Emerging Trend In Deep Basement Construction Top Down

Offers solutions to more than twelve hundred common home maintenance problems related to basements, carpeting, wallpaper, mildew, driveways, fireplaces, wood stoves, plumbing, furnaces, and roofs

Urban centers are increasingly becoming the locus of enterprise, innovation, and population. This pull toward the center of cities has steadily elevated the importance of these areas. Growth has necessarily spawned new construction. Consequently, modern buildings are often constructed alongside legacy structures, new deep basements are constructed alongside existing shallow foundations, and city blocks composed of a variety of building types result. The underlying soil, foundation, and superstructure of each of these buildings can interact and combine to yield unique seismic responses. Since the seminal work of researchers such as Luco and Contesse (1973) and Wong and Trifunac (1975), researchers have investigated the effects of soil-structure interaction (SSI). This phenomenon refers to the interaction between a single building, its foundation, and the underlying soil during a seismic event. However, as the trend toward urbanization continues, a shortcoming of this conventional SSI approach is that in reality, a structure will almost certainly be located near other structures in metropolitan areas. In this line of research, the interaction of multiple, adjacent buildings during a seismic event, a phenomenon known as structure-soil-structure interaction (SSSI), is investigated. This topic does not yet command the level of attention given to SSI. However, SSSI has the potential to be significantly detrimental or beneficial, depending on the configuration and dynamic properties of the buildings and their foundations in dense urban environments. It is important to understand SSSI effects so that earthquake engineers can make informed decisions about the design and construction of structures in increasingly dense urban areas. As part of a larger, multi-university National Science Foundation (NSF)-supported Network for Earthquake Engineering Simulation Research (NEESR) project, a series of centrifuge experiments were performed at the NEES-supported Center for Geotechnical Modeling (CGM) at the University of California, Davis. Each of these experiments examined aspects of SSI or SSSI through the use of nonlinear structural model buildings situated on different foundations that were supported on deep sand deposits. The centrifuge experiments created a suite of small-scale physical model "case histories" that provided "data" and insight that could be extended through calibrated numerical simulations. The results of the first three centrifuge experiments in the test series (i.e., Test-1, Test-2, and Test-3) were utilized in this dissertation. Numerical analyses are usually only performed for high-profile projects. The effort, expertise and resources required to calibrate and to perform detailed numerical simulations is often prohibitive for typical low- to mid-rise structures. There is a need for a

more accessible numerical tool that both geotechnical and structural engineers can utilize to gain insight. In this research, the FLAC finite difference program (Itasca, 2005) with a fully nonlinear effective stress soil constitutive model was used to analyze the centrifuge test-generated "case histories." Test-1 and Test-2 examined SSI and SSSI effects of two moment-resisting frames (MRFs). Test-1 employed a solitary 3-story (prototype) MRF founded on shallow spread footings and a solitary 9-story (prototype) MRF founded on a deep basement (equivalent to 3-stories, prototype) to investigate SSI effects. In Test-2, the 3-story (prototype) and 9-story (prototype) MRFs were placed immediately adjacent to one another to examine SSSI effects. Kinematic interaction effects were primarily observed in these tests. Hence, Test-3 was designed to investigate inertial interaction effects. Three structures were included in Test-3: two MRFs founded on shallow spread footings and one elastic shear-wall structure on a mat foundation. Each of these structures was designed to maximize inertial interaction by: (1) matching the flexible base period of each structure to the soil column to induce resonance, and (2) optimizing structural properties to increase inertial interaction effects. One MRF was positioned alone at one end of the centrifuge model, a SSI condition, and the other MRF and the elastic shear-wall structure were positioned immediately adjacent to each other in the other end of the centrifuge model, a SSSI condition. The rich data set developed through the centrifuge experiments formed the basis of the initial FLAC analyses. A critical aspect of any seismic analysis is the constitutive model used to capture the soil response to cyclic loading. Several soil models were examined during an initial seismic site response analysis. Free-field data from sensors located within the centrifuge soil column were used to quantify the vertical propagation of ground motions through the soil profile. The best model for the dense (Dr = 80%), dry sand used in the centrifuge for Test-1 through Test-3 was a Mohr-Coulomb based model with hysteretic damping, UBCHYST (Naesgaard, 2011). Pseudo-acceleration response spectra and acceleration time histories at the base and at the free-field surface from the centrifuge and the numerical model were compared. The numerical simulations successfully captured the key aspects of the observed seismic site-response for both near-fault pulse-type motions and ordinary motions at a variety of intensities. After successfully capturing the free-field seismic site responses of Test-1 and Test-2, the dynamic responses of the structural models were examined. Each structure was modeled satisfactorily with a two-dimensional, plane-strain numerical model. Engineering design parameters (EDPs) were computed for key structural responses, including (1) transient peak roof drift, (2) residual roof drift, (3) transient peak displacement and (4) peak acceleration at the center of mass of the structure. Additionally, the acceleration time histories and pseudo-acceleration response spectra at the center of mass of the structure for each motion were examined. These metrics were used to compare the numerically estimated dynamic responses with those recorded in the centrifuge experiments. The dynamic response of the 3-story (prototype)

