SNIP 1.965
Scopus rating (2015): SJR 2.088 SNIP 2.174 CiteScore 4.07
Scopus rating (2014): SJR 2.123 SNIP 2.936 CiteScore 4.21
Scopus rating (2013): SJR 1.897 SNIP 2.433 CiteScore 3.79
Scopus rating (2012): SJR 1.816 SNIP 2.737 CiteScore 3.36
Scopus rating (2011): SJR 1.506 SNIP 2.536 CiteScore 3.23
Scopus rating (2010): SJR 1.631 SNIP 2.081
Scopus rating (2009): SJR 1.564 SNIP 1.79
Scopus rating (2008): SJR 1.624 SNIP 2.028
Scopus rating (2007): SJR 1.033 SNIP 1.718
Scopus rating (2006): SJR 1.411 SNIP 1.788
Scopus rating (2005): SJR 1.293 SNIP 1.277
Scopus rating (2004): SJR 0.81 SNIP 1.628
Scopus rating (2003): SJR 1.567 SNIP 1.4
Scopus rating (2002): SJR 1.172 SNIP 1.631
Scopus rating (2001): SJR 0.942 SNIP 1.095
Scopus rating (2000): SJR 0.505 SNIP 1.226
Scopus rating (1999): SJR 0.25 SNIP 0.589
Original language: English
Keywords: Glazed balcony, Glazed space, Sunspace, Sensitivity analysis, IDA-ICE, Building energy simulation, THERMAL SIMULATION, ATTACHED SUNSPACE, PERFORMANCE, VALIDATION, MODELS
DOIs:
10.1016/j.enbuild.2015.04.016
Source: WOS
Source-ID: 000357241800008
Research output: Scientific - peer-review › Article

Vesihuoltoamme uhkaa krisi

General information
State: Published
Ministry of Education publication type: E1 Popularised article, newspaper article
Organisations: Department of Civil Engineering
Authors: Hukka, J., Katko, T. S.
Number of pages: 1
Publication date: 5 May 2015
Peer-reviewed: Unknown

Publication information
Journal: Aamulehti
Issue number: 5.5
ISSN (Print): 0355-6913
Original language: English
Research output: General public › Article

Assessment of state-supported mould renovations in Finland

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering, Research group: Service Life Engineering of Structures
Authors: Marttila, T., Suonketo, J., Kero, P., Annila, P.
Number of pages: 8
Pages: 643-650
Publication date: 24 Mar 2015

Host publication information
Place of publication: Porto
Editors: de Freitas, V. P., de Angelis, E., Corvacho, H., Delgado, J., Guimarães, A. S.
Research output: Scientific - peer-review › Conference contribution

Practical Experiences from several moisture performance assessments

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Research group: Service Life Engineering of Structures, Department of Civil Engineering, Research area: Structural Engineering, Research group: Structures and Their Behaviour
Authors: Annila, P., Lahdensivu, J., Suonketo, J., Pentti, M.
Number of pages: 8
Pages: 115-122
Publication date: 24 Mar 2015
Kosteus- ja mikrobivaurioiden laajuus kuntien rakennuksissa

Valltion tukemien homekorjaushankkeiden arviointi (HKPro 2)

Valltion tukemien homekorjaushankkeiden arviointi -jatkotutkimus (HKPro 3)
Glazed space thermal simulation with IDA-ICE 4.61 software—Suitability analysis with case study

Many previous articles point out the need of using accurate energy simulation programme for studying the indoor climate and energy use of the highly glazed spaces. This article examines the suitability of IDA Indoor Climate and Energy (IDA-ICE) software for the glazed space energy simulation in theory and practice. The analysis of how the programme meets highly glazed space simulation needs has been done and comparison to the actual field measurement case conducted by using two different window and zone models featured by the simulation tool to examine the software function in practice. The measured data is from the two flats and attached balconies situated in Tampere (61 degrees 29'53 '' N, 023 degrees 45'39 '' E), Finland. The final outcome was that the IDA-ICE 4.61 is well suited for the glazed space studies and the most accurate results are achieved by using a detailed window and zone models. Critical input parameters were the absorption coefficient of the surfaces, the balcony's unintended ventilation, external shading and building supply air flow rate from the outside to apartment through the balcony. The results show that in design situation where attached balcony's one side is glazed and two sides opaque, the uncertainty of the input parameters can easily cause greater deviation between measured and simulated indoor temperatures than the deviation caused by the use of different zone and window models. (C) 2014 Elsevier B.V. All rights reserved.
A Co-creation Centre for University–Industry Collaboration – A Framework for Concept Development

Abstract It is argued in general that future success in effective innovation creation is built on the ability to connect and manage talent, partnerships and related practical innovation processes. This makes it challenging for a university to develop an ecosystem of knowledge creation. The full benefit from a university can only be obtained if the university and society are organically linked together. The needs of society have to be at the centre of a university’s activities, and flexible adjustment to changing needs is necessary but often lacking. Campus management has a major role in the facilitation of multidisciplinary interaction between students, scientists, entrepreneurs and other industry partners that inspire each other with different perspectives on the same subject. One significant tool to support open innovation with diverse stakeholders is to provide supportive spaces with relevant services. This paper aims to identify the requirements of a Co-creation Centre as a concept serving the third role of university. The literature review was conducted and, based on the result, this paper proposes a conceptual framework for capturing the key requirements for developing a multiuser Co-creation Centre. The framework consists of the requirements on the demand and supply sides of campus management. The main findings in this paper are that different modes of knowledge conversion have different capabilities to support knowledge co-creation requirements. Knowledge co-creation process requirements in the multiuser Co-creation Centre for university–industry collaboration are best supported by originating “Ba”, which means the place where individuals share...
feelings, emotions, experiences, and mental models and the place where the knowledge-creation process begins. The results contribute to the concept development in campus management and provide a starting point for evaluating the success of multidisciplinary and multi-actor innovation environments.

**General information**
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering
Authors: Huhtelin, M., Nenonen, S.
Pages: 137 - 145
Publication date: 2015
Peer-reviewed: Yes

**Publication information**
Journal: Procedia Economics and Finance
Volume: 21
ISSN (Print): 2212-5671
Original language: English
Keywords: spaces and services.
DOS:
http://dx.doi.org/10.1016/S2212-5671(15)00160-4
Source: Bibtex
Source-ID: urn:eaca1c4af451146bd5f6ca3acaaa20e86
Research output: Scientific - peer-review › Article

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"Air pressure difference between indoor and outdoor or staircase in multi-family buildings with exhaust ventilation system in Finland"

**General information**
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Structures and Their Behaviour, Research area: Structural Engineering, Research group: Building Physics and Acoustics, Life Cycle Effectiveness of the Built Environment (LCE@BE), Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth
Authors: Leivo, V., Kiviste, M., Aaltonen, A., Turunen, M., Haverinen-Shaughnessy, U.
Number of pages: 6
Pages: 1218-1223
Publication date: 2015
Peer-reviewed: Yes

**Publication information**
Journal: Energy Procedia
Volume: 78C
Article number: 78C
ISSN (Print): 1876-6102
Ratings:
Scopus rating (2016): CiteScore 1.16 SJR 0.467 SNIP 0.586
Scopus rating (2015): SJR 0.365 SNIP 0.561 CiteScore 0.92
Scopus rating (2014): SJR 0.433 SNIP 0.81 CiteScore 1.09
Scopus rating (2013): SJR 0.425 SNIP 0.785 CiteScore 1.02
Scopus rating (2012): SJR 0.425 SNIP 0.563 CiteScore 1.08
Scopus rating (2011): SJR 0.918 SNIP 1.505 CiteScore 2.42
Scopus rating (2010): SJR 0.433 SNIP 0.957
Original language: English
Electronic versions:
Air pressure difference between indoor and outdoor
DOIs:
10.1016/j.egypro.2015.11.188
Links:
http://urn.fi/URN:NBN:fi tty-201605023900
Research output: Scientific - peer-review › Article
Challenges Facing BIM Education: Development of Appropriate Teaching and Learning Resources

Building Information Modelling (BIM) is becoming the new norm in the AEC industry and also part of many construction project management (CPM) programmes. In terms of teaching BIM there is the need for specific resources in explaining the theoretical principles of BIM, BIM tools (authoring, audit and analysis) and building models themselves. Theoretical resources that are available for education in the form of books, articles and websites are easy and straightforward to locate. Likewise a good share of various tools are available for educational purposes. On the other hand, actual building models represent a challenge in terms of preparing and optimising usage of the model for high quality educational purposes. This paper addresses the difficulty in walking the narrow line between an industry ready BIM versus a BIM that is good for student learning and offers a realistic and practical, but simultaneously achievable learning environment.

