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DOI:10.24200/J30.2018.1351

Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 143-151, Research Note

- Received 30 May 2016; received in revised form 1 October 2016; accepted 8 October 2016.

Abstract

Three main parameters in steel moment-resisting connection (MRC) design are; stiffness, strength, and ductility. The response of the beam-to-column connections is strongly affected by the panel zone. Wide experimental and analytical studies have been carried out in order to examine the behavior of panel zone Northridge (1994) and Kobe (1995) earthquakes showed that excessive shear distortions could create brittle ruptures at the welds of beam-to-column connection. The results obtained from these Earthquakes have been reflected in the subsequent changes proposed to the design approach in the American and European codes. AISC prequalified connections can be used for columns if horizontal continuity plates are used inside the column. The use of internal horizontal continuity plates as thick as the beam flange plates or stiffeners has been emphasized by FEMA355-D, to provide a good seismic performance for beam-to-column connections. Continuity plates are welded to the column web and flange at the level of tension and compression beam flanges. Performing these plates in connection with I beams to wide flange columns is easy and possible .Three faces of continuity plates in moment frame connection with I section beam and Box column section can weld CJP groove weld but in the connection forth face has many difficulties. This study first discusses the effects of continuity plate in I beam to Box section moment frame connection with top and bottom plate (WFP) then recommend new details for eliminating continuity plate. Studies have shown that the elimination of continuity plate in WFP connections decreased loading capacity, rigidity and energy absorption about 43, 58 and 35 percent respectively. In addition connections are proposed in this study for WFP connection with internal continuity plates, on average leading to reduction in loading capacity, rigidity and energy absorption about 8.9, 11.6 and 9.2 percent respectively. Moreover, I shape continuity plate has better performance than other two mentioned connections.

Key Words: Continuity plate, top and bottom plate connection, i shape continuity plate.

ment consider more than one index and do not rely on a single index before any decision making.
Drought analysis based on a single variable may not be sufficient, because drought is a multi-dimensional phenomenon that is related to multiple variables (e.g., runoff, soil moisture, and precipitation).
Considering the importance of indices in drought risk management, in this study, a Two-variate Standardized Index (TSI), based on rainfall-runoff data (1972-2010), regarding the concept of copula, has been developed for two river basins located in Guilan Province and Urmia Province, Iran. Moreover, the mentioned index is compared with two popular drought indices, i.e., the standardized precipitation index (SPI) and standardized streamflow index (SSFI), in order to assess drought conditions.
Results showed that TSI determines more severe drought conditions than SPI and SSFI in a specific drought event. Therefore, the disadvantages of SPI and SSFI are not found in TSI, making it more appropriate for drought frequency analysis. This analysis also indicated that, for specific conditions, Urmia basin experiences more severe drought than Rasht basin.

Key Words: Copula, drought frequency analysis, drought monitoring and forecasting, two-variate standardized index (TSI).

EXPERIMENTAL STUDY ON THE EFFECT OF NANO SILICA PARTICLES ON CREEP BEHAVIOR OF SOFT CLAY SOIL

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DOI:10.24200/J30.2018.1356

Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 133-141, Research Note

- Received 2 May 2016; received in revised form 26 July 2016; accepted 25 September 2016.

Abstract
The compressibility behavior of clay soil has been a major concern in geotechnical engineering. When clay is subjected to a load, effective stress increases with time as a result of dissipation of induced excess pore water pressure, which is known as primary consolidation. After the complete dissipation of the excess pore water pressure, if the load is continuously maintained on the clay, further deformation can be observed over a long period of time, which is known as the secondary compression or creep. When buildings, embankments, and other structures are built on clay soils, large settlements can often be found. Especially, time-dependent deformation in structures built on soft soil may cause damage. Therefore, the study of creep behavior of clay soil for geotechnical application is necessary. Before construction of a structure, to provide a suitable bed, different ways, such as preloading, consolidation and appropriate additives, are applied. In recent years, improvement of soil characteristics using different additives is widely employed. In this study experimental programs are conducted to investigate the effects of low percent Nano silica on creep behavior. One-dimensional single stage and stepwise compression creep tests are conducted using standard oedometer apparatus under different stress levels on soft clay samples. Creep mechanisms are explained based on contacts and deformation of particle and relationship between coefficients of secondary compression and void ratio. Test results clearly indicate that the behavior of soft clay affects percentage of Nano silica and stress levels. With increasing the Nano silica to a specified level, the creep rate of samples decreases, and thus, the soil sample becomes denser. However by a more increase in ratio of Nano silica, porosity and coefficient of secondary compression decreases. On the other hand, it was observed that there is a nonlinear relation between the vertical stress level and coefficient of secondary compression. Also in stabilized samples with Nano silica, the values of compressibility index are smaller than the samples without Nano silica. Of course with increasing the Nano silica to 0.5 weight percentage, due to soil resistance increment against settlement the compressibility index decreases, and with more increase in the weight percentage of Nano silica the compressibility index increases.