MRF estimated with the numerical model was in close agreement with the observed experimental data for both the SSI (Test-1) and SSSI (Test-2) configurations. The more complicated 9-story (prototype) model exhibited greater sensitivity to numerical system inputs, including fixed-base fundamental period and applied structural Rayleigh damping. However, the majority of its recorded dynamic responses were well-matched by the numerical model. The resonant condition created in Test-3 proved challenging to model numerically. The two Test-3 conditions (i.e., SSI and SSSI) were analyzed separately. Significant inertial interaction, including rocking, was observed during the centrifuge test and in the post-processing of data; pseudo-acceleration responses three to five times those recorded in Test-1 and Test-2 were recorded. While the shapes of the pseudo-acceleration response spectra, periods of amplification, and time-histories were well-captured, the numerical model estimated significantly lower amplitudes of the responses for the structures than were observed during the centrifuge test. A sensitivity study was performed to evaluate the influence of several parameters, including (1) the shear wave velocity profile, (2) interface elements, (3) fixed-base fundamental period estimate, and (4) constitutive model parameters. Some of the relative lack of amplification in the numerical simulations was due to over damping in the constitutive model. This was addressed by altering the shear modulus and material damping curves for the soil directly beneath the structures' foundation elements. However, the primary reason for the lower amplitude estimated by the numerical model appeared to be due to the difficulty of capturing the seismic responses of structures in the resonant condition. Shifting the period of any component of the soil-structure system would necessarily have a significant impact on the dynamic response by shifting the system away from resonance. Despite this challenge, the numerical simulations yielded important insights. While the amplitudes of dynamic responses were underestimated for most of the ground motions, the changes in response of the 3-story (prototype) MRF between SSI and SSSI were captured. The elastic shear wall displayed similar behavior; while the spectral shapes were matched for most motions, the amplitudes estimated by the numerical simulations were consistently below those observed in the centrifuge. Comparison of overall change from low- to high-intensity motions or trends from SSI to SSSI could be captured with the model; however, the amplitudes of the responses were generally underestimated. This set of analyses highlighted the challenge of modeling a resonant condition. Additional work is needed to explore the characteristics of the centrifuge when intense input motions are used which are in resonance with the soil in the model. Finally, two prototypical structures were examined. The first, a 3-story MRF, was the model upon which the centrifuge 3-story (prototype) model was based (Ganuza, 2006). Both solitary (SSI) and adjacent (SSSI) configurations were considered for this prototypical 3-story MRF founded on a dense sand soil column. The dynamic responses of the MRF for the solitary (SSI) condition paralleled those observed in the

centrifuge experiments. For the considered configurations of adjacent low-rise structures, SSSI effects were found to be either negligible or only slightly beneficial or detrimental for the five ground motions utilized for dynamic analysis. The other prototypical MRF, a 5-story structure, was a simplified version of a typical, medium-rise structure (Ganuza, 2006). The 5-story MRF exhibited dynamic responses consistent with previous work. Amplific.

This book provides an attractive and informative overview of Colombian landscapes and their geological evolution, including comprehensive descriptions of seventeen key selected sites in the country. It provides insight into the geomorphological diversity of Colombian landscapes characterized by climatic and topographic variation. The book covers the essence of the landscapes in the country: coastal features, mud volcanoes, desertic geoforms, snow covered peaks, active volcanoes, deeply incised canyons and subdesertic valleys. It contributes knowledge and understanding into Colombian landscapes and prospects.