Conducting a case study in an undergraduate CPM education setting, three approaches for obtaining BIM resources were identified with various challenges and benefits. A combination of internally developed models for early exposure and industry models for later courses is proposed.
Effect of Tire Configuration on the Performance of a Low-Volume Road Exposed to Heavy Axle Loads: Mechanical Modeling

A series of response measurements was conducted at an instrumented low-volume road test site to determine the effects of different tire configurations of a heavy vehicle on the performance of the road structure. After the measurements were made, a true three-dimensional finite element model was developed with PLAXIS 3D 2012 software. The aim of the modeling was to find explanatory factors between the measured stress-strain relationships and confirmed permanent deformations, rutting in particular, at test site conditions. A model was created with reasonable material parameters. The model produced stress levels and road surface deflections that are comparable with the measured values. The mobilizing levels of shear strains seem to explain the notable permanent deformation at the test site despite the relatively low amount of heavy traffic. The shear strain levels can also be used as an efficient tool in evaluating the effects of other variables, such as road structural layers, construction materials, and environmental conditions, on the risk that structural deterioration of roads may occur when the intensity of loading increases.

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Earth Constructions, Research area: Earth and Foundation Structures, Research group: Structures and Their Behaviour, Life Cycle Effectiveness of the Built Environment (LCE@BE)
Authors: Kalliainen, A., Kolisoja, P., Haakana, V.
Number of pages: 11
Pages: 174-184
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Transportation Research Record
Volume: 2474
ISSN (Print): 0361-1981
Ratings:
Scopus rating (2016): SJR 0.494 SNIP 0.722 CiteScore 0.75
Scopus rating (2015): SJR 0.547 SNIP 0.769 CiteScore 0.6
Scopus rating (2014): SJR 0.529 SNIP 0.8 CiteScore 0.58
Scopus rating (2013): SJR 0.608 SNIP 0.877 CiteScore 0.76
Scopus rating (2012): SJR 0.522 SNIP 0.907 CiteScore 0.6
Scopus rating (2011): SJR 0.428 SNIP 0.999 CiteScore 0.72
Scopus rating (2010): SJR 0.398 SNIP 0.959
Scopus rating (2009): SJR 0.393 SNIP 0.79
Scopus rating (2008): SJR 0.392 SNIP 0.747
Scopus rating (2007): SJR 0.377 SNIP 0.728
Scopus rating (2006): SJR 0.389 SNIP 0.837
Scopus rating (2005): SJR 0.281 SNIP 0.791
Scopus rating (2004): SJR 0.402 SNIP 0.867
Scopus rating (2003): SJR 0.318 SNIP 0.839
Scopus rating (2002): SJR 0.295 SNIP 0.777
Scopus rating (2001): SJR 0.259 SNIP 0.719
Scopus rating (2000): SJR 0.245 SNIP 0.564
Scopus rating (1999): SJR 0.292 SNIP 0.671
Original language: English
DOIs: 10.3141/2474-21
Links:
Effect of Tire Configuration on the Performance of a Low-Volume Road Exposed to Heavy Axle Loads: Response Measurements

A series of response measurements was conducted at an instrumented low-volume road test site to determine the effects of different tire configurations of a heavy vehicle on the performance of the road structure. The test site road had a thin asphalt concrete surface, and the total thickness of its structural layers was about half a meter; the road rested on a silty subgrade. The response measurements with two axle loads, 80 kN and 100 kN, included recording of road surface deflection and vertical stresses at three depths below the road surface. The results indicated that the stresses inside the road structure were up to 30% higher when narrow types of single tires were used instead of normal dual tires. According to the employed distress models, this means a threefold to fourfold difference in the service life of the road.

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research area: Earth and Foundation Structures, Research group: Earth Constructions, Research group: Structures and Their Behaviour, Life Cycle Effectiveness of the Built Environment (LCE@BE)
Authors: Kolisoja, P., Kalliainen, A., Haakana, V.
Number of pages: 8
Pages: 166-173
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Transportation Research Record
Volume: 2474
ISSN (Print): 0361-1981
Ratings:
Scopus rating (2016): SJR 0.494 SNIP 0.722 CiteScore 0.75
Scopus rating (2015): SJR 0.547 SNIP 0.769 CiteScore 0.6
Scopus rating (2014): SJR 0.529 SNIP 0.8 CiteScore 0.58
Scopus rating (2013): SJR 0.608 SNIP 0.877 CiteScore 0.76
Scopus rating (2012): SJR 0.522 SNIP 0.907 CiteScore 0.6
Scopus rating (2011): SJR 0.428 SNIP 0.999 CiteScore 0.72
Scopus rating (2010): SJR 0.398 SNIP 0.959
Scopus rating (2009): SJR 0.393 SNIP 0.79
Scopus rating (2008): SJR 0.392 SNIP 0.747
Scopus rating (2007): SJR 0.377 SNIP 0.728
Scopus rating (2006): SJR 0.389 SNIP 0.837
Scopus rating (2005): SJR 0.281 SNIP 0.791
Scopus rating (2004): SJR 0.402 SNIP 0.867
Scopus rating (2003): SJR 0.318 SNIP 0.839
Scopus rating (2002): SJR 0.295 SNIP 0.777
Scopus rating (2001): SJR 0.259 SNIP 0.719
Scopus rating (2000): SJR 0.245 SNIP 0.564
Scopus rating (1999): SJR 0.292 SNIP 0.671
Original language: English
DOIs: 10.3141/2474-20
Source: WOS
Source-ID: 000358552600021
Research output: Scientific - peer-review » Article

Energiansäästöä parvekkeen lasitukselle
Energy Efficient Modernization of Housing Stock: Demonstration of Impacts on Indoor Environmental Quality in Northern Europe

Evaluation of a carbonation model for existing concrete facades and balconies by consecutive field measurements

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering, Research group: Structures and Their Behaviour, Research area: Structural Engineering, Research group: Building Physics and Acoustics, Kaunas Univ Technol, Kaunas University of Technology, Dept Environm Technol, Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth
Authors: Martuzevicius, D., Prasauskas, T., Du, L., Täubel, M., Leivo, V., Kiviste, M., Haverinen-Shaughnessy, U.
Publication date: 2015

Host publication information
Title of host publication: Healthy Buildings Europe HB2015
Publisher: International Society for Indoor Air Quality and Climate
ISBN (Print): 978-0-9846855-4-7
Links:
http://hb2015-europe.org/
Research output: Scientific - peer-review › Conference contribution

The square root model is widely used to predict the initiation phase of reinforcement corrosion induced by carbonation of the concrete cover. The model is based on diffusion laws which makes its validity arguable. The model has been accused of not being able to model accurately carbonation in structures exposed to drying/wetting cycles. The model was evaluated by field measurements on 18 existing concrete buildings conducted twice at an average interval of 8 years. Data from individual parallel samples as well as averaged measurement data were produced. The propagation of carbonation over a certain period of time and variation in the carbonation coefficient were studied using the data. Individual measurements indicated high variation and even inconsistency in carbonation depth. Thus, the carbonation coefficient calculated for the square root model also varied widely. Despite the high scatter, the averaged carbonation of many buildings was found to be closely in line with the prediction of the square root model.
Health assessment aspect on energy efficiency renovations

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering, Research group: Structures and Their Behaviour, Research area: Structural Engineering, Research group: Building Physics and Acoustics, Nati Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth, Kaunas Univ Technol, Kaunas University of Technology, Dept Environm Technol
Authors: Turunen, M., Leivo, V., Aaltonen, A., Pekkonen, M., Prasauskas, T., Martuzevicius, D., Haverinen-Shaughnessy, U.
Publication date: 2015

Host publication information
Title of host publication: Healthy Buildings Europe HB2015
Publisher: International Society of Indoor Air Quality and Climate
ISBN (Print): 978-0-98468855-4-7
Links: http://hb2015-europe.org/
Research output: Scientific - peer-review › Conference contribution

Heat Loss Rate of the Finnish Building Stock
This paper presents a bottom-up model for studying the heat loss rate of the building stock. The model is a step towards more complex building-stock power modeling, whose goal is to predict the sources and the amount of demand response potential under different conditions. The heat loss rate is the fraction of thermal power needed to compensate for the heat loss via exterior walls, windows, roofs, floors and ventilation in the buildings. The heat loss rate depends on the physical characteristics of the building envelope and ventilation and on weather conditions.

We first examine the current state of power and energy modeling. We then describe the research object of this study and
the calculation method. The calculation results presented in the third section are illustrated at the hourly level, sorted by the main source of the heating energy of the building. In addition to the analysis of the building stock level, the heat loss rate was calculated on a building level using some typical building information models for validation purposes. The validation indicated that the results obtained with the two methods were consistent and that the order of magnitude was reasonable. The Finnish building stock was used as a research object in the demonstration of the model. Finally, some further needs for research are discussed.