Key Words: Creep, nano silica, one-dimensional consolidation, soft clay soil, coefficient of secondary compression.

SUGGESTIONS TO REMOVE THE CONTINUITY PLATES OF BOX COLUMNS

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Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 111-122, Research Note

- Received 7 February 2016; received in revised form 11 September 2016; accepted 9 October 2016.

Abstract

Solitary waves are often applied for simulating tsunami phenomenon. In this article, a meshless method based on exponential basis functions (EBFs) is developed to simulate the propagation of solitary waves and run-up on the slope. This method is a boundary-type meshless method using exponential basis functions with complex exponents. The solution to governing equations is considered as a series of these basis functions and boundary conditions satisfied via a point-wise collocation approach. In this research, the simplified Navier-Stokes equations in the Lagrangian form for an incompressible inviscid fluid are employed. Governing equations and boundary conditions are established on pressure as a potential equation. A stable Lagrangian time marching algorithm is developed for tracking free surface on the beach. So, the solution process can be preceded by boundary nodes tracking, and the most important characteristics of a fluid, such as the displacement, velocity, and acceleration, are the results of pressure Laplace equation. Geometry updating is only performed by changing the location of boundary nodes, and there is no need to mesh generation or any integration in solution process. According to the Lagrangian formulation, the numerical solution is performed at a time marching approach using an implicit two-step algorithm. In this algorithm, pressure equation is solved twice a step, and position of boundary nodes is corrected at the end of each time step. Minimum calculation time, convenient performance, and high accuracy in the solution process are the advantages of this method. The results of the present numerical method in the prediction of solitary wave propagation and estimation of run-up are verified through the comparison with experimental data. Different wave amplitude cases are simulated, and the resulted run-up is compared with experiments. The results show that presented meshless method and developed time marching algorithm are capable of simulating the run-up under non-breaking condition quiet accurately.

Key Words: Solitary wave, meshless method, exponential basis functions, lagrangian formulation, wave run.

DROUGHT FREQUENCY ANALYSIS BASED ON DEVELOPMENT OF A TWO-VARIATE STANDARDIZED INDEX (RAINFALL-RUNOFF)

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Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 123-132, Research Note

- Received 10 April 2016; received in revised form 4 September 2016; accepted 24 September 2016.

Abstract

Drought is one of the catastrophic events which has always imposed a lot of irreparable damages on human societies. Drought is not only related to a specific climate condition, but also it can occur in any areas under any climate regime. Therefore, investigating drought and its effects is a critical issue.

To minimize the negative effects of drought, prioritizing risk management instead of crisis management and also drought monitoring and forecasting are essential. Drought indices have specific importance in assessing drought conditions as they are extensively used in drought literature. Many drought indices have been developed for evaluating drought conditions all around the world. Although different drought indices have no preference to each other, some of them have a better performance under a specific situation. In some cases, it is more appropriate to assess drought conditions with several indices. Therefore, most of the designers, planners, and decision-makers in water resources manage-