"Extending from Colorado, USA, on the north to the state of Chihuahua, Mexico, on the south, the Rio Grande rift divides the Colorado Plateau on the west from the interior of the North American craton on the east. This volume focuses on the Rio Grande rift's upper crustal basins and is organized geographically with study areas progressing from north to south. Nineteen chapters cover a variety of topics, including sedimentation history, rift basin geometries and the influence of older structure on rift basin evolution, faulting and strain transfer within and among basins, relations of magmatism to rift tectonism, and basin hydrogeology"--Provided by publisher.

Vacant lots, so often seen as neighborhood blight, have the potential to be a key element of community revitalization. Sandra Albro offers practical insights through her experience leading the five-year Vacant to Vibrant project, which piloted the creation of green infrastructure networks in Gary, Indiana; Cleveland, Ohio; and Buffalo, New York. Vacant to Vibrant provides a point of comparison among the three cities as they adapt old systems to new, green technology. Albro offers insights from every step of the Vacant to Vibrant project, including planning, design, community engagement, implementation, and maintenance successes and challenges of creating a green infrastructure network from vacant lots in neighborhoods. Landscape architects and other professionals whose work involves urban greening will learn new approaches for creating infrastructure networks and facilitating more equitable access to green space.

This collection of papers on the geology of the Grand Canyon and the Colorado River is an outgrowth of informal conversations among Colorado Plateau geologists over a period of several years.

Hardcover plus CD

The Art of Reading Buildings focuses on the practical art of reading a building and applying its positive and negative attributes in developing a size-up for fireground operations that center on structure fires. First-due company officers, incident commanders, and safety officers will appreciate the practical “street-wise” lessons captured in the book. Chief officers, training officers, engineers, firefighters, and fire

science degree candidates will benefit from the wide range of building construction topics covered in this text. Features include: • Understand the technical and practical aspects of building construction • Learn on-the-spot building construction assessment using the authors' custom Rapid Street-Read Guides • Develop a quick construction size-up for immediate application to fireground operations • Recognize firefighter traps in newer and alternative construction methods • This text covers objectives for the National Fire Academy's Fire and Emergency Services in Higher Education (FESHE) Building Construction for Fire Protection course

This volume combines review and solicited contributions, related to scientific studies of Division I of IAGA presented at its Scientific Assembly in Sopron in 2009. The book is aimed at intermediate to advanced readers dealing with the Earth's magnetic field generation, its historical records in rocks and geological formations - including links to geodynamics and magnetic dating, with magnetic carriers in earth materials, electromagnetic induction and conductivity studies of the Earth interior with environmental applications of rock magnetism and electromagnetism. The aim of the book is to provide an overview of recent advances and future challenges in these particular fields of research.

Ground water resources are receiving global attention, as human population growth and development cause significant changes to the earth system. It plays a major role in ensuring livelihood security in many parts of South Asia and its contribution to poverty alleviation is substantial. The complex nature of ground water problems in the Indian Sub-continent requires a precise delineation of the ground water regimes in different hydro geological settings and socio-economic conditions and is a primary necessity for sustainable and equitable management. Strategies to respond to ground water over-exploitation and deteriorating water quality must be based on a new approach. Practical policies and various solution options urgently need to be formulated and implemented to prevent the development problems. There is pressing need to evolve workable methods and approaches based on modern scientific researches on ground water resources, as well as to build a social framework including community participation at all levels for a ground water development system. The community participation in water pumping policies, incentives of efficient use, affordability of low income users and other vulnerable groups, water awareness are prime factors for success of any ground water based water supply project.

A provocative call for the transformation of science museums into "idea colliders" that spark creative collaborations and connections. Today's science museums descend from the Kunst-und Wunderkammern of the Renaissance—collectors' private cabinets of curiosities—through the Crystal Palace exhibition of 1851 to today's "interactive" exhibits promising educational fun. In this book, Michael John Gorman issues a provocative call for the transformation of science museums and science centers from institutions dedicated to the transmission of cultural capital to dynamic "idea colliders" that spark creative collaborations and connections. This new kind of science museum would not stage structured