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Life-cycle Economics, Research group: Construction Processes, Research group: Service Life Engineering of Structures
Authors: Vihola, J., Sorri, J., Heljo, J., Kero, P.
Number of pages: 8
Pages: 601-608
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Procedia Economics and Finance
Volume: 21
ISSN (Print): 2212-5671
Original language: English
Keywords: buildings stock, energy systems, heat loss rate, power modeling

Heat loss rate of the Finnish building stock
DOIs:
10.1016/S2212-5671(15)00218-X
Links:
http://urn.fi/URN:NBN:fi:ttty-201604183810
Source: RIS
Source-ID: urn:16F0384ED693DEFF48B71B73D5740E05
Research output: Scientific - peer-review › Article

Heat release caused by the smouldering combustion of the binder of rockwool
General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Structural Fire Engineering, Research group: Mechanics of Structures
Authors: Leppänen, P., Neri, M., Mäkinen, J.
Number of pages: 15
Pages: 68-82
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Rakenteiden mekaniikka
Volume: 48
Issue number: 1
ISSN (Print): 0783-6104
Original language: English
Keywords: smouldering combustion, heat release

Heat release caused by the smouldering combustion of the binder of rockwool
DOIs:

Links:
http://rmseura.tkk.fi/rmlehti/2015/nro1/RakMek_48_1_2015_5.pdf
Research output: Scientific - peer-review › Article

HKPro3 - Valtion tukemien homekorjaushankkeiden arviointi: Jatkotutkimus
General information
State: Published
Ministry of Education publication type: D4 Published development or research report or study
Organisations: Department of Civil Engineering, Research group: Service Life Engineering of Structures, Research group: Structures and Their Behaviour
Authors: Marttila, T., Annila, P., Kero, P., Suonketo, J., Heino, S., Pentti, M.
Number of pages: 68
Publication date: 2015

Publication information
Publisher: Tampereen teknillinen yliopisto, rakennustekniikan laitos, rakennustekniikka
Original language: Finnish

Publication series
Name: Tampereen teknillinen yliopisto. Rakennustekniikan laitos. Rakennustekniikka; Tutkimusraportti
Publisher: Tampereen teknillinen yliopisto, rakennustekniikan laitos, rakennustekniikka
Volume: 163
ISSN (Print): 1797-9161
Electronic versions: hkpro3_loppuraportti
Links:

Bibliographical note
pdf ok 11.1.2016 KK
Research output: Professional › Commissioned report

How to co-learn in campus.

General information
State: Published
Ministry of Education publication type: D2 Article in professional manuals or guides or professional information systems or textbook material
Organisations: Department of Civil Engineering, Research group: Construction Management
Authors: Salmisto, A.
Number of pages: 18
Pages: 320-337
Publication date: 2015

Host publication information
Title of host publication: Oppiva kampus - How to co-create campus?
Place of publication: Tampere
Publisher: Suomen Yliopistokiinteistöt Oy
Editors: Nenonen, S., Kärnä, S., Junnonen, J., Tähtinen, S., Sandström, N.
Links:
Research output: Professional › Chapter

Insulate project – building assessment as a part of assessment impacts of energy efficiency on indoor environmental quality and health

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering, Research group: Structures and Their Behaviour, Research area: Structural Engineering, Research group: Building Physics and Acoustics, Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth, Kaunas Univ Technol, Kaunas University of Technology, Dept Environm Technol
Authors: Leivo, V., Aaltonen, A., Kiviste, M., Du, L., Prasauskas, T., Martuzevicius, D., Haverinen-Shaughnessy, U.
Publication date: 2015

Host publication information
Title of host publication: Healthy Buildings Europe HB2015
Publisher: International Society for Indoor Air Quality and Climate
Knowledge creation and innovation in civil engineering course for the first-year university students

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Construction Management, Regulation of learning and active learning methods (REALMEE), University of Tampere
Authors: Salmisto, A., Nokelainen, P.
Number of pages: 16
Pages: 506-521
Publication date: 2015
Peer-reviewed: Yes

Scopus rating (2016): CiteScore 1.01 SJR 0.501 SNIP 1.043
Scopus rating (2015): SJR 0.812 SNIP 1.456 CiteScore 1.34
Scopus rating (2014): SJR 0.84 SNIP 1.213 CiteScore 0.96
Scopus rating (2013): SJR 1.048 SNIP 1.105 CiteScore 0.95
Scopus rating (2012): SJR 1.163 SNIP 1.125 CiteScore 0.83
Scopus rating (2011): SJR 1.622 SNIP 1.543 CiteScore 1.19
Scopus rating (2010): SJR 0.931 SNIP 1.044
Scopus rating (2009): SJR 0.322 SNIP 0.973
Original language: English
DOIs:
10.1080/03043797.2014.960510

Bibliographical note
Published online: 07 Nov 2014
Contribution: organisation=rak,FACT1=1
Portfolio EDEND: 2014-11-25
Publisher name: Taylor & Francis Ltd.; European Society for Engineering Education
Source: researchoutputwizard
Source-ID: 1444
Research output: Scientific - peer-review › Article

Kohti tasapuolisempaa tutkimuksen arviointia: Pääkirjoitus

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering
Authors: Katko, T. S.
Number of pages: 2
Pages: 4-5
Publication date: 2015
Peer-reviewed: Yes
Kysynnän jousto - Suomeen soveltuvat käytännön ratkaisut ja vaikutukset verkkoyhtiölle (DR pooli): Loppuraportti


Ilmastonmuutoksen hillitsemisen taustalla on myös uusissa rakennetuissa energiatehokkuusmääräyksissä, joiden tavoitteena on ohjata rakentamista yhä energiatehokkaampaan ja uusiutuvia energialähteitä hyödyntää vastaavasti. Sähkötehokkuutta arvioitaessa tuleekin eristää sähköverkon huippu muodostaa esimerkiksi keskeisellä paikassa myös hetkellisiä tehohuippu- ja käyttötapausten. Kysynnän joukon annostelu on sekä jaettu myös terveellisena osana tulevassa lähes nollaenergiavälineen eli nZEB-rakentamisessa.

Kysynnän jousto sisältää laajan joukon erilaisia toimintoja, joiden merkitys, tarve ja ansaintalogiikka vaihtelevat toimijan näkökulmasta. Kysynnän joustosta voidaan ymmätä myös sellaisena, joka myökkää sähköverkon kehityksen ja hyödyntämisen sekä siirtotähtiä ja jakelevurkkoja ansiosta.

- Kantaverkkoyhtiölle kysynnän jousto tarjoaa mahdollisuuksia tehostatasapainon hallintaan ja taajuuden säättöön käyttö- ja häiriöreserviin sekä mahdollisesti myös joustavuutta tehopolihallintaan.
- Sähkön vähittäismyyjä voi hyödyntää kysynnän joustoa sähkön hankinnan suunnittelussa, tasevastaavana oman taseensa hallinnassa muiden toimenpiteiden rinnalla, säätö- ja jakelevurkkoja myös sellaisena, jossa mahdollisesta kiinteä käyttöä pidetään mahdolliseksi.
- Jakeluverkkoyhtiö voi hyödyntää kysynnän joukon mahdollisuuksia pitkän aikavälin verkon suunnittelussa verkon mitoitusjärjestelmen käyttöönottoon sekä paikallista ja osa-aiakkain, jonka osuus on mahdollisesti mahdollista ojan käytön tapaan.
- Laite- ja järjestelmätietoimittajille sekä palveluiden tarjoajille (esim. kahvila) tarjoaa mahdollisuuksia tehostatapaahdollin hallintaan ja mahdollisuuksia joustavuuden tarjoamiseen.

Kysynnän joukon luontatuota hyödyntäminen edellyttää eri toimijoiden välisiä yhteistyötä. Uusi AMR- siirränta (Advanced Meter Reading), joiden on tarkoitus Suomessa, on edellä täydellä digitaalanajaisuus, mahdollistavan kodintekniikan valinnan vahvistamisen ja käytön muutamisen sekä mahdollisesti myös käyttötoiminnan.
vuorokaudesta ja vuorokauden tunnista riippuen potentialitaali vaihtelevat voimakkaasti. Suurimmat ohjauspotentialit ovat lämmityskaudella sähkölämmityksessä sekä käyttöveden lämmityksessä läpi vuoden. Mahdollisuuksia on myös isompien kiinteistöjen ilmanvaihdon, jähdyttelyn ja valaistuksen ohjauksessa sekä mm. ulkovalaistuksessa, autolämmityksissä, erilaisissa lisäämmitysvastuuksissa sekä erikoiskohteissa, kuten kasvihuoneet.