binary blended admixtures and six mixtures containing both silica fume and natural pozzolan as ternary blended mixtures. The purpose of 40% and 60% replacement of cement with natural pozzolan was investigating mechanical and durability properties of concrete containing high volume natural pozzolan. The results indicated that, natural pozzolan used in this research did not have significant effect on concrete chloride resistance in 28 days, however in long term it shows effective improvement. Combined use of silica fume with natural pozzolan enhanced significantly the compressive strength and chloride resistance of concretes containing natural pozzolan, particularly at early ages. Using the natural pozzolan at high volumes reduced the compressive strength especially at early ages in comparison with ternary mixtures containing silica fume and natural pozzolan and the control admixtures. Nonetheless, the differences between compressive strength of mixtures decreased by increasing the curing age up to 90 days. Regarding the capillary absorption test results, binary mixtures containing silica fume or natural pozzolan did not show any significant effect on reduction of capillary absorbed water, but ternary mixtures with silica fume and natural pozzolan show reduction of capillary absorption content. Considering the water absorption test and sulfuric acid resistance ternary admixtures containing silica fume and natural pozzolan did not indicate any desirable effect.

Key Words: High performance concrete (HPC), blended cement, silica fume, natural pozzolan, sustainable development.

INVESTIGATION ABOUT SHEAR BEHAVIOR OF SAND REINFORCED WITH GEOTEXTILE WITH EMPHASIS ON SHEAR ZONE

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Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 99-109, Research Note

- Received 21 November 2015; received in revised form 28 August 2016; accepted 25 September 2016.

Abstract

Investigation of the effect of angle and geotextile position on the sand resistance parameters is the aim of this experiment. The behaviors of the tested samples were analyzed by the direct shear tests results and charts derived from it. In this study, three positions, including vertical, horizontal and oblique, were studied. Each of these items also has other arrangements. In total, 17 different arrangements were tested under three overload stresses. The type of soil is have lower initial shear sand. The results show that soil reinforced horizontal arrangements stiffness. Also, they have softer behavior. In vertical arrangements, the shear strength increases with increasing number of layers. Shear strength in oblique arrangement with two layers is greater than the vertical arrangement with two layers. For example, for stress of 2 kg per square centimeter, in arrangement with two-layer vertical and double-layer, there are oblique 23 and 33 percent increases in resistance. In oblique arrangement, the less the position angle relative to the horizon is, the more the shear strength will be.

Using reinforcement elements in improving geotechnical properties of soil has been considered by a human for many years. In recent years, many improvements have been made in the field of improving poor soils and reinforcing them. Soil reinforcement has been used as an effective method to improve the soil layers in order to increase the bearing capacity and reduce the settlement. In oblique arrangement, the results showed that if the direction of moving geotextile is in line with that of cutting, then we can observe an increase in the rate of resistance; if the direction of moving is in opposite direction with shearing direction, then we can observe a decrease in the rate of resistance. The results of vertical arrangement showed that by increasing geotextile layers, the rate of resistance increased. The results of the test showed that in horizontal arrangement, the rate of flexibility decreased and not significant difference in the rate of resistance was seen. The results of the study on different samples showed that using geotextile almost in all the conditions caused an increase in the rate of flexibility and resistance.

Key Words: Geotextile, shear strength, sand reinforcement, shear zone.

NUMERICAL SIMULATION OF SOLITARY WAVE RUN-UP ON THE BEACH BY A MESHLESS METHOD BASED ON EXPONENTIAL BASIS FUNCTIONS

Key Words: Steel plate shear wall, semi-connected, partially connected, nonlinear analysis, finite element.

OPTIMUM DESIGN OF SPECIAL R.C. SHEAR WALL WITH BOUNDARY ELEMENT

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Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 75-85, Original Article

- Received 25 May 2016; received in revised form 11 September 2016; accepted 25 September 2016.