tableaux of science facts but would draw scientists into conversation with artists, designers, policymakers, and the public. Rather than insulating visitors from each other with apps and audio guides, the science museum would consider each visitor a resource, bringing questions, ideas, and experiences from a unique perspective. Gorman, founder of the trailblazing Science Gallery, describes three scenarios for science museums of the future—the Megamuseum Mall, “the Cirque de Soleil of the science museum world”; the Cloud Chamber, a local space for conversations and co-creation; and the invisible museum, digital device-driven informal science learning. He discusses hybrids that experiment with science and art and science galleries that engage with current research, encouraging connection, participation and surprise. Finally, he identifies ten key shifts in the evolution of science museums, including those from large to small, from interactive to participatory, from enclosed to porous, and from subject-specific to cross-disciplinary.

The Earth's Magnetic InteriorSpringer Science & Business Media

The first comprehensive study of the acclaimed Modernist architecture of Vancouver. The Modernist architecture of the two post-war decades established Vancouver's reputation as a center for progressive design and culture, a city where architects pursued their desire "to make of architecture a great humanistic experience." With an introduction by Adele Freedman discussing Modernism in Canadian architecture as a whole, Rhodri Windsor Liscombe's The New Spirit is the first comprehensive study of the acclaimed Modernist architecture of Vancouver. Modernism in Vancouver had many facets: it was a synthesis of expressions driven by a sense of social responsibility; it emphasized concerns such as economy of form, human uses, relation to site, affordability, and the effective employment of new technology. The author explores 25 years of sophisticated and distinctive architectureal innovation, examining both the conditions that brought this movement about and the forces that led to its decline. Given the eventual debasement of Modernism and the demolition of many of these Vancouver buildings, this account of the ambition of Modernist Canadian architects "to enhance the physical environment for human well-being" -- in homes, community centers, libraries and universities, churches, office towers, and apartment buildings -- serves as a reminder of how high ideals and a lively architectural culture can shape a better city.

This book summarizes the latest research on the structural geology of the mobile belts of the Indian subcontinent including the Himalayas, NE Himalayas, Bangladesh thrust belt, Andaman subduction zone, the Aravalli?Delhi, the Central India Tectonic Zone, the Singhbhum, the Eastern Ghats and the Southern granulite terrane. It offers essential information on deformational structures in the mobile belt, such as folding patterns, the character of the shear zone, shear strain analysis, and faults, as well as fault zone rocks. The findings presented here are based on field observations, mapping, sampling and analysis work (e.g. petrographic studies), as well as limited geochemical and geochronological analysis to support the findings. A discussion on the structural evolution of these mobile belts and their connections with other belts rounds out the coverage.

A surprisingly simple approach to help everyday people become everyday innovators.

The pressure to generate big ideas can feel overwhelming. We know that bold innovations are critical in these disruptive and competitive times, but when it comes to breakthrough thinking, we often freeze up. Instead of shooting for a $10-billion payday or a Nobel Prize, the most prolific innovators focus on Big Little Breakthroughs—small creative acts that unlock massive rewards over time. By cultivating daily micro-innovations, individuals and organizations are better equipped to tackle tough challenges and seize transformational opportunities. How did a convicted drug dealer launch and scale a massively successful fitness company? What core mindset drove LEGO to become the largest toy company in the world? How did a Pakistani couple challenge the global athletic shoe industry? What simple habits led Lady Gaga, Banksy, and Lin-Manuel Miranda to their remarkable success? Big Little Breakthroughs isn't just for propeller-head inventors, fancy-pants CEOs, or hoodie-donning tech billionaires. Rather, it's a surpassingly simple system to help everyday people become everyday innovators.

Sometime around 1500 A.D., an African farmer planted a maize seed imported from the New World. That act set in motion the remarkable saga of one of the world's most influential crops--one that would transform the future of Africa and of the Atlantic world. The recent spread of maize has been alarmingly fast, with implications largely overlooked by the media and policymakers. McCann's compelling history offers insight into the profound influence of a single crop on African culture, health, technological innovation, and the future of the world's food supply.

New York magazine was born in 1968 after a run as an insert of the New York Herald Tribune and quickly made a place for itself as the trusted resource for readers across the country. With award-winning writing and photography covering everything from politics and food to theater and fashion, the magazine's consistent mission has been to reflect back to its audience the energy and excitement of the city itself, while celebrating New York as both a place and an idea.