Tehtyjen analysiin ja verkkooyhtiöille tehdyn kyselyn perusteella AMR-mittareiden ohjausaikatauluun kytketyn ohjausreleen kautta on ohjattavissa yli 1 000 MW pääosin erilaista sähkölämmitys- ja lämmintesisavaraajakuormaa. Tämä ohjattavissa oleva kuormitus olisi otettavissa käyttöön hyvinkin nopeasti, ja hyödynnettävässä esim. day-ahead (Elspot) - markkinoilla toimittaessa. Käytännön toteutus vaatii kuitenkin vielä tietojärjestelmärajoitteitten standardointia siten, että ohjausyhteensä kulkevat saattomattomasti sähkömmyyjien ja verkkooyhtiöiden välillä. AMR-mittareiden ns. kuormanohjausreeseen on kytkettynä samaa suuruusluokkaa oleva määrä kuormitusta ohjaamalla, jota voitaisiin hyödyntää päivän sisällä tapahtuvissa ohjaussäännöksissä. Siitä riippuen ja luotettavasti tiedonsiirtoon sekä mittareihin ja keskustoihin liittyviä ohjausyhteensä perustuu kyky ohjaamaan kokonaisuuden verrattuna pienemmän teknisäia vastauneita.

Jakeluverkkoyhtiöiden valvontamallia, esim. innovaatiorakennuksen muodoissa, tuleekin kehitä siten, että se tuo kannustetaan verkkooyhtiöille edistää AMR-mittareiden kautta ohjattavissa olevan ohjauspotentialin täysimääräistä hyödyntämistä.

Lasitetun parvekkeen sisäilman lämpötilojen ja energiansäättön laskennallinen arviointi

General information
State: Published
Ministry of Education publication type: D1 Article in a trade journal
Organisations: Department of Civil Engineering, Research group: Building Physics and Acoustics, Research group: Service Life Engineering of Structures
Authors: Laukkarinen, A., Hilliaho, K., Rahko, A.
Number of pages: 5
Pages: 7-11
Publication date: 2015
Peer-reviewed: Unknown

Publication information
Journal: Lasirakentaja
Volume: 25
Issue number: 2
ISSN (Print): 0788-8147
Original language: Finnish
Research output: Professional › Article

Leveraging concepts for environmentally sustainable business management in construction - a focused review
The main objective of this paper is to advance applied conceptual knowledge about environmentally sustainable business management (BM) in construction. Environmentally sustainable BM is herein defined to encompass the utilization and development of natural resources in ways which are compatible with the maintenance of these resources, and with the conservation of the natural and built environments, for current and future generations. In principle, concept designers can incorporate environmental sustainability into their BM concepts as a dimension, an element, or an attribute of managing, or as a criterion in decision making. Readily, the 71 construction-related BM concepts have been published between 1990 and 2013. A focused review resulted in the expected findings, i.e., only the 11 (15%) construction-related BM concepts have been designed along the environmental sustainability dimension. Thus, it is posited that high-sustainability BM
concepts be designed by coupling environmental sustainability with the three other necessary dimensions, i.e., content-free frames of reference on BM, schools of thought on generic BM, and focal contexts in construction, respectively. In turn, CIB-related researchers may adopt these couplings and engage themselves with cross-disciplinary BM conceptualization programs in collaboration with farsighted business managers in construction.

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering, Research group: Construction Management
Authors: Huovinen, P.
Number of pages: 11
Pages: 286-296
Publication date: 2015

Host publication information
Title of host publication: CIB Proceedings 2015: Going North for Sustainability: Leveraging Knowledge and Innovation for Sustainable Construction and Development
Place of publication: London, UK
Publisher: IBEA Publications Ltd
Editor: Egbu, C.
ISBN (Print): 978-1-326-47951-0
Keywords: business management, concept design, construction, environmental sustainability, research review
ASJC Scopus subject areas: Building and Construction
Electronic versions:
CIB 2015 Huovinen Pekka Leveraging environmentally sustainable BM concepts 121115
Links:
Research output: Scientific - peer-review › Conference contribution

Näkökulmia parvekkeiden ja terassien paloturvallisuudesta

General information
State: Published
Ministry of Education publication type: D1 Article in a trade journal
Organisations: Department of Civil Engineering, Research group: Service Life Engineering of Structures
Authors: Hilliaho, K.
Number of pages: 6
Pages: 10-15
Publication date: 2015
Peer-reviewed: Unknown

Publication information
Journal: Lasirakentaja
Volume: 25
Issue number: 3
ISSN (Print): 0788-8147
Original language: Finnish
Research output: Professional › Article

Piennelysten omistusasujan energiaköyhyys: Energiaköyhyyden jatkoselvitys liittyen asuntojen lämmitysremonttiin ja energiakulutukseen


Energiaköyhyden riskiä voidaan pienentää ja energiaköhyyttä ennaltaehkäistä parhaiten uudenlaisia rahoitusmuotoja kehittämällä. Eritysen miljoniin kohtaisia ovat rahoitusinstrumentit, joissa investointikustannukset maksetaan syntyvällä energiakustannusten säästöllä sekä valtion takaamat lainat. Lisäksi olisi tarpeen luoda uusia toimintamalleja, joiden avulla energianeuvonta ja rahoitus olisivat paremmin energiaköyhyyden riskirahmien saavutettavissa.

**General information**

**State:** Published

**Ministry of Education publication type:** D4 Published development or research report or study

**Organisations:** Department of Civil Engineering, Research group: Life-cycle Economics, Research group: Construction Processes, Tyrsky-Konsultointi Oy

**Authors:** Runsten, S., Berninger, K., Heljo, J., Sorvali, J., Kasanen, P., Vihola, J., Uotila, U.

**Number of pages:** 80

**Publication date:** 2015

**Publication information**

**Place of publication:** Helsinki

**Publisher:** Ympäristöministeriö

**ISBN (Electronic):** 978-952-11-4385-4

**Original language:** Finnish

**Publication series**

**Name:** Ympäristöministeriön raportteja

**Publisher:** Ympäristöministeriö

**No.:** 6/2015

**ISSN (Electronic):** 1796-170X

**Keywords:** asunto, perusparannus, lämmitysremontti, energiaköyhyys, pienituloinen, energiakustannus, lämmitystapa, rahoitus, energianeuvonta

**Links:**

[http://www.ym.fi/fi-FI/Ajankohtaista/Uutta_tietoa_energiakoyhyydesta%2832589%29](http://www.ym.fi/fi-FI/Ajankohtaista/Uutta_tietoa_energiakoyhyydesta%2832589%29)

**Research output:** Professional > Commissioned report
Rakennusten energiatehokkuuden parantamisen vaikutukset - Insulate-projektin tuloksia

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering, Research group: Structures and Their Behaviour, Research area: Structural Engineering, Research group: Building Physics and Acoustics, Natl Inst Hlth & Welf, Finland National Institute for Health & Welfare, Dept Environm Hlth
Authors: Leivo, V., Turunen, M., Aaltonen, A., Kiviste, M., Pekkonen, M., Haverinen-Shaughnessy, U.
Number of pages: 12
Pages: 369-380
Publication date: 2015

Host publication information
Title of host publication: Rakennusfysiikka 2015 : Uusimmat tutkimustulokset ja hyvät käytännön ratkaisut, 20.-22-10.2015, Tampere
Publisher: Tampereen teknillinen yliopisto, rakennustekniikan laitos, rakennetekniikka
Links:
Research output: Scientific - peer-review › Conference contribution

Rakennusten rakennusfysikaalisen suunnittelun ja toteutuksen periaatteet

General information
State: Published
Ministry of Education publication type: D2 Article in professional manuals or guides or professional information systems or textbook material
Organisations: Department of Civil Engineering, Research group: Building Physics and Acoustics
Authors: Vinha, J.
Number of pages: 28
Pages: 399-426
Publication date: 2015

Host publication information
Title of host publication: Rakentajain kalenteri 2016
Publisher: RAKENNUSTIETO OY

Publication series
Name: Rakentajain kalenteri
Publisher: Rakennustieto Oy
Volume: 100
ISSN (Print): 0355-550X
ISSN (Electronic): 1799-9391
Research output: Professional › Chapter

Regulatory governance, strategic asset management and sustained water services nexus

General information
State: Published
Organisations: Department of Civil Engineering, HAMK University of Applied Sciences
Authors: Hukka, J., Katko, T., Mattila, H.
Publication date: 2015
Peer-reviewed: Unknown
Links:
Resilient asset management and governance for deteriorating water services infrastructure

General information
State: Published
Ministry of Education publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering
Authors: Hukka, J. J., Katko, T. S.
Number of pages: 8
Pages: 112-119
Publication date: 2015

Host publication information
Title of host publication: 8th Nordic Conference on Construction Economics and Organization
Publisher: Elsevier Science Publisher

Publication series
Name: Economics and Finance
Publisher: Elsevier
No.: 21
DOIs:
10.1016/S2212-5671(15)00157-4
Links:
Research output: Scientific - peer-review › Chapter

Safety, Space and Structure Quality Requirements in Construction Scheduling
Abstract Quality assessment of a construction project schedule can be a challenging task for project stakeholders. A little research work has addressed quality of schedules though a good project schedule can be considered as of the key factors of project success. The development of a reliable and easy to perform construction schedule quality assessment procedure seems to be a challenging task. Since Schedule Health Assessment of a construction project has to be strictly related to process requirements, it is used the3 “S” rule as a starting point and framework for obtaining improved understanding of quality of construction schedules. The 3 “S” are Safety, Space and Structure, meaning that the planned process should provide a safe working environment to construction workers, sufficient space to perform construction activities and the required sequence of construction operations and project phases. The aim of the study is to implement a schedule quality assessment method that takes into account the 3 “S” rule of construction process. The 3 “S” requirements can be successfully integrated in a Schedule Health Assessment method, but to facilitate their implementation and control a flow-line chart is needed, thus the schedule tool becomes a new requirement for construction schedule quality control.