Abstract

Construction cost reduction for design engineers has always been important. However, reducing the cost of building should not reduce the quality of the structures. In other words, by providing an optimized design, the maximum capacity of the materials is used. In this study, to achieve these objectives, meta-heuristic algorithms perform the optimization. To optimize RC shear walls, meta-heuristic hybrid algorithm called firefly and particle swarm optimization (FA-PSO) is used. The results of this study confirm the efficiency and accuracy of the algorithm to achieve the global optimum. In this study, the optimal design of reinforced concrete shear walls is done by boundary element and seismic conditions. Cost of reinforced concrete shear wall includes the cost of materials (steel and concrete) and cost formwork, introduced as a goal function. Shear wall design criteria and constraints according to ACI Regulations are written. So the optimal point at the lowest cost is achieved when all constraints are met. In addition, the objective function is written in a manner that requires no database optimization done continuously. This collection is presented in the form of a program. This program is a graphical interface, allowing the user to enter information related to the shear walls and outputs designed to easily observe. Two methods are provided to optimize the shear walls in this research. The first method is continuous optimization, and the second method is the continuous optimization while taking into account the dimensions of discrete variables to include construction conditions. One of the main advantages of this method compared to discrete is that there is no need to create the database (Section database). This causes the application to review all design modes. The results show that plan is the most economical as possible due to the continuous optimization, as opposed to discrete method, which depends on a variety of databases and problem types.

Key Words: Improved algorithm hybrid, hybrid particle swarm and firefly algorithm, reinforced concrete shear walls, structural optimization.

THE PROPERTIES OF CONCRETE CONTAINING TERNARY CEMENT OF HIGH VOLUME TUFF AND SILICA FUME

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Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 87-98, Original Article

- Received 21 June 2016; received in revised form 18 September 2016; accepted 2 October 2016.

Abstract

In blended Portland cement, clinker is replaced partially with supplementary materials such as Pozzolanic materials, which may improve the mechanical, physical and durability characteristics of cement and concrete. Sirjan Tuff is volcanic natural pozzolan that is in vicinity of Sirjan mountain and using for producing pozzolan cement in cement companies of Kerman-Iran. Use of blended cements has advantages such as reducing air pollution, saving natural resources and reducing energy consumption. The properties of blended cements with high volume pozzolan have been investigated in this research. For this purpose, pozzolanic materials including silica fume (SF) and a natural pozzolan (NP) were investigated. The concrete mixes include one plain mixture with 100% Portland cement type II, three admixtures containing 3, 6 and 9 percent of cement replaced with Silica fume as binary blended admixtures, two mixes with natural pozzolan replacement levels 40 and 60 as

Abstract

Soil cement consists of Portland cement, soil, and water, in which hydration of cement and compaction causes the materials to bond together making a dense and durable composition with low permeability and resistance to abrasion. According to ACI 116R, soil-cement is a mixture of soil and a certain amount of cement and water which has been compacted to high density. A more comprehensive definition has been provided in ACI 230 IR, which defines soil-cement as a hard material with specific engineering properties produced by mixing, compaction and curing of soil, aggregate, Portland cement, additives and water. All types of soils can be used in soil-cement mixture, except the organic and plastic soils and reactive sand. The most suitable soil for soil-cement contains 5% to 35% of fine passing sieve 200. However, more than 2% of organic materials in soil are strictly unacceptable. Soil cement application in dams and pavement construction has grown rapidly in recent years. Although soil-cement is similar to concrete, the main difference is in the type and size of aggregate particles used. Soil-cement is principally made of round natural fine aggregates while concrete is made up of coarser aggregates. Most of the recent researches are focused on the addition of various types of cement to mixture. In this paper, we decide to use nano-SiO_2 particles in soil-cement and observe the out-coming effects. According to what was mentioned above, tests were conducted on the soil cement/nano-SiO_2 matrix in order to find the stress-strain behavior of these materials. The test procedure consists of tri-axial tests on the soil-cement-silica matrix. In these tests, silica fume (with specific surface area of $21m^2$/g) and nano-SiO_2 (with specific surface area of 200 and 380 m^2/g) were added to soil-cement. The studied parameters are curing time, types, and contents of silica production. The results show that adding certain amounts of nano-SiO_2 particles to soil-cement matrix can improve shear strength and change behavior of the matrix.

Key Words: soil-cement, nano-sio_2, triaxial test, shear strength, behavior of materials.

CYCLIC BEHAVIOR OF STEEL PLATE SHEAR WALL CONNECTED TO FRAME BEAMS ONLY

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DOI:10.24200/J30.2018.1357

Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 63-73, Original Article

- Received 20 April 2016; received in revised form 23 July 2016; accepted 24 September 2016.