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Construction Management, Research group: Construction Processes, Research group: Life-cycle Economics
Authors: Bragadin, M. A., Kähkönen, K.
Number of pages: 8
Pages: 407-414
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Procedia Economics and Finance
Volume: 21
ISSN (Print): 2212-5671
Original language: English
Keywords: Construction management, Project Control, Project Scheduling, Quality, Safety.
DOIs:
10.1016/S2212-5671(15)00193-8
Links:
Source: RIS
Source-ID: urn:F0EEB88647642A7A838E1B2E16C028A8
Research output: Scientific - peer-review › Article
Social and Economic Importance of Water Services in the Built Environment: Need for More Structured Thinking

Abstract Community water supply takes priority over other water use purposes worldwide. Investment in water and sanitation systems in developing economies brings a multitude of economic and social benefits. Water infrastructure systems across the world will deteriorate unless substantially more rehabilitation is done. This paper presents a structured and hierarchical framework for sustained water services development consisting of institutions, provision, water infrastructure and production of services that hopefully create better understanding of how to develop our systems and services as part of the built environment for more sustained futures.

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering
Authors: Katko, T. S., Hukka, J. J.
Number of pages: 7
Pages: 217-223
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Procedia Economics and Finance
Volume: 21
ISSN (Print): 2212-5671
Original language: English
Keywords: ageing water infrastructure, institutional development, priorities, production, provision, special features.
DOIs: 10.1016/S2212-5671(15)00170-7
Source: RIS
Source-ID: urn:E2D918716A9EA0A2093B36459CF62676
Research output: Scientific - peer-review > Article

Stirring the Construction Project Management with Co-creation and Continuous Improvement

Abstract Gathering information that is capable to explain customers' needs is usually seen as a quite straightforward part of the traditional construction process: a customer should be able to tell all relevant needs in the first stage so that a building could be designed and built according to the gained information. But the process is lacking of service abilities if a customer wants to modify the given information due to a change in circumstances, albeit such a change is easily caused due turbulent economic situations and long spans in real-estate development projects. Hence the customer perspective regarding the construction management (CM) process should be accommodated better. In this paper, the case studies of the four premises improvement projects are reported upon, where the CM process was altered to include and apply the concepts of continuous improvement and co-creation. The process documentation covered the impacts of the case project on the usability of the premises, the indoor climate conditions (carbon dioxide and temperature) metering, the time lapse cameras and the on-line user feedback system. The documentation consists of the minutes of the meetings, the financial reporting and the time tables. Both the processes and the results of the projects are analysed. Based on the key findings, some suggestions are put forth upon how to improve the CM process to better serve customer interests and quality improvement in the future.

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Research group: Construction Management, School of Architecture
Authors: Savolainen, J., Kähkönen, K., Niemi, O., Poutanen, J., Varis, E.
Number of pages: 8
Pages: 64-71
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: Procedia Economics and Finance
Volume: 21
ISSN (Print): 2212-5671
Original language: English
Keywords: Co-creation, construction management, continuous improvement, customer relations management, quality management
DOIs:
Townhouse-talotyypin rakennuskustannukset: kolmen suunnitteluratkaisun taloudellisuuden analysointi

General information
State: Published
Ministry of Education publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering
Authors: Saari, A., Tauriainen, M.
Number of pages: 4
Pages: 94-97
Publication date: 2015

Host publication information
Title of host publication: Nollaa parempi – Townhouse energiatehokkaassa asuinrakentamisessa
Publisher: Aalto-yliopisto
ISBN (Print): 978-952-60-6409-3

Publication series
Name: Aalto University publication series Crossover
No.: 9/2015
ISSN (Print): 1799-4950
ISSN (Electronic): 1799-4969
Research output: Scientific - peer-review › Article

UNESCO Chair in Sustainable Water Services: The world needs sustained water supply and sanitation services

General information
State: Published
Ministry of Education publication type: D2 Article in professional manuals or guides or professional information systems or text book material
Organisations: Department of Civil Engineering, Research group: Industrial Bioengineering and Applied Organic Chemistry
Authors: Katko, T., Hukka, J., Pietilä, P.
Number of pages: 2
Pages: 186-187
Publication date: 2015

Host publication information
Title of host publication: Water, People and Cooperation : 50 Years of Water Programmes for Sustainable Development at UNESCO
Place of publication: France
Publisher: UNESCO
Editors: Sykes, T., Hattersley, V.
ISBN (Print): 978-92-3-100128-4
Links:
http://unesdoc.unesco.org/images/0023/002350/235002e.pdf
Research output: Professional › Chapter

The Challenge of Aging Infrastructure, Aging Staff and Reflections for Education and Research

General information
State: Published
Organisations: Department of Civil Engineering
Authors: Katko, T. S.
Publication date: 12 Aug 2014
Advancement of International Business Ideation as Three Recursive, Multi-Competence-Enabled Systems

The aim of this paper is to advance applied theoretical knowledge on international business (IB) ideation by designing the managing of such ideation as three recursive, multi-competence-enabled systems. The core principles of Beer's (1985) Viable System Model are adopted for this system design task. The Viable System Model consists of five interacting sub-systems that can support a viable IB unit. The contribution of this design of the three recursive, multi-competence-enabled systems will be three novel pieces of the applied theoretical knowledge about recursivity and competences that advance the management of an IB unit as a whole and in particular that of IB ideation. For future research, I initially propose that the IB ideation (unit) is being managed the more successfully within its focal contexts, the more extensively the IB ideation is designed as a set of three recursive systems enabled by respective multi-competences. Moreover, the 3-system design may serve as the frame of reference for those compatible theorization initiatives vis-a`-vis viable IB ideation management that interested competence-based management scholars will conduct in the future. I put forth the three templates to facilitate the enhancement of the IB ideation practices among leading, innovative firms and especially by the pioneering management of IB (ideation) units.

General information
State: Published
Ministry of Education publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering
Authors: Huovinen, P.
Number of pages: 41
Pages: 337-377
Publication date: 2014

Host publication information
Title of host publication: A Focused Issue on Building New Competences in Dynamic Environments
Publisher: Emerald Group Publishing Limited
Editors: Sanchez, R., Heene, A.
ISBN (Print): 978-1-78441-275-3
ISBN (Electronic): 978-1-78441-274-6

Publication series
Name: Research in Competence-Based Management
Publisher: Emerald Group Publishing Limited
Volume: 7
ISSN (Print): 1744-2117
Keywords: Business ideation, competence-based management, international business management, Viable System Model
ASJC Scopus subject areas: Business, Management and Accounting(all)
Awareness and Attitudes Toward Age-Restricted Communities in Finland

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering
Authors: Tyvimaa, T.
Number of pages: 15
Pages: 59-73
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Seniors Housing & Care Journal
Volume: 22
Issue number: 1
ISSN (Print): 1941-7187
Original language: English

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2014-12-31
Source: researchoutputwizard
Source-ID: 507
Research output: Scientific - peer-review › Chapter

Construction Projects as research objects - different research approaches and possibilities

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering
Authors: Naaranoja, M., Kähkönen, K., Keinänen, M.
Number of pages: 10
Pages: 237-246
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Procedia: Social and Behavioral Sciences
Volume: 4
Issue number: 119
ISSN (Print): 1877-0428
Ratings:
Scopus rating (2015): SJR 0.159 SNIP 0.703
Scopus rating (2014): SJR 0.156 SNIP 0.471
Scopus rating (2013): SJR 0.153 SNIP 0.437
Scopus rating (2012): SJR 0.225 SNIP 0.228
Scopus rating (2011): SJR 0.169 SNIP 0.169
Scopus rating (2010): SJR 0.144 SNIP 0.128
Economical utilization of high strength steel: Welded slim floor box beams

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering, Research group: Metal Construction
Authors: Mela, K., Heinisuo, M.
Publication date: 2014

Host publication information
Title of host publication: Eurosteel 2014 7th European conference on steel and composite structures
ISBN (Print): 978-92-9147-121-8
Research output: Scientific - peer-review › Conference contribution

Editorial: Decision making is everywhere in projects - taking special notice of this job!

General information
State: Published
Ministry of Education publication type: B1 Article in a scientific magazine
Organisations: Department of Civil Engineering
Authors: Kähkönen, K.
Number of pages: 2
Pages: 4-5
Publication date: 2014
Peer-reviewed: No

Publication information
Journal: Project Perspectives 2014
Volume: XXXVI
ISSN (Print): 1795-4363
Original language: English
Links:
http://ipma.ch/assets/re-perspectives_2014.pdf
http://www.e-julkaisu.fi/pry/project_perspectives_2014/

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2014-08-04<br/>Publisher name: The Project Management Association Finland (PMAF) in co-operation with International Project Management Association (IPMA)
Source: researchoutputwizard
Source-ID: 633
Research output: Scientific › Article

Energiatehokkaan rakentamisen parhaat käytännöt

General information
State: Published
Ministry of Education publication type: E1 Popularised article, newspaper article
Organisations: Department of Civil Engineering
Authors: Teriö, O., Sorri, J.
Number of pages: 1
Pages: 24-24
Publication date: 2014
Peer-reviewed: Unknown
Environmental index for Finnish construction sites

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Life Cycle Effectiveness of the Built Environment (LCE@BE)
Authors: Teriö, O., Sorri, J., Kähkönen, K., Hämäläinen, J.
Number of pages: 18
Pages: 245-262
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Construction Innovation: Information, Process, Management
Volume: 14
Issue number: 2
ISSN (Print): 1471-4175
Ratings:
Scopus rating (2016): CiteScore 1.56 SJR 0.522 SNIP 0.893
Scopus rating (2015): SJR 0.457 SNIP 0.828 CiteScore 0.97
Scopus rating (2014): SJR 0.557 SNIP 0.983 CiteScore 1.13
Scopus rating (2013): SJR 0.315 SNIP 0.539 CiteScore 0.85
Scopus rating (2012): SJR 0.174 SNIP 0.245 CiteScore 0.39
Scopus rating (2011): SJR 0.124 SNIP 0.098
Scopus rating (2010): SJR 0.135 SNIP 0.1
Scopus rating (2009): SJR 0.205 SNIP 0.212
Scopus rating (2008): SJR 0.155 SNIP 0.062
Scopus rating (2007): SJR 0.113 SNIP 0.018
Scopus rating (2006): SJR 0.151 SNIP 0.101
Scopus rating (2005): SJR 0.146 SNIP 0.213
Scopus rating (2004): SJR 0.144 SNIP 0.254
Scopus rating (2003): SJR 0.137 SNIP 0.248
Scopus rating (2002): SJR 0.124 SNIP 0.167
Original language: English
DOIs: 10.1108/CI-06-2013-0030

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2014-05-20<br/>Publisher name: Emerald Group Publishing Limited
Source: researchoutputwizard
Source-ID: 1614
Research output: Scientific - peer-review › Article
Implications On Facilitating Interaction In Public Hearings With Virtual Models

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering
Authors: Porkka, J., Rekola, M., Kuula, T., Kähkönen, K., Rannisto, J.
Number of pages: 10
Publication date: 2014

Host publication information
Title of host publication: Proceedings of the 14th International Conference on Construction Applications of Virtual Reality, 16-18 November 2014, Sharjah, UAE
Place of publication: Sharjah, UAE
Publisher: Teesside University, UK
Editors: Dawood, N., Alkass, S.
ISBN (Print): 978-0-9927161-1-0
Links:
http://www.sharjah.ac.ae/en/c14/Pages/default.aspx

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2015-01-08<br/>Publisher name: Teesside University, UK
Source: researchoutputwizard
Source-ID: 1294
Research output: Scientific › peer-review › Conference contribution

Laatua ja tuottavuutta - Rakennusteollisuus laatupolilla

General information
State: Published
Ministry of Education publication type: B2 Part of a book or another research book
Organisations: Department of Civil Engineering
Authors: Pekkanen, J.
Number of pages: 6
Pages: 125-130
Publication date: 2014

Host publication information
Title of host publication: Rakentajain kalenteri 2015
Place of publication: Helsinki
Publisher: RAKENNUSTIETO OY
Editors: Koskenvesa, A., Heloma, T., Laine, K.

Publication series
Name: Rakentajain kalenteri
Publisher: Rakennustieto Oy
Volume: 99
ISSN (Print): 0355-550X
ISSN (Electronic): 1799-9391

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2014-12-30
Source: researchoutputwizard
Source-ID: 1249
Research output: Scientific › Chapter

Modeling and visualization of residential sector energy consumption and greenhouse gas emissions

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering
Authors: Mattinen, M. K., Heljo, J., Vihola, J., Kurvinen, A., Lehtoranta, S., Nissinen, A.
Number of pages: 11
Pages: 70-80
Poor state of water and sanitation services: Why ignorance is reshaping our future?
This paper diagnoses the lack of understanding and ignorance of consequences due to unviable water services. In terms of water quality and related services, access to improved water sources and to sanitation facilities remains a key development challenge. Between 1990 and 2008, access to improved water sources increased by 1.8 billion people, however 240 million people are still expected not to have access to an improved water source by 2050, primarily in developing countries. This problem is particularly acute in urban areas as the share of city dwellers without access to treated water actually increased between 1990 and 2008. The share of people without access to treated water is also expected to increase in sub-Saharan Africa, where the Millennium Development Goal for improved water supply is unlikely to be met.

Worse still, nearly 1.4 billion people are expected to have no access to basic sanitation services in 2050. 2.6 billion people still do not use improved sanitation, whilst 884 million people do not use improved sources of drinking water. Of critical importance is the fact that access to an “improved” water source does not necessarily mean access to “safe” water fit for human consumption. As a result, half of Africa’s hospital beds are filled with people suffering from a water-related disease. While the service coverage estimates identify the order-of-magnitude of the problem, the numbers of people threatened by poor management of constructed systems is much greater.

Investment in water infrastructure can reduce the strain on government health budgets by reducing external costs from adverse health impacts resulting from poor water and sanitation services. Benefit-to-cost ratios have been reported to be as high as 7 to 1 for basic water and sanitation services in developing countries. The social benefits that water and wastewater services provide are well known, including reduced mortality and morbidity from waterborne diseases. Most of these benefits accrue outside the financial accounts of the infrastructure investor, creating a significant gap between “project” and “social” rates of return. Since the development of water and wastewater infrastructure grew out of the public health revolution in the late 1800s, there is a strong link between public health and the development of water and wastewater utilities.

Provision of adequate infrastructure and basic services to the poorest populations in developing countries will be an essential step to protect these communities and to build resilience to external stressors. In developing countries, access to water and sanitation services is a fundamental precondition for poverty reduction and economic progress. The multiple benefits of providing access to water and sanitation in terms of health, life expectancy, and the freeing of time for education and economic activities, are well known. Yet, the prevailing paradigm has been for decades and still is: Although investments in water and sanitation services are producing unquestionably high rate of returns, we’ve much more fashionable items on our agenda, such as climate change, integrated water resources management, food and water security, green economy, water as a human right. Therefore the needed investments are not simply done.

General information
State: Unpublished
Organisations: Department of Civil Engineering
Authors: Hukka, J., Nyanchaga, E.
Publication date: 2014
Peer-reviewed: Unknown
Event: Paper presented at COOPERATION ACROSS BORDERS, Helsinki, Finland.
Research output: Scientific \ Paper, poster or abstract

Rakennusliikkeiden laatukäsitykset toiminnan laadusta

General information
State: Published
Ministry of Education publication type: B2 Part of a book or another research book
Organisations: Department of Civil Engineering
Authors: Viita, J.
Number of pages: 7
Pages: 212-218
Publication date: 2014

Host publication information
Title of host publication: Rakentajain kalenteri 2015
Place of publication: Helsinki
Publisher: RAKENNUSTIETO OY
Editors: Koskenvesa, A., Heloma, T., Laine, K.