Abstract

Many previous experimental and analytical studies have shown that the column demands, especially column axial force demands, in a traditional multi-story steel shear wall (SPSW) system are extremely large for typical systems. Such configuration, in turn, results in large column dimensions and prohibits the use of narrow walls, thereby reducing the system's economy. Further, most of the column axial forces, especially in multi-story cases, come from plate tension forces on interfaces with the columns at different stories of the system. Thus, releasing the infill wall from the columns can help the column axial force demands to be reduced significantly. In the present paper, the behavior of steel shear walls connected to frame beams only is investigated using the finite-element method and compared with that of the corresponding system with fully connected infill walls (typical SPSW), in terms of strength, initial stiffness, ductility and max of out-of-plane deformation. In this study, the effects of different system aspect ratios, various infill plate thicknesses and application of end plate stiffeners on the free edges of the infill plates are also considered. SPSWs are analyzed using the nonlinear pushover analyses. The adequacy of the finite element modeling approach to representing the pushover responses of SPSWs is verified through comparison with experimental results. Results show that releasing of the infill wall connection to the columns limits the widespread yielding of the infill plate. This, in turn, affects the strength, initial stiffness and ductility of the system. Notably, the behavior of SPSW frames is not affected much by such configuration. Increasing the infill plate thickness in proportion to the decrease of its strength, not only offsets the effect of this configuration on the system strength, but also improves the system behavior in terms of initial stiffness and ductility (compared to the corresponding system with infill plate connected to boundary columns and beams). Application of end-plate stiffeners on the free edge of the infill plates in semi-connected systems can effectively reduce the out-of-plane deformation of the infill wall, but it has no significant effect on the system strength.

struction industry, and hence, to reduce the emission of this gas.

Key Words: $CaCo_3$, nano-carbon layers, compressive and flexural strength, electrical resistivity, water absorption.

PROBABILISTIC ASSESSMENT OF THE EFFECS OF THE UNCERTAINTY ON THE SEISMIC PERFORMANCE OF STEEL FRAMES EQUIPPED WITH TUNED MASS DAMPER

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DOI:10.24200/J30.2018.1353

Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 41-50, Original Article

- Received 9 February 2016; received in revised form 21 August 2016; accepted 25 October 2016

Abstract

Protecting civil engineering structures from environmental loads, such as strong winds and severe earthquakes, can save lives and reduce structural damages. Using passive, semi-active, and active control schemes for this purpose has become more promising and feasible over the past two decades. Passive control devices, such as viscous elastic dampers, viscous fluid dampers, friction dampers, metallic dampers, tuned mass dampers and tuned liquid dampers can partially absorb structural vibration energy and reduce seismic responses of structures. Meanwhile, Tuned Mass Dampers (TMD) are used as passive devices for energy dissipation in structural systems. A TMD device consists of a mass, spring, and dashpot and typically is tuned to the natural frequency of the primary structural system. By attaching a TMD to the main structure, a portion of the vibration energy of the main structure is to transferred to the TMD where it dissipates in the damper of the TMD. One of the disadvantages of TMD is the sensitivity of its parameters to dynamic characteristic of the structure. In large earthquakes, the dynamic characteristics of the structure change due to inelastic behaviors. However, TMD parameters are set on the basis of initial dynamic characteristics of the structure and do not change during the vibration of the structure. Hence, any change in the dynamic characteristics of structure may lead to interference with TMD optimum performance and, in some cases, to an increase in the structure response. In this paper, inelastic behavior of material and geometric non-linearity of the structure are considered, and the effects of uncertainty in mass, damping, module of elasticity and yielding strength of the material on the performance of the TMD are investigated by using the fragility curves. Results indicated that uncertainty in mass and damping of the structure has greater influence on the response of structures equipped with TMD compared to module of elasticity and yield strength.

Key Words: Fragility curve, uncertainty, material inelasticity, geometric nonlinearity, incremental dynamic analysis.

EFFECTS OF ADDING SILICA BASED PARTICLES WITH DIFFERENT SPECIFIC SURFACE AREAS ON THE SHEARING STRENGTH PARAMETERS AND BEHAVIOR OF SOIL-CEMENT MATERIALS

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Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 51-61, Original Article

- Received 1 March 2016; received in revised form 18 June 2016; accepted 26 September 2016.