Publication series
Name: Rakentajain kalenteri
Publisher: Rakennustieto Oy
Sisäilman laadun parantaminen. Olosuhteiden tasaaminen tilojen välillä


General information
State: Published
Ministry of Education publication type: D4 Published development or research report or study
Organisations: Department of Civil Engineering
Authors: Lassila, A.
Number of pages: 174
Publication date: 2014

Publication information
Place of publication: Tampere
Publisher: Tampereen teknillinen yliopisto. Rakennusteknikan laitos
Original language: Finnish
Electronic versions:
lassila_sisailman_laadun_parantaminen.pdf
Links:

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2015-02-27
Source: researchoutputwizard
Source-ID: 891
Research output: Professional › Commissioned report

The Potential for Consumer Segmentation in the Finnish Housing Market

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering
Authors: Gibler M., K., Tyvimaa, T.
Number of pages: 29
Pages: 351-379
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Journal of Consumer Affairs
Volume: 48
Issue number: 2
ISSN (Print): 0022-0078
Ratings:
Scopus rating (2016): SJR 0.44 SNIP 0.906 CiteScore 1.39
Scopus rating (2015): SJR 0.728 SNIP 1.286 CiteScore 1.56
Scopus rating (2014): SJR 0.884 SNIP 1.266 CiteScore 1.58
Scopus rating (2013): SJR 0.91 SNIP 1.702 CiteScore 1.75
Scopus rating (2012): SJR 0.762 SNIP 1.263 CiteScore 1.47
Scopus rating (2011): SJR 0.762 SNIP 1.176 CiteScore 1.74
Scopus rating (2010): SJR 0.477 SNIP 1.418
Scopus rating (2009): SJR 1.104 SNIP 1.66
Scopus rating (2008): SJR 0.806 SNIP 1.743
Scopus rating (2007): SJR 0.555 SNIP 0.985
Scopus rating (2006): SJR 0.397 SNIP 0.777
Scopus rating (2005): SJR 0.405 SNIP 0.76
Scopus rating (2004): SJR 0.583 SNIP 1.256
Scopus rating (2003): SJR 0.41 SNIP 1.38
Scopus rating (2002): SJR 0.291 SNIP 0.562
The Relationship between the Determinants of Rental Housing Satisfaction and Considering Moving in Finland

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering
Authors: Gibler, K. M., Kananen, J., Tyvimaa, T.
Number of pages: 21
Pages: 104-124
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Property Management
Volume: 32
Issue number: 2
ISSN (Print): 0263-7472
Ratings:
Scopus rating (2016): SJR 0.318 SNIP 1.099 CiteScore 0.86
Scopus rating (2015): SJR 0.321 SNIP 0.765 CiteScore 0.82
Scopus rating (2014): SJR 0.299 SNIP 0.698 CiteScore 0.52
Scopus rating (2013): SJR 0.275 SNIP 0.687 CiteScore 0.54
Scopus rating (2012): SJR 0.31 SNIP 0.748 CiteScore 0.47
Scopus rating (2011): SJR 0.279 SNIP 0.688 CiteScore 0.43
Scopus rating (2010): SJR 0.374 SNIP 0.602
Scopus rating (2009): SJR 0.244 SNIP 0.702
Scopus rating (2008): SJR 0.284 SNIP 0.531
Scopus rating (2007): SJR 0.212 SNIP 0.38
Scopus rating (2006): SJR 0.213 SNIP 0.221
Scopus rating (2005): SJR 0.116 SNIP 0.235
Scopus rating (2004): SJR 0.14 SNIP 0.22
Scopus rating (2003): SJR 0.123 SNIP 0.463
Scopus rating (2002): SJR 0.111 SNIP 0.437
Scopus rating (2001): SJR 0.139 SNIP 0.186
Scopus rating (2000): SJR 0.161 SNIP 0.386
Scopus rating (1999): SJR 0.11 SNIP 0.077
Original language: English
DOI: 10.1108/PM-02-2013-0009
Links: http://www.emeraldinsight.com/0263-7472.htm

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2014-05-20<br/>Publisher name: Emerald Group Publishing Limited
Uudet korjausrakentamisen energiamääräykset pientalonäkökulmasta

Variable Load Distribution

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering
Authors: Poutanen, T.
Number of pages: 9
Pages: 989-997
Publication date: 2014

Host publication information
Title of host publication: Proceedings of the Second International Conference on Vulnerability and Risk Analysis and Management (ICVRAM) and the Sixth International Symposium on Uncertainty Modeling and Analysis (ISUMA), Liverpool, UK, July 13-16, 2014
Publisher: American Society of Civil Engineers
Editors: Beer, M., Au, S., Hall, J. W.
ISBN (Print): 978-0-7844-1360-9
DOIs: 10.1061/9780784413609.100
Links: http://ascelibrary.org/doi/abs/10.1061/9780784413609.100

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2014-08-22
Source: researchoutputwizard
Source-ID: 1301
Research output: Scientific - peer-review › Conference contribution

Opening of the seminar

General information
State: Published
Ammattityövoiman osaamisen varmistaminen energiatehokkaassa rakentamisessa

General information
State: Published
Ministry of Education publication type: B2 Part of a book or another research book
Organisations: Department of Civil Engineering
Authors: Teriö, O., Sorri, J.
Publication date: 2013

Host publication information
Title of host publication: Rakentajain kalenteri 2014
Place of publication: Helsinki
Publisher: RAKENNUSTIETO OY
Editor: Koskenvesa, A.

Publication series
Name: Rakentajain kalenteri
Publisher: Rakennustieto Oy
Volume: 98
ISSN (Print): 0355-550X
ISSN (Electronic): 1799-9391

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2013-12-29
Source: researchoutputwizard
Source-ID: 3531
Research output: Scientific › Chapter

Asuntoyhtiöiden uudistava korjaustoiminta ja lisärakentaminen

General information
State: Published
Ministry of Education publication type: D4 Published development or research report or study
Organisations: Department of Civil Engineering
Authors: Nykänen, V., Lahti, P., Knuuti, A., Hasu, E., Staffans, A., Kurvinen, A., Niemi, O., Virta, J.
Number of pages: 170
Publication date: 2013

Publication information
Place of publication: Espoo
Publisher: VTT
ISBN (Print): 978-951-38-7987-7
ISBN (Electronic): 978-951-38-7988-4
Original language: Finnish

Publication series
Name: VTT Technology
Publisher: VTT
Volume: 97
ISSN (Print): 2242-1211
ISSN (Electronic): 2242-122X
Links:

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2014-04-29
Dags att ta itu med utmaningarna inom vattenförsörjningen

General information
State: Published
Ministry of Education publication type: E1 Popularised article, newspaper article
Organisations: Department of Civil Engineering
Authors: Katko, T.
Publication date: 2013
Peer-reviewed: Unknown

Publication information
Journal: Finlands Kommuntidning
Volume: 19
Issue number: 8: 30-31
ISSN (Print): 1235-9343
Original language: Swedish
Research output: General public › Article

Environmental impact of Building Construction Projects in Northern Europe / Impatto ambientale nei progetti di Building Construction nel Nord Europa

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering
Authors: Teriö, O., Honkanen, J.
Number of pages: 10
Pages: 37-46
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: In_bo: Ricerche e progetti per il territorio, la città e l'architettura. Construction Management
Volume: 4
Issue number: Special issue 2
ISSN (Print): 2036-1602
Original language: English
Links:
http://in_bo.unibo.it/article/view/4056/3506
http://in_bo.unibo.it/issue/view/405

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2013-12-29
Source: researchoutputwizard
Source-ID: 3528
Research output: Scientific - peer-review › Article

Ikkunakorjausten vaikutukset kerrostalon energiankulutukseen

General information
State: Published
Ministry of Education publication type: D1 Article in a trade journal
Organisations: Department of Civil Engineering
Authors: Uotila, U.
Number of pages: 2
Pages: 4-5
Publication date: 2013
Peer-reviewed: Unknown

Publication information
Innovazione nel construction project control / Innovation in construction project control

General information
State: Published
Ministry of Education publication type: A3 Part of a book or another research book
Organisations: Department of Civil Engineering
Authors: Bragadin, M. A., Kähkönen, K.
Number of pages: 20
Pages: 138-157
Publication date: 2013

Host publication information
Title of host publication: ICT, Automation and the Industry of the Built Environment: from the Information Exchange to the Field Management
Place of publication: Italy
Publisher: ISTeA Italian Society of Science, Technology and Engineering of Architecture; Maggioli Editore
Editors: Alaimo, G., Carbonari, A., Ciriëni, A., Danioitt, B., Dell'Osso, G., Esposito, M. A.
ISBN (Print): 978-88-387-6258-1

Project management for construction: Towards methods and tools meeting demands of modern construction operations

General information
State: Published
Ministry of Education publication type: B3 Non-refereed article in conference proceedings
Organisations: Department of Civil Engineering
Authors: Kähkönen, K.
Number of pages: 8
Pages: 1-8
Publication date: 2013

Host publication information
Title of host publication: Construction Management workshop, October 17-18, Ravenna, Italy
Place of publication: Italy

Item Type: Conference contribution

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2013-12-29
Source: researchoutputwizard
Source-ID: 3602
Research output: Professional › Article
Virtual Reality For Meeting Interaction In Infrastructure Construction Projects