• Received 1 February 2016; received in revised form 11 June 2016; accepted 7 November 2016.

Abstract

Destination choice problem is an essential element in transportation planning processes. The problem is to find the probability that a person traveling from a given origin will choose a destination among many available alternatives. In recent decades, applications of discrete choice models in trip distribution have increased. Destination choice models are coupled with several challenges, including large choice sets, complicated alternative specific attributes, and endogeneity problem. Determining the destination of trips with no fixed destinations, such as shopping and recreational trips (unlike mandatory trips), has been the focus of researches as soon as the activity/tour-based paradigms were introduced. Nonetheless, the classic destination choice models have paid less attention to psychological and personal attributes of travelers. Several studies on consumer behavior in shopping centers have revealed that in addition to observable emographic and socio- economic variables, latent constructs, such as psychological variables, lifestyle, and the orientation of the center, are important indicators to be considered to capture the true behavior of travelers. This paper presented a comprehensive analysis on shopping behavior of travelers in major shopping centers in Tehran, Iran. A hierarchical analysis of abovementioned characteristics of costumers in choosing shopping centers with or without parking and food court was discussed. An internet-based survey was conducted to collect the required data for the modelling exercise which included information of 213 individuals. The nested logit model is currently the preferred extension to the simple multinomial logit discrete choice model. The appeal of the nested logit model is its ability to accommodate differential degrees of interdependence between subsets of alternatives in a choice set. The results did not reject the proposed hierarchical decision-making process hypothesis. While being aware of the biases associated with internet-based surveys, it was found that women and highly educated travelers prefer shopping centers with both parking and food courts, whereas people who travel by public transportation select centers with neither parking nor a food court facility.

Key Words: Destination choice, nested logit, latent variable, shopping behavior, Tehran.

EFFECT OF CACO3 PARTICLES COVERED BY NANO-CARBON LAYERS ON THE PROPERTIES OF HIGH-STRENGTH CONCRETE

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DOI:10.24200/J30.2018.1352

Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 31-39, Original Article

• Received 8 February 2016; received in revised form 28 September 2016; accepted 8 October 2016.

Abstract

Over the past decades, the production of cement as a key material in concrete has been increasing due to the need of civil works to this vital construction material. However, the production process of cement is costly and, more importantly, is not environmentally-friendly due to the emission of huge amount of carbon dioxide (CO_2) in the atmosphere. Reducing cement consumption in concrete through partial substitution by inexpensive eco-friendly materials can effectively reduce the emission of greenhouse gases. Calcium carbonate ($CaCo_3$) widely available as a waste material during wastewater treatment process can be one of those materials. In this paper, the effects of $CaCo_3$ covered by nano-carbon layers on the mechanical as well as durability properties of concrete are experimentally investigated. In the first phase, the effect of cement substitution by $CaCo_3$ covered by nano-carbon layers on the early strength of high-strength concrete is evaluated to determine a reasonable range of substitution for the second phase. The influence of partial cement substitution by these particles on the compressive strength in different ages, tensile strength, flexural strength, water absorption capacity, and electrical resistivity of concrete is investigated in the second phase. The results indicate that due to the presence of $CaCo_3$ particles, the compressive strength of concrete remains more or less constant even with reducing the amount of cement in concrete. Based on the result obtained in this research, up to 7 percent of cement content in concrete can be substituted by $CaCo_3$ particles covered by nano-carbon layers without remarkable reduction in mechanical properties of hardened concrete. Bearing in mind that reducing the amount of Co_2 emission is remarkably essential for our environment, using these particles as a partial cement substitution is an effective way to decrease cement consumption in the con-

part-9 and Iranian standard 2800 for seismic design. The results indicate that the torsion induced by the eccentricity of axis of wide beam relative to axis of column, must be included in the design of wide beam-column connections. Furthermore, increasing eccentricity causes a drop in lateral load-drif. In the case of maximum eccentricity and 5% drift the drop embarks on 12.8%. In addition, by increasing the ratio of beam-to-column width, eccentricity is more destructive.

Key Words: Reinforced concrete, wide beam, exterior connection, nonlinear finite elements, eccentricity.

EXPERIMENTAL INVESTIGATION OF THE FLOWFIELD AROUND STRAIGHT SPUR DIKES LOCATED IN A DIFFERENT LOCATION OF 90° BEND

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DOI:10.24200/J30.2018.1348

Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 13-22, Original Article

- Received 16 January 2016; received in revised form 4 June 2016; accepted 24 December 2016.

Abstract
Spur dikes deflect the approaching flow to the far bank and decreases the sediment deposition. The scour hole formation and flow field features around spur dikes are interesting subjects in hydraulic engineering. In this paper, the flow field around straight spur dikes in a 90˘d52 sharp bend was investigated experimentally. Three different experiments were conducted in a prismatic channel with 90˘d52 bend at Tarbiat Modares University Tehran, Iran. In each experiment, a straight spur dike was attached to the outer bank in different angles with respect to the beginning of the bend. The flow fields were measured using Vectrino apparatus. In each point, the velocity was measured in 100 HZ frequency for 3 min. Despiking process was done using previous research approach. The spectral analysis, mean flow analysis, higher correlation analysis, bed shear analysis, turbulent intensity analysis, power spectrum analysis, and quadrant analysis were conducted. Results confirm the existence of the secondary flow in the bend, horse shoe vortex, and recirculation flow region. There is no strong difference between the mean flow fields around the spur dikes. Ejection and sweep events have the main role in shear layer regions, and the interactions are the dominant processes in the downstream recirculation zone. The spectral analysis confirms the existence of the inertial subrange for some frequency range. Some peaks are observed in power spectrum graphs that may, due to the vortex shedding process, confirm the ability of the flow for sediment transport. The bed shear stress based on linear relationship between bed shear stress and turbulent kinetic energy and bed shear stress and vertical velocity fluctuation in vertical direction cannot predict the scour potential region accurately. In addition, the contribution of the ejection events in Reynolds stresses may be one of the important reasons in sediment suspension in the initial time of scour process.

Key Words: Experimental study, ADV, spur dike, 90° bend.

A HIERARCHICAL ANALYSIS OF FOOD COURT AND PARKING IMPACT ON TRAVEL TO SHOPPING CENTERS

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DOI:10.24200/J30.2018.1358

Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 23-30, Original Article

Abstracts of Papers in English

NUMERICAL INVESTIGATION ON THE SEISMIC BEHAVIOUR OF REINFORCED CONCRETE EXTERIOR WIDE BEAM-COLUMN CONNECTIONS WITH ECCENTRICITY

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Sharif Civil Engineering Journal
Volume 34, Issue 2.1, Page 3-12, Original Article

- Received 27 July 2015; received in revised form 7 November 2016; accepted 18 November 2016.

Abstract

During past decades, the use of wide beam-column RC system as a way to optimize the cost of construction has been proposed. In this context, many researchers have studied seismic behavior of wide-beam column connections. However, no researches have been carried out on the behavior of these joints when the axis of wide-beam and that of column have eccentricity relative to each other. In order to illustrate the structural performance of reinforced concrete wide beam-column connection, an experimental research was carried out to illustrate the behaviour of exterior RC wide beam-column connections when subjected to quasi-static cyclic loading. The specimen was full-scale connection. This specimen was designed in accordance with ACI-318 version 2008 and controlled by ACI-318 version 2014. Experimental results indicated that the hysteresis response of the wide beam was likely exhibited remarkable enhancement compared to that of conventional beam and the total energy dissipating capacity of a wide beam—column connection was higher than the conventional joint. In this study, exterior wide beam-column connections were simulated using nonlinear finite elements. Concrete material was simulated using plastic-damage model integrated into ABAQUS software. The lateral load- drift curves are in good agreement with experimental results. After validation of the numerical models, the effects of various parameters including eccentricity, beam to column width ratio and column axial load have been investigated for the wide beam-column connections of six buildings containing three 5 stories, two 6 stories and one 7 stories designed based on the Iranian Building code of practice