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering
Authors: Porkka, J., Kuula, T., Kähkönen, K., Rannisto, J.
Number of pages: 9
Pages: 354-362
Publication date: 2013

Host publication information
Title of host publication: 13th International Conference on Construction Applications of Virtual Reality October 30th-31st 2013, London UK
Place of publication: London
Publisher: Teesside University
Editors: Dawood, N., Kassem, M.
ISBN (Print): 978-0-9927161-0-3

Publication series
Name: International Conference on Construction Application of Virtual Reality
Volume: 13
Links:
http://www.convr2013.com

Bibliographical note
Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2013-12-29<br/>Publisher name: Teesside University
Source-ID: 3175
Research output: Scientific - peer-review › Conference contribution

Education, Research and Capacity Building for Water Services

General information
State: Published
Organisations: Department of Chemistry and Bioengineering
Authors: Katko, T.
Publication date: 20 Sep 2012
Peer-reviewed: Unknown
Research output: Scientific › Paper, poster or abstract

Huge Challenges. Editorial

General information
Valtavat haasteet: Pääkirjoitus

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering
Authors: Katko, T.
Number of pages: 6
Pages: 4-9
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Ympäristöhistoria: Finnish Journal of Environmental History
Volume: 2
Issue number: 3
ISSN (Print): 1799-6953
Original language: English
Research output: Scientific - peer-review › Article

Time Allocation of Site Management

General information
State: Published
Ministry of Education publication type: A4 Article in a conference publication
Organisations: Department of Civil Engineering
Authors: Marjasalo, A., Koskenvesa, A., Tolonen, T., Koskela, L.
Number of pages: 10
Pages: 230-239
Publication date: 2011

Host publication information
Title of host publication: 19th Annual Conference of the International Group for Lean Construction IGLC 2011, 13-15 July 2011, Lima, Peru
Place of publication: Peru
Publisher: International Group for Lean Construction
ISBN (Print): 978-1-62276-823-3

Publication series
Name: Annual Conference of the International Group for Lean Construction
Volume: 1
ISSN (Print): 2309-0979

Bibliographical note
ei ut-numeroa 9.4.2014<br/>Contribution: organisation=rak,FACT1=1<br/>Portfolio EDEND: 2013-12-29<br/>Publisher name: International Group for Lean Construction
Integration of water and wastewater utilities: A case from Finland

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Chemistry and Bioengineering, Department of Chemistry and Bioengineering, Finnish Water Utilities Association
Authors: Katko, T. S., Kurki, V., Juuti, P. S., Rajala, R. P., Seppälä, O.
Number of pages: 9
Pages: 62-70
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Journal American Water Works Association
Volume: 102
Issue number: 9
Article number: 9
ISSN (Print): 0003-150X
Ratings:
Scopus rating (2016): SJR 0.298 SNIP 0.646 CiteScore 0.37
Scopus rating (2015): SJR 0.362 SNIP 0.6 CiteScore 0.41
Scopus rating (2014): SJR 0.383 SNIP 0.753 CiteScore 0.3
Scopus rating (2013): SJR 0.472 SNIP 0.859 CiteScore 0.36
Scopus rating (2012): SJR 0.472 SNIP 0.964 CiteScore 0.37
Scopus rating (2011): SJR 0.456 SNIP 0.839 CiteScore 0.3
Scopus rating (2010): SJR 0.427 SNIP 0.759
Scopus rating (2009): SJR 0.529 SNIP 0.98
Scopus rating (2008): SJR 0.446 SNIP 1.045
Scopus rating (2007): SJR 0.589 SNIP 1.078
Scopus rating (2006): SJR 0.484 SNIP 1.197
Scopus rating (2005): SJR 0.951 SNIP 1.352
Scopus rating (2004): SJR 0.855 SNIP 1.116
Scopus rating (2003): SJR 0.917 SNIP 1.31
Scopus rating (2002): SJR 0.99 SNIP 1.643
Scopus rating (2001): SJR 1.057 SNIP 1.497
Scopus rating (2000): SJR 1.391 SNIP 1.809
Scopus rating (1999): SJR 1.847 SNIP 1.671
Original language: English
Links:
http://www.awwa.org/Publications/AWWAJournalIssue.cfm?ItemNumber=55031

Sammutusveden hankintasuunnitelmat tulee päivittää

General information
State: Published
Ministry of Education publication type: E1 Popularised article, newspaper article
Organisations: Department of Civil Engineering, Department of Civil Engineering
Authors: Väänänen, J., Katko, T. S., Pietilä, P.
Publication date: 2009
Peer-reviewed: Unknown

Publication information
Journal: Kuntateknikka
Volume: 63
Kunnallisten vesihuoltotoimien järjestelyt – yhteisen edun ajamista vai lyhytnäköistä opportunismia?

**General information**
State: Published
Ministry of Education publication type: E1 Popularised article, newspaper article
Organisations: Department of Civil Engineering
Authors: Vinnari, E. M., Hukka, J., Katko, T. S.
Number of pages: 2
Pages: 20-21
Publication date: 2005
Peer-reviewed: Unknown

**Publication information**
Journal: Kuntatekniikka
Volume: 60
Issue number: 1
ISSN (Print): 1238-125X
Original language: Finnish
Research output: General public › Article

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**General information**
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Bio- ja ympäristöteknikka
Authors: Juhola, P., Hukka, J., Katko, T. S.
Number of pages: 9
Pages: 46-54
Publication date: 1999
Peer-reviewed: Yes

**Publication information**
Journal: European Water Management
Volume: 9
Issue number: 2
Original language: English
Research output: Scientific - peer-review › Article

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Water supply and sanitation as an entry point to human development: Vision21- Knowledge synthesis.

**General information**
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Bio- ja ympäristöteknikka
Authors: Hukka, J., Katko, T. S.
Publication date: 1999
Peer-reviewed: Yes

**Publication information**
Original language: English

**Bibliographical note**
<www.wsscc.org/vision21/docs/index.html>
Research output: Scientific - peer-review › Comment/debate
The need for "champions" in rural water supply

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Bio- ja ympäristöteknikka
Authors: Katko, T. S.
Pages: 19-22
Publication date: 1994
Peer-reviewed: Yes

Publication information
Journal: Waterlines
Volume: 12
Issue number: 3
Original language: English
Research output: Scientific - peer-review › Article

Evolution of consumer-managed water cooperatives in Finland with implications for developing countries

General information
State: Published
Ministry of Education publication type: A1 Journal article-refereed
Organisations: Department of Civil Engineering, Bio- ja ympäristöteknikka
Authors: Katko, T. S.
Number of pages: 9
Publication date: 1992
Peer-reviewed: Yes

Publication information
Journal: Water International
Volume: 17
Issue number: 1
ISSN (Print): 0250-8060
Ratings:
Scopus rating (2016): SJR 0.641 SNIP 1.033 CiteScore 1.42
Scopus rating (2015): SJR 0.484 SNIP 0.597 CiteScore 1
Scopus rating (2014): SJR 0.45 SNIP 0.597 CiteScore 0.81
Scopus rating (2013): SJR 0.506 SNIP 0.593 CiteScore 0.83
Scopus rating (2012): SJR 0.31 SNIP 0.503 CiteScore 0.61
Scopus rating (2011): SJR 0.625 SNIP 0.817 CiteScore 0.99
Scopus rating (2010): SJR 0.421 SNIP 0.461
Scopus rating (2009): SJR 0.307 SNIP 0.462
Scopus rating (2008): SJR 0.372 SNIP 0.61
Scopus rating (2007): SJR 0.627 SNIP 0.853
Scopus rating (2006): SJR 0.242 SNIP 0.483
Scopus rating (2005): SJR 0.623 SNIP 0.888
Scopus rating (2004): SJR 0.346 SNIP 0.564
Scopus rating (2003): SJR 0.6 SNIP 1.128
Scopus rating (2002): SJR 0.404 SNIP 0.738
Scopus rating (2001): SJR 0.499 SNIP 0.966
Scopus rating (2000): SJR 0.31 SNIP 0.9
Scopus rating (1999): SJR 0.198 SNIP 0.413
Original language: English
Research output: Scientific - peer-review › Article

Developing a multistage swirl concentrator for higher separation efficiencies

General information
Major constraints in water supply in developing countries.

State: Published
Organisations: Bio- ja ympäristöteknikka
Authors: Häkkinen, R., Katko, T. S., Ryynänen, S., Teizazu, T.
Number of pages: 3
Publication date: 1987

Publication information
Publisher: Filtration & Separation
Year: 1987
Original language: English
Research output: Scientific - peer-review › Other contribution

General information
State: Published
Organisations: Bio- ja ympäristöteknikka
Authors: Katko, T. S.
Number of pages: 231
Publication date: 1986

Publication information
Publisher: Aqua Fennica
Year: 1986
Original language: English
Research output: Scientific - peer-review › Other contribution